THE INDUSTRIAL REORGANIZATION ACT

HEARINGS

BEFORE THE

SUBCOMMITTEE ON ANTITRUST AND MONOPOLY

OF THE

COMMITTEE ON THE JUDICIARY

UNITED STATES SENATE

NINETY-THIRD CONGRESS

SECOND SESSION

ON

S. 1167

PART 4

Ground Transportation Industries

APRIL 4, 9, 10, AND 11, 1974

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(Pursuant to S. Res. 255, Sec. 4)

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THE INDUSTRIAL REORGANIZATION ACT (S. 1167)

(Ground Transportation Industries)

THURSDAY, APRIL 4, 1974

U.S. SENATE,
SUBCOMMITTEE ON ANTITRUST AND MONOPOLY
OF THE COMMITTEE ON THE JUDICIARY,
Washington, D.C.

The subcommittee met, pursuant to notice, at 10:30 a.m., in room 2228, Dirksen Senate Office Building, Hon. Philip A. Hart (chairman of the subcommittee) presiding.

Present: Senator Philip A. Hart.

Staff present: Howard E. O'Leary, Jr., staff director and chief counsel; Dr. David D. Martin, chief economist; Patricia Bario, editorial director; Janice C. Williams, chief clerk; and Peter N. Chumbris, chief counsel for minority.

Senator HART. The subcommittee will be in order.

We open before Senator Hruska has had an opportunity to join us. His attendant indicates that he is making every effort to get here and it is proper that we begin since the likelihood is great that we may be interrupted by Senate votes, hence losing some time.

Our first witness this morning is the associate general counsel and secretary of the Chrysler Corp., of Detroit, Mr. Paul A. Heinen. Mr. Heinen?

STATEMENT OF PAUL A. HEINEN, ASSOCIATE GENERAL COUNSEL AND SECRETARY, CHRYSLER CORP., DETROIT, MICH., ACCOMPANIED BY WALTER B. MAHER, STAFF MEMBER

Mr. HEINEN. Good morning. I have with me this morning Mr. Wally Maher who is a member of my staff.

I would like to read the statement. The attachments, of course, I won't go through but the statement itself, I think contains a number of points I would like to bring out.

At the outset I think it would be well to point out two significant differences in my viewpoint and that of some of your earlier witnesses. The first, of course, is that they have not worked for an automobile company, as I have for the entire 17 years of my business career.

This means that while they tend to see the problems of the industry purely from a bird's-eye point of view, I must consider not only the bird, but also the worm—and I must say that occasionally I fear for the survival of the worm.

But to clarify what I mean by this, an outsider can view a decision to bring out a new car, for example, as a relatively simple decision and the expenses involved, even though they may be in the hundreds of millions of dollars, are simply figures to him.

To me, they represent something quite different, for these hundreds of millions of dollars are really people and resources of the company.

In many cases, these decisions involve dislocations, they involve tremendous concerns and risks, they involve millions of subsidiary decisions, tremendous problems of coordination, not only of our own people, but also of vendors and others over whom we have no control, and an infinite number of details that do not appear obvious to an outsider.

For this reason, I have to view sweeping plans for rearrangement of plants and facilities and for changing existing industrial structures with a degree of skepticism that an outsider would not possess.

The second very vital distinction is that outsiders tend to think of the automobile industry in industry terms, and so make statements and reach conclusions concerning the industry's failure to do certain things and the desirability of the industry pursuing certain courses of action.

Many of these statements are premised on the assumption that the industry is a monolith that can make joint decisions on many matters.

They fail to recognize not only the tremendous competitiveness that exists between the various people in the industry, almost all of whom are extremely competitive by nature, but also the fact that if the industry acted in the manner that some people suggest they should, it could only be by reaching agreements among themselves that would be in clear violation of the law.

I think, then, that it is essential to clarify at the beginning that even though I will introduce some industry facts later in my testimony, I do not consider myself an industry witness.

I do not work for the automobile industry—I work for one company that builds and sells automobiles and competes vigorously with other companies, both domestic and foreign, that also build and sell automobiles.

In this connection, I note that the industry is alleged to be a shared monopoly, of which Crysler is one of the components.

In general terms, I gather that a shared monopoly is determined by combining the output of all of the producers of a product and then saying that since, in total, they are the only producers of that product, they are, by definition, a shared monopoly.

Of course, since this would even include wheat farmers, I assume the definition has to be narrowed a bit. From the comments I have read, it would appear that this broad definition should be refined to mean a relatively small number of producers of a product who make extraordinarily high profits.

Certainly it seems that anyone who occupies such an enviable position must find it very comfortable—large profits and little competition.

The only difficulty is that I do not see how, by the wildest stretch of the imagination, anyone could apply this definition to Chrysler Corp.

In my 17 years with Chrysler, I cannot recall one day that any of its top executives have ever been unaware of the tremendous competitive struggle that we face constantly.

Nor do I ever recall anyone feeling that, because of some understanding or arrangement, we do not need to fear competition from General Motors, Ford, or American Motors, or that we should, for any reason, hold back from doing anything lawful to attempt to best our competitors in any way we can.

Since, for these reasons, I cannot discuss either the automobile industry as a whole, or its allegedly shared monopoly position, I will discuss some of the issues that have been raised by previous witnesses from the perspective of, and as they apply to, Chrysler Corp.

Perhaps the first and most significant issue is the subject of excessive profit margins. It has been alleged that in 1972 shared monopoly overcharges to the consumer averaged $230 per car.

Let us examine this figure. In 1972, Chrysler earned a 2.3-percent rate of return on sales, and the average selling price of a car to its dealers was approximately $3,200.

This means that Chrysler had an average profit of approximately $74 for each car it sold. Since the claimed shared monopoly overcharge of $230 per car is several times greater than our actual 1972 model per car profit, and since it is supposedly over and above the normal profit which I presume even our critics would allow, it is a little difficult for me to accept.

The fact is that we have operated at inadequate profit margins for a number of years, in spite of every effort to increase them.

These profit margins, averaging 2.7 percent over the last 10 years, reflect not shared monopoly but rather intense and continued competition.

We have also been criticized for our model changes. Model changes are not, as many people imply, a result of shared monopoly in the automobile industry, but rather result from the intense competition that exists.

If there were some sort of agreement or understanding among the various companies in the industry, Chrysler would not find it necessary to attempt each year to produce a product that we hope will compete more effectively for the consumer's dollar.

We cannot consider what the industry as a whole should or should not do. As I stated earlier, we are an individual company that faces intense and continuous competition in the marketplace.

If we do not produce competitive products, we will soon go out of business. This, plainly, simply, and exclusively, is the reason why we bring out new models.

As a byproduct of the criticism of model changes it is stated that these do not involve any change in the integral quality of the product itself, but rather simply involve changes in cosmetics. I am attaching a memorandum prepared by our engineering office comparing a 1964 Plymouth Fury and a 1974 Plymouth Fury.

[See exhibit 1 at the end of Mr. Heinen's oral testimony.]

Mr. Heinen. While some of these improvements could have been incorporated as running changes—and some were—others could not.

Major product feature changes to a car require all new design engineering concepts which can only be accomplished in a new environment and incorporation is dependent on the assembly lines not running.

Such a change requires extensive basic tooling revisions, coordinated timing for a number of different parts, and major alignment of assembly plant operations.

Finally, on the question of model changes and styling costs, I believe it is helpful to note that in 1972 Chrysler testified before the Price Commission that of its annual tooling and other costs associated with producing its 1971 models, approximately $30 per car could be ascribed solely to styling changes.

While it is difficult to break out pure styling change costs with absolute precisions, I would point out that the order of magnitude of this figure is far different than the several hundreds of dollars per car that some persons have estimated are involved.

I will next turn to the subject of vertical integration. There are advantages to a company in remaining purely an assembler of a product, particularly in times of economic recession.

An assembler can much more easily withstand any downturn in the economy because he can shift a great deal of the fixed cost penalty to his component suppliers.

Chrysler was in this position in the early 1930's and that helped it make a fast turn around in the depression years. Indeed, during the entire depression, Chrysler had only 1 loss year.

Since being solely an assembler minimizes cyclical risks, why then have the automobile companies integrated as much as they have?

In Chrysler's case, its vertical integration resulted from two basic causes. The first was that it found situations where it could build a component less expensively than it could purchase it from an outside supplier and still make a reasonable profit on the necessary investment.

Thus, if it was to improve its cost and profit position, it was logical that it should make the investment and manufacture its own components, either by acquiring the supplier or by building its own plant.

The second prime factor was the need to assure continuity of supplies. In many cases, a supplier, because of inadequate profits, unstable labor relations, poor management, or for other reasons, could not assure that Chrysler would continue to be able to obtain the number and quality of components it needed in order to keep its production lines going.

Chrysler could not take the risk of shutting down the whole corporation and, accordingly, went into the business to minimize its risks.

I cannot enumerate each component and state the reason for purchasing it rather than purchasing it from an outside source.

I have, however, attached a chart, in response to the committee's question, showing those major components which we sell to other companies in the automobile industry and which we purchase from them.

[For the chart referred to, see exhibit 2 at the end of Mr. Heinen's testimony.]

Mr. Heinen. During the course of the hearings, adverse comment has also been made regarding our international investments. It has been stated that if we produced cars only in the United States and exported them to other countries, rather than investing abroad, this would increase U.S. employment and improve our country's balance of payments.

Theoretically this may be fine; in practice it simply is not so.

Chrysler has consistently advocated and continues to this day to advocate free trade in automobiles. We have never asked for tariff or quota protection from foreign products, in spite of the significantly lower labor rates that prevail in foreign countries and the claimed technical advantages of foreign products over ours.

We are perfectly willing to compete freely in the world with the products of any other manufacturers, foreign or domestic.

However, unfortunately, foreign manufacturers have not always been willing to compete on this basis. The markets around the world have been characterized by a significant number of restrictions preventing free competition by American automobiles.

These have included high tariff protection, import quotas or absolute import prohibitions, local content requirements, and currency exchange restrictions.

Until very recently, a significantly overvalued American dollar added an additional difficulty. Thus, if it were not for investments by American automobile companies abroad, it is safe to say that American automotive products would not be represented at all in a significant part of the world.

Let us look at the results of Chrysler's investments abroad, which essentially started in 1958, when we acquired our initial interest in our French company. Since that time Chrysler has contributed approximately $1.76 billion to a positive U.S. balance of payments.

This results, to a great extent, from the export of components and technology to our many assembly plants around the world.

These exports would not have existed without Chrysler's overseas investments and, as a consequence, there would have been fewer jobs and a less-favorable balance of payments situation.

Chrysler's international investments have contributed neither to a negative U.S. balance of payments nor to loss of jobs in the United States—the opposite has been the case.

Another point that has been raised repeatedly in these hearings and elsewhere has been the American companies' alleged lack of response to consumer demand.

It has even been suggested, I hope facetiously, that automobile companies, knowing that consumers want one product, intentionally design a different kind of product and then spend a great deal of money in advertising to force the undesired product down the customer's throat.

We are in the automobile business to attempt to sell cars at a profit. The most efficient way to do this is to build what the customer wants, so there will be no trouble selling the product and we can save a good deal of advertising money and sales expense.

In order to do this we attempt diligently, through continued use of market research, to predict what customers will want to buy several years in the future.

The risks involved in a wrong decision are fantastically large. It is very easy to say after the fact, or if one has not risked the hundreds of millions of dollars involved, that a company should have done something different.

It is much more difficult when you cannot be certain what the future will hold and when you are responsible for many millions of dollars and many thousands of jobs.

The automobile industry has a history of several hundreds of companies that made wrong decisions and are no longer in business.

Because of these risks, the decisions cannot always be made with the flair and rapidity that some critics say afterwards should have been the case.

The small car is a case in point. The gradual shift to smaller cars, as a proportion of the total car population, came as no surprise to Chrysler.

Over 3 years ago, we began to take the steps necessary in component production, engine manufacture, assembly capacity, and a host of other factors that would permit us to shift an ever-increasing portion of our production away from larger cars.

As a result, Chrysler's present production capacity is over 50 percent in small cars, the largest percentage of the Big Three, and will exceed 60 percent during the 1974 calendar year.

This is a very impressive tailoring of our production to consumer desires.

However, we do not believe that no one in the United States will ever buy a large car again. We cannot help but feel that once the current period of uncertainty has passed, a number of people will decide that their family's needs require at least one standard-size car in the family.

We may be wrong, but we do not believe that we would be acting responsibly in the interests of our employees, our shareholders, or our dealers if we were to immediately panic, abandon all of our large-car production capability, invest hundreds of millions of dollars and convert completely to small-car production.

Some of our critics, I am sure, would say we should do this and that this would show true adaptiveness to consumer demand.

The difficulty is, of course, that if they are proven wrong 3 years from now they will have lost nothing. We do not have that luxury.

You have also asked that we discuss the subject of buses and mass transit. Chrysler has never been in the bus business, in spite of the picture, in the sense of building complete buses, but we have supplied chassis to bus builders.

We also build chassis for recreational vehicles and motor homes. Through our Dodge Truck Division, we supplied, last year, close to 85 percent of all the chassis for this market.

A number of our customers, in the face of declining sales of recreational vehicles and motor homes, are now considering turning to building buses of various kinds and we hope to continue to be able to supply chassis to them.

As far as mass transit is concerned, we are, of course, interested in it and will continue to study all the possibilities in this area.

Obviously, a significant movement into the mass transit field requires a substantial investment and there are a great many conflicting theories concerning the basic method of mass transit for the future.

If we believe we can enter this field profitably, we likely will do so; but we believe there is a need for a good deal more study before we can justify incurring the necessary significant investment risk.

I would now like to point out just a few facts about the automobile industry generally, as they relate to some of the comments that have been made by earlier witnesses.

Several comments have been made regarding the ideal size of an automobile company and contending that significantly smaller companies would be just as efficient as the existing companies, if not more so.

I will not attempt to comment on this point. I would point out for the record, however, that over the last 10 years, the average rate of return on sales for General Motors, the largest of the American manufacturers, has been 7.2 percent.

The average for Ford, the second largest, has been 4.2 percent. For Chrysler, it has been 2.7 percent; and for American Motors, 0.5 percent.

It has been stated that General Motors' higher rate of return is because they have the smartest management. Presumably, it would follow from this that Ford has the second smartest management, Chrysler the third smartest, and American Motors, the company that produces the largest percentage of small cars, has the dumbest management.

This may be the case. It may also be true, however, that size does permit economies and that those persons who believe that atomization of the automobile industry would result in a bonanza of lower prices and more efficient producers may find quite the opposite to be the case.

It has also been stated that the American automobile industry has shown its lack of responsiveness to the desires of the American consumer by allowing foreign products to take over a significant part of the market.

It is difficult to follow the logic of this reasoning. The significant fact is that, in spite of lower labor rates abroad and the export assistance which many companies receive from their governments, American manufacturers still produce, in the United States, products that, on a freely competitive basis, 80 to 85 percent of American consumers prefer to those produced by foreign manufacturers.

It would be interesting to see what other industries match this record. Radios? Cameras? Television? Sewing machines? Motorcycles? Watches? Textile products?

How many other domestically manufactured products have retained 80 to 85 percent of the American market in the face of free foreign competition?

How many other producers have never asked for Government protection from imports? The record of the American automobile industry in response to foreign competition is something to be proud of—not something for which it should be criticized.

Next, I think it might be well to comment on price behavior in the automobile industry. The fact is that if all product prices had performed in the same manner as automobile prices, there would be no inflation in the U.S. today.

I am attaching a chart showing a 10-year comparison of Bureau of Labor Statistics figures for average hourly wages in the United States, wholesale price levels, consumer prices, and automobile prices.

[The chart will be found at the end of Mr. Heinen's testimony as exhibit 3.]

Mr. Heinen. It is a tribute to the efficiency and competitiveness of the industry that, in the face of these significant increases in all of the components that go to make up an automobile, automobile prices have risen as little as they have. Few industries can match this record.

Next I would like to touch briefly on certain implications that have been made that, in addition to the so-called shared monopoly, there may have been active antitrust conspiracies in the industry.

In the last 10 years, there have been two claimed industry antitrust conspiracies. The first was the alleged conspiracy to retard development of pollution control equipment.

Critics of the industry have implied and, in many cases, have stated flatly that the automobile companies engaged in an antitrust conspiracy to retard pollution control. Let us look at the facts.

A civil suit along these lines was brought by the Department of Justice in 1969. It was settled by a consent decree later in the year.

Critics of the industry alleged that this was a sellout by the Department of Justice. However, Los Angeles U.S. District Judge Jesse W. Curtis, who signed the decree, stated at the time he signed it:

> Furthermore, this decree brings an assured result. The thing that amazes me is that all of the opponents seem to assume with such assurance that if this case were tried the Government would win. Now there are many knowledgeable people who disagree with this.

The validity of his statement was confirmed by later events for, subsequently, over 30 States brought suit against the automobile companies.

On November 20, 1973, Judge Manuel L. Real, of the U.S. District Court in Los Angeles, before trial but after several years of discovery proceedings and thousands of pages of depositions, dismissed all of the State cases, having found that no antitrust conspiracy existed.

The other conspiracy case that has been alluded to in these hearings involves fleet pricing. Chrysler was not a defendant in this case and I have no desire to argue General Motors' and Ford's case.

However, since references have been made to the committee concerning this alleged conspiracy, and since references to "industry

conspiracies" discredit, in the public's mind, all components of the industry, it seems only fair for the record to show that a jury, after 3 months of trial, found General Motors and Ford not guilty of conspiring to fix prices on fleet sales.

It is interesting to me that the earlier witnesses who referred to these alleged conspiracies in discussing the sins of the industry somehow overlooked these two decisions.

In conclusion, I would like to make the following points. No. 1. I cannot imagine, at least from Chrysler's experience, how any industry could be characterized by fiercer competition than that which exists in the automobile industry.

2. We have no anticompetitive understandings of any kind with any of our competitors. We will introduce any product that we think will give us an edge over our competitors, which we can produce profitably.

3. Concentration in the automobile industry results from the fact that hundreds of companies were not able to survive the severe competition in the industry and failed.

This is a trend that is occurring throughout the world. Perhaps only relatively large size permits the significant risk-taking that is involved in the multimillion-dollar investments and product decisions that characterize the industry.

4. And I say this with some risk, the greatest impetus toward uniformity of product and loss of efficiency in the industry today is the result, not of concentration, but of the increasing amount of Government regulation with which the industry is faced.

Increasingly, the amount of a company's overhead, the allocation of its engineering and research budgets, the product it produces, its price, and even its method of distribution are being determined by Government.

This, inevitably, results in greater uniformity, greater cost, lessened opportunity for the smaller producer and correspondingly greater advantage to the larger companies.

Thank you. And now I will be happy to attempt to answer any questions you might have.

Senator HART. Thank you very much. The staff has developed some questions, some of which I would like to raise, and then ask Mr. O'Leary to turn to those that I may not raise with you.

This member of the committee feels about the wisdom, or absence thereof, of the management of the American automobile companies, to use that amusing list, which, in turn, identifies the most brilliant and the least brilliant.

Mr. HEINEN. Right.

Senator HART. Ask somebody who knows some of the men and has observed over a long period of years the performance of those who have been responsible for them, for the automobile manufacturer in this country.

I have never met or known of any single one who would be a candidate for the label dumb. Quite the contrary, it is my impression, and I know that some of them think I am pretty dumb, but I have never spotted one who was other than extremely effective.

Mr. HEINEN. Senator, obviously this remark was not intended toward you. I believe there was one witness who indicated that the reason for General Motors success, greater success than the other companies, was unrelated to the economies of size, but, rather had to do with a higher level of wisdom in their management structure. And he would like to spread that through all the other companies.

As will presumably be developed, we happen to think that economy of size is a very significant factor. And this was intended to be somewhat amusing, and say if this is not the case, it is astonishing.

Senator HART. It was the case that was dwelt on, and I am not reacting because I sense that it was directed at me. Quite to the contrary, but I just wanted to use it as an opportunity to get on the record my own feeling about the capacity of those that have made Detroit what it is.

Mr. HEINEN. If I could clarify the record for one moment? My kidding allusion to American Motors is in spite of the fact that I think they, against very terrific odds, have done a brilliant job.

And so I certainly didn't mean to say that they are dumb men. I think they have done just an unbelievable job over the last 2 years with the odds they have been fighting.

Senator HART. I doubt that anyone at American would misunderstand, and I am glad you had a chance to clarify that.

Now, having said that, it does not stop me from suggesting that the brilliant men who manage American automobile production are like everybody else, not just from the States, which we can all understand, but to reflect the experience that inevitably affects our judgment and our view the longer we are exposed to a particular assignment.

That should have surprised no one who lived in Detroit, that a brilliant American automobile manufacturer honestly believed that what was good for his company was good for his country.

That was a brilliant man, but he was speaking in a way that reflected the consequence of a long series of experiences which would affect me if I had had the same thing.

Mr. HEINEN. It wasn't my company; I won't defend it.

Senator HART. No. At least in those days if you had scratched any of the fellows running for office, they would have come up with the same feeling, but "it ain't necessarily so."

Mr. HEINEN. That is right.

Senator HART. But on this business of what the two antitrust decisions that had actually been written——

Mr. HEINEN. The two industry conspiracies?

Senator HART. Yes. Let me see if you would agree to modify a little bit what that California decision brings out.

That was the consent decree that settled the alleged conspiracy on the smog.

Mr. HEINEN. That is correct.

Senator HART. Now, let me give you a chance to get this. Even though Chrysler entered into the decree which terminated the suit, the position of Chrysler is that it did not participate in any such conspiracy, indeed, if one existed.

Mr. HEINEN. That is correct.

Senator HART. Now, you quote on page 16 the Federal district judge that signed the decree, and the assumption of opponents that if the case went to trial, the Government would win it.

And then you go on with this language:

> The validity of his statement was confirmed by later events for, subsequently, over 30 States brought suit against the automobile companies.
>
> On November 20, 1973, Judge Manual L. Real, of the U.S. District Court in Los Angeles, before trial but after several years of discovery proceedings and thousands of pages of depositions, dismissed all of the State cases, having found that no antitrust conspiracy existed.

But isn't it correct that the judge heard no evidence as to whether or not the conspiracy existed, and made no such findings?

As I read it, he dismissed the case on a finding that whether or not a conspiracy existed, the States couldn't sue for the relief under section 16 for what was, essentially, a nuisance.

Mr. HEINEN. I don't think that is exactly correct, Senator. It may take me a second to find that, but I think he found that, in fact, what caused smog to the extent automobile caused smog is the intense competition between the automobile companies.

Senator HART. While you are looking, see if you can do that and listen to this last point. Would you agree that it might be a more precise summary of that decision to say that the judge never got to the point where he had to make a finding, or even received testimony as to whether or not a conspiracy existed.

Mr. HEINEN. Well, there was a good deal of testimony. Well, to go into the kind of thing what he said is:

> No claim is made by plaintiffs that any combination or conspiracy in violation of the antitrust laws occurred in connection with this aspect of defendant's business.

And he means the marketing, and the sales, and so on, of the products in the defendants' business. "It is as a result of this competition and the monumental use of the smog producers internal combustion engine, that substantial discomfort" and so on "is caused.

"This conduct is the sole and proximate cause of smog * * *. It is, if anything, the consequence of the free marketing of a smog producing product."

He did not find any evidence of any conspiracy. If you are saying, Senator, that the case was never tried, in full. I will have to agree with you.

I can't quarrel with that. Now, I guess the thing that bothers me is that as I have read the papers over the last several years, without there ever having been a case or any evidence to establish that there was a conspiracy, what has been played up to the public, generally, has been the fact that such a conspiracy did, in fact, exist.

And not only have I heard people say that there may have been, I have heard people on the "Today Show" and other shows say the automobile industry engaged in a conspiracy.

Now, we would have been perfectly happy to try our case. Our briefs that were submitted to the judge, all of which he read, dealt with the facts of what happened in that whole history of smog.

It is a factual thing, not a question of pure legal technicalities. All that we can say is that when it is all done, he did not find that an antitrust conspiracy existed.

At the very minimum, I think that we should benefit, not from allusions to the possibility that we got together and conspired, but rather to the fact that no one has yet come up with any evidence that we did conspire.

Senator HART. Maybe I am reacting but you have developed a sensitivity to people who say that there was proof of conspiracy in the Los Angeles situation.

I am reluctant to see the notion developed that the court found that there was no conspiracy.

Mr. HEINEN. All right, I am willing to accept that. I think he said there was no evidence of conspiracy. Let's put it this way, he did not find any facts to warrant continuing with an antitrust case in that situation?

And he dismissed all the cases. Is that fair?

Senator HART. We would entertain just about the same notions of that case as we entered the problem.

I am advised that the plaintiffs have appealed to the ninth circuit if the trial court was in error, and I am not suggesting they are.

Mr. HEINEN. Oh, I, that is true. And I think——

Senator HART. In that case it will be remanded to the district court and the respective trial would follow as to whether or not a conspiracy did exist.

Mr. HEINEN. And in all fairness, on the other one that I cited, where GM and Ford were found not guilty, there still is a civil suit pending which could go against them.

Senator HART. I was going to make that comment, but that was the only comment I was going to make about that.

Mr. HEINEN. But I think, again, we have to go back to the only point I was trying to make which was that the impression that I think may have been given earlier was a strong implication that, in fact, apparently, there is evidence of some sort of conspiracy.

And I think it should be clear that at least at this moment in time there is no more evidence one way than the other.

In fact, we have not been found guilty of doing anything wrong.

Senator HART. Right. Well, this business of vertical integration, would it be a fair understanding that Chrysler manufacturers all of the major components of Chrysler cars? You know, bodies, engines, and frames, and transmissions, steering gear.

Mr. HEINEN. Generally speaking, yes; that is fair. I am not an expert on exactly which ones are manufactured, but I would say, if you say major components, I think that is a fair statement.

Senator HART. Perhaps you would then want to reserve your answer to this one for submission to the record after you have checked.

But what are the most significant items that Chrysler purchases from outside suppliers?

Mr. HEINEN. Well, steel, of course, as a material, is probably the most by quantity. I would guess it is probably the biggest single one.

Tires are a very significant item. Bumpers. I think that in all fairness it would be more helpful to you if we did give you a list of the most significant ones. There is a wide variety of them.

Senator HART. All right. We are really after the ones that, in your judgment, are the most significant, and we will reserve this point in the record for your written response.

[See exhibit 4 at the end of Mr. Heinen's testimony.]

Senator HART. You list on the attached table your sales of components to other auto manufacturers. As we read that, it shows that the Chrysler sells about $43 million worth of transmissions to American.

Do you know whether or not that represents substantially all of American's transmissions?

Mr. HEINEN. My impression is that that is correct. But I think you should ask American Motors. I think it is; I can't be sure.

Senator HART. As I understand it, Chrysler began producing automobiles abroad in the 1950's. One of the studies that the subcommittee has received earlier was done by Dr. Boyle.

It indicated that during the period from 1961 to 1970 Chrysler increased its foreign employment tenfold. Now, does Chrysler think that there is more potential growth abroad than here?

Mr. HEINEN. Well, here we are going out in to the wild blue yonder, but I would say if you take the world, in general, and the number of cars that people have, and the hope that we all have, that the economic status of people in the world will improve, in time, the answer has to be yes. There are more people, and we would hope they would all get to livable standards and to a standard of living where they can afford some of the things we have.

And, surely, cars will probably be one of those items. So, yes, certainly.

Senator HART. That same study showed that GM's foreign production is about 26 percent of its total production. This is in the year 1972.

And Ford's foreign production is about 36 percent. And Chrysler's runs about 44 percent. I could ask you the easy question. Why this, how come?

Mr. HEINEN. You mean, why the number?

Senator HART. The more precise question is does that reflect a strategy on the part of Chrysler to concentrate its efforts abroad and simply maintain its volume in the domestic market?

Mr. HEINEN. Oh, absolutely not, Senator. I think that I, once having defended the fact that we are not, hopefully, all idiots, I am going to have to say that we also are all human beings, and that sometimes I believe there is an overemphasis on the sort of great master strategies that are conceived of by corporations and their Machiavellian approach to a situation.

What has happened is that you see situations that present an opportunity, an opportunity for an investment that, hopefully, will be profitable and that looks as if you can take advantage of it. And then we make an investment in that country at that time, or, here if it is here. We have got a plant that is half completed in New Stanton, Pa., which we would love to be able to fill, if we could sell the cars.

We are more than ready, to the extent we have the capital resources

to do it, to expand to fill any opportunity we can to market cars in the United States.

So that there is certainly no strategy of emphasizing one area to the exclusion of the other at all, not in slightest.

It just doesn't exist.

Senator HART. It would follow, I suppose, that if the income levels of peoples elsewhere in the world are increased, and the purchase of a car comes within the reach of many more than find it possible now, that you would have more overseas production employment activity.

Mr. HEINEN. I would guess that would probably be the case, depending on some factors, however. If we assume a world of free trade it would not necessarily always be the case.

I think we have a pact with Canada that essentially is a free trade pact, which, I think, has been very beneficial to both Canada and to the United States. And I think the net effect of that probably has been to increase production or employment in both countries and to benefit them.

Part of this program of overseas investment is that there are countries where you cannot sell a car there if you do not have, say, 90 percent local content or 50 percent local content, or you have tariffs there, prohibitive, that are difficult.

If that kind of situation exists and the incomes in those countries do go up and there is an opportunity to sell cars there, certainly, we will probably increase the work force there.

If we had a world of free trade, there would be different reasons for locating plants in different areas, and it may be that more of them would be located here because of skills that people might have, or resources, or something like that.

Senator HART. Freer trade, in your judgment, would be more likely to retain production here than overseas, is that right?

Mr. HEINEN. I don't know that I can answer that unqualifiedly. It happens that I believe any interference with free trade tends to hurt the total income level of people in the world, generally.

I strongly believe in free trade, and I think that it would benefit the American worker and the overseas worker, both.

Now, whether to quantify it and say with free trade we would have some jobs here and some there, I can't answer. I think everyone would benefit from it.

Senator HART. But we should recognize that direct overseas investment many times is simply a defensive strategy.

Mr. HEINEN. It is the only way to get there. There is no other way to get into that.

Senator HART. Now, to this last area. As far as I am concerned, this goes back a few years in the history of the subcommittee.

Back in 1967 we had testimony from George Huebner, who was director of research product, planning and development from Chrysler, who was talking about Chrysler's progress with the gas turbine automobile.

He indicated that in 1963, fifty gas turbine autos were run for a period of 3 months by some 200 different individuals in 48 States for this 2½-year program.

And here is how he described this program. He demonstrated that he had a powerplant which could operate in competition with the piston engine, which would produce approximately the same fuel mileage, the same performance as the piston engine and the same control.

These things are relevant, but, nevertheless, it could do this. And, in addition, they demonstrated that the other characteristics which we felt were possible in the turbine, long life, freedom from oil changes, to freedom from antifreeze replacement, instead, he did the rest of the things which I mentioned.

The level of clean exhaust, they were there, in that they were meaningful; and further than that, we satisfied ourselves that we weren't dreaming a hopeless dream, that what we had produced the people liked.

This was a very important thing for us to find out. We thought the engine had all these possibilities, but did people like it?

It turned out that they did. And then, in answer to one of my questions, he said that within 3 ot 5 years, this was in 1967, the gas turbine automobile would be at a stage where it would be safe to make a decision on tooling for mass production.

You know what my question is. What happened with the gas turbine automobile?

Mr. Heinen. Well, it is still very much alive, Senator, as a research project. I have a speech here called "Alternative Power Systems," by George Huebner, which was delivered a few months ago, and I would be happy to leave a copy for the record.

Senator Hart. We will receive it.

[See enclosure to exhibit 4 at the end of Mr. Heinen's testimony.]

Mr. Heinen. This deals with others in addition to the turbine. But he does happen to deal with the turbine engine.

We still believe very strongly in the turbine engine. And, as you know, Mr. Huebner has spent a great portion of his life working on this engine.

We are now in either the sixth or the seventh generation of turbine engines and are working on a contract with EPA on the problem of the turbine engine.

But I think when he gave that speech, or when he made the comments that you are referring to—did you say that was 1967, Senator?

Senator Hart. Yes, in the fall.

Mr. Heinen. Shortly after that the Clean Air Act came out and described a standard for NOX control—0.4—which is now a subject of debate, as you know, as to whether or not that should be changed, which almost eliminated the turbine from consideration as a viable engine.

The turbine is very low on hydrocarbons and carbon monoxide, but there was no way that we could see that you could reduce NOX to that kind of level.

That slowed down work on the turbine for a while. In addition to that there are problems still of cost. There are problems of mass production because a great deal of the turbine work yet is a hand-done kind of thing and still involves expensive alloys of a nature that we continue to work on to reduce the cost.

We still believe that the turbine engine is a very, very viable engine. It is something that we look at as the most feasible of the alternative powerplants that have been discussed, the futuristic kind, the steam engine, the electric car, all of these.

To use, the turbine is by far the most feasible, and we still have high hopes that it will work. All I can say is that we are continuing to work on it.

As I say, we have a contract with EPA. We are now in the seventh generation of turbine families. There are still problems to be worked out with it.

He has in this speech, I believe, a schedule. Well, I guess I saw that someplace else, yes. No, no, it is here.

He says the possible schedule for the introduction of any new automotive powerplant, whether it be electric, steam, or gas turbine, might be as follows:

Final design, development, and tooling for initial production—4 years.

Initiate small scale production and begin large volume tooling—4 years. Expansion of large scale production to meet total requirements—2 to 4 years.

So you are looking at 10 to 12 years, if you were looking at a transformation of an engine, even if it had now solved all its problems, which it has not.

And this, incidentally, ties in very closely with a Department of Transportation study that was made as to, if today, someone had an alternative powerplant, a brand new powerplant that did everything all of us wish it would, how long would it take the machine tool industry in the United States to be able to produce the tools necessary to produce the engine.

And the Department of Transportation came up with a figure of 10 to 12 years. And this is—we are talking in that same ball park.

We still have problems with it. We hope it will work. We believe in it, and we are trying to make it work.

Senator Hart. Well, if you can—if it is possible for you to make an assumption which would be very hard, given the problem it is causing.

Assume there is a Clean Air Act.

Mr. Heinen. Assume there is not?

Senator Hart. Is not.

Mr. Heinen. Good Lord.

Senator Hart. On page 7, you have given us the two basic reasons for your vertical integration, and you say the first reason was that you found some situations where a component would be less expensive than if purchased from an outside supply; and you still make a reasonable profit on the necessary investment.

No, back in 1967 Mr. Huebner told us that the gas turbine engine had fewer than 20 percent of the moving parts of a piston engine.

Now, to the extent that Chrysler, or anyone else, makes a reasonable profit on the components that go into a car, isn't there a disincentive to move to any technology which reduces the number of the components?

Mr. HEINEN. No, there are really—the answer to that is no, Senator, this, and, here again, it reminds me a little bit of an old movie that you may have seen with Alec Guinness called the "Man in the White Flannel Suit," where he goes through all the things that all the corporations in the world developed that they have kept hidden from everyone, the suit that will never wear out, the pill that you put in the gas tank that runs for 50 miles a gallon and so on.

The fact is that if we came up with a powerplant, such as the turbine, that was clearly superior to anything else, the profit to be gained by being able to come out with something that is that good and that new, and that would sell that well would far outweigh the minor loss in those particular components.

After all, there are other places we can direct these energies. The tools are going to wear out in time in any case.

We do shift constantly different kinds of items and phase out old tooling and bring in new tooling. It is just not a fact.

Senator HART. All right, let me try another one and see if this might be a more likely disincentive. Mr. Huebner indicated that there was a whale of a lot less maintenance on the gas turbine car because there were fewer parts to maintain.

He put it this way:

> For instance, only one spark plug instead of eight. Under the heading of maintenance comes things as small as oil changes. We have never changed oil in a turbine car.
>
> And it requires no antifreeze because there is no cooling system. These things alone indicate this. There are no timed ignition effects, consequently there is no ignition timing to be set and checked regularly.

Now, would Chrysler's dealers react to the prospect of that kind of reduced maintenance?

Mr. HEINEN. Well, I think almost all the items you mentioned are ones that dealers probably don't get too much of anyway.

Those are gas-station-type items, I think, in the main. Second, you are talking about spark plugs, oil changes——

Senator HART. I'll bet you have a favorite position. You just try to get a dealer. You have to make an appointment right now.

Mr. HEINEN. To get to the dealer?

Senator HART. To get somebody to lift the hood for you.

Mr. HEINEN. No, what I am saying is I think on the kind of items you are talking about the public has tended, or is tending more to go to a gas station.

I don't think that would cut into a dealer's business. Dealers more and more are becoming specialists on the more serious items connected with a car.

However, as Wally reminds me, there is electronic ignitions, for example, which we introduced voluntarily in 1972 and it became standard in 1973.

We don't have timing problems. So we have eliminated certain factors already of the kinds of things that you are talking about, from our dealers' business.

Believe me, Senator, regardless of any other consideration, if we could tell somebody we have got a car that you will never have to

change the oil in, you will never have to do the timing, we would love to produce that car and market it and sell it.

There is no question about it.

Senator HART. I understand. My instinct tells me that is probably right.

Mr. CHUMBRIS. Mr. Chairman, before we go to questions and the counsel and Dr. Martin, may I get to one point that you were discussing.

On this issue of foreign production, we have the statistics of percentages: GM 26 percent; Ford, 36 percent; and Chrysler, 44 percent of overall production.

Taking the statistics that were put into the record earlier, and assuming that General Motors is producing 4,424,491 autos, which was the average from 1969 through 1971, and if we took 26 percent it would amount to 1,150,367 cars.

Ford, at 36 percent, Ford's comes out to 806,005 cars; and Chrysler, at 44 percent, comes out to 684,509 cars. It still puts Chrysler almost 450,000 to 500,000 cars less than General Motors, and about 120,000 less than Ford.

That might have a bearing on the percentages. When you were producing were you producing because of maintaining a percentage of production, foreign to domestic, or because you thought that you needed to produce so many cars in your foreign operations?

Mr. HEINEN. Well, if I understand the question, I have to go back and say again that I'm not really sure that we started out with any concept of a percentage, or any idea of a percentage.

We happen to have almost 100 percent interest in a company in France; we have the same interest in a company in Spain; we have 100 percent interest in a company in England; plus others in Latin America and whatever.

The person who is running that company, who has been given the job of running that company, has got as his primary goal to build as many cars as he can possibly, to sell as many cars as he can possibly sell, to make as much money, and that is his sole concern in life.

The people in the United States who are in charge of sales are interested in selling cars here, in manufacturing and selling them and making a profit in making them.

So, I think these figures have come about in part simply, it just happened to work out that way, and I think they might vary from year to year, too. We, for instance, do not have a plant in Germany. Both Ford and General Motors do. We have a plant in France; they do not.

Depending on what might happen in one of those countries and the economic situation of that country, you might see a very significant shift in some of these percentages. When I say significant, as much as 50,000 or 100,000 units one way or the other.

Mr. CHUMBRIS. You have answered the question.

Mr. HEINEN. Yes. It just happens, you know, I mean, that is it.

Mr. CHUMBRIS. Thank you.

Senator HART. Mr. O'Leary?

Mr. O'Leary. Mr. Heinen, during this shift to small cars does Chrysler plan to increase its imports of small cars that it produces abroad—Colt and other such cars?

Mr. Heinen. Well, we don't import a great many Colts. I've made such a mess here that I probebly cannot find any of the pages that I brought to be able to answer some of the questions.

I think that to the extent that there is a market for these cars and, after all, the Japanese car—we only own 15 percent of the company—it is not our company; we don't control their policies, and they have markets. It is a question of how many they want to ship here to us, too.

I don't think we have any preconceived plan that we are going to increase them. If we can sell them, and if they will sell them to us, and if the price is right—as you know, the price of foreign cars lately is becoming extremely expensive by comparison with American cars. Once the dollar relationship with other currencies got straightened out, you are now finding that cars that were once much cheaper than American cars are now significantly more expensive.

You take a Super Beetle, and it is now well above a number of American—not only subcompacts, but compacts. I think the Japanese cars are running into that same problem. I don't know whether we will have market resistance with the Colt or not, at price, but if there is a market for it, if they are available, if they are willing to ship them here, and if we think we can sell them, we will import them.

But I can tell you that there is no strategy that says at this time we have now made a plan that we are going to increase the importation of these cars.

Mr. O'Leary. You have indicated that Chrysler has always—and still—taken a strong pro free-trade position. UAW has recently called for a temporary quota on imports.

Mr. Heinen. That is right.

Mr. O'Leary. Doesn't it aggravate the situation to have the Big Three importing small cars that they manufacture and assemble abroad?

Mr. Heinen. Well, again, I'm speaking for Chrysler. I will only speak for Chrysler; I will not speak for the other companies.

The number of cars that we import—if you exclude Canada, and there we have about a tradeoff, we go about the same both ways, so I consider that as almost the United States—is relatively insignificant. They are so small a number that is not really going to affect anybody's jobs.

I think that it is interesting that import car sales also are down. I have a figure, again, if I could find it here, that indicates that they are not selling them in great droves.

I think Volkswagen—and if Wally finds the figure—I think Volkswagen sales, for example, in March were down 50 percent from last year. We're not anyplace near that kind of ballgame.

All imports in February were down 21 percent from last year. Our small cars—our Valiants and Darts—are up 4 percent from last year.

So now, if you take the imports for small cars, as I say, the Volkswagen, February, down 31 percent; March, down 50 percent; all imports, February, down 21 percent. If you take our own domestically produced small cars—Chryslers, up 4 percent—we don't have to go out and import cars. We have small cars. We have small cars that people are buying and that, apparently, they like.

Mr. O'Leary. All right. Let me shift gears for a moment. During our first set of hearings we received some testimony with respect to estimates, primarily, of some economists who studied the auto industry as to where the economies of scale exist. I think Dr. Porter presented one table which indicated that out of 44 assembly plants in the United States there were only 3 which produced over 400,000 vehicles; while 12 produced 250,000 vehicles; 3 produced 250,000 to 400,000 vehicles; 27 produced between 100,000 and 250,000 vehicles.

Can you tell us what you believe the optimum size of the assembly plant to be?

Mr. Heinen. Well, in a word, no. But let me expand on that a little bit. I spent about 5 hours with our vice president of manufacturing, and our vice presidents of stamping, assembly, power train, and I said, "Now, look, this question is going to come up, and can we arrive at a figure on all this?" And the answer was "No," they could not arrive at a figure. You can pick a particular thing, they would take a press line and someone would say, "All right. If I could run an identical quarter panel, one identical panel, and could run 800,000 of those a year, that would probably be at a level that approximates optimum production." That is two shifts, and this has to do with the way most of these presses are designed.

Now, someone else, one of the other people in the room, would say, "Well, that's fine. But I can run roof panels faster than you can run those. I can get a better optimum figure out of that."

Also, every time we are talking about optimums, we are talking about an identical car. We have never had a production run of identical cars that reaches even this theoretical optimum that we are talking about, and that theoretical optimum assumes that you are not going to have better technology that will allow you to produce more of these. There are some machines that, on certain kinds of stampings, could turn out 3 million most efficiently. There are some machines that you can't afford to purchase because you can't hit the volumes that they could turn out at the most efficient rate.

And what we finally arrived at—and this is going to sound facetious, but it is the only guideline we had to go on—I said, "Well, what would you say is the most efficient size for an automobile company," and the final conclusion was, at least as big as General Motors. Now, maybe it is something bigger than that, but that one is the one that is running at the most optimum efficiency rate that we can tell based on their rate of return on sales and their production runs. Maybe something bigger would do more. Maybe we would be able to find new presses and new technology that could turn out stuff faster than that.

Again, when we talk about an optimum plant, I want to go back to this identical thing because if you are saying here is one plant,

you are now building x car. X car has to look identical; all of these cars have to be absolutely identical; we're not talking about any variations in these cars, now, we're talking about identical cars.

Let us talk about a company that now has to make a decision to build that one identical car, and let us assume that car doesn't sell that year. I think at this moment in time, no matter how strong they are and how efficient they are, you would have a very chaotic situation in the State of Michigan and in the country if you had a Buick Motor Corp., for example, at just this moment in time, if you look at what has happened to the sales of that particular car.

We would have a very chaotic situation if we had a large Dodge Corp., let us say. So that you cannot gamble all your—we cannot get investors to say we are going to build one identical car and run it through a plant, apart from the fact that, even then, we wouldn't reach optimum efficiency as I understand it. But even if you could that way, you are throwing everything on one product, and if that one doesn't go, you are out of business.

Mr. O'Leary. Well, how many stamping plants does Chrysler have in the United States and Canada?

Mr. Heinen. Well, we have two major ones: we have Twinsburg, we have Sterling, Mack Avenue—three, maybe.

Mr. O'Leary. Can you provide us with the information as to what you stamp the most of, be it a fender, or a door?

Mr. Heinen. Well, do you mean by dollar volume, or do you mean by number of units?

Mr. O'Leary. Number of units.

Mr. Heinen. I certainly can't right now. It is going to be a list that is going to number into the thousands, if you want all stampings that come out of these plants.

Mr. O'Leary. Let me make myself clear. We had some testimony from Dr. White of Princeton, and he estimated on the basis of his study that there were two Chrysler dies, the more expensive of which lasted for somewhere around 400,000 stampings. There were less expensive dies that lasted for approximately 100,000 stampings, but that the unit cost of the more expensive dies ended up being cheaper.

What is your estimate as to how long—and when I say how long I mean how many stampings—the best dies last.

Mr. Heinen. Well, of what kind? To stamp what?

Mr. O'Leary. Well, the dies that you use to make the most stampings.

Mr. Heinen. Well, again, I would have to go—do you mean by dollar value? We have little stampings, we have big stampings, you have fenders, you have doors, you have——

Mr. O'Leary. Number of units. What we are trying to do, Mr. Heinen, is, if Dr. White is wrong with respect to his estimate, we would like to have your estimate of what is right.

Mr. Heinen. Well, I can say that I was told—and I would have to admit to you I am not a production expert—that I was told that there are machines that on a certain kind of stampings would last beyond anything that we could possibly produce most efficiently—beyond any number that we could possibly——

Mr. O'Leary. You are saying machines?

Mr. Heinen. Dies.

Mr. O'Leary. Dies.

Mr. Heinen. Yes. There are also—incidentally, you get into this whole subject, and you get into the subject of plastic dies and plastic technology, and whether you could cut down by cutting down on the cost of the dies—these are all areas that everyone is studying. There are problems with some of these dies. Plastic dies, as an example of—I think someone commented on the fact that maybe you could go that route, and as a result cut down your initial investment costs and still produce an optimum size with a smaller company because you would have a smaller investment in the dies. I am told again by our manufacturing people that while there is work being done in this area, the technology is such now that they wouldn't be able to put a car together with most plastic dies that are there. They just aren't true enough; they tend to flake. So, when you try to put the two doors into the frame, it just doesn't fit.

Mr. O'Leary. I assume that some of your stampings go into the different cars that you produce. In other words, some stampings may also end up in a Plymouth, or may end up in a Dodge?

Mr. Heinen. Right. Sure.

Mr. O'Leary. Would you provide us for the record—perhaps we can work with you on this after the hearing—a list as to which components you stamp the most of for that which goes into the assembly of the vehicle. I assume that you use the same die stamp to stamp out parts for replacement?

[See exhibit 4 at the end of Mr. Heinen's testimony.]

Mr. Heinen. Well, let us work on it afterwards. I am not trying to be evasive, but I really do not know the magnitude of the question you are asking. I think I can answer, certainly, that we attempt to commonize parts, and we have managed to, I think, bring down from 21,000 parts to 16,000, some parts by commonization, and there are certainly small stampings of certain kinds that will go into every one of our cars, for instance, or others that will not. But I think we could work together, and we will try and give you the kind of thing you are talking about.

Right now, I cannot even envision the magnitude of what we are talking about.

Mr. O'Leary. I guess we would like to begin as to what you stamp most of in terms of units.

Mr. Heinen. Even if it is a little tiny thing?

Mr. O'Leary. Even if it is a little tiny thing, but I think primarily we are also interested in that to which he really directed his attention, and he was speaking, I am sure, in terms of hoods and fenders and doors, et cetera.

Mr. Heinen. Well, I think he was speaking of a few major types of stampings, and as I said, our people do not entirely adhere to his testimony, and I repeat again, I believe we have cut down the number of parts from 21,000 to 16,000 so that when you are talking of a roof and a deck lid and a couple of quarter panels, you are a long ways from talking about everything that has to be coordinated and

goes into the car. There are some machines that can stamp out millions of these things, of certain kinds of stampings, and others that will not.

[See exhibit 4 at the end of Mr. Heinen's testimony.]

Mr. O'Leary. Now, Professor White also made an estimate with respect to the economies of scale which exist in manufacturing of engines and transmissions, and he concludes that on an annual basis the production of somewhere between 260,000 to 280,000 units per year would exhaust the economies of scale and the process of making both engines and transmissions. Would you agree with his estimate, starting, say, with engines?

Mr. Heinen. Well, I will say, without having any facts on which to back it up, no, because I don't believe that is the case. And again, we will be happy to supply some further information, if you would like, on that.

[See exhibit 4 at the end of Mr. Heinen's testimony.]

Mr. Heinen. I know this, that if we can get more transmission business such as we receive from American Motors, this is more profitable. If it is more profitable, it has to be a more efficient manufacturer.

I might also add another thing. This company, presumably this engine company or whatever it is that is going to manufacture these items, is it going to have its own pollution engineers, and is it going to have its own purchasing department studying the best new methods of technology, of buying the material, and is it going to be running its own crash tests? Is each one of them going to be doing this?

The economies that, I think, very often can be overlooked are fantastic in the area, for instance, of central purchasing. Now, by central purchasing, I don't mean that you get a lower price because you buy at higher volume. I mean that you would have specialists who are constantly searching new, more efficient die technology; who are looking for sources of material. We are heading into a world today where part of the problem is going to be how do you design a car to take advantage of the raw materials that exist in the world, because we are moving purchasing out of just a situation of saying, well, we will call up such and such a vendor and get the stuff—we may have to find the raw material in some country to permit that vendor to build the parts for us, so that these staffs are essential, essential engineering staff, the tests that you have to run to qualify your cars for emission controls, the kind of specialists you need for this kind of thing are increasing by leaps and bounds, so that you cannot simply take a company and say, well, fine, here is an engine plant that has now gotten all the benefits of the financial planning of the central group, of the fund raising of the central group, of the engineering staffs of the central group, of the purchasing experts, and say, but we are going to ignore all that and now we are going to look simply at once all that has been done for them, all the process engineering research has been done for them, can they run as efficiently if this number is at a larger number?

Now, these are all very, very valid and very strong considerations,

and at the risk of belaboring the point, and although I like them, I don't like to build them up, but the fact is, I don't happen to think that the General Motors people are that much smarter than we are, and I don't think they are that much smarter than Ford. But they do have a manufacturing efficiency rate that allows them a higher rate of return in sales than Ford, which beats us, almost directly proportional to size, and that comes from someplace. There is something that allows that efficiency to exist.

Mr. O'Leary. We are just trying to arrive at some approximations, here. How many engine plants do you have in Canada and the United States?

Mr. Heinen. How many what?

Mr. O'Leary. Engine plants. And so I indicate where I am going, we would like to get the annual——

Mr. Heinen. Well, let us see. We have a whole list of plants here, none of which is entitled "engine plant." We have something called "vehicle assembly plant," we have something called "manufacturing plant." Wally tells me three, so I will take his word for it for the moment. At least it is in that order of magnitude.

Mr. O'Leary. Will you supply for the record your annual production figures from those three facilities?

Mr. Heinen. Sure.

[See exhibit 4 at the end of Mr. Heinen's testimony.]

Mr. O'Leary. And we would like the same thing with respect to transmissions.

Mr. Heinen. Transmission plants? Fine, yes.

[See exhibit 4 at the end of Mr. Heinen's testimony.]

Mr. O'Leary. Now, you mentioned earlier that you have a plant which is half completed in New Stanton, Pa.?

Mr. Heinen. That is correct.

Mr. O'Leary. Could you tell us what the planned capacity of that assembly plant is on an annual basis?

Mr. Heinen. No, I sure can't. No. I will also supply that for the record.

[See exhibit 4 at the end of Mr. Heinen's testimony.]

Mr. O'Leary. Is your largest production plant in Hamtramck?

Mr. Heinen. I think that is right.

Mr. O'Leary. Some 400,000 cars.

Mr. Heinen. Yes, I think that is right.

Mr. O'Leary. Apart from New Stanton, what is your most recently constructed plant?

Mr. Heinen. Belvedere, Ill.

Mr. O'Leary. Could you give us the approximate production figures for that plant?

Senator Hart. We will receive all these figures, subject to correction, for the record. If some of your associates would like to join you there——

Mr. Heinen. Yes, well if we have them, we will be happy to tell you now, but we will certainly supply it. There is no secret.

While they are looking, if you want to go on—243,000 in 1973 was the production at Belevedere. Now, whether that was its maxi-

mum production or not, that is the range, that is the general order of magnitude.

Mr. O'Leary. In view of the fact that there are some 27 assembly plants out of 44 that are of that approximate size, is it fair to infer that the industry considers that, if not the optimum size plant, the one most worth constructing?

Mr. Heinen. I don't think it is fair to infer that the industry considers it that. I think it is a fair statement to say that, a least as far as Chrysler is concerned, to the extent that the plants we have built recently—the assembly area—are of that size; that apparently we think that is a pretty good size to build a plant, yes.

Mr. O'Leary. The large plant at Hamtramck, is that an old plant?

Mr. Heinen. It is a very old plant, it is a multilevel plant. It is not the kind of a plant that you would build today. That is right, for a lot of reasons, not just its size, but its whole layout. It goes back to the 1920's or earlier.

Mr. O'Leary. Mr. Heinen, our information is that Chrysler produces and sells buses in Spain; is that correct?

Mr. Heinen. The company which was called at one time Barreiros Diesel S.A. originally was a producer of trucks and buses and farm equipment only, and when we invested in the company starting in 1963, it was with the idea of setting up a car division for that company. So that our initial investment of 40 percent went solely to the production of cars. Today it still continues to produce buses and trucks and tractors and so on, and cars. But initially, it was that kind of a company.

Mr. O'Leary. How many buses were produced.

Mr. Heinen. I don't know, but it is a large vehicle producer.

Mr. O'Leary. You also manufacture approximately 3,000 Dodge diesel trucks each year; am I right on that?

Mr. Heinen. I would accept the fact that we manufacture 3,000 trucks in which we put diesel engines if you say it is so. I can't verify that, but I assume that if you are saying it, it is right, yes.

Mr. O'Leary. Do you make your own diesels, or do you get them from General Motors, or——

Mr. Heinen. Well, we buy them from several. I think we buy some from Cummins; I think we buy some from Perkins. I don't know if we buy any from General Motors, as a matter of fact. Well, we could see on our list. If we do, they are on the list of items that we said we purchase from other automobile makers.

Mr. O'Leary. Our figures with respect to the present production of city buses is that there are approximately 3,700 made per year. The American Transit estimates that the demand for buses may be as high as 14,000 per year. Has Chrysler any plans, or has Chrysler given any consideration, to entering this field domestically?

Mr. Heinen. Well again, let me separate. When you are talking about buses, you are talking about the body, and you are also talking about the chassis. I think I explained in my testimony, if you take a recreational vehicle, a motor home, of the size of some of these motor homes, you are darned near into a bus size. We build chassis, and as a matter of fact last year we did have 85 percent of that

market. We would be more than happy to sell chassis to any bus body builder that wanted to build them. Now, whether we would want to get into the bodies without having seen any studies that have been made in this area, and I am not sure any have been made, my initial guess—and this is purely a guess—is that at the moment there are probably other areas that we would feel to be more beneficial from our point of view than getting into the body manufacture of buses, just like we didn't get into the body manufacture of motor homes. We didn't feel that that was a good area to put our funds.

Mr. O'Leary. It seems that if the American Transit Association is anywhere near correct, there is a demand for city buses. To what extent does the presence of General Motors—our figures are that they make approximately 65 percent of city buses and 90 percent of bus engines—inhibit entry by your firm into that field?

Mr. Heinen. Not at all.

Mr. O'Leary. Would you also have to get your bus engines from General Motors if you did enter that field ?

Mr. Heinen. What kind of engines? Do you mean diesels?

Mr. O'Leary. Yes.

Mr. Heinen. Well, to the extent that we do not now manufacture diesels, and we buy them from these various companies, we would have to buy them from those companies unless we decided to make our own. But it is not buying them from General Motors, I repeat; we buy our diesels from a variety of suppliers; some we buy from General Motors, some we buy from Cummins, some we buy from Perkins. At the moment, it is not a business that we have felt, in the scale of priority of our resources, that we would want to get into the building of diesel engines. Now, if it were a big enough market, if it appeared profitable enough, we might want to get into it.

Mr. O'Leary. There is little difference in the diesel that goes into a bus and the diesel that goes into a truck.

Mr. Heinen. Very possibly. Well, let me say, while I can't speak for General Motors, knowing them I think if they had a chance to sell some more diesel engines to somebody and they wanted to buy them, that they wouldn't have any trouble buying them from them, because the guy in charge of selling diesel engines for General Motors would be out trying to get all the business he could solicit.

Mr. O'Leary. Mr. Heinen, we have a number of witnesses to come before the subcommittee and testify about the dire consequences which arise from concentration of economic power in terms of its effect upon, or its relationship to political power. We are interested in getting from Chrysler and from the other domestic manufacturers a list of your contributions to the Motor Vehicle Manufacturers Association and its predecessor, the American Manufacturers Association; also, a list your contributions to the Highway Users Federation for Safety and Mobility, either directly or through——

Mr. Heinen. MVMA?

Mr. O'Leary. Right. Can we get together with respect to——

Mr. Heinen. Sure. I can't think of any reason why we would

have any problem with it. I may say, incidentally, that with what has happened to the automobile industry in the last 10 years, if we have any great political power, it is certainly the best kept secret that I have seen.

[See exhibit 4 at the end of Mr. Heinen's prepared statement.]

Mr. O'Leary. On pages 10 and 11 of your statement you speak of the risks that are involved in the wrong decisions in the automobile industry, and you are characterizing it as "fantastically large." Given the power of your two principal competitors, isn't the safest course of action to do pretty much what they do in terms of developing a product for the market?

Mr. Heinen. Well, I think it is almost just the opposite. If you take a look at the—well, let us start out with, if you are talking about, well, shall we take a chance and build, say, a three-wheeled car and see how that goes over because the other guys aren't doing it, I would have to agree with you, because there are certain basic cars, you know, you have four wheels and you want to put so many people in them, and they normally have a trunk, and they have to have an engine, and that kind of thing, given the statistics that I recited on average return of sales, if, in fact, we were to build a uniform product with our competitors—an identical product—I guess that eventually we would go out of business because we do not make as much return on sales as our competitors. So that, really, what we are trying to do—and what we think we have to do—is to go just the opposite, to be somewhat different than what our competitors do, to build in things that we think in our products are better or different or will appeal to certain groups that theirs will not. This is the only way we can survive. The opposite situation would kill us. We cannot live that way. Our electronic ignition is something that we thought could put a premium on our cars from the point of view of the consumer. We have been criticized in one of these very sort of Alice in Wonderland situations, we are told on the one hand that we do everything the others do, and then we are told that we were crazy because we decided not to build a subcompact. But in fact we have a larger percentage of the small car market than we have of the total market, and this has been our strongest segment. So here again, we made a decision that in regard to our car—our Valiant and our Dart—that we had a product that we felt was saleable. We cannot afford to follow our competitors in everything; have no intention of doing it.

Mr. O'Leary. Back in 1958, Tex Colbert testified before the subcommittee about one of Chrysler's poor years of that era, namely, 1953. He stated as follows,

> In 1954, I will tell you a little bit about how we got into trouble there, trying to bring out a smaller car. Our management in 1949 made a decision that it was time to start thinking about a smaller car in this country, and we went to work, our stylists and engineers, to bring out a smaller car. By 1953, we produced cars with shorter wheel base and smaller cars than we had been building in the previous years. As I say, we made that decision in 1949, and we were going to swamp the industry with smaller cars. General Motors and Ford went the other way. They made longer, bigger cars.

You also talked about advertising in your statement, and I guess we are back to that single question. To what extent does the con-

sumer shape the demand, and to what extent does the power of GM and Ford's advertising budget—which I assume is a good deal greater than yours—shape demand?

Mr. HEINEN. I think that, my own opinion is, that the consumer shapes the demand absolutely, but now I would like to qualify that a little bit because I think that we tend to think of situations in an immediate time frame.

For instance, let us take a look at the Edsel. The Edsel was conceived in 1955 at the time of the big car, just about the time that Colbert was saying that we blew it by coming out with a small car. At that time, everybody wanted big cars.

Now, came 1958, that is when the Edsel finally came out. At that time the country was in a recession; there was a trend toward small cars. George Romney had done an excellent job of building up the concept of the gas guzzling dinosaur and so on, and the benefits of the small car. American Motors, at a point in 1961, for one 10-day period, had a greater percent of the market than we did—for one 10-day period. So that you have to try and predict what the consumer will want 3 to 4 years ahead.

Now, admittedly, if you once have that car out there, and you are stuck with that car, and you made what is the wrong decision, sure, you are going to try and sell that car. You are going to advertise it and say these are all the benefits of this car. It doesn't mean that you might not have preferred to have gone back and said, "gee, I wish I had known that all of a sudden, 3 years from now, people were going to like bigger cars," or people were going to like smaller cars, but in the absolute term of trying to plan to hit that consumer demand, I think the public determines it absolutely. If there is a disequilibrium between the public's desire and what is being offered, it is because of the problem of time frames and attempting to predict. We have to predict 3 years in advance, and we make mistakes like everyone else. Everybody in the industry does.

Mr. O'LEARY. But the power of their advertising budget does not inhibit your decisionmaking process as to what kind of product to put on the market.

Mr. HEINEN. Absolutely not. The only thing that inhibits our decisionmaking process is how sure we are that we are correctly gaging what the car is going to be that people are going to want in 3 years; how much money we have got that we can afford to put into that kind of a car; whether we can build the car; those kinds of decisions.

Now the power of the advertising doesn't have any effect on it; whatsoever. None at all.

Mr. O'LEARY. Thank you.

Senator HART. On that last point, I know you believe that. I have never convinced myself. I am yet to be convinced that General Motors couldn't make us all think that a three-wheeled car was the greatest thing that ever happened.

Mr. CHUMBRIS. I think that the statement that the witness made about Edsel, which was produced by Ford, is significant. Ford is

among the largest advertisers in the country, and Ford couldn't sell Edsel with all of the advertising power it had.

Mr. HEINEN. That is correct.

Mr. CHUMBRIS. Was 1953 about the same time that Studebaker tried to come out with a smaller car, or a different type of model, and then were completely out of business?

Mr. HEINEN. Yes, Mr. Chumbris, in trying to pin down precise dates, there was a period after the war, if you recall, when there was a Henry J and a Frazier that tried to come out, and that didn't go.

Then a gentleman named Tucker tried to introduce what was really, supposedly, a completely new car, and that didn't go.

Someplace in there, Studebaker ran into difficulty. I think before Studebaker, Packard, I guess, was a standard car, not different. You also first had both Nash and Hudson, which eventually became American Motors.

I know there was a shakeout after the war of a number of these cars, and I think someplace in there was the Studebaker situation that you are talking about where they did have really quite a different car, and a very attractive, stylish car from many persons' point of view, but apparently not for enough people.

Part of the problem with a very avant garde kind of car, too, is that a car is a large investment for a consumer, and the person that buys a car in the main is a person with a family. He is going on a vacation and he wants a car which is a fairly standard car that gives him certain amounts of room, and certain amounts of space, and so on.

It is difficult to be too far out with this kind of a person and sell to him. You can sell a specialty car that is very high priced, and sell them in small quantities to people who can afford them, but this is not the average customer.

Mr. CHUMBRIS. There are a lot of other questions I could ask you. We have a live quorum going right now for a vote on the cloture petition.

Mr. Chairman, I would like to have placed in the record at this point the bill that Congressman Riegle introduced yesterday in the House dealing with the Automobile Free Trade Act, since the witness testified on that issue.

[The bill referred to, H.R. 13920, appears at the end of Mr. Heinen's testimony as exhibit 5.]

Mr. CHUMBRIS. I think that we have covered the waterfront pretty well with the witness this morning. With that, Mr. Chairman, I would like to defer any questions.

Senator HART. The timing is fortunate.

Mr. Maher, did you have anything to add?

Mr. MAHER. No, sir.

Senator HART. Gentlemen, thank you very much.

Mr. HEINEN. Thank you very much. I have enjoyed it.

Senator HART. We will recess to resume at 2.

[Whereupon, at 12:10 p.m., the proceedings were adjourned to reconvene at 2 p.m. the same day.]

[The following was received for the record. Testimony resumes on p. 2202.]

MATERIAL RELATING TO THE TESTIMONY OF PAUL A. HEINEN

Exhibit 1.—Chrysler Engineering Office Memo Comparing Equipment Features of 1964 Fury and 1974 Fury

COMPARISON OF STANDARD EQUIPMENT FEATURES—1974 FURY GRAN COUPE VS. 1964 SPORT FURY TWO DOOR HARDTOP

PASSENGER COMFORT IMPROVEMENTS

Numerous interior packaging changes have been made since the 1964 Fury to make the 1974 Fury more comfortable to all occupants. The front seat has increased leg room, hip room, and shoulder room while the rear seat has more head room, leg room, and shoulder room.

MAINTENANCE SCHEDULE IMPROVEMENTS

Chrysler has continued its efforts to minimize the necessity of the owner having frequent or extensive maintenance of his car. Considerable gains have been made in this area from 1964 to 1974. The 1964 Fury cars had seventeen normal service items recommended while the new 1974 Fury has eliminated three of the items and increased time/mileage intervals on eight of the original items.

BODY CONTRUCTION AND SUSPENSION ISOLATION

Today's Fury is of the unibody-type construction with a rubber isolated front frame used to carry the suspension, engine, and transmission. In the rear, the suspension components are also isolated from the body by sophisticated rubber mounts. With the standard sway bar, 15 inch wheels, wide bias belted polyglas tires this car has greater torsional rigidity, improved handling, more comfortable ride, plus less engine and road noise inside the passenger compartment.

ENGINE PROGRESS

Fury's 1974 V–8 engine has a displacement of 360 cu. in. compared to the 318 cu. in. V–8 engine used in 1964 and has improved durability. All engines have induction hardened exhaust valve seats to allow use of low octane unleaded fuel and a new spool type engine mount to restrain more effectively engine movement on frontal impact. Other significant features of the 1974 engine include an Electronic Ignition System, Hi-Speed (1½ H.P.) Starter, Transistorized Voltage Regulator, more durable/higher output Alternator, and Glass Filament-Hypalon (high temperature resistant) Spark Plug Cables. Numerous changes to the Chrysler Cleaner Air system have been introduced during the past ten years to reduce emissions. The current 1974 Fury engine incorporates a Two-Stage Electric Assist Choke, Orifice Spark Advance Control (OSAC), Proportional Exhaust Gas Recirculation (PEGF), Charcoal Canister, Closed Crankcase Ventilation, Heated Intake Air. To complete the emission package the fuel tank has a Vapor Liquid Separator and Pressure-Vacuum Relief Filler Cap.

SOUND LEVEL IMPROVEMENTS

Quiet interiors of 1974 Gran Coupe Furys are a result of extensive efforts in many areas of the car. The body has Large Section Body Weatherstrips, Moulded Dash Panels, Full Layer of Floor Silencer Material, and a Trunk Front Liner Silencer. The exhaust system has larger mufflers, resonators, and laminated steel exhaust pipes with each car having a Tuned Engine Bending Damper. A new quieter 8¼ rear axle with improved durability characteristics has replaced the 8¾ axle.

IMPROVED SERVICEABILITY

An ongoing program to make cars easier to assemble in a quality manner and less expensive to repair has resulted in numerous product features in 1974. A modular Instrument Panel construction allows easy assembly and disassembly

of a panel and components from the face and top of the panel. A single post glass regulator system with reduced attaching bolts using the two piece door trim panel allows for easy assembly and only the upper trim panel removal for glass adjustment. This glass adjustment is performed with the door closed to provide maximum seal. A larger hood opening with a torsion bar hood hinge reduces the hinge complexity and allows for easier accessibility to components in the engine compartment. Routing of all Air Conditioning hoses over the right front wheelhouse allows for engine component repairs to be made without discharging the freon in an Air Conditioned Car (optional equipment.)

The Radiator Coolant Reserve System provides a readily visible means of checking engine coolant and eliminates loss of coolant through the overflow tube as used in 1964.

ELECTRICAL AND ACCESSORY DEVELOPMENTS

Fusible links have been developed in several locations to protect expensive components from burning out with one of these located near the Battery Quick Disconnect which makes car storage easier. A shunt type ammeter has replaced the 1964 series type along with an improved alternator to better control battery charging which provides more voltage at required locations such as headlights, wiper motor, and blower motor.

Numerous items that have been made standard equipment since the 1964 Sport Fury Two Door Hardtop are: Glove Box Light, Two Speed Windshield Wipers, Brake System Fluid Warning Light, and Improved Lo-Beam Headlights. Heater capacity has been increased by 15 percent and upper level ventilation provided. A new swing down fuse block has been provided to allow for easier trouble shooting, easier fuse replacement, and a computerized assembly plant inspection check of the cars' electrical system.

MATERIAL DEVELOPMENTS—PRODUCT IMPROVEMENT

Vinyl on Aluminum Body Side Mouldings provides protection to the moulding not provided by the 1964 Stainless Steel Mouldings, while continuing to protect the painted surfaces. The current extensive use of exterior aluminum mouldings and the improved method of Discontinuous Nickel Chrome Plating of Die Cast Trim have drastically reduced corrosion problems. Vinyl top materials are now standard release in many colors and grains. Galvanized sills with solder joints have dramatically reduced previous corrosion problems in this area. Super Enamel (Alkyd) used in 1964 for the exterior finish has been replaced by Buffable Acrylic Baker Enamel that can be highly polished like a lacquer and is more resistant to chipping, scratching, and staining.

GENERAL DRIVEABILITY IMPROVEMENTS

Many changes in Chassis components since 1964 improve the general ease of handling and the overall driveability of the Fury. A major step was take in improving brake performance by replacing the front manual drum brakes with Power Front Disc Brakes (Floating Caliper). This performance is further bolstered by the use of a Duel Master Cylinder to separate the front and rear braking systems which replaced the Single Master Cylinder System. A new improved durability, better sealed, and smoother Torque Flite Automatic Transmission is standard in 1974 Furys compared to the 3-Speed Manual Transmission in 1964. Passing ability has been improved through the introduction of part throttle transmission kickdown on the current Torque Flite Transmission. More accurate (0–3%) speedometer readings have been achieved with the introduction of a new family of Speedometer Pinion Gears. Effort to park the 1974 model cars has been reduced with the new higher output pump and road feel has been improved by going to a crowned gear in the Power Steering Unit. A 25 gallon Fuel Tank has been introduced on the 1974 Fury Gran Coupe compared to the 20 gallon Fuel Tank available in 1964.

SAFETY PRODUCT DEVELOPMENTS

A number of items that are now standard equipment have been developed by Chrysler Corporation to protect the car occupants. Many items were provided

as a normal part of research and development since the 1964 Fury and others were developed to meet Federal or State Regulations. Articulated Wipe Windshield Wipers replaced the non-overlap wipers to provide increased area of wip pattern for improved visibility. A new Security Deck Lid Lock has been achieved to reduce likelihood of Trunk break-ins. The 1974 Fury has a new Skid Windshield Header to reduce the possibility of occupant injuries from secondary impacts. In this same area compared to 1964, the Windshield has a Thicker Vinyl interface to retain unrestrained occupants better and Padded Sun Visors to help avoid injury. Improved visibility for the driver has been achieved on the 1974 Fury by lowering the Glass Belt line and decreasing the obstruction of the various pillars and door upper frames to the roof. Visibility has also been improved by adopting a wider Inside Rearview Mirror. Hydraulic Bumper Systems are all new on Fury in 1974 to meet MVSS 215. Other developments to meet specific regulations are the Lap and Shoulder Belts With Starter Interlock, Steering Wheel Lock, Steel Door Beams, Illuminated Side Marker Lights, Fasten Seat Belt Warning Light and Buzzer, Instrument Panel Crash Pad, Fire Retardant Interior Soft Trim Materials, and Front Seat Head Restraints. Prior to the effective date of MVSS 203 and 204, the Deep Dish Steering Wheel and Collapsible Steering Columns had been made standard equipment. The Stronger Door Locks and Stronger Door Hinges were developed as standard features that continue to exceed the requirements of MVSS 206. Additional safety features in the door area include Flush Safety Inside Door Handles, Non-Override Inside Door Locks (exc. Driver), Soft Side Window Handle Knobs and Safety (recessed) Outside Door Handles.

Hi-Strength Butyl Tape was developed to retain the Windshield in accordance with MVSS 212 and because of its excellent sealing and installation characteristics it was also released for Rear Window installation. In 1974 a Flexibly Mounted Hood Ornament is standard on the Fury Gran Coupe.

CUSTOMER CONVENIENCE DEVELOPMENTS

The Glove Box has been relocated from the right side of the Instrument Panel to the Center Lower for improved driver access on the new 1974 Fury. All new Weather Protected Door Lock Cylinders have been developed to eliminate locks freezing in the cold and accumulation of foreign materials in the mechanism. An Inside Hood Release is conveniently provided to the left of the driver replacing the outside grille area mounted mechanical release.

1974 Fury Optional Features—New or Upgraded Since 1964

BODY

Right outside remote mirror, positive 2nd seat latch—wagons, split front bench seats, inside car-vacuum deck lid release, roof mounted air deflector (wagons), larger wagon rear compartment 4′–½″(u), two way tailgate (wagons), and door ajar warning lights.

CHASSIS

Complete trailer tow package(u), sure grip rear axle, automatic speed control, adjustable (tile and tel) steering wheel, and steel belted radial tires).

ELECTRICAL AND ACCESSORIES

Higher capacity air conditioner(u), electronic digital clock, electric door locks, 6-way power front seat, fender mounted turn signal lights, 3-speed windshield wipers, power window safety lock-out, automatic temperature control air conditioner, time delay ignition light, solid stainless steel radio antenna, stereo radio (2 front and 2 rear speakers), 8 track tape player, light emitting diode warning lights (fuel-amp.), and electronic security alarm system.

Exhibit 2.—Chrysler Major Components Purchases From and Sales to Other Companies in the Automotive Industry

CHRYSLER PURCHASES—1973

[Dollar amounts in thousands]

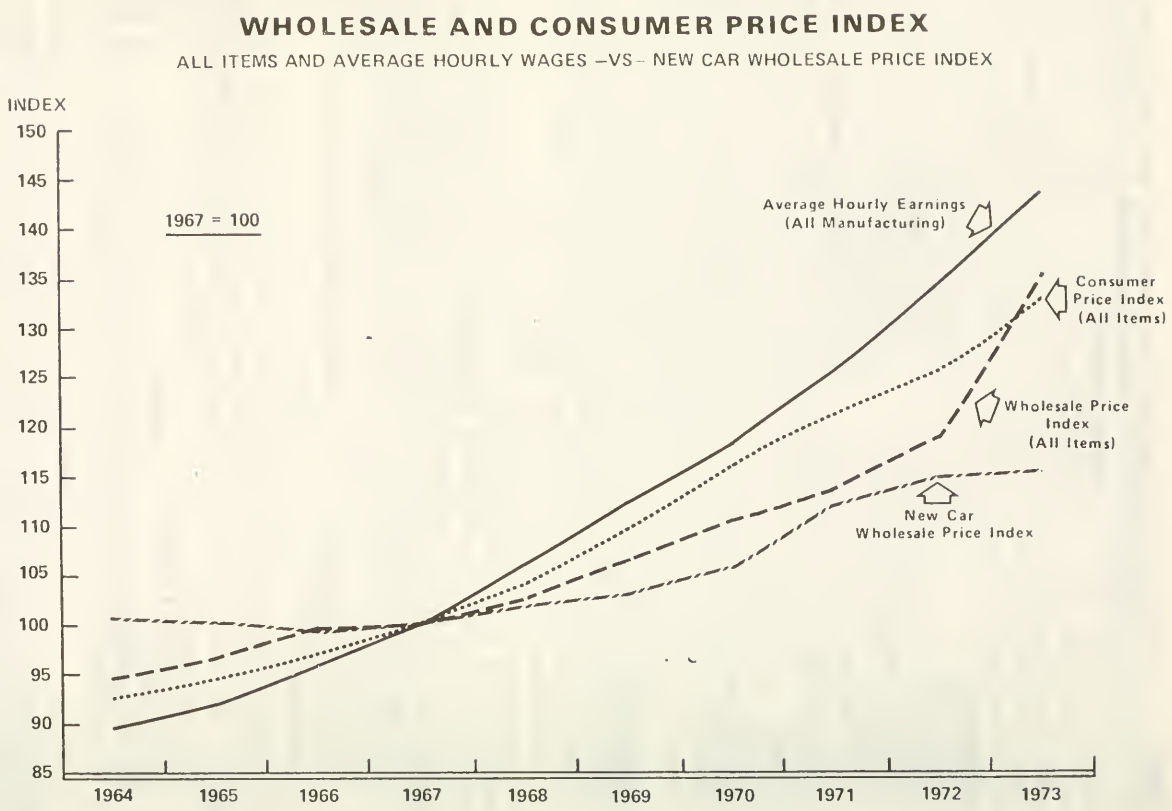
	Amount	Commodity
General Motors Corp:		
Allison	$1,068	Truck transmissions.
Central Foundry	22,646	Castings.
Delco Products	2,754	Shock absorber valves.
Delco Radio	1,035	Radios and components.
Detroit Diesel Engine	4,384	Diesel engines.
New Departure-Hyatt Bearing	3,331	Bearings.
Packard Electric	1,819	Wiring components.
Saginaw Steering Gear	28,665	Air pumps, power steering pumps, collapsible steering columns.
All other—miscellaneous	1,685	
Total	67,387	
Ford Motor Corp:		
Parent corporation	1,962	Steel.
Glass division	3,130	Glass.
All other	42	
Total	5,134	
American Motors Corp.:		
Evart Products	11	Plastics.
Mercury Plastics	2,600	
Total	2,611	
Total all purchases	75,132	

CHRYSLER SALES—1973

[In thousands]

General Motors:	
Emission controls	$333
Governors	7,048
Transmissions	35,111
Powder metals	1,226
Perforated head liners	842
Miscellaneous	97
Total	44,657
Ford:	
Grey iron castings	335
Instruments and governors	2,690
Transmissions	26,205
Powder metals	1,055
Miscellaneous	99
Total	30,426
American Motors:	
Grey iron castings	2,078
Foam seat cushions and backs	1,540
Universal joints	337
Instruments and governors	3,145
Transmissions	43,595
Torque converters	11,030
Total	61,725
Total all sales	136,844

Exhibit 3.—BLS Chart Comparing Wholesale and Consumer Price Index With New Car Wholesale Price Index



Source: U.S. Bureau of Labor Statistics

Exhibit 4.—Letter From Mr. Heinen to Senator Hart Transmitting Information Requested at Hearing

CHRYSLER CORP.,
Detroit, Mich., April 19, 1974.

Hon. PHILIP A. HART,
Chairman, Subcommittee on Antitrust and Monopoly, Committee on the Judiciary,
U.S. Senate,
Washington, D.C.

DEAR SENATOR HART: As you requested, I am returning the transcript of my testimony, which you forwarded to me, with appropriate grammatical and typographical corrections.

During the course of my testimony, there were a number of items of information that I stated I would supply for the record. These are as follows:

1. On page 490, I was asked what were the most significant items purchased by Chrysler. The most significant items we purchase for the purpose of inclusion in motor vehicles are as follows:

a. Raw materials: (1) steel; (2) petrochemials; (3) flat glass; and (4) aluminum.

b. Semi-fabricated materials; (1) grey iron castings; (2) malleable iron castings; and (3) zinc die castings.

c. Tires.

d. Bumpers.

e. Bumper reinforcements and attaching parts.

f. Seat restraint systems.

g. Radiators and heater cores.

h. Batteries.

i. Carburetors.

j. Electrical wiring harnesses and cables.

k. Decorative and functional mouldings.

2. On page 496, I indicated I would supply the text of a speech entitled "Alternative Power Systems" by Mr. George H. Huebner, Jr., Director of Engineering Research for Chrysler Corporation, which he presented in October of 1974. The text of Mr. Hubner's speech is enclosed.

3. On pages 511–514 of the transcript I was asked a number of questions concerning our stamping plants and our stampings. Chrysler operates the following stamping plants: a. Eight Mile and Outer Drive Stamping Plant Detroit, Michigan; b. Mack Avenue Stamping Plant Detroit, Michigan; c. Sterling Stamping Plant Sterling Heights, Michigan; d. Twinsburg Stamping Plant Twinsburg, Ohio; and e. Warren Stamping Plant Warren, Michigan.

Set forth below are some examples of the volumes of stampings produced from hard dies. These volumes include contemplated volumes through 1976, as these are items that we do not plan to change prior to that time. Also to be of further assistance, I am including the year the dies were built. Thus, the volume figures shown are the volumes from that year through 1976:

SMALL STAMPINGS

Year dies built	Description of stamping	Total volume
1963	Window retainer	43,320,000
1964	Hood lock latch	20,648,000
1967	Plate hood latch	9,494,000
1970	Heater hose clamp retainer	35,670,000

MAJOR STAMPINGS

Year dies built	Description of stamping	Total volume
1967	Fender	2,788,000
1967	Quarter panel	2,645,000
1963	Rear floor pan rail	12,177,000

4. On pages 517 and 518, I was asked for production figures of our engine plants and transmission plants. For the year 1973, these are as follows:

Engine plants:	
Mound Road Engine Plant, Detroit, Mich	798, 056
Trenton Engine Plant, Trenton, Mich	884, 193
Windsor, Engine Plant, Windsor, Ontario	541, 773
Transmission Plants:	
Kokomo Transmission and Casting Plant, Kokomo, Ind	2, 474, 990
New Process Gear Division, East Syracuse, N.W	418, 186

5. On page 518, I was asked about the planned capacity of the New Stanton Assembly Plant. The planned capacity of this assembly plant is 960 cars per day, assuming our current type of production car. At this rate, with our normal overtime, we would produce 230,000 cars per year.

6. On page 523. I was asked to furnish the amount of our contributions to the Motor Vehicle Manufacturers Association (MVMA) and the Highway Users Federation. Chrysler's membership fee in the MVMA is determined on the basis of its market share. For the calendar year 1973, our market share was about 13.02%. This resulted in Chrysler paying the sum of $1,485,025 to MVMA.

MVMA contributed $1,412,683 to the Highway Users Federation. 13.02% of this, or $183,953, could, therefore, be considered to be Chrysler's indirect contribution to the Federation. Chrysler made no direct contribution to the Highway Users Federation.

I believe this letter supplies all of the information that I was not able to supply at the hearing.

Sincerely,

PAUL HEINEN.

Enclosure.

Enclosure 1

"ALTERNATIVE POWER SYSTEMS," REMARKS BY GEORGE J. HUEBNER, JR., DIRECTOR, ENGINEERING RESEARCH, CHRYSLER CORP., PRESENTED AT INTERNATIONAL MOTOR PRESS ASSOCIATION, TUESDAY, OCTOBER 30, 1973, NEW YORK, N.Y.

Over the past 25 years, the research activity at Chrysler Corporation has continuously and carefully studied the possibility of alternative power systems.

The success of the automobile as a means of personal transportation has been totally dependent upon its powerplant. The first self-propelled road vehicles were powered by steam, principally because this was the only portable power system known at the time. These crude vehicles were unsuccessful, primarily because the powerplant was unsatisfactory. It was too heavy, too bulky, too inefficient and too dangerous. This continued to be true even after steam powerplants had begun their gradual takeover in the marine field.

It is only natural that the automobiles of the early twentieth century were powered by three different methods. More than a hundred years of steam experience in the design and development of powerplants and of their manufacture made the use of steam care inevitable. Electric cars, too, had behind them 25 years of the growing use of electricity. Both of these power systems could compete easily with the then primitive internal combustion engine which had not, up to that time, found any viable economic niche in the power systems of the day.

Thus, the consideration of steam and electric cars cannot be considered new. In the early days of the automobile they were considered superior to the internal combustion engine and until the new system reached a point of efficiency in which it was demonstrable economically superior, steam and electricity ruled the growing automobile industry.

The consideration of any alternative to the spark-ignition engine as the principal power source for passenger vehicles is a very serious, almost awe-inspiring problem. Passenger car owners and drivers are interested in only one thing: transporting themselves, their families and their goods from one place to another with the maximum of convenience and comfort in the minimum amount of time and at minimum cost. They are being made aware of the fact that this must be done without deteriorating the atmosphere.

The great majority of automotive vehicle owners and users really do not care what kind of powerplant is used to accomplish these objectives. They are interested in results, not means of processes. Unless, of course, their powerplant requires more care, greater maintenance, costs more or is less reliable. If any alternative powerplant, although in its early stages of use, departed in any way from previous user experience or even expectation, negative customer response would be immediate and, from the standpoint of private enterprise, retribution would be swift.

All the practical types of automotive vehicles known today must store their energy source on board in chemical form. For the steam engine and gas turbine (as well as the reciprocating internal combustion engine) that form is hydrocarbon fuel.

An electrical propulsion system also uses hydrocarbon fuel as its prime source, but an intermediate step is inserted into the process: the storage battery. This allows combustion to take place, not in each individual car, but in large central generating stations, thus transferring the pollution problem to a central location. This is not a minor consideration, since a change over to electric cars in the United States would double our required central station capacity. But the problem with electric cars is the storage battery itself, because as far as the car is concerned, that is the "fuel." Unfortunately, as an energy storage device, the electric battery is a very poor substitute for hydrocarbon fuels. For, on the basis of either power density or energy density, no practical battery systems today, or the foreseeable future, can even approach motor fuels.

One of our electric prototypes was a converted Simca. Unfortunately, the results of this experimentation merely confirmed the basic facts which you all know, that lead-acid batteries deliveryin 14-watt hours per pound or even hypothetical future batteries at 150-watt hours per pound cannot compete in the personal transportation field with internal combustion engines burning hydrocarbon fuels at 5,900-watt hours per pound.

On any basis, range, performance, size, weight, or a combination of these factors, the internal combustion engine would have a clear advantage of 17 to 1 over the electric car with even the highly advanced batteries which it is hoped the future will bring forth.

During the past 25 years of alternative powerplant work at Chrysler, steam powerplants have been studied very seriously.

Not only the hardware used in a steam powerplant was designed and studied extensively but attempts were made to develop suitable inorganic and organic fluids as well as water-plus-antifreeze combinations. Extensive lubrication studies were undertaken, since this was recognized as being one of the most serious problems of the reciprocating steam expander. At the temperatures and pressures required to obtain modestly comparable efficiency in comparison to the internal combustion engine, lubrication remains today a technological barrier, requiring not simple development work but a breakthrough of the same order of difficulty as the battery problem in the electric car.

Various steam proposals have been made using organic liquids in place of water. The best of these materials available today will allow powerplant efficiency only about 75% as great as the internal combustion engine. The boiler for a steam engine using this fluid would be substantially larger than a boiler using water, the condenser would be 2½ times the size of an automobile radiator and the expander or engine would be nine times as large. Under these conditions, it would be a little difficult to find rooms for passengers.

The principal advantage of the steam powerplant claimed by its protagonists is that its combustion system offers the possibility of low exhaust emissions. Theoretically we see little to choose between the combustion system of a steam engine and that of a gas turbine. They are essentially the same system, the only difference being that the gas turbine combustor operates at a higher pressure ratio than the combustor of a steam boiler.

The only steam powered passenger automobile which to our knowledge has had exhaust emission measurements confirmed this hypothesis. The emissions were indeed low. But the oxides of nitrogen were marginal and it is our feeling that if the boiler and burner in this car had been correctly sized for the expanded that the emission would have been substantially worse.

Within the past few months the results of the California Steam Bus Program have become public knowledge. Al three of the buses tested showed fuel consumption results 3 to 5 times that of the standard commercial buses equipped

with their conventional diesel enginers. Nor were exterior noise levels much better than the diesel powered units. Emissions levels were lower in comparison to the diesel buses which had no special preparation for low emissions and which could undoubtedly be lowered substantially.

In January, 1972, the Environmental Protection Administration placed three contracts with non-automotive companies to design and construct steam powerplants capable of meeting the 1976 emissions requirements.

We were asked to assist one of these firms, Scientific Energy Systems of Newton, Massachusetts, in adapting a vehicle that would accommodate a Steam powerplant, to make an analysis of the production cost of such a powerplant, and to conduct a detailed analysis of various arrangements to deliver the best possible combination of performance, fuel economy, and emissions.

Since that time, a fourth steam engine designer has obtained a contract under the sponsorship of EPA, but so far, none have presented the government with enough data to plan the future course of this work.

To summarize, our work has indicated that an automotive steam powerplant would be bulky, heavy and, as a system, up to twice as expensive as the internal combustion engine. It does not appear to have any clear-cut potential advantage in emissions over the gas turbine, which has fewer moving parts than even the internal combustion engine, and it is much more complicated, thus implying substantially greater maintenance.

Chrysler's continuing research effort in automotive propulsion has covered not only electric and steam powered vehicles but has explored the possibilities of various types of hybrids. A hybrid system consists of a heat engine (Otto, Diesel, Stirling, Brayton, etc.) and an energy storage medium (battery, flywheel, fluid). Short-time possibilities should perhaps be restricted to the Otto cycle with either batteries or flywheels.

The best system choice depends on intended vehicle use. At one extreme is the small limited purpose car with a large battery and a small engine to keep the battery charged. At the other extreme is the full-sized car with a smaller engine and short-time power boost provided by a flywheel. A variety of combinations can exist between these two extremes.

The added weight of a hybrid combination, as compared with a vehicle having only a larger heat engine, requires additional energy to overcome rolling resistance and more power to provide the same performance.

Only a small part of the kinetic energy can be recovered by regenerative braking. Losses in conversions of energy from one form to the other within the system reduce overall efficiency.

Emissions during cold starts will still be high, and in addition, other exhaust treatments such as thermal reactors or catalysts will still be required to meet low emissions levels.

The Stirling engine is receiving a substantial amount of attention today. This is a reciprocating type external combustion engine, with a continuous combustion burner. The primary energy source is diesel fuel. It can run also on coal, sunshine energy, stored thermal energy, wood, lithium, etc. The engine works best with hydrogen as a working gas. Helium may also be used, but the efficiency of the system suffers considerably. The pressure of the working gas is in the range of 1,000 to 3,000 psi.

The Stirling's thermal efficiency is at least as good as that of the disel engine. It has extremely low hydrocarbon and carbon monoxide emissions, and it has a wide range of multi-fuel capability. However, NOx emissions require additional control measures, since its combustion is similar to the gas turbine. It uses explosive hydrogen as working gas at high pressure. Well over 200 brazings per cylinder (for heat exchanger, tube ends, etc.) require space science technology. Stainless steel and expensive super-alloys hav to be usd for cylinder head and heat exchanger tubes. Mass production technology is not yet developed. Size is about 1.5 times of the diesel engine. Load change is slow. It requires working gas pressure changes in the system so vehicle driveability and performance are questionable.

Finally, as a conventional alternative, the diesel engine—already a commercial success—is being re-examined for passenger cars. It has many similarities to stratified charge engines. Each has the potential advantages of good

fuel economy and low emissions due to very lean mixtures (excess air combustion).

However, the diesel with its compression ignition produces high cylinder pressure and requires expensive fuel injection equipment. The pre-chamber form of diesel lends itself most favorably to emissions control. Available data indicates that, as a passenger car powerplant, the diesel could meet both the 1975 Federal emissions numbers as well as the 1975–76 recently announced interim numbers.

Diesel fuel economy will depreciate somewhat with emissions control, though less than for thermal reactor or dual catalyst systems on conventional engines. However, it is estimated that a 15–20% advantage over the spark-ignition engine would be maintained. The more rigid structure required to withstand the high cylinder pressure in a diesel plus its fuel injection system make it a heavier, bulkier and substantially more costly engine. Furthermore, the chronic diesel problems of noise, smoke and odor will require considerable effort if they are to become acceptable in passenger vehicles.

In a way similar to the diesel in that it is operated with excess air is the stratified-charge engine. It uses either a divided combustion chamber or one that creates a rich zone near the spark plug and a very lean mixture in the balance of the combustion chamber. The stratified-charge engine allows the combustion of extremely lean mixtures which results in low oxides of nitrogen formation.

Chrysler has worked with stratified-charges for many years, particularly the type with a single combustion chamber, where a fuel injection system is used to obtain a rich burning zone surrounded by an extremely lean mixture in the combustion chamber. The Texaco system, in which we are particularly interested, produces low oxides of nitrogen but loses most of its fuel economy advantage by the methods which must be used to after-burn the unburned hydrocarbons and carbon monoxide in the exhaust. Briefly, it has all the expensive components of the diesel fuel injection system plus an ignition system, plus a thermal reactor, plus two oxidation catalysts.

Recently Honda in Japan announced a three-valve stratified-charge engine with a small pre-chamber, fed a rich mixture which then acts as a torch ignitor to a very lean mixture in the main chamber. The success of this engine, as in the Texaco system previously described, depends on a good thermal retetion to burn the unburned hydrocarbons and carbon monoxide in the exhaust. Although the NOx is inherently low, it is not yet know whether it can meet the more rigorous oxides of nitrogen requirements for 1976 regulations and if it can meet them without a substantial degradation in fuel economy.

And finally, the gas turbine, an alternate powerplant on which we have been seriously working since the early 50's. Our first gas turbine power vehicle was built in 1953 and was followed by successive generation designs which showed steady improvement.

In 1964 we embarked on a 50-car consumer evaluation program in which we loaned 203 different people a gas turbine powered car for a three-month period. Nearly 1,300,000 miles were driven by all types of drivers in all parts of the country.

Consumer reaction to this experiment was most enthusiastic, but we became aware of certain deficiencies in this engine (our fourth generation design) which we realized would have to be corrected before the gas turbine could be considered a satisfactory passenger car prime mover.

The important deficiencies at the end of the evaluation program were: 1. Fuel economy poor at low speeds; 2. Excessive gas generator rotor lag; 3. Excessive noise at idle; 4. Inadequate engine braking; 5. Could not provide air conditioning; and 6. Excessive specific weight.

Correction of most of the listed items required major revisions. A newly designed engine shifted many of the accessories; air conditioning, alternator and power steering, which were originally driven from the gas generator, to the power turbine. This allowed better balance of the available pressures between compressor and power turbine, particularly at idle and a 150°F. increase in acceleration temperature reduced the rotor lag from 2.0 seconds to under 1.2 seconds. This made a vast improvement in the driving quality of the car.

The engine noise was also decreased because many of the reduction gears were eliminated.

Fast reliable starts at —20°F. using a 12-volt system are no longer a problem.

Engine braking is now at the point of being equal to or slightly better than a piston engine.

Component life has been greatly improved through continual modifications and accelerated endurance testing. Engines are tested on a 24-hour automatic endurance cycle which is very severe. All parts now have over 3,500 hours, equivalent to more than 100,000 miles of normal car use and many parts have accumulated up to 4,000 hours.

CURRENT ACTIVITY

The automotive passenger car gas turbine is a good engine, but not yet developed to that final point where it can be made available to the public in large volume. The objective of our turbine program is to overcome the remaining few deficiencies.

Near the end of 1972, Chrysler was awarded a contract by the Environmental Protection Agency to demonstrate the feasibility of meeting, with a gas turbine, the original 1976 emissions standards with satisfactory produceability, cost, reliability and with substantial improvement in vehicle tank mileage over the spark ignition engine. Our sixth generation turbine, the advanced powerplant which was developed to answer the problems illuminated by the fifty-car consumer experiment, was to be used as a baseline for the EPA work.

Following definitive tests on this baseline engine in both dynamometer cells and in vehicles the design is to be up-graded. This will be done by incorporating into it proven technical advances developed under the baseline contract and under separate Environmental Protection Agency contracts with groups outside of the automobile industry. Chrysler will also offer research advances developed since the original definition of the sixth generation, baseline powerplant.

The contract work also includes cost studies and assessment of produceability potential for high volume passenger car manufacture.

To date, results have indicated that the turbine can not only produce low hydrocarbon and carbon monoxide emissions, which we have always known, but that marked improvement can be made in oxides of nitrogen emissions. Whether or not it can ever reach the 0.4 grams per mile of the original 1976 Federal regulations is currently unknown, but Chrysler's latest vehicle tests indicate that we can meet the original 1975 California regulations which include 1.5 grams per mile of NDx and encouraging work is continuing.

However, the rules of the game may be changing again. The National Academy of Sciences, the Environmental Protection Agency and others have indicated that the target of 0.4 NOx may be too stringent and that higher emissions numbers may be indicated. This will not be decided for some time to come. But, if we assume that the turbine will meet desired emissions levels when this decision is made, we should examine its potential for meeting the other big problem facing the automotive powerplant today, namely reducing energy consumption, that is; improved vehicle tank mileage.

This next slide indicates a principle with which you are all familiar—the tradeoff between performance and tank mileage. Two vehicles are shown, one at 4,300 lbs., the other at 5,600 lbs. Power augmentation of a base powerplant shown by the points on the curves can be either taken as improved performance or improved fuel economy. The conclusion is that by increasing the specific output of the turbine without sacrificing basic engine economy that vehicle economy can be improved.

The next slide shows projected powerplant improvement as applied to a sub-compact vehicle.

And finally, this step chart shows in the first four steps how we think this can be brought about in the near term, that is two to four years.

But, we still must manufacture the powerplant. The techniques which have developed over several decades for the high volume manufacture of internal combustion engines have only been partially explored for the gas turbine.

Now let me anticipate a question. If new powerplants are so desirable, and, if we think we can meet or have met every goal for the turbine, why aren't we deep into the work of mass producing for passenger cars?

The answer is that any new product, whether it is a powerplant or a safety pin, must go through three basic stages on its way to the market place. The producer must: (1) Prove a production design; (2) procure tooling and plants, and (3) launch production.

These steps must be accomplished whether the production volume is high or low, but the techniques used depend heavily on that volume. The first stage of gas turbine production could probably begin at a volume of a few thousand a year using "interim" tooling. There would be a lot of job-shop operations, but many of the basic engine manufacturing problems could be solved.

But if gas turbines are to make a significant contribution to clean atmosphere, they must be used in large numbers, so most studies have been made for high volume production. And here is the heart of the problem. Gas turbine engines have never been produced in automotive quantities by anyone. To do so will require replacement of current manufacturing methods with equipment and techniques that have never before been used in large volume manufacturing businesses.

These techniques do exist, however, and many of them are currently used for moderate volume production, but the labor content in prohibitive. Processes like precision investment casting must be automated before they are practical for automotive purposes. Engine plants, and most of the present foundry, metal cutting, fabrication and transfer line equipment will have to be completely replaced. Finally, as with any new product, the production program must be launched and guided through its early growing stages.

A possible schedule for the introduction of any new automotive power plant, whether it be electric, steam or gas turbine, might be as follows:

Final design, development and tooling for intial production, 4 years.

Initiate small scale production, and begin large volume tooling, 4 years.

Expansion of large scale production to meet total requirements, 2–4 years.

From this date, just to get to the point where large-scale production could begin would take at least eight years. Ten to twelve years would pass before the new powerplants could reach the road in sufficient numbers to have an appreciable effect on air pollution. This is the reason that we must reduce emissions from the piston engine. And this is why we are engaged in a no-holds barred, all-out effort to that end.

The prospect of new powerplant does not frighten us, we thrive on novelty, that's how we grew up. Where powerplants, old or new, are concerned we know what has to be done and we think we know how to do it.

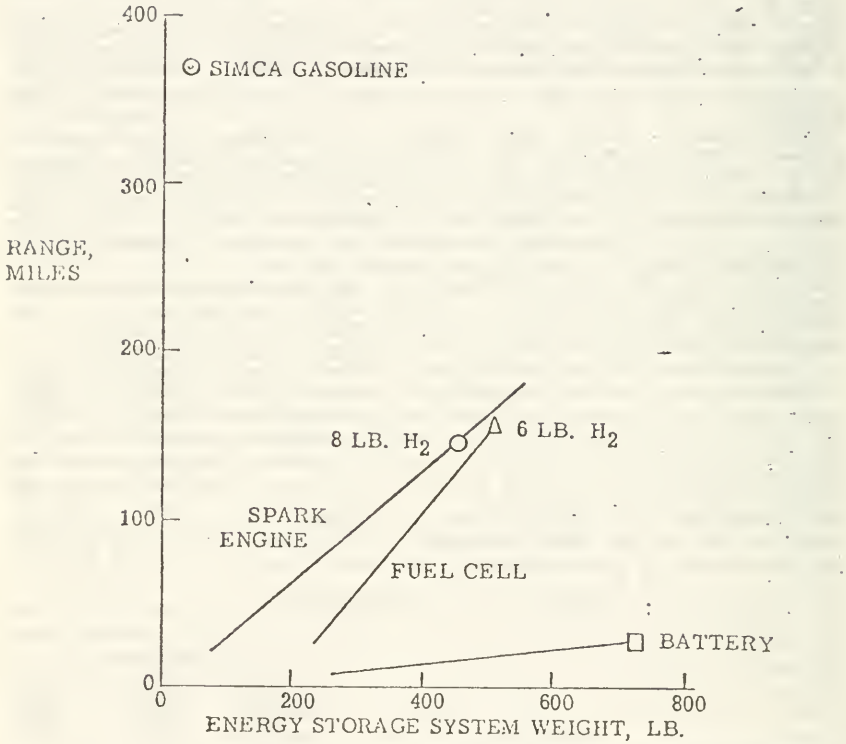
POWER PLANT—FUEL SYSTEM COMPARISON

	Powerplant type		
	Gasoline reciprocating engine	Hydrogen fuel cell electric	Battery electric
1. 4,000 pounds vehicle plus fuel storage, 0–30 mi/h in 5 seconds:			
Weight, pound	4,100	6,600	8,400
2. 2,000 pound vehicle plus fuel storage 0–30 mi/h in 10 seconds:			
Weight, pound	2,050	2,500	2,720
Maximum speed, miles per hour	75	45	55
Range, miles (cycle operation)	370	155	30
Cost basis (producer's price—no road tax, etc.)	[1] 2.2 [3] 13	[1] 5	[2] 1
Base fuel cost, cents per 100 miles	33	19	66
Total fuel cost, cents per 100 miles	84	?	?

[1] Cents per pound.
[2] Cents per kilowatt hour.
[3] Cents per gallon.

Slide 2.

VEHICLE RANGE - CYCLE OPERATION



HETEROGENEOUS CHARGE SYSTEMS

1. Single Chamber Charge Stratification through Swirl Control and Fuel Injection—TCCS and PROCO.
2. Divided Chamber—Phillips Petroleum, Newhall et al, Azure Blue, Honda, Etc.

COMPRESSION IGNITION

Longer Range Prospect.
Less Suited to Passenger Cars.

TCCS CRICKET TEST RESULTS (CAR 300)

	Emissions—grams per mile		
	HC	CO	NOx
Standard car, 1972 EPA	2.03	28.7	3.28
TCCS installation, first test	1.38	.50	1.73
Prior to Texaco testing, 1975 EPA	.56	.30	.46
Texaco tests, 1975 EPA, Avg. 3 (insulated exhaust pipe and polishing catalyst, moved polishing catalyst forward, increased EGR)	.36	1.15	.38

FUEL ECONOMY COMPARISON

	CS–EPA–1975 cricket tests (miles per hour)	Relative fuel economy (percent)
TCCS engine—Best economy settings	25.3	Base
TCCS engine—Full emissions package	20.0	79
	Jeep tests steady state	
TCCS engine—set for best economy only	33.0	132
Same engine—Carbureted version	25.0	Base
Net fuel economy gain—TCCS with emissions control versus standard engine, no controls: (1.32) (.79)=1.04		

140 CID POWERPLANT COMPARISON

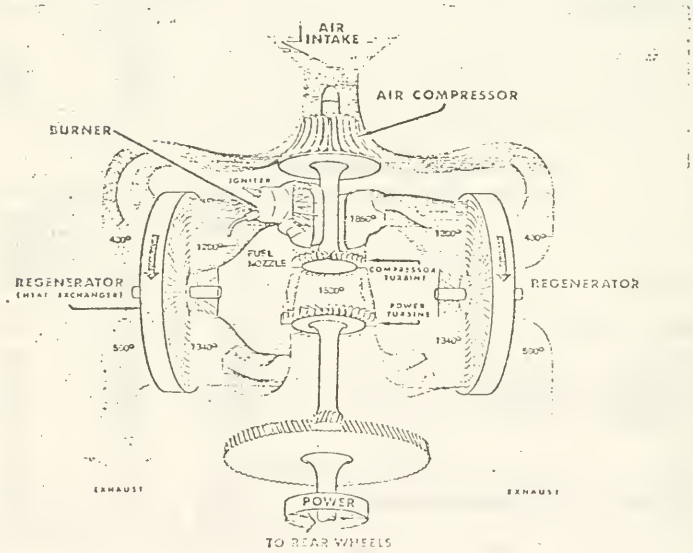
	Standard engine (1972 California specifications)	CVCC engine
Engine weight, pounds	349	339
Curb weight, pounds	2,213	2,204
Axle ratio	Std.	+10%
Performance:		
Maximum horsepower (DIN)	72 @ 4,500	73 @ 4,500
Maximum torque (DIN)	108 @ 2,500	99 @ 3,000
Maximum speed, miles per hour	94	94
Accelerate (S.S. ¼ mile), seconds	19.7	20.5
Emissions, 1975 EPA:		
HC	2.13	.26
CO	10.6	2.62
NOx	3.8	1.16
EPA, MPG	17.2	18.6

DIESEL EMISSIONS—MERCEDES-BENZ

Engine-vehicle description	220	220D	Calculated diesel (engine sized to give performance of 220)
Car weight (test), pound	3,460	3,540	3,600
Engine:			
Displacement, cubic inch	134	134	247
Rated power, horsepower	116	65	121
At rated speed, revolutions per minute	5,000	4,200	4,200
Specific Output, horsepower per cubic inch	.866	.485	.485
Accelerate 0-60 MPH, seconds	13.7	28.1	13.7
Emissions—EPA 1972:			
HC, grams per mile	2.68	0.87	[1] 1.3
CO, grams per mile	32.34	1.62	[1] 2.4
NOx, grams per mile	3.54	1.27	[1] 1.4
Average fuel consumption, miles per gallon, Uhlenhaut, Daimler-Benz	16	25	.....

[1] Estimated value.

Slide 8.



CHRYSLER CORPORATION SIXTH GENERATION GAS TURBINE ENGINE

Gas Turbine Features

Low maintenance.
Multi-fuel capability.
Negligible oil consumption.
Low noise and vibration levels.
Light weight.
Clean exhaust.

GAS TURBINE "STATE OF THE ART" AT END OF 50-CAR PROGRAM

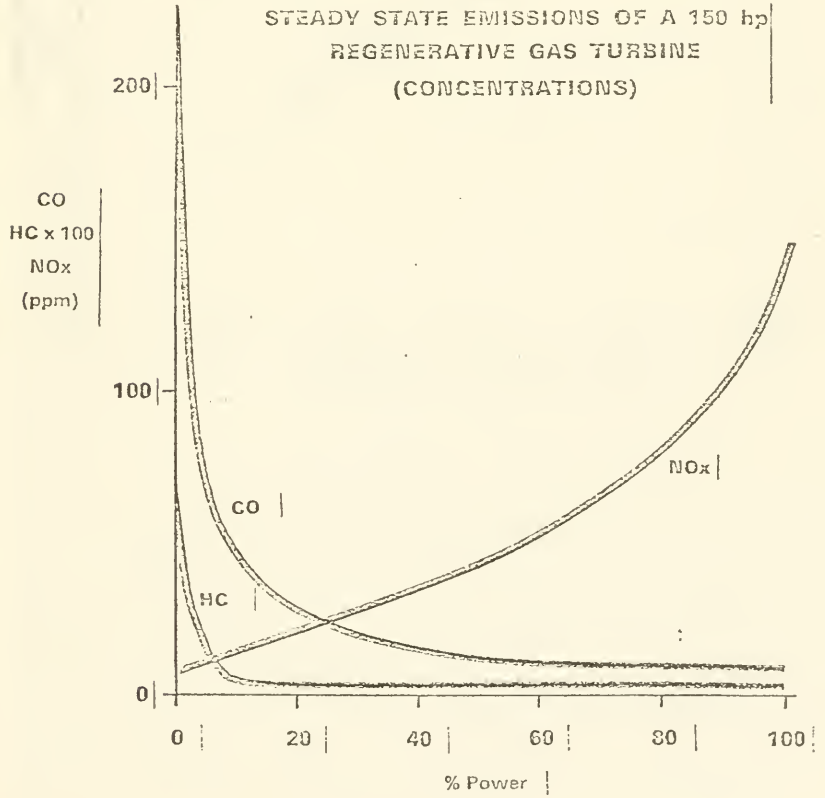
Fuel consumption excessive.
Gas generator lag excessive.
Noise level at idle excessive.
Engine braking inadequate.
Air conditioning unavailable.
Power inadequate for size and weight.

ENGINE COMPARISON

	Fourth generation A-831	Sixth generation A-128
		0
Horsepower rating	133.0	150.1
Maximum pressure ratio	4.1	4.0
Maximum steady temperature—°F	1,750.0	1,850.0
Maximum accelerate temperature—°F	1,850.0	2,000.
Vehicle accessory drive	(1)	(2)

[1] Gas generator.
[2] Power turbine.

Slide 12.



POLLUTANT CONCENTRATION CONSIDERATIONS

1976 Standards on 1972 Cycle;

Gm/Mi

HC = 0.41, CO = 4.7, NOx = 0.40

(Weighted 1975 Cycle: CO = 3.4 Gr/Mi)

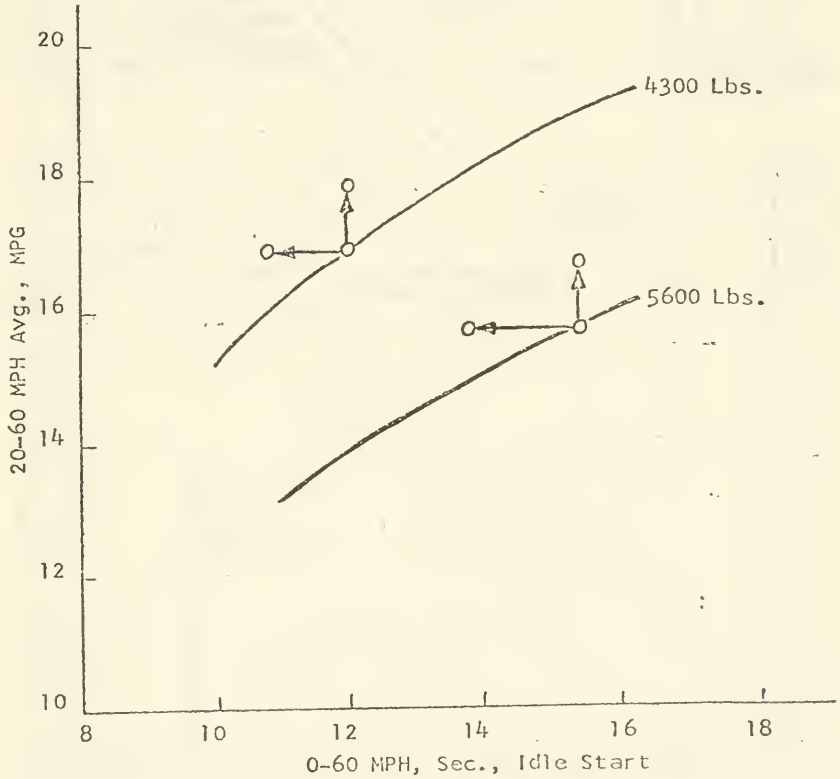
		4000# TURBINE TAILPIPE	4500# RECIPROCATING TAILPIPE	CVS BAG
Airflow/Cycle (Ft^3)		16000	1200	7200
Net Exhaust Concentration (ppm) To Equal Standards.	HC_3	4	52	9
	CO	67 (40)	990	149
	NOx	3.5	46	8

Typical Ambient Concentration Ranges

HC_3	1-5 ppm
CO	5-20 ppm
NOx	0-2 ppm

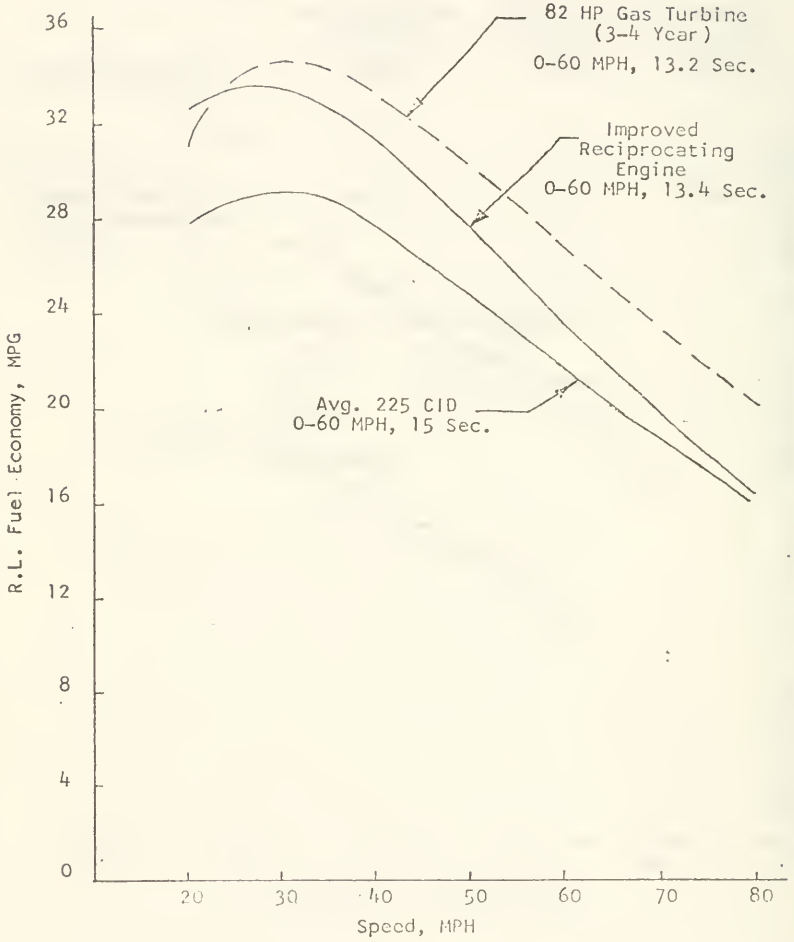
Slide 14.

EFFECT OF PEAK POWER AUGMENTATION ON
BASE ENGINE PERFORMANCE
150 HP



Slide 15.

SUB-COMPACT FUEL ECONOMY



Slide 16.

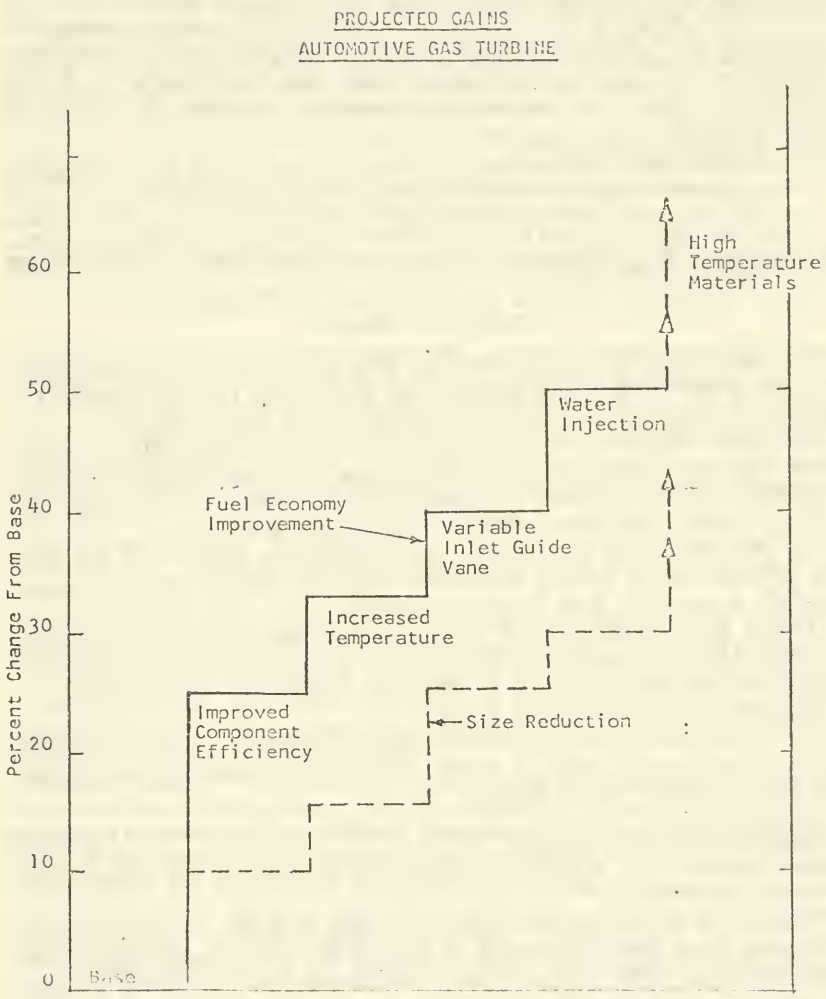


Exhibit 5.—H.R. 13920, *the "Automobile Free Trade Act"*

H.R. 13920, 93d Cong., Second Sess.

A BILL To impose temporary quotas on motor vehicles imported into the United States from foreign countries which do not allow substantially equivalent market access to motor vehicles manufactured in the United States

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "Automobile Free Trade Act".

SEC. 2. Within thirty days after the date of the enactment of this Act, the President shall—

(1) determine those foreign countries which allow, or will allow, market access in respect to motor vehicles manufactured in the United States which is substantially equivalent to the market access allowed by the United States in respect to motor vehicles produced in such countries; and

(2) publish in the Federal Register a list of such foreign countries.

SEC. 3. The total quantity of motor vehicles manufactured in any foreign country not included on the list published pursuant to section 2 of this Act which may be entered after June 30, 1974, and before January 1, 1976, shall not exceed the average annual quantity of motor vehicles manufactured in such country and entered during calendar years 1971, 1972, and 1973.

SEC. 4. The Secretary of Commerce shall compute the quantities provided for in section 3 on the basis of available import data and shall certify to the Secretary of the Treasury the amounts which may be entered from each foreign country. The Secretary of the Treasury shall take such actions as may be necessary to insure that the amounts which may be entered do not exceed these quantities.

SEC. 5. As used in this Act—

(1) The term "entered" means entered, or withdrawn from warehouse, for consumption in the customs territory of the United States.

(2) The term "motor vehicles" means automobile trucks, motor buses, and other motor vehicles for the transport of persons or articles as specified in items 692.02, 692.04, and 692.10 of the Tariff Schedules of the United States (19 U.S.C. 1202).

AFTERNOON SESSION

Senator HART. The subcommittee will be in order. This afternoon we will hear from Prof. George W. Hilton of the Economics Department of the University of California at Los Angeles.

Professor Hilton is highly regarded as one of the Nation's foremost highway transportation authorities. He has testified on other occasions on the subject of ground transportation, and, most recently, before the House Public Works Committee.

He started some controversy by suggesting then that by 1980 the present rapid transit movement will be looked upon as unsuccessful, misguided, and purely wasteful.

Today his statement will add to the debate regarding whether General Motors' control of the competing methods of ground transportation has proved to be in the best interest of our country.

Professor, we welcome you, sir.

Mr. CHUMBRIS. Mr. Chairman, before Professor Hilton proceeds with his statement, may I make just a brief comment concerning the press release which states:

> Chairman Philip A. Hart, Democrat of Michigan, today announced the names of automobile company witnesses who will appear at the second round of the Senate Antitrust and Monopoly Subcommittee hearings on the ground transportation industries.

I think I would like to have the record show that these three witnesses have been requested to testify by the subcommittee. Recommendations were given to the chief counsel and the staff director by me.

Mr. Demsetz was to appear last year during the general hearings. Because of other hearings we couldn't have any further economists at that time. But all of these gentlemen are coming in on their own, and the only emolument they will be getting from this is the usual transportation cost and per diem that the subcommittee pays for witnesses who come here.

And, therefore, they will be speaking in their own professional capacity, and not on behalf of any one particular company, industry, or other point of view, except their own.

I think the record should be clear on that one point.

Senator HART. I hope it is even without that clarification. If there is any doubt, I welcome the clarification.

It is true that my attention was called to the fact that the press release speaks of the automobile company witnesses. But that is not intended to suggest that any of the witnesses are automobile company witnesses.

I suspect that given the idea of what makes news, the drafter of that release sought to call attention to the fact that we would hear from Chrysler, General Motors, and Ford.

This is not to say that the press doesn't get excited about noxious emissions, too. But we don't sell quite as many papers as we do with the possibility of the manufacturer coming in.

Professor, you may proceed as you see fit.

STATEMENT OF GEORGE W. HILTON, PROFESSOR OF ECONOMICS, UNIVERSITY OF CALIFORNIA AT LOS ANGELES

Professor HILTON. Thank you. My prepared testimony is rather lengthy, running to 26 pages. I see no point in reading it.

I would like to summarize the principal contents of it I hope somewhat more briefly than the text, and then to make some additional observations.

Senator HART. It will printed in full; feel free to say whatever you want.

Professor HILTON. Thank you.

[Professor Hilton's prepared statement appears as exhibit 1 at the end of his oral testimony.]

Professor HILTON. I was asked by the subcommittee to write an evaluation of "American Ground Transport," by Bradford C. Snell.

I have addressed myself, essentially, to the two principal lines of argument in the report which was all that I think I could reasonably have been expected to do in the approximately 10 days I had to prepare my evaluation.

Senator HART. I just read the end of that first paragraph. Let me make another clarification. You are correct in your description of the Snell report as being issued under the subcommittee's imprint. That is not the position of the subcommittee.

Professor HILTON. Oh, I understand that. Yes, sir.

Senator HART. It is a matter of printing, and the Government Printing Office wouldn't print it for the individual.

Professor HILTON. I am aware of that. Obviously, it is preliminary.

Senator HART. A lot of people are very sensitive about it, and I welcomed the chance to put it on the record.

Professor HILTON. Yes, fine.

Now, briefly, the argument of the report is that General Motors is treated as a monopolist of autos although one of three producers—four producers, rather. Two of the other three, Ford and Chrysler, are treated in the report as acting either in collusion with General Motors or behaving passively so as to produce a collective monopoly. It is argued that the firm has used this monopoly power to produce

large, expensive, unsafe, and polluting automobiles instead of what might be more profitable and competitive environment.

The report then interprets GM's behavior as using its monopoly gain in a variety of cross-subsidization operations through its bus and locomotive branches so as to maintain its monopoly position in automobiles. It argues that GM, in collusion of Firestone and Standard Oil of California, formed National City Lines, which bought up a large number of electric railway properties to replace streetcars with buses, partly to achieve a monopoly gain on buses and partly to accelerate the decline of the transit lines and railroads and to increase the demands for both automobiles and trucks.

The report makes two principal examples to buttress these arguments. One, the city of Los Angeles where General Motors is accused of having brought about the replacement of local rail service with automotive transportation; and, two, in the main line of the New Haven Railroad, which General Motors is alleged to have caused to be deelectrified.

I would argue that these interpretations are not correct, and, further, that they couldn't possibly be correct, because major conversions in society of this character—from rail to free wheel urban transportation, and from steam to diesel railroad propulsion—are the sort of conversions which could come about only as a result of public preferences, technological change, the relative abundance of natural resources, and other impersonal phenomena or influence, rather than the machinations of a monopolist.

Monopoly is a situation which results in certain goods and services being more expensive than they would otherwise be through the monopolist's restriction on the supply. It is customarily a short-run and self-liquidating problem. The existence of a monopoly gives the economy the incentive to find alternatives for the monopolized good or service. The existence of a monopoly in any goods or service could not create the degree of comprehensive power over a long period which is alleged in this report to have been in the hands of General Motors, whereby General Motors is already able to achieve the economic changes in urban transportation and railroading in question.

There are several questions which arise here. First, whether General Motors ever did have a monopoly position. It has certainly been the dominant firm in the automobile industry. It has never achieved the degree of dominance which the Ford Motor Co. had before 1925, but it has, as we all know, been the principal producer more recently.

If the firm did have a substantial degree of monopoly power, it is by no means clear that the behavior which is attributed to it in the report would be a rational exercise of that power. If General Motors operations in the transit industry were an effort to build up the demand for automobiles, it is by no means clear that it had an incentive to go into the bus business; it would simply have bought up transit systems to get rid of them.

The relation between the transit industry and the demand for automobiles in the report is one so completely oversimplified that it is different to take seriously. The report argues that getting rid

of one bus generates the demand for 35 automobiles because there are 35 seats in the bus, getting rid of one streetcar generates the demand for 50 automobiles because there are 50 seats in the streetcar, and getting rid of a train generates demand for a larger number depending on the size of the train.

There is a substantial body of academic literature on the demand for automobiles and the demands for transit, conceptualizing these in terms of responses of people to income and to prices of automobiles and of transit. Many, if not most of the people on transit are there because they are too young to drive, too old to drive, have handicaps, are too poor to have automobiles, or their spouses have the automobile, and, thus, getting rid of a transit vehicle does not send people out to automobile dealers, as the report would indicate.

The report's argument in this respect is really inconsistent with what is said elsewhere in the report that General Motors is a monopolist in the bus industry, since, if it is achieving a monopoly gain in the transit industry, it has an incentive to decelerate rather than accelerate the decline of transit.

In my evaluation of the report I go on to discuss General Motors' behavior through National City Lines. This firm had a small number of transit enterprises, some of which had never been electric railway operations. It beheaved about as other transit enterprises did. In the late 1940's and the first few years of the 1950's it apparently accepted the conventional wisdom of the industry, that streetcars were preferable for heavily traveled lines, trolley buses for intermediate, and internal combustion buses for more lightly traveled lines.

After 1952 changes in cost plus the rapidly declining demand for urban public transportation caused the industry, generally, to opt for diesel buses as the most suitable for the present demand conditions. The streetcar survived only in circumstances in which there were some special cases. The most general circumstance that caused the streetcar to survive was the use of tunnels in which there were ventilation problems. Access to downtown areas in Boston, Philadelphia, Newark, and Pittsburgh all entailed this problem. In San Francisco there were two tunnels under the Twin Peaks. In other cities there were private rights of way which municipalities did not wish to see foregone. The remaining lines in New Orleans, Shaker Heights, and one of them in San Francisco have this characteristic.

And there are some unique characteristics, such as narrow streets in Philadelphia in which the use of a fixed-rail vehicle reduced the incidence of collision with parked cars, for example, and a customs inspection en route in El Paso for which streetcars with the so-called bowling alley configuration of seating lent themselves to the inspection better than buses.

National Cities Lines was no exception to this pattern. In St. Louis it ran the Hodiamont Streetcar Line until well into the 1960's because of a private right of way.

It operated the streetcar line in El Paso until July 30, 1973. I cited in my evaluation, data from the San Francisco Municipal Railway and Los Angeles Transit Lines indicating that the con-

version in those enterprises, as in the industry as a whole, were motivated by the cost advantage of buses over streetcars.

Since writing my prepared testimony I have had one additional response to my inquiries. Mr. E. J. Diaz, the general manager of El Paso City Lines, sent me the operating cost per mile for buses versus streetcars there. The buses of El Paso City Lines operate for approximately 51 cents per mile. The El Paso streetcar operates for about $1.20 per mile. That is probably a more unfavorable comparison than one would find in most cities for the reason that I have already mentioned, that there is customs inspection en route, and, thus, the streetcars are likely to sit for long periods while the customs inspectors go through, thereby increasing their labor cost per mile.

So the other figures I have shown you would be more general, but all of these are consistent. I have also pointed out that at the time of the conversion of the last streetcar line in Chicago in 1958, the Chicago Transit Authority reported that the buses operated for 48 cents less per mile than the streetcars did.

The Chicago and San Francisco figures, both are those of public transit systems. Neither was ever operated by National City Lines. And both of them converted to bus, mainly, with non-General Motors equipment. General Motors simply wasn't involved in the conversion.

The argument of the report would apply only to that portion of the industry which National City Lines dominated, whereas the entire industry was making the conversion.

Specifically, with respect to Los Angeles, the report has a confusion between the Los Angeles Railway, which was the streetcar system in the center of the metropolitan area, and the Pacific Electric, which was the largest American interurban, which radiated to all of what is usually looked upon as the southern California metropolitan area with the exception, obviously, of San Diego.

But Pacific Electric ran to all of what is looked upon as the Los Angeles portion of southern California: Los Angeles itself, the San Fernando Valley, the Riverside-San Bernardino area, and Orange County, which is to say Santa Ana, and certain other communities to the south of Los Angeles. These two properties must be distinguished, partly because for most of their histories they had different ownerships, and partly because they had a gage difference.

Los Angeles Railways had the old cable gage of 3 feet, 6 inches, whereas the Pacific Electric, the Southern Pacific subsidiary, had the standard railroad gage of 4 feet, 8½ inches.

Los Angeles Railways became a National City Lines subsidiary, and National City Lines operated it, apparently, as any other operator would have. It retained rail for the most heavily traveled lines. It bought 40 streetcars for them. It converted some lines. It did not convert the most heavily traveled ones. These came into the hands of the Los Angeles Metropolitan Transit Authority, and were converted by it in 1963.

The Pacific Electric was never a National City Lines subsidiary. General Motors never had any interest in it. The Southern Pacific

Railroad ran it until 1953. It conveyed it at that time to Metropolitan Coach Lines under a plan approved by the Public Utilities Commission. Metropolitan Coach Lines was locally financed and organized by J. L. Haugh. He operated it until 1958 when he transfered it to the Metropolitan—the same body, the Los Angeles Metropolitan Transit Authority.

This body completed the conversion of Pacific Electric's original rail lines to bus in 1961. Thus, the report's argument concerning Los Angeles is fallacious. Even if it were correct, it would not have the generality which the report attributes to it.

I would make the incidental observation that the report's characterization of Los Angeles as an ecological wasteland is, in the first place, highly offensive to its residents, and, second, it is inconsistent with the observed behavior of the population. If the city were the repellent mass of smog and concrete which the report considers it, it could not conceivably have attracted the large inflow of population which it has.

The nature of the city can be explained, once again——

Senator HART. I should interrupt you, Professor, to say that the gentleman has made a free and independent decision as a resident of Los Angeles.

Professor HILTON. Americans by the millions have done so. The city's characteristic are, once again, something which can be explained objectively—the city's characteristics have taken shape for objective reasons, once again, as distinct from the consequences of the exercise of the monopoly power.

The city grew up around the central business district without significant water barriers or other natural barriers, and, as a result, took on the characteristics of cities without major natural barriers, such as Indianapolis, Houston, or Columbus, rather than Chicago, Philadelphia, or Toronto, or other cities with water barriers. The mild climate caused a high percentage of the population to opt for houses as versus apartments. None of its major industries had roots in the central business district with the single exception of oil companies which did, in general, establish their central offices in downtown Los Angeles. The city did not, until recently, develop a large financial community because San Francisco traditionally provided that function for the State.

Thus, the metropolitan area, although it eventually became approximately the size of Chicago's, developed only about a third of the population density and a third of the concentration of the economic activity in the central business district. As a result of this the city had a relatively early conversion to the automobile. At least by 1914, at the time of the so-called jitney episode in American history, it already had the reputation, along with Detroit, of being one of the two big automobile-oriented cities. The rail transit was still there. The automobiles were principally products of the Ford Motor Co. rather than General Motors.

The home-to-work trips, in particular, in Los Angeles were so diffused that the two rail systems, essentially, could do nothing but decline. As they declined, buses were less costly methods of moving

people, and the transit systems had the conversion to bus, which was observed elsewhere.

Even though, and this does seem somewhat surprising, the ultimate conversion to an all-rubber-tire system was later than most cities—as I said, 1961 to 1963.

The forces for diffusion in the Los Angeles pattern were to some extent unique, but to some extent general. Meyer, Kain, and Wohl, in the principal treatise on urban transportation of the past decade, have an impressive demonstration in their consideration of demand conditions for urban transit, that almost all of the forces at work on cities are forces for diffusion.

The automobile is the principal one. It has brought about diffusion in the urban pattern by providing greater lateral mobility than the electric railway transportation, on which society was almost completely dependent previously—about 90 percent of urban trips were made by streetcar—could have done.

But almost every other force was in the same direction. The computer reduced the demands for central office employment of clerical labor. The factory technology moved to land extensive, single-story, assembly line operations so that new factories were almost invariably in suburban locations. The truck and containerization, or piggybacking of railroad freight, gave freedom from rails in industrial location. Airports replaced railroad stations. Television replaced theaters and cinemas.

And in particular, as Negroes replaced immigrants as the principal urban slum dwellers, they neither worked, shopped, dined, nor amused themselves in central business districts to the extent their predecessors had done.

They typically worked in service employments or factory employments, which were widely spread about the urban area, and they shopped, dined, and amused themselves in their own neighborhoods, as distinct from central business districts.

Senator Hart. Professor, I apologize. That is the second signal for a vote. We will recess briefly.

[Whereupon, a brief recess was taken.]

Senator Hart. We will resume, Professor.

Professor Hilton. Yes, thank you.

The geographical changes which I have mentioned produced a decline in transit, first, because of the nature of the adaptation of the population to increases in their income, and also their behavior with respect to changes in prices; and second, because of the way in which the economic organization of the transit industry had been decided upon on the eve of the first World War.

There is some data in my prepared testimony that indicates people tend to turn away from transit to the automobile with increases in income. People tend to be relatively unresponsive to changes in intransit fares, and also to the price of gasoline and other inputs into automobiles.

The transit industry is inappropriately organized into a series of monopolies, some privately owned, some publicly owned. The reason for this is entirely historical. The optimal way to organize an electric streetcar system was in a citywide monopoly. You had

one power station and then a citywide grid of electric distribution facilities so that the power could be used wherever the demand for it was. The transit industry had not had this characteristic before the electric streetcar, and it did not once the electric streetcar was replaced by buses.

The bus arose as a cream-skimming device with a comparative advantage for moving short distance passengers with a higher quality of service than the electric streetcar. It had a comparative advantage for moving passengers originally under about 2½ miles. The flat citywide fares of streetcar lines—any distance for a nickel, typically—meant that short distance passengers were cross-subsidizing longer distance passengers.

The bus arose in the form of the jitney, which was mainly a Ford Model-T touring car being used as a common carrier in 1914 and 1915. Buses could have been a competitive industry. However, every city in the country put down the jitneys to protect the street railways. That is to say, they opted for a monopolistic organization of transit systems. As costs moved in favor of buses and against streetcars, the transit systems converted from streetcar to bus technology with the exceptions which I mentioned earlier. The bus lent itself to the more diffused urban pattern better than the streetcar did, but still very imperfectly, given the fact that it was being run by transit monopolies. The monopolies proved expensive to operate if only because their monopolistic organization stimulated a strong union, currently called the Amalgamated Transit Union.

The jitneys were a casual activity of owner operators which had proved essentially impossible to organize. The activity was carried on by people whose alternative employments were relatively inferior, or relatively unattractive. As a consequence, it proved to be a very cheap form of transportation. As I have pointed out, jitney operators who are tolerated even though they are nominally illegal on Martin Luther King Drive in Chicago handle passengers in secondhand Cadillacs for 25 cents each, while the Chicago Transit Authority charges 45 cents with 10 cents additional for a transfer for its passengers, and covers only about 90 percent of its variable costs.

I call the committee's attention to a recent study done by the Institute for Defense Analyses for the Department of Transportation entitled, "Evaluation of Rail Rapid Transit and Express Bus Service in the Urban Commuter Market." This report demonstrates that the transit industry is overcapitalized. Owing to the high level of labor costs, which amount to 75 to 85 percent of the cost of a transit enterprise, transit enterprises opt for a relatively large vehicle, a diesel bus of approximately 50-passenger capacity. They run this almost exclusively, except in the larger cities, on radial routes from the central business district. Service of this sort, stopping at every block, operating at 8 to 10 miles per hour, the report demonstrates, is appropriate only for densely traveled routes of passengers of low evaluation of time.

So, the way in which the transit enterprises are organized results in the transit enterprises providing a relatively low quality of service relative to what buses could provide. With owner operation

of buses on the jitney basis, they would probably use vehicles of the approximate character of a Volkswagen microbus, and would be able to operate faster, more in response to demand, not on fixed route, but in accordance with the destinations of the passengers.

Added to this problem, the way in which roads are priced creates queues of vehicles in which buses become mired. This results in their providing a slow, low-quality service in rush hours. I have repeated a rather familiar academic argument for variable user changes on roads. The prohibitions on jitney service prevent filling up the empty seats in automobiles at a price and assure a grossly excessive number of vehicles with a low-load factor.

Now, I pointed out that the nature of the automobiles which we use is also determined by this set of considerations. We pay an annual license fee on th basis of the value or the horsepower of automobiles instead of the square footage. Noxious emissions are not taxed; we cannot fill up empty seats at a price; therefore, we use large vehicles, highly polluting vehicles, and operate them with low-load factors. We make too many trips—especially trips to work by automobiles—because we don't have adequate pecuniary disincentive for doing so.

So, much of what the report attributes to the evil behavior of an alleged monopoly is readily explained on the basis of the economic organization and the taxing systems which confront society.

The same thing is true of the other principal argument—the argument concerning the dieselization of the railroads.

Now, it was widely anticipated that the railroads would be electrified because electric locomotives were recognized to have a variety of attractions over the steam locomotive, notably in providing a continuous torque and in being freer of pollution, especially of the worst sort of pollution, which is coal smoke, which results in sulfur being sent into the atmosphere. I have made much of this point. It strikes me that it is worth amplifying. Sulfur in the atmosphere causes the rain to be dilute sulfuric acid. This not only eats buildings—especially limestone buildings and mortar—but it results in the ingestion of sulfuric acid into the lungs and increases the incidence of respiratory diseases of most forms.

The undesirable consequence of this is, I am told by friends who specialize in pollution, better documented than the cost of any other form of pollution.

The electric locomotives which were instituted in America were mainly instituted to deal with pollution problems. I pointed out in my report why this is true. The more general attractions of electric locomotives were not realized for a very simple reason—the capital required for electrification in the overhead and the power stations was so great that another form of investment was preferable to increase capacity of railroads.

Conventional wisdom in the railroad industry in the steam locomotive era was that it was preferable to expand capacity of a rail line up to four tracks, and beyond that it was preferable to go to electrification. The electrification increased acceleration and deceleration of trains and thereby increased capacity of the line. However, there was only one rail line in the United States which

had that much traffic—the Pennsylvania Railroad main line between New York and Philadelphia.

As a consequence, the electrification which went on was done for other reasons—for suburban commutation service, where the acceleration properties of multiple unit electric cars were particularly valuable—but the demand for such service was highly concentrated in the major metropolitan areas, so that with the exception of some rather small ones, all of these were in Chicago, New York, Philadelphia, and the San Francisco Bay area.

The other electrifications were mainly intended to deal with pollution problems in tunnels or very steep gradients. The tunnel was most frequently at the top of a steep grade or, in the case of the tunnels under the Detroit and St. Clair Rivers, at the bottom of a steep grade. So, these two tied in very well.

In the 19th century, the country received a grossly excessive mileage of railroading—double that of any other country. What this meant was that our traffic was so widely dispersed over a large mileage that essentially only 90 miles out of a mileage of 254,000 miles had the characteristics which would have justified electrification, other than because of pollution or other special considerations.

Now, the diesel locomotive is in fact an electric locomotive. It is a self-contained electric locomotive. It uses a diesel engine to generate electricity, which is then used in its traction motors. This allowed the railroads to realize all of the attractions of electric locomotives except for one: It didn't concentrate the noxious emissions at a single source, as an electric power station does, but it produced nonsulfurous exhaust. The exhaust of diesel locomotives is estimated to be less then one percent of all of the pollutants in the country.

Its polluting characteristics were so much more satisfactory than of the steam engines which it replaced that approximately half of the electrified mileage in the country was removed as a result of this development. Essentially all of the tunnel electrifications were removed except for the tunnel approaches to the two New York passenger stations. So all that has survived of electrification is the suburban electrifications out of New York, Philadelphia, and Chicago, where there was only one of them, plus electrifications that ran into New York. The only main line electrification which has any real prospect of survival is the Pennsylvania Railroad, now Penn Central, electrification from New York to Washington and Harrisburg. It was done partly because of the heavy traffic density between New York and Philadelphia. But I should add, which I didn't state in my prepared statement, that the railroads in the Northeastern United States are having an absolutely declining traffic. That railroad line doesn't have as much traffic as it did in the 1920's, so its survival is no longer justified on the basis of the traffic.

In addition, one of the principal incentives to put it in was to electrify over the mountains between Altoona and Pittsburgh, but they never got that far. They got to Harrisburg before the war. After the war, the diesel locomotive was available so they didn't have any incentive to finish it. So even that, I should say, is unlikely

to survive in the long run, but if it is going to be vested in the public enterprise it will have some degree of insulation against market pressures, and it may survive.

But the report generalizes concerning the electrification of railroads on the basis of an allegation of what happened on the New Haven Railroad, and as in the case of what happened in Los Angeles this has to be discussed individually. The New York, New Haven, and Hartford electrified its main line from New York to New Haven for 72½ miles, 72.5 miles, and it did so for reasons consistent with the foregoing discussion. It operated a main line commutation service for passengers. It used both New York stations. It had long tunnel approaches, one under Park Avenue and the other under the East River. The electrification is an 11,000-volt, alternating current, electrification consistent with the Pennsylvania Railroad's main line electrification, but inconsistent with the New York Central's electrification into Grand Central Station.

As I pointed out in my prepared testimony, one of the problems with electrification is that no one ever argued that it was appropriate for more than a small part of railroad mileage. Therefore, intrinsically it is incompatible with most of railroading. This electrification was incompatible not only with the main line east of New Haven, but also incompatible with the entry into Grand Central Station.

So they had to have electric locomotives which could take alternating current from the overhead, but which could also run on direct current into Grand Central. They had some locomotives that couldn't do that and could go into only one of their two terminals. They had to make an engine change in New Haven, so that they had an incentive to get rid of the electrification to avoid this incompability problem.

But they never did so; the report states very clearly that this railroad deelectrified—on page 3 of the Snell report—and it has never done so. As, I have stated, Mr. Snell could have ascertained by buying a ticket on the railroad that exactly as much of it is electrified on the main line as ever was—72½ miles.

What he seems to be referring to is a purchase of 60 locomotives from General Motors. This company dieselized in the immediate postwar era, as most did. Like many companies, it used a purveyor of diesel engines which was close by—in this case, the American Locomotive Co., which was in Schenectady, built most of its engines. About 50 of its 408 diesels, in 1956, had been made by General Motors, and none of those were passenger engines.

The company wanted to get a diesel locomotive which could run on third rail. It could get into Grand Central on a third rail; it could also get into Penn Station on the third rail of the Long Island Railroad. If it could do this it could use the same engine, either from Boston on its main line trains or from Springfield-Hartford on its principal branch line.

General Motors produced 60 such engines called the FL–9 engine for the New Haven; 30 in 1957 and 30 in 1960. No other railroad ever ordered such locomotives, so no generality can be attributed to them. They were able to do what the New Haven wanted. The

New Haven had the further problem that the two third rails are not compatible. You have to take power by pushing up on the New York Central and pushing down on the Long Island, but the FL–9 engines were arranged so that either of the two rail shoes could be fitted, and so they could get into either of their two stations.

However, the New Haven continued electric operations for some main line trains and for all of its multiple unit suburban trains. To attribute the New Haven's subsequent problems to the acquisition of these engines and to a deelectrification which never took place is indefensible, as I have said. It is an example of post hoc ergo propter hoc reasoning, and once again, it is easy to explain the weakness of the New Haven Railroad.

It is an old railroad with a poor physical plant, with very restrictive clearances. The centers of its main line track are too close together, even too close together for running some normally sprung passenger equipment. The electrification made it expensive to operate. The main line east of New Haven is too close to the shore line, so that it tends to be wiped out by hurricanes, several of which occurred in the late 1950's or early 1960's. It was the fourth largest passenger hauler in the country, and this traffic is highly unprofitable. It pays too many urban real estate taxes.

But even these are not its most important handicap. It has a directional imbalance in traffic which most Northeastern railroads do—this one just had it worse than any others. It was a facility for inbound raw materials. It handled them approximately 90 miles to industrial plants. The cars would stay for about 5 days and move out empty, and then what was produced in the area—locks, clocks, firearms, ammunition, aircraft components, and so on—was small in size, high in value, and frequently breakable; the sort of thing that typically moves by truck in any area. All of this is true of the Penn Central and most of the other Northeastern railroads. It just happened to be more true of this one. It serves an area which very largely produces the services of educated individuals, writing insurance policies, producing diplomas in universities, and you can't ship diplomas and insurance policies in carload lots.

The report attempts to generalize that the dieselization of the railroads took place because GM threatened the railroads with loss of freight traffic if they did not use GM locomotives. GM, as I have stated in my prepared testimony, has always denied engagement in such behavior. I should probably have phrased it more strongly—it had a very explicit policy from the highest levels of management to refrain from engaging in such policy.

To have engaged in such policy could have been done only at a cost. The railroad would have had to refrain from shipping in optimal fashion to engage in such discrimination. I would refer you to an excellent book called, "The Economics of Discrimination," by Gary S. Becker. It is concerned with racial discrimination in employment. But the case which it makes, that people can discriminate against Negroes or any other identifiable group only at a cost to themselves, by foregoing the most attractive alternatives, is equally applicable to this.

General Motors decided on the basis of policy statements issued by its management to refrain from engaging in such cost. Several railroads, contrary to what the report argues, managed to get along quite well using non-GM diesels exclusively. The Delaware and Hudson, which serves Schenectady, did as you would expect, opted for American Locomotive Co. diesels, and is among the strongest northeastern railroads, one of the few which is not at present in bankruptcy. The Monon Railroad in Indiana was loyal to the American Locomotive Co. which had produced most of its steam locomotives. It has operated throughout its recent history almost exclusively with ACO engines.

The one generalization one can make about the purchase of diesels is that railroads that have bought from a wide variety of sources had higher motor power costs than others. The Pennsylvania, Rock Island, and Missouri-Kansas-Texas all bought widely among builders and had chronic problems of incompatibility of units and excessive inventory costs.

The cheapest way to do it was as the Illinois Central did, dieselize almost exclusively with one engine—in this case, General Motors general purpose engines, the so-called jeep models—which it used for virtually all of its freight trains and all except a few main line expresses in passenger service. There was no point in forcing the railroads to dieselize, simply because this was the greatest technological improvement which they had ever had, at least since the introduction of the Westinghouse airbrake in 1869, and that is so far in the past that it really isn't comparable. This locomotive permitted phasing out of a large number of maintenance facilities; it permitted any desired number of units to be operated by one engineer; it would have permitted, except for union pressures, getting rid of firemen.

It had certain other advantages. Units could be distributed through the train—so-called "slave" units—and controlled from the first one by radio, permitting longer trains through distributing the strain on couplers. Diesels had low center of gravity so that they could go around curves faster than steam locomotives.

Now, this set of advantages lent themselves to what the railroads were trying to do. This industry also is inappropriately organized. It has a cartelized organization which tends to perpetuate an inappropriate technology, which ought to be phased out. The industry ought to be operated competitively with a containerized technology, but given the fact that it isn't, its only way of increasing productivity is to run longer trains. This results in a secularly declining quality of service, but it does do what is intended—increase the productivity per employee so that the industry can match the increases in productivity in the manufacturing industries with which the industry competes for labor. The greatest single means of doing this has been the diesel locomotive. Centralized traffic control is probably the second most important. What GM did in this industry, as in transit, was produce the lowest cost vehicle, given the inappropriate organization of the industry.

As in the case of buses, its locomotives broke down less frequently than its rivals and it had lower operating costs per mile. By further analogy to the earlier argument which I presented concerning

transit, GM locomotives are optimal given the relatively low price of fuel—compared with other countries, and the zero price of air.

As the increase in the price of gasoline recently has caused people to go to smaller automobiles, the recent increase in the price of oil has caused railroads to reconsider electrification. At least three major American railroads—the Burlington Northern, the Union Pacific, and the Southen Pacific—are now considering electrification to use low grade coal or nuclear energy as fuel, and the Canadian Pacific is making a similar consideration in Canada. All of these are doing so without any apparent fear of retribution from General Motors, such as the Snell report would lead one to anticipate.

So here, once again, one can explain what the railroads have done and what they appear to be considering doing by objective criteria concerning the costs confronting them rather than by taking a villain theory.

Well, as I stated toward the end of my prepared testimony, I concerned myself only with the two principal arguments, but I am quite certain that I haven't exhausted the misrepresentations in this report.

I will draw your attention to only one further one. The report states that six railroads that formed Greyhound Lines replaced substantial portions of their commuter rail lines with Greyhound service. These are the Pennsylvania, New York Central, Southern Pacific, New Haven, Great Northern, and St. Louis Southwestern. The St. Louis Southwestern was a very minor passenger operator which never did have any commuter service. The Great Northern had a train during World War II out of Minneapolis, and I think at certain earlier periods did have a small number of commuters out of Minneapolis and St. Paul, but otherwise had none.

The other railroads, with limited exceptions, have retained their commuter services to the present. I can think of only one example of what the author states. The Southern Pacific did have through a subsidiary a service in Marin County after the opening of the Golden Gate Bridge. It was taken out of service, and Greyhound Lines succeeded to the service, which now the Golden Gate Bridge Transit Authority operates. Otherwise, I can see no justification of what the author has argued, and if one looks at his footnotes, it is clear that what was being talked about was the establishment of intercity bus service, which is a cheaper way of serving a lower income market than railroad trains.

I have various objections to this report. It is a misrepresentation of what has happened which is likely to give rise to inappropriate policy. A very important objection to it is that it is misrepresenting an historical record. As you remember, if you studied economic history, documents of this character are one of the most important historical sources. More of what we know about 19th century English economic history comes out of the Parliamentary Papers than out of any other source, so this report is a disservice to the historical documentation of the Nation, in addition to its other shortcomings.

But what I most object to in this is holding out to society the prospect of certain changes which come about only through specific public policy. It is holding out to the public the prospect that the

divestiture by General Motors of its locomotive and bus subsidiaries would restore passengers to rails, reduce pollution, and bring about other changes, and not all of these changes are desirable, but these changes could be accomplished only by specific public policy in the general areas. The divestiture which is proposed would result in somewhat higher or lower prices of locomotives or buses and somewhat more or less resources being used in these industries than at present. I have no way of knowing which. But they wouldn't bring about the changes which this report leads society to anticipate.

Senator HART. Professor, thank you very much.

We are going to take a brief recess before beginning questions, but I can't resist reacting to your caution that much of our history developed from parliamentary debate.

I am almost tempted to advise my children to skip history classes if that is the case.

Professor HILTON. They are very important. That is why no one should miss an opportunity to testify in this fashion.

Senator HART. All right, we will take a brief recess.

[A brief recess was taken.]

Senator HART. The committee will be in order.

Professor, in your prepared testimony you discuss some of the charges that are imposed on automobiles and the transit industry and describe them as inappropriate, and you indicate that although the users of public roads are taxed at the gasoline pumps, there is no differentiation between the social cost of moving in a peak traffic hour and a thin traffic hour.

Now, if I understand, you are suggesting that the Government should charge for use of these roads in a fashion that would differentiate between the social cost of driving at certain hours?

Professor HILTON. That is right.

Senator HART. In terms of its feasibility, how would we go about it?

Professor HILTON. The principal academic proponent of this is Prof. William Vickery of Columbia University, who has written on it extensively.

He has stated that there are at least 15 ways of instituting it in an engineering sense, of which he thinks the most easily implemented would be a meter like a taxi meter on each vehicle which would receive impulses from a wire imbedded in the road. A computer would adjust the emission of impulses from the wire on the basis of the social cost of using the road. Therefore, the meter would spin at about 5 times the rate in morning and evening rush hours than it would spin at 3 o'clock in the morning. For example, it would cost $5 to make a roundtrip into Manhattan or the Chicago Loop in rush hours, whereas it might cost $1 at 2 o'clock in the afternoon, or perhaps 50 cents at 3 o'clock in the morning.

Most of what we don't like about urban transportation at present is a consequence of the present nature of taxation.

Alternatively stated, the present taxation doesn't give the public an incentive to use automobiles and buses in accordance with the comparative advantage of each, which is to say, automobiles for

miscellaneous point to point trips and buses for habitual home-to-work trips.

Senator HART. I do agree that no such distinction was made. You are suggesting also that we have some kind of charge—at least, that there is no charge now imposed—on the air we use or abuse by the automobile.

Now, I take it that you believe that we should in some fashion tax emissions?

Professor HILTON. That is right.

Senator HART. The same question—how?

Professor HILTON. That is much easier to do. It would be possible to have a metering device for noxious emissions, but it wouldn't be necessary to do that.

One could charge per month or even per year, on the basis of the known polluting characteristics of an automobile.

All of these taxes should be announced ahead of time, obviously, so that one would know what one was paying on the roads at any given time, and also one would know what the tax on pollution of exactly the sort of automobile he had would be.

There are plenty of other ways to run an automobile. The internal combustion and the diesel bus are the least cost vehicles given the fact that the use of air is free. The economy would respond by on the one hand having people use less-polluting vehicles which are at present available, though more expensive to operate, and it would bring forth less-polluting vehicles than are at present in existence. People simply don't have the incentive to invent them at the moment.

Senator HART. And you suggest also the need or desirability of imposing an annual license fee on the basis of the square footage of a car?

Professor HILTON. Yes. That is recommended by Professor C. Lowell Harris of Columbia University.

Senator HART. This is a practice in certain of the other developed countries, isn't it? I have the impression that Japan, at least, has some kind of tax or annual fee like that.

Professor HILTON. I think it is. I am not certain. In Japan—at least in major metropolitan areas—it is necessary to produce an affidavit that one has off-street parking in order to be able to buy a vehicle. This amounts to an enormous disincentive for the use of automobiles and an incentive to use small automobiles, as you would expect in a very densely populated country.

Senator HART. You suggest also that we get rid of these anti-jitney regulations.

Professor HILTON. Yes.

Senator HART. Develop just a little your notion of how that might ease or solve our transportation problem.

Professor HILTON. Well, in several ways. Owner operation of vehicles would be a cheap way to run them. It would be an attractive option for people whose alternative employments were relatively unattractive. It wouldn't require much capital. It would make use of a talent—driving a vehicle—which is quite universal in society without regard to income or educational attainments.

While the jitneys were legal in 1914 and 1915, they comprised an industry which ran in a continuum from personal automobiles which people registered in most cities simply by taking out a chauffeur's license, which was usually $5 to $15 a year. This entitled them to carry passengers in their own automobiles. About 60 percent of the jitney operators provided the service in rush hours only.

Either they drove for 2 hours before work and 2 hours after work or, alternatively, they just carried passengers on the home-to-work trip. Now, if this were legal, it would result in metropolitan areas being criss-crossed with an infinity of public transportation routes for the home-to-work trip in every rush hour.

While the jitneys were legal, about 40 percent of the operators were full-time operators. Some operated on linear routes at all times. In some cities, like San Francisco and San Antonio, they would load at centralized locations—say, the ferry terminal in San Francisco—pick up the first passenger without having any destination in mind, find out where he was going, leaf through some cardboard signs, put one on the windshield which was consistent with his destination, and then go there, and pick up anybody who was going along the line.

A jitney is so much cheaper to operate than a standard bus, owing to the fact that the driver is so much cheaper, that a smaller vehicle can be used. The vehicle can be more demand responsive. It isn't limited to the trips into the central business district which are the only ones which generate enough demand to make the standard large bus with the union member driving it economical.

So you would have essentially an infinite proliferation of vehicles if they were not restricted to routes, if they were not restricted to specified fares, if simply anyone who took out a chauffeur's license or otherwise demonstrated that he had no criminal intent could get into the activity.

It would present the problem of avoiding criminal activity. Optimally, just anyone ought to be able to get into it without even demonstrating an absence of criminal intent. This isn't so extreme as it sounds. People would have a choice of taking their chances with an unknown operator or taking the pink jitney with gold lettering which they saw go by every day. They would know that they could trust the operator of that because that would be part of the capital which he was trying to gather—reputation for honesty.

It would be a problem of dissemination of knowledge analagous to a lot of others in society.

Senator Hart. I have got to interrupt again. My worry would be that if we had too many of those floating cabs, we would be raising hob with the operating cost of whatever remained of your public transportation system.

Professor Hilton. Oh, I don't think the public transportation systems could survive. They would be driven out of business.

Senator Hart. How can you get those jitneys to go into the worst parts of town?

Professor Hilton. Well, they would very largely be driven by people who live there who are used to the risks and who have to deal with them habitually.

Senator HART. We have to recess. I have a vote.

[A brief recess was taken.]

Senator HART. We will resume.

Professor HILTON. May I add one sentence to the answer of the previous question? I said that the supply of operators would be highly concentrated in ghettos but I should add the observation that the demand would be highly concentrated there, also. The home-to-work trips of the residents are so diffused that linear systems don't serve them very well and there are a large number of people who don't have automobiles and contrary to popular conceptions, the demand for taxicabs has a bimodal distribution. A large number of high income people take taxicabs because there is a high valuation of time, but a large number of low-income people take taxicabs because they are making point-to-point trips that are difficult to make by other means. They don't have their own automobiles and the crime hazards are frequently such that they don't want to walk long distances.

Senator HART. Well, if you will permit me to follow up on that. You are recommending certain tax treatment which would have an effect on users.

You are suggesting—we are talking now about these metropolitan centers—you are suggesting that it is not likely that there would be—you haven't said it but I take it you doubt that there is—a place for electrified mass transit, or unirail?

Professor HILTON. That is right. With certain exceptions, mainly in New York City, with an appropriate system of taxation and the competitive organization of transit, buses could drive most existing rail systems out of existence. Existing rail systems survive essentially for one reason. They don't get into the queues of vehicles which the nonprice rationing of roads create.

They have their own rights of way. They are, however, a very expensive way of moving people. It is estimated the Bay Area Rapid Transit will move people for somewhat in excess of $2 per passenger at an average fare of 64 cents. They will move at an average cost to the carrier of over 7 cents per mile.

Rail systems are also limited to a small and dwindling number of trips. They can provide almost nothing but the trip in and out of central business districts. Demand for such trips is mainly concentrated in rush hours. This is typically absolutely declining and is invariably declining relative to all other trips in metropolitan areas.

Essentially rail transit is a solution to a New York problem and even there it is a very imperfect solution. The rail systems are currently being advocated mainly to produce certain external benefits: relief of traffic congestion; relief of atmospheric pollution. Unfortunately, they don't do either. They can take off the roads about the equivalent of 6 months to 1-year's growth in traffic on the roads. They handle a small enough number of people that they have an imperceptible effect on noxious emissions. They have negative effects with respect to these, also. Eighty-two percent of the rapid transit passengers are in New York. New York has the worst traffic congestion and the most concentrated output of noxious emissions, and this is no coincidence. The existence of a New York subway permits such a high concentration of economic activity that it at-

tracts a lot of vehicles. The vehicles start and stop continually so they are not much driven by momentum. They are almost entirely driven by their engines so they put out a heavy volume of noxious emissions. The city's pollution problems are the worst in the country. The city is simply lucky that it has the highest average wind velocity of any American city.

Senator HART. What is your judgment about the construction here in the District of Columbia environs of the subway?

Professor HILTON. Well, the first thing to be said about it is that the interest on the investment will be approximately four times the gross revenue of all the bus systems in the area, which is consistent with what I have already said, that this is a terribly expensive way of moving people. It is going to move people to and from work almost exclusively. The demand for off-hours trips has very largely disappeared. The shopping, dining, entertainment function of the District has declined as it has, essentially in central business districts everywhere.

The crime hazards of rapid transit systems are mainly in off hours. They are safer to travel on in peak hours. In off hours you have lightly utilized stations with lightly utilized vehicles, both of which are outside the normal course of policing so that it is a very real hazard to using them.

The system, I think I can assure you, will be looked upon as a misguided investment and very quickly. I said in my earlier testimony, by 1980. I think the movement for such systems is already beyond its apogee. I have expected for several years that the completion of the Bay Area Rapid Transit would begin to dissipate the enthusiasm for this form of investment. It is political of a nonmarket demand. Its political support comes from an industry lobby which will persist and some well-meaning people who honestly believe that these systems can generate the external benefits which are being sought for them. As soon as it is definitely demonstrated that they cannot—and this is already happening—that political support for them will disappear and the enthusiasm will be in the past. I would think probably as soon as 1977.

But the point I wanted to make in this connection was that whether diesel buses are produced mainly by General Motors or mainly by somebody else is essentially an irrelevant consideration.

I make the additional observation, which isn't in my prepared testimony, that what you see in the two industries in consideration here, buses and diesel locomotives, is what you see in most industries producing big complicated things on an assembly line. Compare what you see here with what you are seeing in producing aircraft. Now, in all three of these industries you have firms producing for other firms. It is, in economic jargon, a derived demand. What this means is that the purchasers are going to make some very hardheaded calculations on the basis of relative cost. In the cast of producing something for people, for millions of people who have their private preferences on the basis of traditional loyalties, the cosmetic aspects of the vehicle, what they conceive are the prestige characteristics of the vehicle, and so on. Consequently, you get a demand for a wide variety of things. An airline transit company, or railroad,

doesn't behave this way. It will be confronted by a small number of alternatives. The economies of scale in producing such things are apparently considerable. All of these are highly concentrated industries and industries which produce other things of this character outside transportation are, also: Printing presses, for example.

Usually one of what is produced of such a set of alternatives is preferable to the others of the alternatives.

At various times since the airlines have been a major industry, since the mid-1930's, the Douglas DC–3, the Douglas DC–6B, the Boeing 707 and 727, and the Douglas DC–10 have been superior in lower cost of operation than the planes which did approximately the same thing and they have dominated that industry to the extent that General Motors has with the bus industry and the locomotive industry.

As I said in my prepared testimony, it has been quite obvious why General Motors has dominated this industry. It developed a lightweight, high-speed, two-cycle diesel engine, which was preferable for power generation for a self-contained electric locomotive, not only to any other diesel engines, but to power sources such as gas turbines or steam boilers, both of which have been tried as alternatives. This resulted in GM's having a dominant position. Their bus diesel also seems to be preferable. Both of these diesels have preferable breakdown characteristics to the alternatives.

General Motors argues in this publication, "The Locomotive Industry and General Motors," that their rate of breakdowns was better than the alternatives by a ratio of well over 2 to 1, but I don't appear to be finding it. This is reported to be true in the bus industry. I have been told that their diesel buses break down every 75,000 miles. The principal rival's buses break down every 45,000 or thereabouts. This is a major cost item.

Senator HART. We have to have another break right here. I would like to go and vote.

[A brief recess was taken.]

Senator HART. The committee will be in order.

Professor HILTON. Senator, in your absence I found the data for which I was fumbling earlier, on relative breakdowns of General Motors versus rival locomotives. It was a set of data from the New York Central Railroad's passenger locomotives in 1950. Their General Motors locomotives ran 70,282 miles between failures.

The American Locomotive Co. engines—14,902 miles. And their Fairbanks-Morse engines—11,142 miles between failures. This, I suspect, is not unconnected with ALCO and Fairbanks-Morse having left the locomotive industry.

Senator HART. That is not the insignificant sales argument.

Professor HILTON. One other point ought to be made in connection with the locomotives. There were certain characteristics of individual locomotive models which made them relatively attractive. For example, Fairbanks-Morse so-called trainmaster unit has excellent acceleration properties. A substantial number of railroads operated it for that reason. So, I don't think you would have expected to find 100 percent of the locomotives being produced by one producer in any case.

There were enough unique attractions of others. When General Electric went back into this business in 1961 it strove for a relatively uncomplicated locomotive with a chief characteristic of low maintenance cost, and it achieved this. This engine does sell to the extent of about 25 percent of the market. So what you get in this industry, as I was saying, is about what you would expect by analogy to other industries producing big complicated things: a small number of producers, and dominance by one of them.

Senator HART. Mr. O'Leary?

Mr. O'LEARY. Professor Hilton, in your statement you speak of the Los Angeles Railway and Pacific Electric.

Is it your testimony that there was no connection between the National City Lines and Metropolitan Coach Lines?

Professor HILTON. That was what the Southern California Rapid Transit District tells me. Los Angeles Railing and Pacific Electric were predecessors of the present rapid transit district.

Mr. O'LEARY. Professor, I have a packet of exhibits which I may refer to from time to time. I would like to have one handed to you.

If you will refer to that which appears under the tab E. This is a copy of a form 10K, which we obtained from Securities and Exchange Commission, indicating that the president of Metropolitan Coach Lines, Mr. Jesse L. Haugh, was also the third largest shareholder of Pacific City Lines in which General Motors was the largest shareholder, and that in 1946 Pacific City Lines traded all its stock for that of National City Lines.

[The exhibit referred to appears at the end of Professor Hilton's testimony as exhibit 2.]

Mr. O'LEARY. Were you aware of the connection, Professor?

Professor HILTON. No, what is Pacific City Lines? Is that the operator in San Diego?

Mr. O'LEARY. The Pacific City Lines, as of 1946, became the wholly owned subsidiary of National City Lines. Prior to that time, it acquired certain municipal systems on the west coast.

As to whether or not it acquired San Diego, frankly, I don't know.

Professor HILTON. Well, Haugh was the operator in San Diego. I don't know what this enterprise was. National City Lines controlled the Los Angeles Railway through, I think, American City Lines or American Transit Lines.

I simply don't know what this enterprise was.

Mr. O'LEARY. Professor, turning to that which appears under tab F, this is a copy of a page in Poor's Directory of Executives and Directors for the year 1946, which indicates that Mr. Jesse L. Haugh was the president and chief operating officer of some 15 National City Lines subsidiaries.

The dates that you see appearing before those different transit companies, Professor, were provided by the Library of Congress and indicate the date that Mr. Haugh became the president of these companies. Were you aware of this connection between Mr. Haugh and National City Lines?

Professor HILTON. No, I wasn't. However, Metropolitan Coach Lines is not one of those. I would draw your attention to this.

[The excerpt referred to appears as exhibit 3 at the end of Professor Hilton's testimony.]

Mr. O'Leary. Now, Professor, turning to page 20 of your testimony, while reflecting on the shortcomings of Mr. Snell's report, you state as follows: "To attribute the New Haven's subsequent problems to the acquisition of the FL–9 engines and to a deelectrification which never took place is indefensible."

Professor, isn't it true that from 1956 to 1962 the New Haven went from 68 freight and passenger electric locomotives down to 7?

Professor Hilton. I don't know what the number is, but the FL–9 engine certainly permitted them to phase out the majority of their passenger engines. If that is your understanding of it, I see no reason to think it isn't true.

Mr. O'Leary. Professor, isn't it also true that the General Motors' proposal to the New Haven in October of 1957 contemplated the deelectrification of pretty much the entire system?

Professor Hilton. It was widely expected that the New Haven would deelectrify east of Stanford. The multiple unit commutation service is highly concentrated between Grand Central terminal and Stanford.

Mr. O'Leary. Professor, turning to that which appears under tab I, which is a portion of the hearing examiner's report in ICC Docket No. 33332, filed in November of 1960, dealing with a proposed passenger fare increase by the New Haven.

And if you will turn to page 35 of that particular hearing examiner's report and go up to about the middle of the page, specifically, in the second paragraph, the bottom of it reads as follows: "In October of that year, General Motors submitted a plan purporting to show how the use of 88 FL–9 locomotives would permit the New Haven to: One, junk all of its electric locomotives, including the 10 purchased in 1955 at a total cost of $4,416,000; two, abandon Cos Cob"; which, I understand in your testimony, is the powerplant the New Haven owns.

Professor Hilton. That is right.

[The document referred to appears as exhibit 4 at the end of Professor Hilton's testimony.]

Mr. O'Leary. "And dismantle the power distribution system between Stamford and New Haven * * *."

That would pretty much mean the deelectrification of the entire New Haven system, would it not?

Professor Hilton. Yes. It didn't happen.

Mr. O'Leary. Right.

Mr. Chairman, I would ask that along with the hearing examiner's report, an article from Trains magazine in August 1964 entitled, "Why the New Haven Re-Electrified," be made part of the record.

Senator Hart. It will be printed.

[The article referred to appears as exhibit 5 at the end of Professor Hilton's testimony.]

Mr. O'Leary. Professor, your testimony makes it pretty clear that you reject the proposition that GM, Standard Oil of California, and Firestone conspired to eliminate streetcars as a competing mode of transportation.

In your view, streetcars were on the way out anyway because of natural, economic, and other forces, changes in the market place; namely, consumer preference and bus technology.

Is that correct?

Professor HILTON. Yes, generally.

Mr. O'LEARY. If you will turn to that which appears under tab A of the exhibit list. This is an opinion from the U.S. court of appeals for the seventh circuit in *National City Lines* criminal case.

And down at the bottom of the excerpt on that page, the court makes reference to a provision which appeared in the contracts between each of the suppliers and with G.M., Standard Oil of California, and Firestone with National City Lines.

That reads as follows: "* * * that City Lines and their operating companies would not renew or enter into any new contracts with third parties for the purchase of such products or change any then existing type of equipment or purchase any new equipment using any fuel or means of propulsion other than gas."

Professor HILTON. Yes.

Mr. O'LEARY. Professor, referring to the last provision there, is it fair to infer from that, that GM, Standard Oil of California, and Firestone were not as confident back then as you are today that the streetcar would phase out as a competing mode of transportation?

Professor HILTON. I don't say that that follows. The last streetcars were built in 1952 until the new ones being built under the Urban Mass Transportation Administration program.

The year 1951 coincides almost exactly with the end of any claim to economy by streetcars.

Mr. O'LEARY. I understand that, Professor.

Professor HILTON. It is not clear from the passage quoted, what date is being referred to. Obviously, the judge is referring to some date in the past which is not dated.

Mr. O'LEARY. Mr. Chairman, I would add that this excerpt and also the complaint in the National City Lines case which make reference to the dates of the events alleged, which I believe begins in the middle 1930's and continues up to 1947 when the indictment was returned, be made part of the record.

Senator HART. It will be made part of the record.

[The excerpt referred to appears as exhibit 6 at the end of Professor Hilton's testimony.]

Mr. O'LEARY. In any event, you would agree that that particular provision is restrictive in something less than the free market at work.

Professor HILTON. Yes, it is generally thought that, presumably, these firms had some motivation of assuring a market for their products. To the best of my knowledge, they never denied this.

Senator HART. Conversely, wouldn't it prevent them from doing any trolley business?

Professor HILTON. Well, yes; but nobody else did any after the following year either. As I have said, the logic of the report would explain what was happening in the industry only if National City Lines had monopolized the industry, which it never came close to doing, nor is there any such allegation.

Mr. O'Leary. Professor, I would also ask that your letter of March 6 to the chairman be made part of the record.

Professor Hilton. Yes, I would prefer that.

[The letter appears as exhibit 7 at the end of Professor Hilton's testimony.]

Mr. O'Leary. That letter makes a reference to a quote which Mr. Snell used from a book coauthored by you and Professor Due, and your letter makes it clear that that particular quote represents Professor Due's point of view and not your own.

Professor Hilton. That is right. Professor Due has also written the chairman, and I would prefer that that would appear in the record. Professor Due wrote it with that intention.

[The statement appears as exhibit 8 at the end of Professor Hilton's testimony.]

Mr. O'Leary. Is it fair to say, Professor, that you and Professor Due differ with respect to the significance of the Pacific Electric as a nucleus for future rail transportation or mass transit transportation in Los Angeles.

Professor Hilton. Yes. I would remind you that our book is concerned with interurbans and that, to my knowledge, we do not differ on our interpretations of the forces for the rise and the decline of the interurbans. The passage in question is on page 409 toward the end of the corporate history of the Pacific Electric in part two of the book.

There are histories of 496 interurban lines there. This is one of them.

I agree, actually, with half of the passage. I disagree with the other. Professor Due stated in the passage that the Pacific Electric's physical properties, including private rights-of-way through much of the city, and tunnel approach to one of its two terminals in downtown Los Angeles meant that physically it could have been upgraded more readily than the rest of the interurbans into rapid transit technology. I think that is correct. What I think is incorrect is that had it been upgraded into rapid transit it could have produced substantial external benefits in reduction of traffic congestion and reduction of smog.

The percentage of trips in Los Angeles which it was capable of providing was so small that it couldn't have produced any substantial external benefits. I refer you to a statement in the "1968 Highway Needs Report" of the Bureau of Public Roads in which it was stated that the rapid transit systems then on the ballot in Atlanta, Washington, and Seattle, if built, in the opinion of the Bureau of Public Roads, could take off the roads about the equivalent of 1 to 2 years' growth in traffic on the roads, but such a system on the ballot in Los Angeles, which was defeated in November 1968, owing to the city's lower population density and lower concentration of economic activity, would be only about half as effective as the other three systems.

That, I think, is consistent with what I just said; that a rapid transit system based on the nucleus of the former Pacific Electric could not have produced substantial external benefits.

Mr. O'Leary. Professor, turning to pages 2 and 3 of your state-

ment, you make some general observations about monopolies and monopoly power.

At the bottom of page 2 you state as follows:

> In general, monopoly manifests itself in higher prices for specific goods and services, usually with discriminatory rate structures such that the economy has an incentive to find alternatives to the monopolized goods or services.
> As a consequence, monopoliy tends to be a self-limiting phenomenon.

In other words, you do not believe that monopoly perpetuates itself, but rather that monopoly power gradually withers away over time, is that correct?

Professor HILTON. Yes, rather quickly. Dominant firms in every industry have tended to decline over the course of a few decades, including the industry in consideration. Ford Motor Co., as of the early 1920's, was producing considerably more than half of the automobiles. My principal examples are the regulated industries.

I would point out the incentives, the incentives to cream-skimming behavior, in the case of the railroads, the street railways, telegraphy, telephonic communication, and the other principal regulated industries the rate structures are all such that society had an incentive to develop an alternative: the truck for the railroad; the jitney for the street railways; diesel generators for electric power; microwave relays for intercity telephonic or telegraphic communications; and so on.

Mr. CHUMBRIS. The latter of which is part of our hearings that we had last year.

Professor HILTON. I am not surprised.

Mr. O'LEARY. Professor, with respect to the unregulated sector, in your view, do we have a problem, with respect to monopoly power today in this country?

Professor HILTON. There was never a total absence of monopoly. Monopoly, quite properly, is a crime. As in the case of all other forms of crime, some of it persists in spite of the laws against it.

I think the most valid generalization one can make is that we have less of a problem of monopoly than any other highly developed country because in the Sherman Act we have a better thought out statute, more appropriate to the problem, and more readily administered than any other major industrial country does. The Sherman Act does exactly what a statute should in this area. It prohibits collusive pricings, predatory activity, or exclusionary practices by interpretation of the statute.

As a result, it makes use of two observed phenomena in the market. Collusions are unstable. It is to the advantage of any one member of a cartel to break out. Collusive contracts are unenforceable under the common law, and under the Sherman Act the people who participate in them may be pursued criminally or through civil procedures. Under the Sherman Act, collusive pricing is less of a problem here than elsewhere.

Monopolizing is also illegal under the Sherman Act. Efforts at closure of entry, unless they are based on a publicly granted monopoly, which is usually a patent right or else a franchise in some regulatory situation—restrictions on entries, then, are illegal and dominant firms tend to decline. The principal monopolies of the

late 19th century or the turn of the century—Standard Oil Co., the anthracite producers, the U.S. Steel Co., the American Can Co.—have all declined relative to their industry.

My only serious objections to the antitrust laws and their administration is that some unnecessary statutes were passed later which have lent themselves to an administration which has been cartelizing. The Government—Congress—did not stop while it was ahead with the Sherman Act. My other principal objection is that the courts, with the notable exception of Justice Rose in the *American Can* case of 1916, have not been sufficiently willing to recognize that firms with monopoly power will decline relative to their industries. They have not been sufficiently willing to make use of this rather than specific remedies.

My fears in connection with the bill which is currently being considered is that it will give rise to the commission which will engage in cartelizing behavior. It seeks the dissolution of highly concentrated firms through a commission. Unfortunately, there is little that a commission can do other than engage in cartelization. The commissions, such as the Interstate Commerce Commission and the Civil Aeronautics Board, which have price setting authority, do this directly in running cartels. Non-price-setting commissions such as the Federal Trade Commission usually do it in generating passive behavior of firms within the industry.

My fear is that this Commission will do precisely that, have a deconcentrated industry in which the firms fear to realize their economies of scale, and, thus, pursue very passive behavior relative to one another and with respect, specifically, to price competition.

Mr. O'Leary. Professor, you have testified that factors other than General Motors are responsible for the shape of our transportation system.

In your view, does General Motors possess a monopoly power in either buses, locomotives, or bus engines?

Professor Hilton. A firm with that high percentage of output probably has some degree of monopoly power. However, both of these industries, buses and locomotives, are confronting declining industries. An effort to exercise a monopoly power, such as it is, of General Motors would accelerate the declines of the industries to which it is selling. It seems highly unlikely that General Motors would want to accelerate the declines of industries to which it is selling.

Now, this, it seems to me, is the reason that it behaves the way it does, producing least-cost vehicles, given the economic organization and the declining demand conditions for these two industries.

Mr. O'Leary. Thank you, Professor. I have no further questions.

Senator Hart. Mr. Chumbris?

Mr. Chumbris. Thank you very much, Mr. Chairman. I have no further questions either. There is one point that I wish to make pertaining to the so-called dispute between Professor Hilton and his coauthor of the book, Donald Turner, when he was before us, had the same problem with Carl Kaysen in the book they coauthored, which book was the basis of this bill.

There were times when Professors Turner and Kaysen just could

not see eye to eye and one would yield on certain provisions in that book; exactly what you are saying today.

Professor HILTON. It is an inevitable problem of coauthorship, and as I said in my letter to the chairman, I may have said some things in the book to which Professor Due disagreed. He said one other thing with which I disagree. He defended the behavior of the Iowa commission in protecting the Iowa interurbans against the securing of franchises by intercity bus lines as long as the Iowa interurbans wanted to continue operating.

However, for two areas of difference between two authors who wrote a 500-page book, it doesn't seem to me exceptional.

I made reference in my prepared testimony to an article which I wrote with Prof. Ross D. Eckert of the University of Southern California. To the best of my knowledge, we said nothing in there with which one another disagreed.

One of us, however, is of the opinion that President Nixon should be impeached, and the other is very strongly of the opinion that he should not, but I should prefer not to identify which is which. There is no presumption that when two people write a book together they are unanimously of the same opinion.

Mr. CHUMBRIS. I understand you do have the comment of two very interesting people that you have met during your career?

Professor HILTON. Oh, I mention it only because of the unavoidable interruptions in my testimony, as was pointed out by Mr. Chumbris, that Henry Aaron hit his 714th home run during my testimony. I responded that I was absolutely delighted that that historic event had occurred and that I have always prided myself that I thought Lyndon Johnson and Henry Aaron were the two most distinguished people that I had ever met face to face and with whom I had shaken hands. I also own 10 shares of stock in the Atlanta Braves, and so on all grounds, I am particularly delighted with today's events.

Mr. CHUMBRIS. Thank you very much.

Senator HART. Well, after a long day that is refreshing concluding testimony. I can understand.

Professor HILTON. Well, I conclude as I began, saying that I greatly appreciate the invitation to testify.

Senator HART. Professor, we are grateful that you have responded.

We are adjourned to resume in room 1202 of this building at 10 a.m. Tuesday.

[Whereupon, at 5:05 p.m., the subcommittee adjourned to reconvene at 10 a.m., Tuesday, April 9, 1974, in room 1202, Dirksen Senate Office Building.]

[The following was received for the record. Testimony resumes on p. 2271.]

MATERIAL RELATING TO THE TESTIMONY OF GEORGE W. HILTON

Exhibit 1.—Prepared Statement of Professor Hilton

STATEMENT OF GEORGE W. HILTON, PROFESSOR OF ECONOMICS, UNIVERSITY OF CALIFORNIA LOS ANGELES

My name is George W. Hilton, and I am Professor of Economics at the University of California, Los Angeles. I am the specialist in transportation of

the UCLA Economics Department, where I teach courses in both urban and intercity transportation. In 1964 I was chairman of President Johnson's Task Force on Transportation Policy, and in 1972–73 I was a member of the Task Force on Railroad Productivity of the Office of Productivity and the Council of Economic Advisers. In the 1968–69 academic year I was Acting Curator of Rail Transportation of the Smithsonian Institution. I am the author of *The Transportation Act of 1958*, *The Electric Interurban Railways in America* (in collaboration with John F. Due), *The Cable Car in America*, and numerous other works both on railroading and urban transit. I have been asked by the Subcommittee to comment upon the report *American Ground Transport* by Bradford C. Snell, issued under the Subcommittee's imprint in 1974.

The argument of the Report, as I understand it, is as follows: General Motors is in the position of a monopolist of automobiles, in spite of the existence of three other domestic producers. At least two of the other three, Ford and Chrysler, either act in collusion with GM, or behave passively so as to produce a situation of "collective monopoly." The firms use this monopoly power to produce large, expensive, unsafe, polluting automobiles instead of what might be most profitable in a competitive environment. GM uses the monopoly gain in a variety of cross-subsidization operations through its bus and locomotives branches so as to maintain its monopoly position in automobiles. Specifically, in collusion with Firestone and Standard Oil of California, it formed National City Line, which bought up a large number of electric railway properties to replace streetcars with buses, partly to achieve a monopoly gain on buses, partly to accelerate the decline of transit so as to increase the demand for automobiles. Similarly, General Motors used its position as the largest American industrial firm to exert suasion on the railroads to convert to its diesel locomotives, thereby preventing the railroads from converting to electric locomotives, which would have been cheaper to operate and less polluting. The undesirable nature of this conversion accelerated the decline of the railroads, and increased the demand for both automobiles and trucks. The principal example adduced to support his argument are Los Angeles, where General Motors is accused of having brought about the replacement of local rail service with automotive transportation, and the main line of the New Haven Railroad, which General Motors is alleged to have caused to be de-electrified.

The foregoing argument purports to explain two very major conversions in society: from rail to free-wheel urban transportation, and from steam to diesel railroad propulsion. It should be noted at the outset that this argument is novel, relative to academic interpretations. Economists and historians have not, to my knowledge, interpreted these conversions in this fashion, but rather as responses to changes in public tastes and incomes, changing technological alternatives, varying relative availability of fuels and other inputs, and similar demand and supply consideration which manifested themselves through the prices confronting transit enterprises and railroads. More generally, economists have not usually attributed changes of this magnitude to a monopolist, even if its control of a market was more complete than GM has ever attained. In general, monopoly manifests itself in higher prices for specific goods and services, usually with discriminatory rate structures such that the economy has an incentive to find alternatives to the monopolized good or service. As a consequence, monopoly tends to be a self-limiting phenomenon: most firms with a high degree of monopoly power decline either absolutely or relative to their industries after a few decades. A monopolist which was able to bring about long-run secular changes of the character of those in consideration here would be without precedent.

Such considerations do not demonstrate that the argument of the Report is wrong, however. One must consider the internal consistency of the argument, and consistency with evidence concerning the trends in question. Most basically, it is by no means clear that the behavior of which GM is accused would be maximizing behavior of a monopolist. Even if the firm were a monopolist, there is no presumption that manufacturing large, fuel-inefficient automobiles would be preferable to manufacturing small ones if the public preferred the latter. Small automobiles have been readily available from foreign sources, the most important of which (Volkswagen, Datsun, Toyota) have been independent of the Big Three American firms. Similarly, American Motors, which the Report treats as mainly outside the "collective monopoly," has for most of its recent

history specialized in small cars. The behavior of which the Big Three are accused would have stimulated American Motors relative to the major firms.

Apart from such considerations, it is also not clear that General Motors operations in the transit industry would protect its dominant position in automobile production in the fashion argued in the Report. The Report presumes that putting a bus of capacity of 35 out of business creates a demand for 35 automobiles, that annihilating a rail vehicle creates a demand for 50 automobiles, and so on, thereby creating a greater incentive to get rid of streetcars than buses, and a maximum incentive to get rid of entire trains. If this were GM's motivation, it is difficult to explain why it went into the bus business; rather, it would simply have endeavored to buy up transit systems and endeavor to wind them up when their franchises expired, or whenever the regulatory authorities were willing to allow abandonment. If there were a remaining demand for transit, other operators would have taken over the franchises, obviously. Presumably to deal with this intellectual problem, the Report argues that GM's motivation was to reduce the quality of the service so as to bring about or accelerate the decline of the transit industry. Elsewhere the Report argues that GM became a monopolist in the bus business, and so secured a monopoly gain from this activity, presumably subjecting the firm to conflicting incentives with respect to transit.

As the Report point out, GM went into the transit business jointly with Standard Oil of California and Firestone through formation of National City Lines. The author interprets this as an effort to secure a profit out of the conversion of rail lines to bus, thereby reducing the quality of the service and accelerating the decline of transit. This argument depends on GM's having monopolized the transit industry, for it is clearly applicable only to transit enterprises which GM controlled. National City Lines controlled only a minority of transit lines and did not act markedly differently from the industry as a whole. In Los Angeles and other cities its operating companies bought streetcars for their most heavily travelled lines as long as it was felt in the industry that streetcars were preferable for major lines, trolley coaches for intermediate, and diesel buses for light traffic densities. A mixture of the decline in demand for transit and the movement of costs in favor of diesel buses ended this belief in the industry by 1952. Thereafter diesel buses were considered preferable for all routes, other than those which had some special characteristics. Most streetcar lines which survived do so because of ventilation problems in tunnels, (Boston, Philadelphia, Pittsburgh, San Francisco, Newark), or private rights of way which municipalities did not wish to see foregone (New Orleans, Shaker Heights, San Fraecisco) or unique situations (a customs inspection en route in El Paso). Trolley coach lines survived almost entirely on routes with steep grades. National City Lines' properties were no exception to this pattern. It operated the El Paso streetcar line until July 30, 1973, and its Hodiamont car line in St. Louis, which had a private right-of-way, was among the last American streetcar lines to be converted.

The conversion to diesel buses occurred throughout the industry, even in transit enterprises in which National City Lines had no interest, and which did not convert with GM buses. The San Francisco Municipal Railway, a publicly-owned transit system, converted all of its streetcar lines except four which ran through either of two tunnels under Twin Peaks, and one which had extensive private right-of-way in the same area. The conversion was affected with Mack and other non-GM buses, apparently because of favorable ocean shipping arrangements from Mack's plant. In March 1952 the Municipal Railway reported the following figures per mile for operation of vehicles:

Streetcars	$1.0055
Cable cars	1.8018
Trolley coaches	.6438
Buses	.6038

This is consistent with the Chicago Transit Authority's report that when it converted its last streetcar lines in 1958 the busses operated for $.48 per mile less than the streetcars which they replaced. Here again, the operator was a public enterprise, and it converted mainly with non-GM buses, in this instance Twin Coach-Flexible equipment.

National City Lines' properties were responding to the same stimuli as the rest of the industry. Los Angeles Transit Lines, controlled by National City Lines through a subsidiary, reported the following costs per mile:

	1950	1951	1952
Streetcars	$0.6866	$0.7229	$0.7699
Trolley coaches	.5897	.5695	.6148
Buses	.4716	.4797	.5232

Los Angeles Transit Lines, in spite of these incentives, did not convert its principal streetcar lines radiating from downtown Los Angeles during its control of the city transit system. Rather, the conversion was effected by a public body, the Los Angeles Metropolitan Transit Authority, in 1963, after it had succeeded to the system.

The report is even more erroneous concerning the Pacific Electric. This, as is well known, was America's largest interurban network, radiating from central Los Angeles to all parts of the metropolitan area. It was a Southern Pacific Railroad subsidiary, distinct from Los Angeles Railways, and separated from it by a guage difference. Los Angeles Railways was built to 3'–6" and the Pacific Electric to the standard railroad gauge of 4'–8½". There was initially some community of ownership through the Huntington family, but LARY passed into the hands of a National City Lines affiliate whereas the Pacific Electric never did so. The PE was operated by the Southern Pacific until 1953, when passenger operations were convey to Metropolitan Coach Lines, under a plan approved by the Public Utilities Commission for conversion of the rail operations to bus. Metropolitan Coach Lines was organized locally by J. L. Haugh. He did not complete the conversion to bus operation by 1958, when he conveyed the remaining operations to the Metropolitan Transit Authority. This public body completed the conversion, which amounted to less than 10 per cent of the Pacific Electric's original operations, to bus in 1961. Owing to the gauge difference from LARY, Pacific Electric had entered downtown Los Angeles on private rights-of-way and on three-rail trackage shared with LARY. Thus, this was not a situation such as occurred in Toledo and some other cities that abandonment of local streetcar lines caused the cessation of interurbans before it would otherwise have occurred. Pacific Electric could have continued, regardless of what LARY had done. Accordingly, blaming National City Lines for the conversion of Los Angeles from rail to automotive transport is entirely unfounded.

More generally, General Motors cannot be held responsible for Los Angeles taking its present geographical characteristics. The city is almost entirely a product of forces for diffusion in the urban pattern. It grew up around an inland central business district, and so took the character of Indianapolis, Houston, Columbus and other cities without major natural barriers. Had it grown around Santa Monica rather than Los Angeles, it might have had the character of Chicago, Philadelphia or Toronto, which have major water barriers in at least one direction. The mild climate caused an exceptionally high percentage of the population to opt for houses as versus apartments, producing a low population density, between 5000 and 6000 per square mile. None of the major industries—orange growing, motion picture production, aircraft manufacture, oil refining, port activity—had roots in the central business district. San Francisco provided most of the financial function for the state, and nothing but the central officer of oil companies created extensive central office employment. Consequently, although the metropolitan area eventually became approximately the size of Chicago's, Los Angeles had only about a third of the population density and a third of the concentration of economic activity in the central business district.

Under the circumstances, Los Angeles was inevitably in the forefront of American cities in its conversion to the automobile. The diffused pattern of employment and the low density of population caused early recourse to the automobile for home-to work trips, and the mild climate encouraged pleasure driving. Los Angeles had its present reputation as, along with Detroit, one of the two major automobile-oriented cities at least by 1914, even though the Pacific Electric and LARY were still running, and the automobiles were mainly products of the Ford Motor Company, then the dominant firm, rather than of

General Motors. The two electric railways declined mainly because they were able to provide almost nothing but the trips into and out of the central business district, demand for which declined absolutely. Such remaining demand as there was for such trips by public transportation could be handled more cheaply by buses, as the foregoing data demonstrate.

Forces for diffusion in the urban pattern were at work on all metropolitan areas. Cities ranged in a continuum from New York, which has the largest financial community, the greatest central office employment, and the most comprehensive water barriers of any American city, to Los Angeles. The geographical forces at work on American cities were to make them successively more like Los Angeles and less like New York. New York, Chicago, Philadelphia and Boston, all of which have combinations of extensive central-office employment and water barriers, resisted the trends most fully, but even they decentralized over time.

John R. Meyer, J. F. Kain and Martin Wohl in the most highly regarded academic treatise on urban transportation, *The Urban Transportation Problem* (Harvard University Press, 1965) enumerate the forces for diffusion at work on cities. The automobile has permitted a more diffused urban pattern by facilitating lateral mobility. The computer has reduced the demand for central office employment of clerical labor. Factory technology has moved to land-extensive single-story assembly-line operation, so that new factories are almost invariably in suburban locations. The truck and containerization or piggybacking of railroad freight gave freedom from rails in industrial location. Airports in suburbs replaced railroad stations in central business districts. Television, which kept people at home, replaced the theaters and cinemas to which they had gone in central business districts. As Negroes replaced immigrants as the principal urban slum dwellers, they neither worked, shopped, dined nor amused themselves in central business districts to the extent their predecessors had done.

These geographical changes produced a decline in transit, first, because of the adaptation of the population to increases in their income, and, second, because of the economic organization of the transit industry. The automobile is used in complementarity to single-family housing, the demand for which is "normal," which is to say that people typically want more of it as their incomes increase. This gives automobiles a strong normality in consumption. Walter Oi and Paul W. Shuldiner have estimated the income elasticity of demand for services related to the automobile at +1.2, which is to say that a 1 per cent increase in income produces a 1.2 per cent increase in quantity demanded of services related to automobiles. In contrast, the income elasticity of demand for transit is apparently positive only in low brackets. A recent dissertation by Sidney Davis ("Household Consumption of Housing Service Flows in Atlanta," Georgia State University, Atlanta, 1973) demonstrates that in Atlanta the income elasticity of demand for transit is positive only in levels of family income below $4000 per year. In such families, additional income comes largely from additional members going to work, thereby increasing the family's demand for transit trips. At higher income levels, such phenomena are outweighed by the tendency of members of the family to desert transit for automobiles as income increases. Over-all, as Meyer, Kain and Wohl conclude, the income elasticity is either negative or insignificantly positive.

Both automobiles and transit have relatively low price elasticities of demand. On the basis of postwar fare increases, the American Transit Association estimates the price elasticity of demand for transit at between —.3 and —.4 which is to say that a 1 per cent fare increase results in a decline in ridership between three and four tenths of one per cent. The RAND Corporation has estimated in connection with the recent fuel shortage, that the elasticity of demand for gasoline for use in automobiles is even lower, only —.1 to —.2. Such elasticity as there is in demand for transit is highly concentrated in off-hours riders; rush-hours riders, having, in general, higher incomes and less discretion in whether to make the trip, have elasticities half or less those of off-hours riders.

The transit industry is organized into a series of monopolies for reasons which are entirely historical. The optimal organization of a streetcar system was to have a single power station with a city-wide grid of electric distribution facilities. This circumstance caused an immediate unification of street railways into monopolies under public utility regulation in virtually all major cities. The horse car and cable car, which had preceded the electric streetcar, had been free of this economy of scale, and the bus, when it replaced the streetcar, was

also free of it. The bus arose as a competitive industry in rivalry to the street railways in 1914 in the form of the jitney movement, which was originally private automobiles, mainly Model-T Fords, used as common carriers. By 1915 specialized bus bodies had been developed, and the jitneys showed every evidence of being a viable industry, essentially a competitive market in urban transportation. (See Ross D. Eckert and George W. Hilton, "The Jitneys," *The Journal of Law & Economics*, XV (1972), pp. 293–325.) The jitneys were put down on a municipal level in every city to protect various direct and implicit benefits which the city governments received from the monopolistic organization of the street railways. The street railways were a declining industry in having chronically depressed rates of return by 1918. Their passenger counts began to decline absolutely about 1924, when virtually all service was still provided by electric streetcars. Buses adapted themselves to declining demand conditions better than the streetcars by being cheaper to operat, more flexible in avoiding obstacles, able to deviate from major routes into lightly populated areas, capable of using a common right-of-way with automobiles, and in other respects. Their short life expectancies were a positive advantage, for they enabled transit firms to provide service in a declining industry in a relative recent vehicle. Most transit firms advertised that replacement of streetcars with buses increased the quality of the service. The buses, however, operated as the streetcars had done, on fixed routes on schedules with transfer privileges about the city, as distinct from operating in response to demand, as the jitneys had done. In addition, the monopolistic organization of transit systems made them expensive to operate. The monopolistic organization created a strong union, the Amalgamated Transit Union, whose members were in a crucial position to tie up the entire enterprises. Labor costs of all sorts amount to some 75 to 85 per cent of the costs of transit systems.

The foregoing combination of circumstances made transit systems incapable of dealing with the forces for their decline. The only routes which, in most cities, were profitable were radial routes from central business districts, but demand for such service declined. Those routes had cross-subsidized crosstown and other light-density lines, but as the radial routes also became unprofitable, the entire transit enterprises ceased to be viable. By the mid-1950's, the private sector was unable to support most transit enterprises. By the mid-1970's municipalities are typically unable to support them, and are seeking operating aid from the Federal Government.

The General Motors bus is the most appropriate—which is to say least costly—vehicle for the industry, given the demand conditions and industrial organization just described. It is probably not an optimal vehicle for urban transit, however. A recent study of the Department of Transportation ("Evaluation of Rail Rapid Transit and Express Bus Service in the Urban Commuter Market," October, 1973) demonstrates that the transit industry is overcapitalized. Transit service of the traditional sort, with diesel buses of the present size stopping at street corners is appropriate only for densely travelled routes for passengers of low evaluation of time. More general urban transit ought to be provided with vehicles of the character of Volkswagen Microbuses, and probably would be if transit were a competitive industry. That is, if buses were owner-operated, they would be run by people whose alternative employments were relatively unattractive, mainly ghetto and barrio residents, instead of by unionized drivers. Jitney operators on Martin Luther King Drive in Chicago apparently operate profitably carrying passengers mainly in second hand Cadillacs for 25¢ each while the Chicago Transit Authority covers about 90 per cent of its variable costs per passenger at a fare of 45¢ plus 10¢ for a transfer. Present diesel buses are most suitable for a line-haul function for longer distances on reserved lanes of freeways or other private rights-of-way, but such services are typically provided by rail vehicles.

In addition to being inappropriately organized, the transit industry—and drivers of automobiles, as well—are confronted by an inappropriate set of charges for use of public facilities. As is well known, users of all sorts pay for roads by an excise on fuel, levied at the pump. This method is used because gasoline or diesel fuel is the only input into driving which is regularly metered, and, consequently, the tax is less costly than any other to collect. This tax does not differentiate between the social cost of moving at various hours, and thus does not present a pecuniary disincentive to driving to work and back. In turn, this creates congestion getting in and out of central business districts in

rush hours analogous to other forms of queueing caused by non-price rationing. The legislation which put down the jitneys prevents filling empty seats in automobiles at a price, causing an excessive number of vehicles in the queues with a low rate of occupancy of each. Annual license fees are typically levied on the basis of value or horsepower of a vehicle, rather than on its weight or the square footage of the road which it occupies. Accordingly, there is inadequate pecuniary disincentive to use large or heavy automobiles. The United States has until recently had a gasoline price at the pump only about half that of other major industrial nations; this also was an incentive to use large automobiles. Finally, governments have not set prices on air used by an automobile, and in consequence drivers have opted for whatever car is most economical, given a low price of gasoline and a zero price of air. This has been the internal combustion automobile, which had vanquished steam and electric automobiles by the 1920's. Alternatively stated, governments have not taxed noxious emissions, and drivers have opted for a highly polluting vehicle. There is no point in General Motors or any other automobile producer bringing out a low-polluting vehicle, because it would be more expensive to operate than internal combustion cars, and only a small number of drivers—presumably those who took satisfaction in making an imperceptible contribution to amelioration of the smog problem—would opt for it. The same logic applies to transit systems in opting for the diesel bus in preference to the steam bus recently brought forth unsuccessfully by the Urban Mass Transportation Administration.

If governments charged for roads by a meter on the vehicle which operates differently by hour on the basis of the social cost of driving, repealed their anti-jitney statutes, levied annual license fees on the basis of square footage of automobiles, and taxed noxious emissions, drivers would opt for smaller cars, make fewer trips to work by driving an automobile, and cause less pollution. The recent doubling in the price of gasoline is causing drivers to opt for smaller cars and to make more trips by transit, as could easily have been anticipated. The social costs which the Report attributes to the evil machinations of an alleged monopolist are readily explained by the incentives given to drivers and transit enterprises by an inappropriate set of taxes, and by an inappropriate organization of urban transit adopted in a series of municipal decisions about 1915. What the Report argues concerning the dieselization of the railroads is equally capable of explanation on the basis of the incentives facing that industry.

The disattractions of the steam locomotive had been evident since the late 19th century. Adaptation of a steam boiler to self-propulsion entailed, in general, a boiler below optimal size by the standards of stationary steam generation, prevented (with some exceptions) compounding of the cylinders, and precluded condensation of the steam. This produced a locomotive which was low in thermal efficiency, polluted heavily—especially in the most undesirable fashion, by discharging coal smoke high in sulphur content—and was poor in mustering its horsepower at low speeds. The engine made four discrete impulses per revolution of its wheels, which made it liable to wheel slippage, and tended to produce jerky starts. Operating steam locomotives required a high skill level, and although it was possible to use more than a single locomotive on a train, each had to have its own engineer and fireman.

Since the Baltimore & Ohio pioneered mainline railroad electrification in the 1890's, it was widely expected that American railroads would eventually be electrified. Electric locomotives would produce their power with larger boilers, concentrate the noxious emissions from the power station, exert a continuous torque in starting, and be capable of multiple-unit operation so that a single engineer could run any desired number of units. The change would reduce the skill level required of engineers, and allow withdrawal of fireman. In spite of these attractions, relatively little electrification was ever done in America, and for a very simple reason: the fixed installations were too expensive relative to the benefits anticipated. The railroads, like drivers of automobiles, were confronted with low oil prices, and also with low coal prices, relative to other nations. Accordingly, the continued to operate mainly with steam locomotives, coal burning in most areas except the southwest and arid west, where the high transport costs of coal caused oil burning steam locomotives to be the more economical.

There was further matter that the industrial organization of the railroads did not produce traffic densities which warranted electrification. The cartelization of the railroads in the post-Civil War period gave the railroads an

incentive to build redundant main lines parallel to one another. The seven rival routes between Chicago and Omaha are the usual example, but the parallel railroads across Indiana and Ohio from Chicago to the east coast are even more familiar. William H. Vanderbilt characterized the railroads running east from Chicago as, "five great railroads to New York, with only business enough for two." Relatively free entry into railroading and the incentives stemming from the cartelization also produced an excessive mileage of branch lines, notably into points in the midwest. The country developed a railroad mileage of over 250,000, about double that of the Soviet Union, and much farther in excess of any other country. This meant that American railroad traffic was dispersed over a grossly excessive mileage, so that virtually none of the trackage warranted the investment in fixed facilities which electrification required. Conventional wisdom was that the most appropriate method of expanding facilities in response to an increase in traffic was adding multiple tracks up to a total of four. If traffic warranted further investment, electrification was considered preferable to adding additional tracks. Only one American rail line had such a volume of traffic, the main line of the Pennsylvania Railroad between New York and Philadelphia. Acordingly, such mainline electrification as was done in America was installed for special considerations. The most common reason for electrification was dense mainline railroad commutation service, where the rapid acceleration properties of electric equipment were useful. Such systems were installed only in the Nw York, Chicago and Philadelphia metropolitan areas, plus some others (Rochester, Portland and San Francisco) where the decline in demand for this form of transportation have ceaused their removal. Most other electrifications were installed to deal with problems of atmospheric pollution, either because cities were unwilling to tolerate steam locomotives in their central areas (the Illinois Central lakefront facilities in Chicago, the Cleveland Union Terminal, both New York stations), or because the railroads had long tunnels with ventilation problems (the Boston & Maine, Grand Trunk, Michigan Central, Great Northern, Norfolk & Western). The Virginian electrified to deal with serious gradients, ad grades approaching the tunnels were a major consideration in the tunnel electrifications. The one example of a long electrification of a main line for carriage of general traffic, the Milwaukee Road's electrification through the Rockies and Bitter Root Mountains, was brought forth partly by gradients. The installation proved a thoroughly misguided investment, was never completed, contributed to two bankruptcies of the railroad in the 1920's and 1930's, and is currently being removed. Only one additional big electrification was made. the Pennsylvania's electrification from New York to Washington and Harrisburg in the 1930's, but this was accomplished partly with public funds. This electrification, the nation's largest, was brought forth partly by the demands of the New York-Philadelphia main line, partly by the presence of existing electrified commutation services at New York and Philadelphia partly by pollution regulations at both cities, and partly by an intention to electrify the grades between Altoona and Pittsburgh. World War II intervened before the electrification was pushed west of Harrisburg.

All of these electrifications had the problem of establishing incompatible motive power districts for the railroads which operated them. This problem was intrinsic to electrification, for no one considered electrification suitable to all railroad lines. Consequently, the railroads which had them had an incentive to get rid of them if the special circumstances which brought them forth could be dealt with by other means.

The diesel locomotive is, in fact, a self-contained electric locomotive. It consists of a diesel engine running a generator which produces electricity for the traction motors. This has permitted the electrification of the railroads completely, not on a limited basis, as would have been possible with fixed overhead. The diesel-electric locomotive provided all except one of the attractions sought of electric locomotives: continuous torque, the possibility of multiple-unit operation, lowering of the skill level, and possible elimination of firemen. It did not provide the attraction of centralizing the noxious emissions into a single source, but because it did not have a sulfurous exhaust its own polluting properties were so superior to the steam locomotives which it was replacing that it met pollution standards except for the tunnel approaches to the two New York stations. The tunnel electrifications on the Boston & Maine, Grand Trunk, Michigan Central and Great Northern were all removed, as were the electrifications of the Cleveland Union Terminal and the Illinois Central's lake-

front yard. The Norfolk & Western de-electrified even before dieselization, and on succeeding to the Virginian, removed its electrifiaction. The only electrifications with any real prospect of survival are the suburban passenger generations and the former Pennsylvania Railroad New York-Washington Harrisburg installation.

The Report attributes a generality to the alleged de-electrification of the New Haven, parallel to that of the alleged motorization of Los Angeles. Accordingly, it is necessary to consider this one individually. The New Haven's main line was electrified from New York to New Haven, 72.5 miles, for reasons consistent with the foregoing discussions. The company operated a mainline commutation service for passengers. Most of the company's passenger train terminated in Grand Central Terminal, which has a long tunnel approach under Park Avenue. Its Boston-Washington expresses ran via the Hell Gate Bridge into Pennsylvania Station through the East River tunnels. Thus, both of its New York entrances entailed pollution problems. The New Haven's mainline east of New Haven was never electrified because the pollution problem and the commutation service were all concentrated at the New York end of the railroad.

The New Haven by the 1950's had the same incentive to get rid of an incompatible electrification as the railroads which removed their electric installations. In fact, it had unique reasons to wish to remove it. The power station at Cos Cob, Connecticut, which powers the electrification, was of an obsolete design, with high maintenance costs, and power so inadequate that freight operations had to be stopped in the late afternoons to allow the evening rush of passengers to be handled. Further, the company had a problem of incompatibility not only with its dieselized main line east of New Haven and its Hartford-Springfield line, but with its New York entrance. The New Haven's electrification is of 11,000 volts AC, which is compatible with the Hell Gate Bridge route into Peensylvania Station, but not with the entrance into Grand Central Terminal, which is equipped with a 660 volt DC third rail, using the New York Central's under-running third-rail shoe as a pick-up. It is also possible to enter Pennsylvania Station on 600 volt DC third rail, but the Long Island Rail Road's over-running shoe must be used.

The episode of alleged de-electrification to which the Report attributes such generality is apparently an effort of the New Haven management to deal with these incompatibility problems. In 1956 the company had 408 diesel locomotives, of which about 50 had been built by General Motors, and most of the rest by the American Locomotive Company, which the New Haven favored, presumably because the proximity to its lines of Alco's Schenectady plant minimized delivery costs. The company sought a diesel locomotive that could run the length of the main line without a change, and then go into either of the New York stations on third rail after the appropriate shoe was affixed at New Haven. The railroad chose a modification of General Motors F–9 model, reportedly because it met a weight limitation on the approach to Grand Central. GM produced 60 such locomotives, called the FL–9 model, for the New Haven, 30 in 1957 and 30 in 1960. The locomotives were a successful effort to deal with a unique problem; no other railroad ever ordered FL–9 models.

Although the Report states (p. 3) "Then, in 1956, GM persuaded it to tear down its electric lines and scrap its powerful, high-speed electric locomotives," the New Haven did not de-electrify. As the author could easily have ascertained by buying a ticket from New York to New Haven, precisely as much of the New Haven's main line is now electrified as ever was. The successor Penn Central continues to operate multiple unit electric trains on the line in suburban service, some of the Metroliners run from Washington to New Haven, and former Pennsylvania GG–1 electrics handle Boston-Washington expresses between Washington and New Haven. To repeat, the New Haven probably had more incentive than most railroads to remove its electrification, but it never did so.

To attribute the New Haven's subsequent problems to the acquisition of the FL–9 engines and to a de-electrification which never took place is indefensible. It is an example of *post hoc ergo propter hoc* reasoning, and like most else in the Report is capable of an alternative explanation. The New Haven is an old railroad with a poor physical plant. Its clearances limited its ability to handle piggy-back and other modern equipment. Its electrification made it expensive to operate. The proximity of the main line east of New Haven to the shoreline made the railroad prone to damage from hurricanes, several of which occurred

in the late 1950's and early 1960's. It was the fourth largest passenger hauler in the country, and this traffic was highly unprofitable. It owned a great deal of urban real estate, the tax load on which was burdensome. The company's greatest single handicap was the directional imbalance of its freight traffic. Its freight was typically inbound raw materials which moved under 100 miles to an industrial plant. The cars stayed for about five days and moved out empty. What the plants in the area produced—locks, clocks, firearms, ammunition, aircraft components—was small in size, high in value, and frequently breakable, traffic of the sort that typically moves by truck in any area. All of this tended to make the New Haven the weakest big American railroad of the 1960's, and the earliest to go bankrupt.

Arguing more generally, as the Report does, that foisting GM diesels on the railroads by threat of withholding General Motors' traffic weakened the industry is even more indefensible. General Motors always denied that it engaged in such behavior. The Department of Justice in 1967 dropped its antitrust suit against GM based on this charge when it concluded that evidence was insufficient for prosecution. Several railroads, such as the Delaware & Hudson, operated almost exclusively with non-GM diesels out of proximity to other builders, loyalty to the producers of the steam locomotives with which they had formerly operated, or other considerations. Such railroads suffered no apparent boycott from GM, and had the prosperity or lack of it that one would expect on the basis of the traffic potentials of their tributary areas, the quality of their physical plants, the number and strength of rival railroads, the character of their connections, and similar objective criteria of evaluation. With respect to motive power, the most valid generalization one can make is that railroads which bought diesels from a wide variety of builders out of a desire not to alienate any builder, or because of an excessive commitment to specialization, or some other reason, had higher motive power costs than railroads which dieselized with a single model or a small number of models. The Pennsylvania, Rock Island and M–K–T all bought widely among builders and had chronic problems of incompatibility of units, and excessive inventory costs. Retrospectively, the most effective way to dieselize was the method of the Illinois Central, which equipped itself almost exclusively with General Motors GP units and used them for virtually all freight and some passenger services. General Motors was usually thought to have established its commanding position in the industry, and also in the bus industry, through the superiority of its diesel engines. Most railroads which re-engined units of other builders did so with GM diesels.

More basically, there was no point in inducing the railroads to adopt the General Motors diesel locomotive simply because it was the greatest improvement in railroading since the introduction of the air brake in 1869. Several firms, including GM, brought out satisfactory diesel switchers in the 1920's, but none developed a road engine superior to the later steam locomotives until GM's passenger units of the mid-1930's, and its FT freight unit of 1939. World War II delayed the dieselization of the railroads until the decade immediately after the war. The characteristics of the diesel locomotive mentioned previously, plus some others—low center of gravity for higher speed on curves, ability to distribute power through the train with "slave" units—lent itself particularly well to the railroads' characteristic effort to increase productivity by running longer trains. The industry is a declining one for a variety of reasons, some of which are a consequence of an inappropriate industrial organization in a mixed public-private cartelization, some of which are inevitable, such as the change in composition of national output away from heavy industry to light manufacturing and services. In any case, the industry as it is currently organized has not potential for major increases in output, and in order to match the increases in productivity of the manufacturing industries with which it competes for labor, it attempts to increase productivity per employee by running longer, less frequent trains. This approach has compensating disadvantages, mainly that damage to cargo from slack action becomes worse, and delivery times of freight less dependable. Over-all, however, the effort has been successful in producing a rate of increase of output per employee greater than that of manufacturing industry, if one does not correct for deterioration in quality of service and some other considerations. Productivity per employee in railroading, uncorrected, grew at a rate of 5.2 per cent per year from 1947 to 1970, as compared with 3.0 per cent for the private sector of the economy as a whole. (See *Improving Railroad Productivity*, Final Report of the Task Force

on Railroad Productivity, Office of Productivity and Council of Economic Advisers, November, 1973). The diesel locomotive has been the principal single factor in this increase in productivity. James C. Nelson wrote:

"The outstanding postwar productivity increase was in product per locomotive. This reflects rapid substitution of diesel for steam locomotives requiring fewer units with more power per unit, the rising mileage utilization fo locomotives, and greater use of heavy-tonnage trains. (*Railroad Transportation and Public Policy*, Brookings Institution, 1959, p. 238.)"

Had the railroads been able to phase ont firemen completely, the diesel locomotive would have realized its potential for increasing employee productivity more fully.

By application of the logic previously expressed concerning buses, present diesel locomotives are optimal only given the present economic organization of the railroad industry. In a competitively organized railroad industry, the firms would probably operate with a containerized technology, moving containers long distances by rail and short distances by truck. Origination, delivery and classification functions would be provided by truck, and most branch lines would be abandoned. In such organization, containers would probably be carried on articulated flatbed units with slack-free couplings, and power distributed throughout the train to motors on the trucks under the flatcars. Present technology of diesel engiuers, AC or DC generators, and DC traction motors could be used. The impediment to this development is the present cartelized economic organization of the railroads, not anything which General Motors has done. As in the case of buses, GM has produced an optimal locomotive, given some constraints which are themselves inappropriate.

By way of further analogy to the argument concerning buses, GM diesel locomotives are optimal given a low price of fuel and a zero price of air in America. The recent rise in the price of oil has caused railroads to reconsider their calculations concerning the relative attractions of diesel-electric locomotives versus straight electrics. At least three railroads, the Burlington Northern, Union Pacific and Southern Pacific are considering electrification of portions of their main lines so as the use low-grade coal or nuclear energy as fuel. A technique of taking the transmission voltage from the overhead directly into the locomotive without use of substations has been developed in France to reduce to capital requirements of electrification. Accordingly, it would be consistent with my argument to see some new electrifications on American railroads within the next few years.

I have attempted to treat in this paper the two principal lines of argument in the Snell Report. Unfortunately, I am reasonably certain that I cannot have exhausted the misrepresentations in the Report. For example, on page 29 of the Report, the author states that by 1939 Greyhound Lines had put pressure on six railroads to replace substantial portions of their commuter rail lines with Greyhound service: Pennsylvania, New York Central, Southern Pacific, New Haven, Great Northern, and St. Louis Southwestern, The St. Louis Southwestern had no commuter service, the Great Northern virtually none, and the rest have continued to operate to the present most of their commuter services. Greyhound succeeded to the Marin County commutation service of the Southern Pacific after opening of the Golden Gate Bridge, but otherwise I know of no major instance of what the author claims. As his footnote indicates, what was being done was establishment of intercity services. As is well known, buses are a cheaper method of providing intercity services than passenger trains, more suitable to a travel market of persons of a low evaluation of time and/or persons making short trips.

A misrepresentation of events of the character of this Report would be offensive in any case, but it is particularly so because it holds out to the public the prospect of great changes which could not be produced by the remedy which it recommends, divestiture of General Motors' locomotive and bus subsidiaries. If GM is required to divest itself of its bus and locomotive businesses, the price of locomotives and buses would presumably be somewhat higher or lower than at present, and those industries would utilize slightly more or less resources than at present. Society would achieve some small, probably imperceptible, benefit or cost from the change. But the change would not affect the relative scarcity of oil compared with other fuels, the pricing of the air and

roads, the industrial organization of transit systems and railroads, the evaluation of people's time in travel, or any of the other variables which really produce the present characteristics of our transportation system. The Report encourages the public to believe that the proposed divestiture would restore passengers to rails, reduce pollution, and otherwise bring about a large number of changes, not all of which are desirable, but all of which could only be achieved through a variety of direct public policies in the area.

Exhibit 2—Form 10K, Filed With Securities and Exchange Commission, Re National City Lines, 1946

NATIONAL CITY LINES, INC.,
Chicago, Ill., March 26, 1946.

FORM 10K, FILED WITH THE SECURITIES AND EXCHANGE COMMISSION BY NATIONAL CITY LINES FOR YEAR 1946

TO THE STOCKHOLDERS OF PACIFIC CITY LINES, INC.: We hereby offer to issue to you a total of 80,000 shares of the Common Stock of National City Lines, Inc. of the par value of 50¢ per share in exchange for all of the outstanding stock of Pacific City Lines, Inc., which we are advised is a total of 127,956 shares.

The stock of National City Lines, Inc. above referred to will be issued to the present stockholders of Pacific City Lines, Inc. in proportion to their stock holdings in said Pacific City Lines, Inc. If such proration calls for the issuance of fractional share of the stock of National City Lines, Inc. no certificate shall be issued for such fractional share but the stockholder entitled thereto will be paid for and accept in lieu thereof a payment in cash based upon the closing market price of the common stock of National City Lines, Inc. on the New York Curb Exchange on the date of the exchange of said securities.

This letter memorandum shall constitute a binding contract upon its acceptance by the stockholders of 80% or more of the outstanding shares of Pacific City Lines, Inc.

Please indicate your acceptance of this offer by signing at the place indicated at the bottom of this letter.

Very truly yours,

E. ROY FITZGERALD,
President.

We, the undersigned stockholders of Pacific City Lines, Inc., hereby accept the above and foregoing offer of National City Lines, Inc. and agree to deliver our stock in Pacific City Lines, Inc., properly endorsed, in exchange for our several proportionate shares of the stock of National City Lines, Inc. above referred to.

FEDERAL ENGINEERING CORPORATION—37,816 shares.
By FEDERAL ENGINEERING CORPORATION

GENERAL MOTORS CORP.—38,819 shares.
By GENERAL MOTORS CORP.

JESSE L. HAUGH—13,607 shares.
Jesse L. Haugh

TIMOTHY J. MANNING—13,607 shares.
Timothy J. Manning

R. STUART MOORE—5,000 shares.
R. Stuart Moore

D. M. PRATT—1,000 shares.
D. M. Pratt

W. E. ANDERSON—7,000 shares.
W. E. Anderson

THE FIRESTONE TIRE & RUBBER CO.—5, 107 shares.
By THE FIRESTONE TIRE & RUBBER CO.

JESSE L. HAUGH
Jesse L. Haugh, Attorney in Fact for Edith M. Haugh (3,000 shares), Dorothy Lee Haugh (1,000 shares), James C. Haugh (1,000 shares), and Richard L. Haugh (1,000 shares).

Exhibit 3.—Excerpt From Poor's Directory of Executives and Directors, 1946 Re Positions Held By Jesse Lee Haugh

HAUGH, JESSE LEE (Born 1887 Sodus Mich.—F&AM)—Chrm. of Board & Pres., Pacific City Lines Inc., 337 17th St., Oakland 12, Cal.
(Res) : 212 19th St., Oakland 12.
1943—Bellingham (Wash.), Transit Co., Pres.
1943—Butte (Mont.) City Lines Inc., Pres.
1943—Eureka (Cal.) City Lines Inc.. Pres.
1943—Everett (Wash.) City Lines Inc., Pres.
1943—Fresno (Cal.) City Lines Inc., Pres.
1943—Glendale (Cal.), City Lines, Inc., Pres.
1943—Great Falls (Mont.), City Lines, Pres.
1943—Pasadena (Cal.) City Lines, Inc., Pres.
1943—San Jose (Cal.) City Lines Inc., Pres.
1943—Stockton (Cal.) City Lines Inc., Pres.
1944—Inglewood (Cal.) City Lines, Pres.
1944—Sacramento (Cal.) City Lines, Pres.
1945—Burbank (Cal.) City Lines, Pres.
1945—Salt Lake City (Utah) Lines, Pres.
1946—Spokane City Lines, Inc., (Wash.), Pres.

Exhibit 4.—ICC Notice and Report, Docket No. 33332

INTERSTATE COMMERCE COMMISSION NOTICE TO THE PARTIES, SERVED NOVEMBER 21, 1960

Exceptions, if any, must be filed with the Secretary, Interstate Commerce Commission, Washington, D. C., and served on all other parties in interest, within 30 days from the date of service shown above, or within such further period as may be authorized for the filing of exceptions. At the expiration of the period for for the filing of exceptions, the attached order will become the order of the Commission and will become effective unless exceptions are filed seasonably or the order is stayed or postponed by the Commission. To be seasonably filed, exceptions must reach the Commission on or before the late they are due. If exceptions are filed, replies thereto may be filed within 10 days after the final date for filing exceptions. The stated specific time periods apply to all parties and give full effect to Rule 1.21(c) of the General Rules of Practice to the extent, if any, the provisions of such rule otherwise would be applicable to this proceeding. It should not be assumed that the recommended order has become effective as the order of the Commission, until a notice to that effect, signed by the Secretary, has been served.

No. 33332[1] as supplemented

PASSENGER FARES—THE NEW YORK, NEW HAVEN AND HARTFORD RAILROAD

Increased interstate one-way and commutation passenger fares on The New York, New Haven and Hartford Railroad, found to be just and reasonable and otherwise lawful.

Recommendations made to the Commission, after investigation, with respect to the manner by which the New Haven Railroad may improve its financial conditions and its service to the public, and continue to furnish transportation service at the lowest possible cost. Title proceedings discontinued.

Authority granted to establish and maintain increased passenger fares between stations Route 128, Readville, Hyde Park, and Mount Hope, Mass., and stations on the New Haven Railroad, East Greenwich, R.I., to New York, N.Y., inclusive and between those four stations in Mass., and points on connecting lines west and south of New York, N.Y., without observing the aggregate-of-intermediate rates provision of section 4 of the Interstate Commerce Act.

III. THE NEW HAVEN'S LOCOMOTIVE POLICY

Without an intelligent locomotive policy, no efficient railroad operation can possible be conducted. Locomotive investment, operation, and maintenance are

[1] This report embraces also F.S.A. No. 35929 and F.S.A. No. 36266 entitled "Passenger Fares—The New York, New Haven and Hartford Railroad Co."

substantial budget items. Acquisitions, retirements, and maintenance practices vitally affect service to passengers and shippers. Decisions regarding motive power often involve a crucial prediction as to the carrier's future. There is no indication on this record that the New Haven has given these complex problems the mature deliberation they deserve.

The New Haven was aptly described by its President as a "hybrid system." Not only is its line partially electrified, but within its electrified zone two kinds of energy are used. Contributing to the complexity of this hybrid system is the fact that the New Haven produces a part of its electric power needs and purchases the remainder from various sources. Accordingly, the New Haven has a special need for a carefully considered locomotive plan. Unlike most other railroads, it is obliged to weigh the relative economic advantages of electric versus diesel-electric locomotives and of self-generated versus purchased power.

Over a period of years, going back before 1955, the New Haven hired expert engineering firms to advise on what should be done about the matter of motive power.

Essentially the advice rendered was this: The New Haven has an electrical system extending from New York to New Haven, Danbury and New Canaan. This system represents a large investment. The railroad is confronted with an increasingly serious locomotive maintenance problem. The solution is to bend every effort toward rehabilitating the railroad's electric locomotives and its electrical system generally, while laying out a long-rang plan for the future. In 1956 and 1957, the New Haven was in a position to finance the program advised.

In the face of this counsel, however, the New Haven embarked upon a costly program of acquiring diesel-electrics to take the place of electric locomotives. Apparently the management was led to believe that, by giving up electric locomotive operation, they could also stop generating power at the Cos Cob plant and purchase, as needed, the additional power required to operate its multiple unit cars used in the commuter service.

The management seems to have clung to this belief, notwithstanding the fact that a number of studies, prepared by the engineering firms, showed that any program calling for 1. abandonment of the Cos Cob power station; 2. purchase of additional power from outside sources; and 3. the purchase of diesel-electrics to replace electric locomotives. Was far more costly than 1. continuance of Cos Cob, with modest improvements; 2. adequate maintenance of electric and diesel-electric locomotives; and 3. replacement, as necessary, of locomotives in kind—electric for electric and diesel for diesel.

In disregarding the advice of independent engineering consultants, the New Haven appears to have relied almost exclusively on the advice of General Motors, the diesel-electric locomotive manufacturer. The savings anticipated from a progressive elimination of electric locomotive operations proved to be a mirage.

Electric Power Policy Prior to 1956

For several years prior to 1903, steam locomotive operations through the Harlem tunnel in New York City were viewed as a safety hazard and, in addition, the increase in traffic resulted in growing discomfort to passengers from smoke, cinders, and gases. In response to public pressure, the Legislature of the State of New York on May 7, 1903, enacted a law [2] prohibiting the operation, within five years, of steam locomotives on Park Avenue, south of the Harlem River. The act authorized the operation of trains "by electricity or by compressed air or by any motive power other than steam and which does not involve combustion in the motors themselves through the tunnel."

Electricity was decided upon. The substitution of electricity for steam within the city limits obviously required the extension of electrification to the outer limits of the suburban area because of the density of suburban traffic and the difficulties which would have been encountered in changing power at any point within the suburban zone, especially at peak hours when trains are operated under exceedingly close headway. Moreover, electrification of only a short segment of line within the New York metropolitan area would have required expensiv urban yard facilities and the necessary engine changes would have prevented efficient utilization of engine crews. Accordingly, it was decided to electrify the line all the way to Stamford.

[2] Chapter 425, Laws of 1903.

On the following page is a diagram of the electrified portion of the New Haven system. The New Haven made its installation for electric operation from Woodlawn, where its trains leave the tracks of the New York Central, to Stamford, Conn., and the first revenue service began in June, 1907. Electrified operations proved to be so successful that the overhead catenary system was extended in 1913 to New Haven and included the New Canaan, Danbury and Harlem River branches. The last named branch extends from New Rochelle Junction and the Hell Gate Bridge, to the Pennsylvania Terminal.

Before considering the New Haven's operational problems within the electrified zone and its power supply and distribution problems, it is necessary to explain how the FL–9 type diesel-electric locomotives made possible a radical change in the New Haven's locomotive policy. These locomotives were designed, at an extra cost of almost $50,000,[3] to operate either as straight diesel-electrics or, as required by law, as full electrics when entering or leaving Grand Central Terminal or Pennsylvania Station.

The FL–9 locomotives were purchased on January 24, 1956. The sales price, as finally adjusted, was $16,766,190. The purchase contemplated a drastic alteration of the New Haven's method of operation. Electric locomotive operations, which had been conducted for more than 50 years, would be discontinued and the electric power distribution system between Stamford and New Haven would be scrapped.

Before acquiring FL–9 locomotive from General Motors, the New Haven conducted three main types of operations within its electrified zone. Through passenger service was performed with electric locomotives between New York and New Haven with most trains originating or terminating at Grand Central Terminal. Then, as now, most commuter service was performed with electrically operated commuter cars operating primarily in the area between New York and Stamford. And finally, some freight operations were conducted with electric locomotives between New Haven and terminals in the Bronx and Brooklyn.

The economies inherent in this mode of operation were chiefly three in number. First, the electrical system was completed more than 45 years ago at the low construction prices and wages then prevailing. The reproduction cost new of the New Haven power distribution system at 1958 prices is $44,245,803 and, less depreciation, is $22,567,962. In other words, the chief economic disadvantage of electric operations—the high initial investment in a power distribution system—is of no concern to the New Haven. It has a system in being, bought at bargain prices, and practically paid for.

The second economy inherent in the New Haven's former method of operation is that it must use electric power in any event in its commuter operations. It would not be economically feasible to use locomotives, electric or diesel-electric, rather than multiple-unit cars, to handle any substantial part of the commuter traffic. To achieve the utmost economy from the system, it was essential to exploit the load factor to the maximum extent possible. Commuter traffic necessarily creates high peak demands for power in the morning and late afternoon rush hours. To the extent that the spread between peak demands and off-peak demands can be narrowed, average energy costs can be very materially reduced. By using electric locomotives to fill in the mid-day and night valleys of electrical energy consumption, the New Haven was able to acquire such energy at little more than the cost of coal. The wholesale abandonment of electric locomotive operations will saddle the commuter service with much higher energy costs than have been allocated to it heretofore.

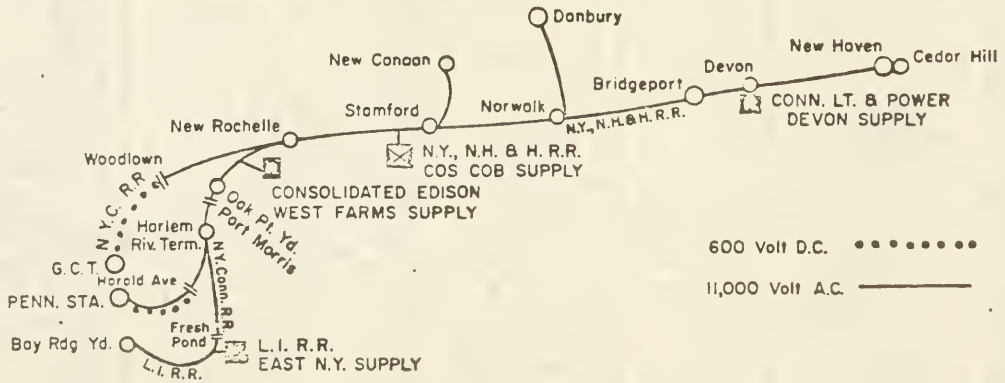
The third economic advantage derived by the New Haven from electric locomotives resulted from their durability and the extraordinary power which they could deliver. The life of an electric locomotive is about twice that of a diesel-electric and, being a less complicated and less delicate piece of machinery, *is cheaper to maintain.* The New Haven's Vice President, Operations, conceded that, considering service life, the per unit horsepower cost of new electric locomotives is only about one-third that of the FL–9 locomotives sold to the New

[3] In its guaranteed loan application filed with the Commission to finance the purchase of these locomotives, the New Haven indicated that the cost of the special equipment necessary to permit full electric operation was approximately $30,000 per unit. This figure is incorrect. The manufacturer's (General Motors) figures show that the cost of such special equipment is $51,950. Some of the cost assigned to full electric operations might have been incurred even if the locomotives were not specially equipped, but it seems clear that the cost of the special equipment was at least $45,000.

THE NEW YORK, NEW HAVEN & HARTFORD RAILROAD

ELECTRIFIED ZONE

SOURCES OF POWER SUPPLY



Haven by General Motors. A diesel-electric locomotive is essentially a locomotive with a portable generator. Common sense would require some special justification for the use of two portable power plants when a single electric locomotive, not so equipped, can do the same work by utilizing available power overhead, but no persuasivejustification can be found in the record of this proceeding.

In the New Haven's former method of operation, there were probably certain disadvantages.[4] Freight and passenger trains operating between New York and Boston, for example had to change engines at New Haven. With two kinds of motive power, flexibility in the use of power was somewhat curtailed. Also, the necessity of running electric freight trains during off-peak commuter hours might have created scheduling problems. However, the chief disadvantage of electric locomotive operations, in the mind of New Haven officials, was concern over the reliability of the New Haven's power supply, or, as President Alpert expressed it, the fear that "Cos Cob might pop."

Initially all the power was supplied by the generating station at Cos Cob, Conn. As the electrified system was extended, the Cos Cob plant was enlarged. Since 1915, an additional power has been purchased from the New York (now Consolidated) Edison Company and the Connecticut Light & Power Company.

As indicated by the map on page 28, 11,000 volt, 25-cycle power is utilized throughout the New Haven's AC distribution system. This frequency has fallen into commercial disuse. As a practical matter, the carrier's older electric locomotives and its 121 old multiple-unit cars are restricted to this frequency of power in operations on the New Haven's line. Only the 10 EP–5 electric locomotives built in 1955 and the 100 multiple-unit cars bought in 1954 can be inexpensively converted to use 60-cycle power.

Sixty-cycle power, being in universal use, costs considerably less than the 25-cycle power (converted from 60-cycle) purchased by the New Haven. Accordingly, in its more recent purchases of multiple-unit cars and electric locomotives, the carrier acted wisely in having them designed to operate on both 25-cycle and 60-cycle power, with only minor adjustments required at the time of conversion.

Between Grand Central Terminal and Woodlawn, N.Y., a distance of 11.9 miles, operations are conducted over the tracks of the New York Central utilizing 600-volt DC energy purchased from that carrier. That power is drawn from the third rail. In order to use DC power, all of the New Haven's electrical rolling stock must be equipped with a special shoe attachment.[5]

From 1951 through 1956, the total amount of power used in the New Haven's electrical system was approximately 200,000,000 kilowatt-hours per year.[6] In the same period electric traction power was divided approximately as follows: passenger train use (67%), freight train use (30%), and switch engine use (3%). The Cos Cob plant generated about 130,000,000 kilowatt-hours per year, or almost two-thirds of the total. The balance was supplied by Consolidated Edison at its West Farms, N.Y., station and by the Connecticut Light & Power Co. at Devon. The amount of power purchased has not been greatly in excess of the minimum amounts guaranteed in contracts with the utilities. Consolidated Edison has supplied approximately 55,000,000 kilowatt-hours annually and Connecticut Light & Power approximately 16,000,000.

Overhead electric power transmission facilities are in good condition and relatively inexpensive to maintain. The system has many years of serviceable life remaining before any major expenditures become necessary.

Late in 1954, the consulting firm of Gibbs & Hill was requested to study the problems involved in purchasing additional power with particular reference to a proposal by Connecticut Light & Power to furnish additional power from Devon. The Gibbs & Hill report, submitted to the New Haven on June 15, 1955, referred to the following factors which ought to be considered by the New Haven before reaching any conclusion on its power supply problem: (1) the effect of the New England Thruway, when completed, on railroad traffic; (2) the effect

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[4] Only one alleged disadvantage—concern over the reliability of the Cos Cob power plant—was discussed in detail by New Haven officials. Certain other disadvantages are alleged in an unsigned memorandum dated August, 1958, and attached to the General Motors report of October, 1957 (ICC Exhibit No. 28) urging total abandonment of electric locomotive operations.

[5] To operate as full electric locomotives between Grand Central and 125th Street, the New Haven's FL–9 diesel-electric locomotives must also be specially equipped.

[6] Power consumption generally increased throughout the period, rising to 208,000,000 kilowatt-hours in 195 5and to 209,000,000 kilowatt-hours in 1956.

that new lightweight trains might have in reducing electric power requirements,[7] and (3) the possibility of eventually applying 60-cycle power directly to railway electrification contact systems with a potential saving of 30 percent in the cost of electric locomotive power. In view of all the complexities involved and the uncertainty as to the volume of future traffic and technological developments, Gibbs & Hill concluded with the admonition "that the railroad review its electric power requirements frequently."

1956—Year of Decision

On January 10, 1956, negotiations were still underway for the purchase of 60 diesel-electric locomotives designed and equipped for third rail operation into Grand Central Terminal. On this date a representative of Gibbs & Hill met in New Haven with Mr. R. P. Goulett, Vice President (Operating-Maintenance-Engineering). At that meeting, Gibbs & Hill were asked to advise what effect the use of three lightweight trains and 60 FL–9 locomotives would have on the New Haven's electric power system.

On the following day—January 11, 1956—the Board of Directors authorized the purchase of 60 FL–9 and 30 diesel road switcher locomotives, as recommended by the Equipment Recommendation Committee.[8] All of the members of this committee were top level New Haven officials.[9] The long range motive power program recommended by the committee called for was purchase by 1960 of 405 diesel-electric locomotives at a cost, according to our estimate, of approximately $92,000,000.

This program, if carried out as planned, would have resulted in a 10 percent increase in the New Haven's aggregate horsepower over a five-year period. A corresponding increase in passenger and freight traffic was not even remotely suggested by traffic trends or by reasoned optimism. Of course, locomotives need not be purchased to handle traffic which fails to materialize. Nevertheless, the fact that top-level New Haven officials, immediately following a disastrous flood and with the Connecticut nearing completion formally endorsed a fantastically expensive locomotive program indicates wishful thinking on a subject which, above all else, requires realistic examination.

The signing of the contract for the purchase of the 60 FL–9 locomotives was on January 24, 1956, but the Gibbs & Hill study, which was authorized just two weeks before for the purpose of obtaining expert advice on the effect additional locomotives would have on the power system, was not submitted until June 26, 1956. It is clear, therefore, that the effect of these locomotives on the New Haven power system had not been thoroughly explored before the actual purchase.

Although no member of the Board of Directors expressed any opposition to the long-range equipment program of the Equipment Recommendation Committee or to the purchase of the 60 FL–9's,[10] apparently there were some qualms about the general program and the particular purchase. In March 1956, Coverdale & Colpitts, a firm of consulting engineers, were asked to study the equipment problems of the New Haven, including its program for the acquisition of new motive power. This report, for which the New Haven paid a fee of $22,500, was submitted on July 26, 1956.

In its report of June 26, 1956, Gibbs & Hill advised that the use of 60 FL–9 locomotives would not reduce the electric load sufficiently to permit discontinuance of operations at the Cos Cob power plant. Gibbs & Hill concluded that the use of 60 FL–9 locomotives to handle a part of the passenger traffic, or more than 60 to handle all passenger service to Grand Central and Pennsylvania Stations, "will result in a much higher investment and also higher operation, maintenance and depreciation expense." The advice given the New Haven was

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[7] The use of FL–9 locomotives, which General Motors was then attempting to sell, would also have the effect of reducing electric power requirements.

[8] The recommendations of the committee were set forth in a memorandum to P. B. McGinnis, dated December 27, 1955. ICC Exhibit No. 55.

this committee were top level New Haven officials.[9] The long range motive power

[9] Members of the New Haven Equipment Recommendation Committee in 1955 were: C. H. McGill, Manager of Purchases and Stores; J. J. O'Neill, Comptroller; P. R. Goulett, Vice President (Operating-Maintenance-Engineering); W. T. Griffin, Vice President (Law); H. E. Hales, Chief Mechanical Officer; R. P. Noyes, General Superintendent of Transportation; W. K. Tate, Vice President; and C. E. Williams, General Passenger Traffic Manager.

[10] Minutes of the Board for January 11, 1956, indicate discussion of the general program recommended by the Equipment Recommendation Committee and authorization to purchase 60 FL 9 locomotives and 30 diesel-electric road switchers, subject to the approval of the Finance Committee. ICC Exhibit No. 59. The approval of that committee is recorded in its minutes dated January 24, 1956. ICC Exhibit No. 60.

that "very careful and detailed studies should be made before making any extensive commitment to the combination [FL–9] diesel-electric locomotives" or any commitment looking toward "the ultimate abandonment of the existing investment in electrification facilities."

In its report of July 26, 1956, Coverdale & Colpitts observed: It appears to us that the Management of the New Haven Railroad would be exceedingly ill-advised to proceed on an elaborate program for purchase of diesel locomotives, coupled with retirement of much of the existing electric system, without fully exploring exhaustively all other alternatives. We find little evidence that such exploration has been made.

Coverdale & Colpitts made four specific recommendations: 1. The expenditure of approximately $1,000,000 to insure the reliability of Cos Cob for at least ten years; 2. The establishment of a sound maintenance program for locomotives, particularly electric locomotives; 3. Cancellation of the contract with General Motors; and 4. Reappraisal of motive power requirements, with the probability that the purchase of ten new electric locomotives and "a few standard diesels" would be required.

Notwithstanding the advice of Gibbs & Hill and Coverdale & Colpitts, no careful and detailed studies of motive power requirements were ever made. Cos Cob was not improved. Sound maintenance procedures were not followed. The contract with General Motors was not cancelled. The New Haven management plunged ahead, apparently convinced that with hybrid locomotives many of the complexities of its hybrid system would be solved.

The Decision to Disregard the Advice of Experts

Why, in mid-1956, did the New Haven reject the advice of two competent, independent engineering firms that the General Motors deal be cancelled? Mr. Alpert gave the following explanation in his testimony:

The WITNESS. All right, let me tell you what I did, because I had to make a decision at that time.

We discussed on these FL–9's what the Cos Cob situation was. I had been told that Cos Cob was 35 to 40 years old, they had a couple of generators there that might pop at any minute, and I said, "If the generators at Cos Cob should go, where do we get the power to run into New York on electric equipment?"

You can't get it. A lot of it is peak hour power, you can't get it from Consolidated Edison, they are on the other side of the New York line; the Connecticut companies can't give it to you, they don't have enough power.

What do we do? Well, if Cos Cob pops, and you haven't anything to get into Grand Central, and you can't get in there on a diesel locomotive, then you are out of the passenger business.

Oh, that is lovely. What do I say to the public if Cos Cob pops and the people can't get into Grand Central from Boston, and they will say, "Where were you, why didn't you get this equipment?"

If you think what I am going up against now with the Commission and the newspapers is bad, you have no idea what it would be if we couldn't run anything into Grand Central Terminal. At least I wasn't so stupid I couldn't see that.

I turned to Coverdale & Colpitts, their two partners were there, and I said, "Can you assure me that we are safe in relying on Cos Cob?"

Well, they said, "Mr. Alpert, we are engineers, we are not guarantors; we can't assure you of anything."

So I said, "I am the fellow that takes the responsibility, is that it?"

Well, they said, "We think it is a pretty good calculated risk."

I said, "Well, I don't think so, I am not taking any calculated risk where the welfare of the public is involved. Here is a machine that will get us into Grand Central station whatever happens. It can be used in freight transportation. All right, it costs a few dollars extra for the third rail, but at least you have the insurance"—and that is the word I used—"it is worth paying for the insurance, and I will tell you now, Mr. Coverdale and Colpitts, if you can't guarantee me that Cos Cob is going to hold up, these machines are going to come, and I am at least going to be able to sleep nights."

That was the conversation, and that is the way I settled it at that time.

The above explanation is unsatisfactory for several reasons. In the first place, neither Gibbs & Hill nor Coverdale & Colpitts advocated a do-nothing policy. They mentioned, as a possible alternative, the taking of a calculated risk, but they recommended modest expenditures at Cos Cob to assure its complete reliability for ten years or so. The New Haven management cannot fairly be criticized for its fear that "Cos Cob might pop" and for insuring against that disaster. However, the cost of the FL–9 insurance policy, so far as this record reveals, was never thoroughly considered.

Apparently, Mr. Alpert was misled by the memorandum of the New Haven's Equipment Recommendation Committee that "if Cos Cob is perpetuated it will require an expenditure of over $20,000,000 to modernize it and then will produce only 30 percent of our power requirements."[11] Representations of General Motors were based on the same erroneous belief.[12]

The cost of insuring the reliability of Cos Cob was actually less than the cost of special equipment on the 60 FL–9 locomotives pertaining to third-rail operation into Grand Central. In addition, since two FL–9 units are required to do the work of a single electric locomotive, entrance fees into Grand Central would be increased by approximately $60,000 a year.

The chief motivation for the FL–9 purchase appears to have been a belief on the part of the operating officials no longer employed by the New Haven that diesel-electric operations are more economical than electric operations and that a substantial cut-back in electric locomotive operations would make feasible the prompt abandonment of the Cos Cob power station. Not until this year was the management's confidence in these assumptions shaken.

In 1954 partial use of 30 FL–9 locomotives reduced the load on Cos Cob from 13,,364,000 kilowatt-hours to 112,176,000. In October of that year General Motors submitted a plan purporting to show how the use of 88 FL–9 locomotives would permit the New Haven to: (1) Junk all of its electric locomotives, including the ten purchased in 1955 at a total cost of $4,416,000; (2) Abandon Cos Cob; (3) Dismantle the power distribution system between Stamford and New Haven; and (4) Save $44,933,452, equivalent to a 16% return on net cash investment and an annual average saving over a 12-year period of $3,744,454.

The principal items of alleged savings were locomotive repair costs ($28,743,6.0), and the cost of energy ($13,813,671). These and other claimed savings over a twelve-year period would be partially offset by increased entrance fees ($672,069), due to the necessity of using two FL–9 locomotives in place of one electric locomotive.

In estimating savings in repair costs of FL–9 locomotives as compared with electric locomotives, the General Motors report took the actual repair costs in 1956 of the electric and other locomotives to be replaced. The actual repair cost per unit was increased by 20 percent "to reflect proper maintenance standards." This cost comparison was unsound for two reasons. First, in 1956 the New Haven made a determined effort to overcome deferred locomotive maintenance, and, in fact, spent more money in 1956 to maintain its locomotives than in any year since 1950. And secondly, the comparative costs of maintaining new electric and the new diesel-electric locomotives would have been far more revealing.

The estimated savings in repair costs were further inflated by the assumption that 88 FL–9 units would replace 138 old locomotives—67 electric road locomotives, 6 electric switching engines, 55 diesel road locomotives, and 10 diesel switching engines. Approximately 50 FL–9's would be required to replace 25 electric locomotives having more than twice the effective horsepower. In some miraculous way, therefore, 38 FL–9's would do the work of 48 other electric locomotives and, in addition, the work of 65 diesel-electric locomotives.

Actually, of course, some of the old locomotives used by General Motors in its cost estimates were ready for retirement and would have been retired irre-

[11] ICC Exhibit No. 55.
[12] ICC Exhibit No. 28, page 4.

spective of the purchase of any FL–9 units. The following table shows how "ridiculous" the General Motors cost estimate really was:

Class	Service	Unit	Unit horsepower	Total horsepower
Electric road locomotives to be replaced:				
EF–1	Freight	10	1,336	13,360
EF–3	do	10	4,860	48,600
EP–2	Passenger	22	2,050	45,100
EP–3	do	10	3,300	33,000
EP–4	do	5	3,600	18,000
EP–5	do	10	4,000	40,000
Diesel-electric road locomotives to be replaced:				
DER–1	Freight	37	[1] 1,640	60,680
DER–3	do	18	[1] 1,640	29,520
Total		122		288,260

[1] Horsepower delivered to the rail considered to be 82 percent of the rated horsepower of diesel-electric locomotives.

To say that 88 FL–9 units, with an aggregate rail horsepower of 126,000[13] will supplant locomotives in active service with a total rail horsepower of 288,260 (plus 16 switching engines) is "manifestly absurd."

In estimating savings in the cost of energy, the General Motors report contains numerous statistical infirmities which need not be elaborated. All of the estimated savings were based on the erroneous assumption that with the acquisition of 88 FL–9 units it would be feasible to abandon Cos Cob without making any major capital expenditure.

The Locomotive Loan Application

Throughout 1958 and 1959 the New Haven management evidently believed that the huge savings predicted by General Motors could be realized. Shortly after passage of the Transportation Act of 1958, the New Haven applied for Commission approval of a loan guaranty to finance the purchase of 60 FL–9 locomotives.[14]

Approval of the original and amended applications was urged by the New Haven on the basis of its estimate that the following savings would be achieved:[15]

Locomotive repair costs	$1,731,710
Energy (retire Cos Cob)	1,300,000
New York City taxes (Van Nest Shop)	70,190
Grand Central Terminal entrance fees (increase)	(60,000)
Enginehouse expense	75,000
Summary—average annual savings for 15-year period utilizing 60 FL–9 units	[1] 3,116,900

[1] This figure will be reduced by the average annual cost of financing, as yet undetermined.

At the hearings in this proceeding, no top-level official of the New Haven had any knowledge of, or was willing to assume responsibility for, cost data submitted less than two years before in justification of a Federal loan guaranty of $17,000,000. When pressed for an explanation of its estimate of savings, the New Haven produced as a witness Mr. J. M. Finch, the Director of its Office of Research.

[13] Horsepower delivered to the rail considered to be 82 percent of the rated horsepower of diesel-electric locomotives.

[14] By letter dated November 12, 1958, the New Haven was requested by Director V. V. Baker of the Bureau of Finance to furnish the following information: (1) Statement as to the reason the total number of locomotives to be purchased at this time was set at sixty; (2) Number of locomotives expected to be retired when the new locomotives are delivered; and (3) Summary of the annual savings expected to be realized by the operation of the new locomotives.

[15] By application filed October 10, 1958, in Finance Docket No. 20372, the New Haven sought a Commission guaranty of the financing of 60 FL–9 locomotives in total principal amount not to exceed $17,000,000. The application was amended on December 15, 1958, to include only the 30 locomotives leased from General Motors and requesting that action be deferred on the 30 to be built. On March 25, 1959, the Commission approved the amended application calling for a guaranty of $8,389,530, subject to the New Haven's compliance with certain conditions.

By further amendment of the application filed on July 14, 1959, the New Haven sought a guaranty for the financing of the 30 FL-9's to be constructed, General Motors having agreed to finance the first group of 30. The Commission, in its report, dated September 14, 1959, modified its previous findings to include the second group of FL-9's, the purchase price for this group being $8,159,400. On June 9, 1960, the Commission authorized a guaranty under Part V of the Act of $8,159,400 principal amount of equipment trust certificates bearing dividends at a rate not to exceed 5 percent per annum. Thereafter, Commission, by its Tenth Supplemental Order of August 5, 1960, modified its when it became clear that financing at 5 percent could not be obtained, the prior finding and found that under the circumstances a dividend rate of 5½ percent per annum was not unreasonably high. Following this action, the loan was closed and delivery of the locomotives was begun in August, 1960.

Mr. Finch testified that the estimate of cost savings submitted to the Commission was derived from an unsigned internal memorandum dated April 16, 1968,[16] and that the estimates made therein were derived, in turn, from the figures used in the General Motors' report of October, 1957. Mr. Finch did not remember by whom the memorandum was prepared. His only recollection was that the figures were compiled by various individuals in the Office of Research and drawn primarily from the General Motors' report.

Mr. Finch did not recall for what purpose the figures were compiled. His first impression was that the memorandum of April 16, 1958, was prepared in connection with the New Haven's pending loan application, but Part V of the Act was not enacted into law until August 12, 1958.

Mr. Finch is not an engineer and was unable to state that he was satisfied that the figures furnished the Commission were substantially correct. All he could say was that he was satisfied that the figures contained in the General Motors' report were accurately adjusted and compiled.

Mr. Finch was also unable to explain the cause and effect relationship asserted to exist between the acquisition of the FL-9 locomotives used almost exclusively in mainline passenger service and the retirement of electric freight and diesel yard locomotives. When Mr. Finch was asked what part of the General Motors' report he personally analyzed and verified, he replied, "I don't know that I verified any of it to go back to the basic data."

Mr. Finch's attention was directed to the statement in the General Motors' report that the Cos Cob power plant could not be feasibly retired *as long as the New Haven had any electric locomotives still in operation.* Mr. Finch said that he did not recall that statement in the report. He was then asked if he would describe as speculative the estimated savings in the amount of $1,300,000 to be realized from the abandonment of Cos Cob and he replied as follows: "I don't know how to describe them. The figure is a figure that was used in the computation, and I did not participate in the decisions that may have been involved, or the future planning in detail. To my knowledge, the planning is not crystalized."

1958-59—The Effect of Intensive Utilization of FL-9 Power in the Electrified Zone

On March 10, 1958, Gibbs & Hill submitted a further report explaining that the use of 30 FL-9 diesel-units had resulted in the operation of Cos Cob at uneconomical base loads and explaining why, even with the acquisition of 30 additional FL-9's, Cos Cob could not be retired. Whereas in 1955 and 1956 the problem was lack of reserve capacity at Cos Cob, the problem in 1958 and 1959 was how to provide Cos Cob with an economical base load. This problem, of course, would become more difficult with the acquisition and use of 30 additional FL-9 locomotives, and the retirement of additional electric locomotives.

Accordingly, Gibbs & Hill recommended that any further reduction in the load on Cos Cob should be offset by electric freight operations between New Haven and the terminals at Bay Ridge and Oak Point. The New Haven did not follow this advice. Instead, the electric locomotive repair shop at Van Nest, N.Y., was sold. From the time of the sale until the recent expansion of the centralized locomotive shop in New Haven, there was no adequate facility for the repair of electric locomotives.

[16] ICC Exhibit No. 54.

On January 1, 1958, the New Haven had 51 electric road locomotives, 10 freight and 41 passenger. By January 1, 1960, the New Haven had retired all its electric freight locomotives and owned only 24 passenger locomotives.[17]

The consequences of disregarding the advice of Gibbs & Hill are reflected in the following table showing the cost of Cos Cob power:[18]

Year	KWH Generated at Cos Cob	Operating expense	Cost per kilowatthour (cents)
1956	137,364,295	$1,442,854	1.05
1957	112,176,072	1,387,743	1.237
1958	59,014,471	1,209,630	2.050
1959	48,192,491	907,248	1.883

These figures show the folly of the locomotive policy pursued by the New Haven. The average cost of AC energy generated at Cos Cob rose from 1.05 cents per kilowatt-hour in 1956 to 1.883 cents in 1959. The amount of the cost of producing such power was only 37 percent less in 1959 than in 1956. Including the cost of power purchased from the two major sources of supply and making allowance for the reduced consumption in 1959 as compared with 1956, annual AC energy costs have increased by approximately $569,000. In fact, the New Haven was unable to meet its purchased power commitments in 1959. Consolidated Edison was paid for 1,306,860 kilowatt-hours which the New Haven was unable to use.

1960—The Vindication of Expert Opinion

Cos Cob is the pivot on which any sound locomotive policy for the New Haven must necessarily turn. Such was the gist of expert opinion furnished the New Haven in 1955, 1956, and again in 1958. In 1960 the New Haven management was forced to concede that the cornerstone of its locomotive power policy—the early retirement of Cos Cob—had crumbled.

In early 1960, the New Haven management finally saw that Cos Cob could not be retired when the second group of 30 FL-9's were delivered. Several New Haven officials, contrary to recent representations to the Commission in connection with the locomotive loan application, testified early in this proceeding that no plans for the retirement of Cos Cob had been made and that its future was in doubt. However, George S. Clark, Assistant Mechanical Superintendent of Engineering, reaffirmed his testimony before the Connecticut Public Utilities Commission that abandonment of Cos Cob was not economically feasible. Mr. Clark indicated, in line with the advice of experts, that it would be very expensive for the New Haven to purchase all the 25-cycle power required to operate the commuter car fleet. Mr. Clark, although identified at the Connecticut hearings as the official most familiar with the New Haven's electric power problems, does not hold a top policy-making position and, apparently, was not consulted with regard to motive power policy in years prior to 1960.

By 1960, if not several years before, most New Haven officials seem to have recognized that there is no danger of a serious breakdown at Cos Cob. Mr. Clark, for example, testified that there is not any danger of Cos Cob blowing up "because the load conditions on the plant have materially changed." Only Mr. Alpert still seems to fear that "Cos Cob may pop."

Early in 1960 the New Haven realized that a searching reappraisal of its electric operations was imperative. Accordingly, President Alpert arranged for Phillip H. Hatch, Chief Mechanical Officer of the Long Island Railroad, to work for the New Haven as a part-time consultant. This action, although belated, was a commendable first step in the formulation of a locomotive power policy based on fact rather than fancy.

Incidentally, the retention of Hatch as a consultant is an ironic example of the havoc previously wrought by the New Haven's game of managerial musical chairs. Hatch, a graduate of M. I. T. in electrical engineering, was first

[17] Of the 10 EP–5 locomotives, two were out of service. This class, used primarily in passenger service, can also be used in freight operations. By the time these hearings opened, two additional electric passenger locomotives had been retired.

[18] Conn. PUC Exhibit No. 6.

employed by the New Haven in 1923. In 1944 he was appointed General Mechanical Superintendent. In 1951, Hatch was capriciously fired by the elder Dumaine. When Hatch's immediate superior protested this arbitrary action, he, too, was summarily discharged. Of all the misfortunes suffered by the New Haven in the past decade, none has been more crippling than the loss of competent personnel.

Mr. Hatch is primarily, if not exclusively, responsible for that section of the New Haven's "Plan Regarding Future Operation" dealing with the future of the electric power distribution system. A stop-gap solution of problems recommended by Mr. Hatch, and adopted by the New Haven, is based on the following major premises:

1. Cos Cob is handling its present demand satisfactorily, with reserve capacity in the event of isolated failures of its various components, and no plant can operate efficiently if its load is reduced below a fairly well defined minimum.[19]

2. The overhead electric power transmission facilities are in reasonably satisfactory condition.

3. It is tentatively considered that suburban service in the New York-Stamford area will continue in substantially the present pattern and will operate with multiple-unit equipment. Cos Cob cannot handle the peak demand alone (without Consolidated Edison); Consolidated Edison supply and our transmission facilities cannot satisfactorily handle this service alone and the Connecticut Light & Power plant at Devon is too far away to be useful in the Stamford-New York area, so that for the time being it is necessary either to continue Cos Cob in its present operation, or else install alternate facilities in that area at costs estimated as high as $2,000,000.

The temporary solution worked out by Mr. Hatch calls for the continued operation of the Cos Cob power plant for approximately five years. At the end of that time, it is contemplated that the equipment limited to 25-cycle power will have been retired. Then, but not until then, would it be practicable to retire the antiquated Cos Cob facility.

The core of the temporary solution proposed by Mr. Hatch is that, during the interim period, efficient use be made of electrical generating and transmission facilities through maximum utilization of electrical rolling stock. In line with this recommendation, the New Haven's plan "now contemplates rehabilitation of six of the EF–3 electric freight locomotives in order to provide for reasonably efficient use of Cos Cob and sufficient requirement for purchased power to exceed the minimum for which we are required to pay under our contracts." It is obvious that the temporary solution is a complete reversal of the motive power policy pursued by the New Haven from 1956 through 1959.

In its rush toward virtually full dieselization, the New Haven retired all its EF–3 electric freight locomotives in 1959. Originally, there were ten locomotives in this class. Fortunately, they were not all scrapped before Mr. Hatch appeared on the scene. According to Mr. Hatch, eight of these locomotives are still available and from these, six will be made operable. The use of these locomotives is essential if the New Haven is to meet its purchased power commitments and if a minimum base load on Cos Cob is to be maintained.

Except for the ten EP–5 locomotives build in 1955, the EF–3's are the most modern electric locomotives owned by the New Haven. Their horsepower is 4800. A single EF–3 can handle a freight train of about 125 cars with normal loading. Each one of the EM–3's can do the work of three FL–9's or of three conventional diesel-electris with horsepower equivalent to that of the FL–9's.

The following cost comparison is quite revealing. An expenditure of approximately $180,000 will be required for major overhaul of the six EF–3 locomotives. The New Haven's retirement of these locomotives, however, was prompted by the acquisition of 18 FL–9 locomotives costing approximately $5,000,000. The estimated annual repair costs for the renovated EF–3's is $36,000 per locomotive while the estimated annual repair costs for three FL–9's is $69,000. And, when it is considered that the electric freight locomotives are

[19] Mr. Hatch testified as follows regarding his impressions of the Cos Cob power plant: "I found it to be well maintained in every respect. All major items of equipment were operable, and there were spare parts in a grat many case• to guard against a breakdown, or rather to facilitate repairs in case of a breakdown. It is not a new plant, nor is it a particularly modern plant, but like any power plant that has been well maintained, it still has a considerable degree of reliability of operation in the service that it now is in. There has grown up an idea that Cos Cob is on its last legs. I do not share that opinion."

essential to providing Cos Cob with an economical base load and to maintaining purchased power commitments, the folly of the New Haven's former locomotive policy requires no further elaboration.

To further increase the load on Cos Cob, Mr. Hatch has recommended that two of the ten EP–5 electric locomotives be used in freight rather than passenger service. Two of these modern 4,000 horsepower locomotives have been out of service for more than a year. In order words, by intensive utilization of FL–9 power in the electrified zone, the New Haven by 1959 had reduced the load on Cos Cob to the point of ineffective operation. As pointed out by Mr. Hatch, "the load was so low that they had to resort to a considerable consumption of fuel oil just to keep fires lit. Now, had the plant been producing more power, there would't have been that question at all * * * and with thirty additional FL–9's the situation will worsen." If the New Haven had other electric locomotives which could be economically restored to service, its average power costs could be correspondingly reduced.

At some time between 1965 and 1970, the New Haven management will be confronted with the same decision presented in 1956 in regard to the relative advantages of electric versus diesel-electric operations, except that there will then be no alternative to making the substantial expenditures required to rehabilitate Cos Cob or to utilize purchased power exclusively. Regardless of what sources of power seem most advantageous five or ten years from now, we believe that with an electric power distribution system in being electric locomotive operations will be found to be more economical than diesel-electric operations in view of the high density of traffic between New York and New Haven and which the population explosion and the mushrooming growth of suburbia promise to make even more dense.

No. 33332[1] (As supplemented)

PASSENGER FARES, NEW YORK, NEW HAVEN AND HARTFORD RAILROAD COMPANY

Decided August 16, 1961

1. Increased interstate one-way and commutation passenger fares on The New York, New Haven and Hartford Railroad, found to be just and reasonable and otherwise lawful.[2]

2. Recommendations of the Commission relative to ways and means by which the New Haven Railroad may improve its financial condition and its service to the public.

3. Recommendations of the Commission relative to insuring the continuance of essential passenger transportation services by the New Haven and other railroads. Proceedings discontinued.

J. W. Grady, John D. Lane, Thomas J. O'Sullivan, and *Eugene E. Hunt* for respondent-applicants.

Clifford J. Woodley, Paul G. Ehrmann, William H. Y. Hackett, Jr., Jonathan S. Towle, E. D. Stone, Nathan S. Paven, David J. Saliba, Irving Libenson, Harry G. Herman, John L. DeLius, Robert T. Gilhuly, Thomas F. Kelly, Donald W. Whitehead, William A. O'Connell, John B. Hedges, John Bradley, Edward C. Bates, Edward C. Ness, Jr., Herbert F. Koelsch, Nelson Polsby, Henry M. Hogan, and Walter R. Frizzell for interveners.

Eugene S. Loughlin, Henry B. Strong, and Basil P. Fitzpatrick for Connecticut Public Utilities Commission.

George A. McLaughlin for Division of Public Utilities, State of Rhode Island.

Troy T. Murray for Massachusetts Department of Public Utilities.

Daniel M. O'Donoghue for Bureau of Inquiry and Compliance, Interstate Commerce Commission.

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[1] This report embraces also fourth-section applications Nos. 35929 and 36266, both entitled Passenger Fares, New York, New Haven and Hartford Railroad Company.

[2] Authority granted to establish and maintain increased passenger fares between stations Route 128, Readville, Hyde Park, and Mount Hope, Mass., and stations on the New Haven Railroad, East Greenwich, R.I., to New York, N.Y., inclusive, and between those four stations in Massachusetts and points on connecting lines west and south of New York, N.Y., without observing the aggregate-of-intermediate rates provision of section 4 of the Interstate Commerce Act.

REPORT OF THE COMMISSION

BY THE COMMISSION:

For several years the Commission has been concerned about the rapidly deteriorating physical and financial condition of the New York, New Haven and Hartford Railroad Company. Early in 1960 we anticipated the need for full information as to the carrier's financial condition, the caliber of its management, and its prospects for the future. An extensive investigation was instituted by our supplemental order of March 17, 1960,[3] for the purpose of determining *inter alia*, the carrier's need for revenues sufficient to enable it "under honest, economical and efficient management" to provide adequate and efficient service. These proceedings were assigned to COMMISSIONER CHARLES A. WEBB and Hearing Examiner Richard S. Ries for hearing. The Commission's Bureau of Inquiry and Compliance, hereinafter called the Bureau, was authorized and directed to participate.

The recommended report and order of the hearing officers was served on November 21, 1960. Exceptions of the New Haven were filed on February 13, 1961, and the reply of the Bureau filed on March 3, 1961. General Motors Corporation on February 13, 1961, filed a petition for leave to intervene for the purpose of filing exceptions to the recommended report. The petition was granted by order of the Commission on the same date.

On March 31, 1961, the Commission issued its interim report in this proceeding, 313 I.C.C. 411. The interim report dealt exclusively with the conclusion in the recommended report that reorganization under the Bankruptcy Act would not solve the basic problems of the carrier and with closely related issues. The Commission found (1) that the New Haven's passenger deficit was the primary cause of its current financial difficulties; and (2) that reorganization under section 77 of the Bankruptcy Act would not be an adequate solution for the basic problems of the carrier.

On July 7, 1961, the New Haven filed a petition under section 77 of the Bankruptcy Act with the District Court of the United States for the District of Connecticut. On the same day the court approved the petition as properly filed. The court's appointment of three trustees on July 26, 1961, was ratified by the Commission on July 31, 1961. At page 426 of our interim report, we said:

We would be remiss in our duty if we failed to point out that the Bankruptcy Act is not a statute dealing with transportation as such but with financial reorganization. Although a major purpose of section 77 proceedings is to assure the continuance of transportation service required by the public convenience and necessity, the statute presupposes that financial adjustments are an adequate means to that end. Usually that is the case. We are unable to find, however, that the essential service of the New Haven can be perpetuated solely by an exercise of the authority conferred by section 77 on this Commission and the courts. If the major problems of the New Haven require political solutions, the many interests directly affected might reasonably conclude that the section 77 procedure is not an adequate mechanism for the effectuation of their desires. This is not to say that the courts or this Commission would be insensitive or indifferent to appropriate pleas of elected public officials employee organizations, shippers, or commuters. However, the interests of these diverse groups lie somewhat beyond the main thrust of a section 77 proceeding. Although it might be possible to a safeguard these interests in the course of reorganization proceedings involving the New Haven, it would be impossible to do so if such a proceeding were widely regarded as a substitute for determined, cooperative action by all concerned.

Our aim in this report is to spell out the kind of "determined, cooperative action" that is required for the New Haven, without any drastic curtailment of essential transportation services, to emerge from reorganization as a viable private enterprise. In the interest of brevity we will not discuss the fare schedules placed under investigation in this proceeding. Nor will we comment on all of the factors contributing to the decline and fall of the New Haven

[3] The investigation was begun following the filing of schedules to become effective February 4, 1960, in which the New Haven proposed to increase its interstate commutation passenger fares 10 percent and its interstate one-way fares 10 cents per ride subject to a maximum of 10 percent. Said schedules became effective without suspension but, by Commission order dated February 1, 1960, an investigation was instituted concerning their lawfulness. This investigation was broadened by the supplemental order of March 17, 1960.

Railroad. These matters are discussed at length in the recommended report and to a large extent are not the subject of exceptions. We adopt as our own the findings of fact and conclusions set forth in the recommended report except as modified herein.[4]

This report will deal with the New Haven's problems and its prospects for the future under the following five sections: (1) the New Haven's present financial condition; (2) the principal causes of the New Haven's downfall; (3) recommended measures of self-help; (4) recommendations for State and local assistance; and (5) recommendations for assistance by the Federal Government.

2. *Locomotive policy.*—Beginning in 1955 the New Haven pursued a policy looking toward the progressive elimination of all electric locomotive operations. The hearing officers found that the New Haven's purchase of new diesel-electric locomotives to replace electric locomotives was consummated countrary to the advice of its own expert consultants and without any thoughtful analysis by management of the seller's representations as to savings; that the anticipated savings proved to be a mirage: that no sound justification for the abandonment of electric locomotive operations was offered; and that, by 1960, even the management recognized that a searching reappraisal of the New Haven's electric operations was imperative. No exception was taken by the New Haven to any of the critical comments and conclusions in the recommended report concerning the locomotive policy pursued from 1955 until mid-1960.

General Motors Corporation, an intervener, takes exception to that part of the recommended report finding that its estimates of savings to be derived from the locomotive purchase program were erroneous and inflated. We have considered intervener's exceptions but find them to be without merit.

We do not suggest, nor did the hearing officers, that General Motors was guilty of any fraudulent misrepresentations. As a seller of locomotives, General Motors had every reason to assume that New Haven officials could and would evaluate the estimated savings claimed in its engineering study. In the light of the circumstances shown by the record in the proceedings, we conclude that the sales representations of General Motors were mere puffing. Actually, General Motors attempted in its engineering study to construct an ideal plan of locomotive utilization based on the purchase of 88 new multipurpose diesels and the retirement of all electric locomotives, most of which were ready for retirement. We are unable to find that intervenor's locomotive utilization plan was unsound. However, a seller of electric locomotives, we believe, could have constructed a similar plan involving the purchase of new electric locomotives and the retirement of old diesel-electric locomotives and, with equal justification, could have estimated comparable savings. In other words, the huge savings held out by General Motors stemmed primarily from the locomotive utilization features of its plan rather than from the use of a particular type of equipment. We agree with the hearing officers that it is "manifestly absurd" to contend that 88 locomotives, with an aggregate delivered-to-the-rail horsepower of 288,260 (plus 16 switching engines) assuming of course, that 288,260 horsepower are required to meet the power requirements of the railroad.

With respect to the New Haven's locomotive policy, the hearing officers concluded:

That the New Haven management continue to produce power at its Cos Cob plant for approximately 5 years and during such period increase its consumption of energy with a view toward giving Cos Cob a more economical base load; and that the New Haven initiate studies looking toward the eventual disposition of the Cos Cob plant and the acquisition of additional electric locomotives to operate between New York and New Haven. [Sheet 76]

On the basis of the record, the foregoing conclusion is fully justified. However, no real effort was made by the respondent to prove the economies that might be derived from full dieselization. We believe that the trustee should authorize a thorough study of the relative advantages of full dieselization versus the increased use of electric locomotives between New York and New Haven. And, in view of the great advances in railway electrification made in Europe and in the Soviet Union, the economic feasibility of complete electrification of the New Haven's main line, with outside research and development assistance, should not be ignored. What is most important, however, is that the future of the New Haven's existing power distribution system be promptly and wisely resolved. An unwise decision or a failure to decide the question might well result in the waste of millions of dollars.

Footnote 4 not available.

CONCLUSION

In view of what has already been said, we do not believe it is necessary to recapitulate our findings and recommendations herein. For the New Haven, and for railroad passenger service generally, the future seems bleak. However, it is not hopeless. A nation that is serious about propelling a man to the moon should be able to solve the mundane problem of moving its citizens dependably and comfortably some 50 miles or less from home to work without multiplying ribbons of concrete and asphalt that would strangle the central cities they are supposed to serve.

An appropriate order will be entered.

Exhibit 5.—Excerpt From Trains Magazine Entitled "Why the New Haven Reelectrified"

WHY THE NEW HAVEN REELECTRIFIED

SO LONG AS THE WIRES ARE UP, IT'S CHEAPER TO USE 'EM

Jerry A. Pinkepank

New Haven's electrification was probably never in danger of total abandonment. The railroad's New York City suburban service is primarily operated by a fleet of 218 M.U. cars—100 of which were new in 1954—and even if the rest of the railroad were liquidated, the suburban service would likely be saved in some way. However, in 1960 it seemed as though everything else under wire was done for. The last of 60 FL9's was delivered in that year and conventional diesel power had long since been operating all freight and yard service in the electrified zone. Whereas in 1956 68 freight and passenger electric locomotives had been in service, by 1962 only 7 electric locomotives—all passenger units—remained serviceable.

In 1963, however, New Haven reversed the trend. It bought Virginian Railway's rectifier freight motors, pushed its 10 newest passenger electrics through a shopping schedule, and performed some touching up on the old machinery in the railroad power plant at Cos Cob, Conn.

Electrification was inaugurated on the New Haven in 1907 with the start of electric operations between Grand Central and Stamford, Conn. It was installed under impetus of a 1903 New York State statute which required in the Park Avenue tunnel after 1908 the replacement of steam power by some form of motive power not requiring combustion. Grand Central landlord New York Central was averse to catenary and chose 600-volt D.C. third rail. New Haven was obliged to follow suit while running on NYC tracks. However, over its own lines NH preferred 11,000-volt A.C. overhead. As a result, New Haven electric locomotives have always had to deal with both types of current and both methods of current collection as long as there was the possibility that the railroad might want to operate them into Grand Central.[1] From the original Grand Central-Stamford territory, the electrification was extended down the Harlem River branch in 1912, from Stamford to New Haven in 1914, on the passenger tracks over Hell Gate to Penn Station in 1918, on the freight tracks over Hell Gate and down to Bay Ridge in 1927, on the New Canaan branch in 1908, and on the Danbury branch in 1925. Major yards on the Harlem River branch at Harlem River, Oak Point, and Westchester were electrified in 1911–1913. The yard at Bay Ridge, although worked by Long Island Rail Road power, was supplied from New Haven catenary for which LIRR supplied a special fleet of 11,000-volt switchers. At the height of the electrification, after 1927, nearly 150 route-miles and approximately 700 track-miles of New Haven line were under catenary. The 11,000-volt, 25-cycle system used by the New Haven exactly matches that of the Pennsylvania, and—via the East River and Hudson River tunnels through Penn Station—the two railroads have a con-

[1] In practice, all of NH's electric switchers and most freight motors lacked the D.C. pickup equipment. Designing the A.C. traction motor to function on the D.C. current entailed some loss of A.C. power potential, besides adding duplicate pickup and control equipment to the expense of the locomotive. This extra equipment, for example, added 50,000 pounds to the weight of the three EF–1 freight motors equipped for A.C.-D.C. operation, as opposed to the 36 A.C.-only units of this class.

tinuous electrified route between New Haven and Washington or Harrisburg. Locomotives of the two railroads have run beneath each other's wires in occasional experiments.

In the years from 1907 onward, New Haven was perennially short of working capital and had to husband its resources carefully in order to make improvements in the electrification. A nagging problem for many years was the lack of adequate power generation facilities. The original Cos Cob power station of 1906 was of 13,000-kilowatt capacity and supplied only the four-track line from Woodlawn Junction (where NYC track and NYC-powered third rail ended coming up from Grand Central) to Stamford, about 21 route-miles. The 11,000-volt generators at Cos Cob fed directly into the traction circuit in the simplest possible electrical system. Electricity, for purposes of explanation, is often analogized to water, and voltage to water pressure. The farther electricity is transported in wires the lower the pressure becomes, so that in a simple electrical circuit such as that used in the original New Haven electrification, voltage pressure may drop drastically below the nominal level—in that case, 11,000 volts. This is particularly true when locomotives are drawing power from the circuit at various points. Cos Cob was expanded in 1912 to approximately 32,000-kilowatt capacity in order to permit it to carry the 42-mile four-track Stamford-New Haven extension and the 12-mile six-track Harlem River branch, as well as the New York, Westchester & Boston interurban line. This was too much for the old simple circuit, and in January 1914 the railroad switched over to a sectionalized system of power distribution. In the sectionalized system, the 11,000-volt generators at Cos Cob feed a step-up transformer which raises the pressure to 22,000 volts. Current is carried at 22,000 volts in a separate circuit and fed to the traction circuit at 11,000 volts by transformer at intervals of every few miles. The result is a large number of short traction circuits instead of one long one. The separate 22,000-volt transmission circuit permits the current to be carried a greater distance without unbearable loss in pressure, and the sectionalization confines damage from a mishap to one or two sections instead of permitting it to interrupt the whole electric operation. This is the standard method of electrical distribution in any sizable system today.

Even with the 22,000-volt transmission circuit, however, the voltage at the extremities of the electrification was often low and the total power supply, even from the expanded Cos Cob, was inadequate. Transformer substations could alleviate the voltage problem but not the deficient total power supply. However, throughout the years New Haven was slow to augment its electric power supply. It entered into a contract in 1915 with a predecessor of New York's Consolidated Edison for the supply of power from turbogenerators set aside especially for the use of the railroad. In 1926 two 500-kilowatt frequency changers for converting commercial 60-cycle current to 25-cycle railroad current were installed at Devon, Conn., and one at New Haven in order to exchange surplus power with the Connecticut Light & Power Company. In 1927 a tie-in was made with the Long Island-Pennsylvania Railroad power source at East New York for emergency use. These additions to the power supply did not keep up with increasing load demands so that while the aggregate horsepower of electric vehicles drawing on the power source increased by almost 300 per cent, the power supply hardly increased 100 per cent. As a matter of fact, from 1914 onward, trains from New Haven to Harlem River continued to be operated with steam power despite the overhead wires, primarily because there was insufficient power supply to permit greater use of electric power. This factor also seems to have played a substantial part in delaying the electrification of the Hell Gate bridge route. Hell Gate was the exclusive dominion of steam from 1914 to 1918, and all freight over Hell Gate was steam powered until 1927. Only after the depression had truncated traffic and after the railroad had decided to add locomotive power without regard to a safe reserve capacity at Cos Cob was nonelectric power banished from the electrified zone.

When New Haven emerged from bankruptcy in 1947, the road seemed to have little time to think about electrification problems. A dieselization program was being pushed at full gallop. Managements changed as F. C. Dumaine Sr. took over from President Howard S. Palmer in 1948. In 1951, managements again changed when Dumaine Sr. died and was succeeded by F. C. Dumaine Jr. "Bucky," as the younger Dumaine was called, saw the last run of steam power

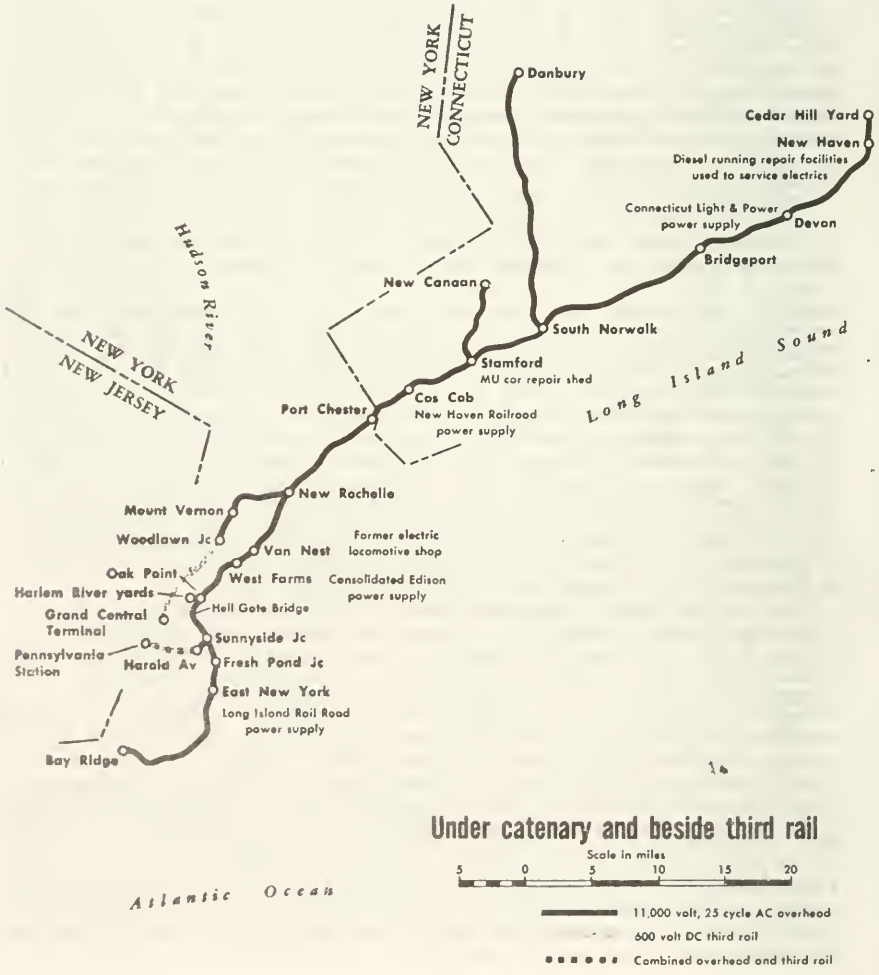
on his railroad in 1952. And when that last fire dropped, it was time to turn the attention back to the territory under wires. By 1952 the electrified lines had been operating almost entirely with electric locomotives and M.U. cars for over 20 years and performance was good. But for those same 20 years Cos Cob had been operating with no spare or emergency capacity during rush hours and the 1912 machinery was getting old in the meantime. Something clearly would have to be done about the power situation. Bucky Dumaine was inclined to obtain a commercial source of power to replace Cos Cob and began to shop around. Meantime, his management decided to take some of the load off Cos Cob by dieselizing the three big yards—Harlem River, Oak Point, and Westchester. With the diversion of most interchange traffic to Bay Ridge after the Hell Gate route opened in 1914, the importance of these yards had declined. Electric switching counted for only 2 per cent of the load over any 24-hour period and much less than that during rush hours. Therefore, the relief afforded was not great. However, the switchers had been built in 1912 for the most part and were rather light (154,000 pounds, 500 continuous h.p.), and diesel economics probably looked quite attractive in comparison to an outlay for new or rebuilt electric yard power. So the intricate net of wires along the Bronx waterfront was stripped away.

In February of 1953 Dumaine announced plans to dieselize the Danbury branch (probably with RDC's) and pull down the wire there, contributing some further relief to Cos Cob—although again, only on a small portion of the load. This plan was not carried out. An order for 100 new M.U. cars was placed with Pullman-Standard in 1953 and specifications were finalized that year for 10 ignitron-rectifier passenger locomotives. The Dumaine policy that seemed to be taking shape was one of renewing all but the marginal electric operations with an emphasis on a shift to commercial power at an early date. Dumaine, however, did not last long enough to implement his policies.

In April 1954, Patrick B. McGinnis displaced the Dumaine management after a proxy fight and set out on a motive power course of his own which seemed to have at its base a presumption, unconfirmed by critical investigation, that the electrification was old-fashioned and should be replaced in the ordinary course of dieselization. It is true that by 1954 the electrification faced the need of considerable expenditure to keep it viable. The accompanying 1955 roster [page 26] shows the state of the electric fleet even after the new rectifier EP–5's were delivered, starting in December 1954. The economic life of an electric locomotive is usually given as 30 years. Therefore, the 10 EP–5's were only a start. Of 63,290 freight electric horsepower, 14,696 horsepower was obsolete, which means that three or four 4000 h.p. units would be needed to replace the 11 EF–1's. In passenger service the obsolescence problem was much greater. If 116,144 passenger horsepower, 78,144 passenger horsepower, 78,144 (about 75 per cent) was obsolete or would come due for replacement in the next five years. On the basis of 1-for-1 replacement of EP–5's for EP–3's and 1-for-2 replacement of EP–2's by EP–5's, at least 21 more EP–5 types would be needed in the next five years. The EP–5's were expensive—$441,646 per unit. On that basis, 21 passenger EP–5 types would cost 9.5 million dollars and three or four similar freight motors would raise the ante to 10.8 or 11.25 million.

The electrical distribution system was good for perhaps 40 more years, but the power generating apparatus, in immediate need of some kind of attention, had an I.C.C. valuation replacement cost stated at 8 million dollars. If one assumes that reserve capacity would need to be added at Cos Cob to the extend of one-third of a peak demand of, say, 30,000 kilowatt (actual peak demand in 1951, for example, was 28,400 kilowatts), a 40,000-kilowatt plant would be required; and at the $200-per-kilowatt rule-of-thumb figure then in use for estimating powerhouse machinery costs, this figure also comes out to 8 million dollars. Furthermore, it appears that the McGinnis management was somewhat confused about the figures and often quoted 20 million dollars instead of 8 million as the cost of replacing Cos Coz's machinery. Actually, 20 million dollars was the figure given to the New Haven as an estimate of the cost of a power plant to replace *all* the present power supplies—Cos Cob and commercial. Compounding the error, the 20-million dollar figure has also been quoted as the cost of building a small plant that would supply only 30 per cent of the New Haven's needs as opposed to the 62 per cent that Cos Cob was at that time supplying.

In addition to the need for these heavy expenditures on the electrification if it was to continue to operate economically, the McGinnis regime also faced a road diesel fleet that was likewise laced with old power in need of replacement. Between 1940 and 1944, New Haven had acquired 60 Alco DL–109 dual-service A1A–A1A 2000 h.p. units. These locomotives—the Kuhler-styled cabs—had served the railroad well in high-utilization service, operating passenger trains in the daytime and freight at night. However, by 1955 they were 11 to 15 years old. Postwar Alco and FM power had replaced them on most mainline trains and they were handling Boston Old Colony suburban trains and passenger odd jobs as well as freight service. The Old Colony jobs were being covered with excess power owing to the age and state of repair of the units. Shrinking service made it plain that unit-for-unit replacement was not necessarry, but a large expenditure for diesel power would have to be made nevertheless. Even if a 1-for-1 replacement of the DL–109's was assumed, an expenditure of 5 million dollars would be involved. Therefore, as the McGinnis management looked over its locomotive situation in 1955, it was confronted with the more or less immediate need of spending at least 24 million dollars and at most (including the mistaken Cos Cob estimate) 36 million on motive power alone.



One of the principal notions which McGinnis had broadcast during the proxy fight was the use of *Talgo* trains on a 2½-hour schedule from Grand Central to Route 128, Boston—at that time a 3½-hour run. On June 29, 1955, a demonstration test run of ACF's *Talgo* was made and McGinnis annuonced that he wanted 20 or 30 such trains—preferably 30—if he could get another road to go along and order on a "wholesale" basis in order to bring the price down to $500 to $1300 per seat. To maintain a 2½-hour schedule to Route 128 would require an average of only 85 mph, and the *Talgo* demonstrator had shown that it could do this on most of NH's curves. The idea was to operate the *Talgo* locomotives all the way through using electricity only where required by law in the Park Avenue tunnel. In this manner, McGinnis would be replacing locomotives in both the electrified and dieselized zones while attacfing both halves of his motive power problem. He would be promoting a dynamic new service to attract new passenger traffic at the same time. The idea of eliminating the engine change at New Haven appealed tremendously to McGinnis' men, even though there is no reason why one fleet of power traveling twice as far between turnarounds should be any smaller than two fleets turning around twice as fast. McGinnis and New York Central's Perlman jointly exhibited the ACF *Talgo* demonstrator at Grand Central in July 1955, but evidently the Central was not as eager as McGinnis to plunge directly into the "wholesale" purchase of lightweight trains. In any event, McGinnis did not get a second large-scale purchaser and had to content himself that year with ordering three sample trains—a Pullman-Standard *Train X*, an ACF *Talgo*, and a modified Budd RDC train. At about the same time, the first approaches were made to or by General Motors regarding the FL9 idea. Once again, the goal was a locomotive that would operate through from New York to Boston without change.

However, aside from placing an order for some SW1200 switchers with GM, McGinnis got no chance to do anything further with what was coming to be called "The Locomotive Situation." Under pressure of public outcries against undermaintained equipment and poor service, McGinnis resigned in January 1956 to be succeded by George Alpert, a lawyer with virtually no railroad experience who soon demonstrated his inexperience. In extenuation of Alpert, it must be said that he inherited a terrible situation—with the public up in arms, a backlog of undermaintenance on all rolling stock, a shortage of cash and declining revenues, a railroad torn up only three months earlier by a hurricane and a "locomotive situation" so acute that the railroad had to borrow 38 Army road-switchers to use until some of the hurricane damage could be repaired. Under the circumstances, locomotives must have loomed out of proportion those first days when he held the reins of the railroad. *Railway Age* reported this press conference statement:

Interviewed on the 10th day of his presidency of this much-in-the news property, Mr. Alpert said he had spent thus far "at least half the time" of his period in office "on the locomotive situation," because he thinks he ought to get into the most critical thing first. Nor has he spent any time "finding out *why* the locomotive situation developed"; he has been too busy "trying to find out *how* to remedy it."

And at that press conference, after 10 days of study and perhaps not enough *why* being asked, Alpert announced his *how:* the New Haven had just ordered 60 FL9's and 60 regular diesels and would begin forthwith to obliterate the electrification except for the Stafford-Grand Central service of 1907 which would be maintained for the M.U. cars.

The 60 regular diesels were delivered that year, 1956. There were 30 GP9's (with steam generators), 15 Alco RS–11's, and 15 Fairbanks-Morse H16–44's. These locomotives immediately eliminated all electric power from freight service and pushed most of the DL–109's into retirement. The FL9's were slower in coming. The original plan was to have all 60 on the property by the end of 1957, but when the first two trial units showed up at the end of 1956 they promptly exhibited an unhappy tendency to take fire in third-rail territory, tear off pickup shoes, and otherwise misbehave. They went back to La Grange for further work, and it was not until 1958 that full deliveries began. Meantime, the three lightweight trains were delivered in the spring of 1957. They, too, exhibited mechanical troubles in their first few weeks of trial and services. But by the spring of 1957 all three trains were in revenue service and the mechanical troubles largely were ironed out. However, Alpert never put these trains on the fast schedules for which they were intended. By trying to

substitute them for regular trains on regular schedu'es, he soon found the public complaining about lack of food facilities and he also found that the fixed capacity of the trains made them unable to handle week end peaks of traffic. All through 1957 the trains were shifted from one run to the next, trying to find the "right slot." In September plans were announced to add diner sections by converting some of the already limited coach space. But by June of 1958 the idea was given up and the two non-RDC trains were retired with hints that they were the fully of the previous management.

Although the FL9's were now arriving, NH's cash position had so deteriorated that at first it could only take 30. Alpert therefore wanted an I.C.C. loan guaranty that would permit him to buy not only the 30 more contemplated in 1956 but enough to raise the total fleet to 88 or 120 FL9's. In that event, the FL9's would completely displace all electric power except the M.U. cars as well as all other diesel passenger power. The I.C.C., however, authorized only enough for the additional 30 which were delivered in 1960.

By 1960 it was clear that a mistake had been made. The railroad had not been able to reduce its electrification overhead expenses by reducing the electric power fleet to seven EP–5's and the M.U. cars. Th Consolidated Edison supply at West Farms was insufficient to take over from Cos Cob the entire job of running even the remaining electrification—partly because of capacity but also because of the distance of transmission, even in the 22,000-volt tranmission line. Voltage losses at the eastern end of the wire would be too great. Nor could the tie-in with Connecticut Light & Power at Devon be terminated, because this would mean that the old boilers at Cos Cob would have to carry all the swings in the load owing to the minimum-purchase contract with Consolidated Edison at West Farms. These swings were especially drastic because there was no electric freight at night at there once had been to help even out the power demand. Finally, it was not desirable to terminate the Consolidated Edison contract. In the meantime, if New Haven should fail to purchase the amount of electricity required in the minimum-purchase contracts with its two commercial suppliers, it would have to pay for power not used. This means that Cos Cob's position must change from supplying too much of the New Haven's electricity for safety to a position of supplying too little for efficiency.

With all these expenses going full blast while power consumption dropped precipitously, power costs—in terms of simple arithmetic averages of total-cost-into-kilowatt-hour—increased painfully. At the same time, diesel locomotives running under wires already live or requiring only a minimum effort to make them so were costing more in diesel fuel to produce each watt of their own self-generated electric power than the cost per watt of the power potential in the wires hanging unused overhead.

This fact faced, the Alpert management by the close of 1956 was beginning to consider the return of some electric power to freight service in order to improve the load-swing factor at Cos Cob and bring down the average cost of electricity. There was a problem in that there were no serviceable locomotives. The EF–3's would be suitable, but they had been stored in the weather without protection and had been in a previous state of deferred maintenance. Extensive rebuilding at a cost of over $200,000 per unit would be required. Considering the age of these locomotives, this was par to paying the new-unit price of $500,000 for equivalent new locomotives. A third alternative—to slip rectifiers into existing diesel units in place of their engines—seemed attractive until the builder quoted a price of almost $500,000 for the job. That was, of course, the same price as for new power of greater capacity. The decision on what should be done was one Alpert did not have to make, for in July of 1961 the New Haven entered bankruptcy and Alpert left.

The trustees had the problem solved for them in a fortuitous manner when the ex-Virginian electrics became available for $20,000 apiece. The first rumors on this transaction leaked out in the fall of 1962. The engines arrived on the property in the summer of 1963: the first of them went into service that October. It was necessary to restore some wire at running tracks in the Oak Point yard and to activate the wire at the engine terminal there. Thereafter, the night piggyback trains to and from Oak Point were operated electrically; subsequently, another train was added. These freights had to depart from the passenger station in New Haven for some months until wire could be restored to Cedar Hill yard. For that interval diesel power shuttled the trains down to the passenger station where the rectifiers took over. This practice terminated

when the Cedar Hill catenary was rebuilt and reactivated. Wire was also reactivated to Bay Ridge in March 1964 after repairs where the line had been severed in an air-rights project in Brooklyn and other restoration of the catenary. With that restroation, the road electrification resumed its 1927 dimensions. Diesel power was banished from all electrified-zone freight service. It had been a Perils of Pauline adventure, but the electrification had been saved.

What now? Cos Cob, with the FL9's still doing most of the work in the electrified zone, is still lightly loaded and therefore safe to rely on for as long as five more years. However, the old machinery is uneconomical to operate and the most likely course seems to be to convert it to a frequency-changer station, purchasing power at 60 cycles from the generous new supply Connecticut Light & Power is making available at Bridgeport and converting it to 25 cycle for railroad use. New York's Consolidated Edison has announced that, since it has inherited a large 25-cycle railroad market in the New York area, it will continue to supply 25-cycle current to any railroad that wants it at the same price as regular 60-cycle current. This takes much of the appeal out of converting the railroad to 60-cycle power at this time.

Beyond this change at Cos Cob, the railroad could perpetuate the present situation for many years without much incentive to further action. It is certain that nothing will be done to re-electrify the yards, since electric yard power has shown no particular advantage that would justify the expense. It is also quite certain that unless Federal funds are provided as a part of the Boston-Washington Corridor project, wire will not be extended beyond New Haven. The railroad needs its cash elsewhere. But it does seem likely that sooner or later the FL9's will be at least partially displaced from the electrified zone. Between 1970 and 1975 they will be in the 12-to-15-year-old age bracket that would justify replacement; and even at the present disadvantageous price of electric locomotives produced in the U. S., one EP-5 can be had for the price of two FL9's and can replace two FI9's in service. This does not even take into consideration the fact that the economic life of the electric would be twice as long. As long as the catenary is already strung, the argument of the electric road locomotive against the diesel is unanswerable.

It is possible that the displacement need not wait until the 1970's. New Haven has a number of older diesels in service outside the electrified zone which will need replacement very soon. Instead of buying new diesel power for all of these old units, some of the FL9's could be sent out and replaced with electrics.

In any event, there is one conclusion to be drawn from the New Haven electrification affair. It was a special case and does not presage, in itself, any new resurgence of electrification in the U.S. However, it does teach us that once the catenary is there, it doesn't pay to take it down.

NH class	Number owned	Range of road numbers	Years built	Age in 1955	Continuous rail horse power per unit
Mr. Mc Ginnis's Electrics of 1955:					
Freight:					
EF1	11	79–111	1912–13	42–43	1,336
EF3a	5	155–159	1943	12	4,860
EF3b	5	150–154	1942	13	4,860
Passenger:					
EP2	12	305–316	1923–24	29–30	2,052
EP2	5	317–321	1927	28	2,052
EP2	5	322–326	1927–28	27–28	2,052
EP3b	10	350–359	1931	24	3,300
EP4	5	360–365	1938	17	3,600
EP5	10	370–379	1954–55	New	4,000
Total	68				
The Trustees' Electrics of 1964:					
Freight:					
EF4	[1] 11	300–310	[1] 1956–57		3,300
Passenger:					
EP5	10	370–379	1954–55		4,000
Total	21				

[1] Bought in 1963.

RENUMBERING

Construction No.	Virginian road No.	Norfolk and Western road No.	New Haven road No
32543	130	230	None
32544-54	131-141	231-241	300-310

[1] Twelve units were purchased from the N&W. One—VGN No. 130, N&W 230—has not been numbered into the New Haven series and will be cannibalized for parts. Following are particulars on these newsworthy locomotives:

Builder: GE
Length: 69 ft.
Total weight: 397,679 lbs.

Wheel arrangement: C-C
(six GE-752 motors—same as in present GE and Alco road diesels)

Exhibit 6.—Excerpt From U.S. Court of Appeals, Seventh Circuit, Re U.S. v. Natiional City Lines

United States Court of Appeals
Seventh Circuit, Jan. 3, 1951.

UNITED STATES
v.
NATIONAL CITY LINES, INC., ET AL.

Nos. 9943-9953.

Rehearing Denied Jan. 31, 1951.

The National City Lines, Inc., and others, were convicted in the United States District Court for the Northern District of Illinois, Eastern Division, William J. Campbell, J., of conspiring to monopolize a certain portion of interstate commerce in violation of the Anti-Trust Act, and they appealed. The Court of Appeals, Lindley, Circuit Judge, held that the evidence sustained the conviction.

Affirmed.

See also 7 F.R.D. 393.

* * * * * * *

There is no dispute that the City Lines defendants and the suppliers entered into various oral and written arrangements in accord with which the latter purchased preferred stock from the former, at price is excess of the prevailing market prices, amounting intotal cost to over nine million dollars and that the money received from the sales of such stock was used by City Line defendants to acquire control of or a substantial financial interest in various local transportation companies throughout the United States. The respective supplier defendants entered into separate ten-year contracts with City Lines under which all of the busses, tire, tubes, and petroleum products requirements of the City Lines operating companies were purchased from the suppliers with an agreement not to buy any part of the same from any party competing with them. They provided, in short, that existing purchase contracts of all operating companies with other competitive suppliers should be terminated at their earliest possible moment; that the operating companies would equip all their units with defendant suppliers' products to the exclusion of any products competitive therewith and that City Lines and their operating companies would not renew or enter into any new contracts with third parties for the purchase of such products or change any then existing type of equipment or purchase any new equipment using any fuel or means of propulsion other than gas.

Exhibit 7.—Letter From Professor Hilton to Chairman Hart Re "American Ground Transportation"

UNIVERSITY OF CALIFORNIA,
Los Angeles, Calif., March 6, 1974.

Senator PHILIP A. HART,
Subcommittee on Antitrust and Monopoly,
U.S. Senate, Washington, D.C.

DEAR SENATOR HART: The report, *American Ground Transport*, by Bradford B. Snell, submitted to your committee in connection with its current hearings on restructuring of the automobile industry, contains on pages 31–32 the following:

"The Pacific Electric," wrote UCLA Professor Hilton, "could have comprised the nucleus of a highly efficient rapid transit system, which could have contributed greatly to lessening the tremendous traffic and smog problems that developed from population growth." . . . . Hilton added: "the (Pacific Electric) system, with its extensive private right-of-way, was far superior to a system consisting of solely of buses on the crowded streets."

The quoted passages, as Mr. Snell documents in his footnotes, are from page 409 of the book, *The Electric Interurban Railways in America*, published by Stanford University Press in 1960, which I wrote in collaboration with John F. Due, Professor of Economics at the University of Illinois. The passage quoted was written by Professor Due, and represents his views. I was not of that opinion at the time, but I was Assistant Professor of Economics at Stanford University, I had never lived in Los Angeles, and felt no particular involvement with its local issues. Accordingly, I did not see fit to try to inhibit Professor Due's expression of his opinion. This is one of the difficulties of co-authorship; I may have made statements in the book which do not represent Professor Due's views.

Since joining the UCLA faculty in 1962, I have continually taken the position that rapid transit is inappropriate for Los Angeles' low population density and low concentration of economic activity in the central business district. For my actual views on the unsuitability of rapid transit to Los Angeles, see my articles, "Rail Transit and the Pattern of Modern Cities: The California Case," *Traffic Quarterly*, XXI (1967), pp. 379–393, and "Why Rapid Transit is not Best for Los Angeles," *Town Hall Reporter*, December 1968, pp. 5–6.

More generally, I have argued that on the basis of experience of rail transit lines instituted under the Urban Mass Transportation Assistance program in the 1960's, rapid transit is unable to generate external benefits of reduction of vehicular congestion and atmospheric pollution in metropolitan areas of any sort. It is also extremely expensive relative to alternatives such as buses running on reserved lanes of freeways. See my testimony in opposition to the recent partial diversion of the Highway Trust Fund to rail transit before the Transportation Subcommittee of the House Public Works Committee, March 23, 1973.

I would greatly appreciate your inserting this letter into the printed record of your present hearings so that my views on the subject can be correctly represented.

Sincerely yours,

GEORGE W. HILTON,
Professor of Economics.

Exhibit 8.—Prepared Statement of Prof. John F. Due

PREPARED STATEMENT OF JOHN F. DUE, MCKINLEY PROFESSOR OF PUBLIC UTILITIES, UNIVERSITY OF ILLINOIS

The Pacific Electric Railways, as it existed at late as 1938, could have provided the basis for a highly efficient yet relatively inexpensive rapid transit system for the Los Angeles metropolitan area. The Pacific Electric was by far the largest intercity electric railway system in the United States, with about 1,000 miles of track and 700 route miles of line. Total investment, around $100 million (perhaps $400 million in 1974 prices), constituted about 10 percent of the total electric railway (excluding street railway) investment in the United States. Pacific Electric, per se, came into existence through merger in 1911, but

the lines were build by several predecessor companies, the first in 1895 (between Pasadena and Los Angeles). Most of the elements in the system had been developed by Henry Huntington, who controlled the Southern Pacific prior to its acquisition by the Harriman group. Following disputes with the Harriman group in 1911, Hunting sold his interest in the properties to the Southern Pacific, which operated the system as a subsidiary from that date on.

With the completion of the San Bernardino line of 1915 and modernization of equipment, Pacific Electric offered the most complete metropolitan area passenger service in the country. As shown on the accompanying map, every community of any size in the area was reached. Over a thousand trains a day left from the two Los Angeles stations, with headway as low as 7½ minutes. Track was well built and the equipment was the most modern available, and high speeds were attained. The entrance to Los Angeles for the western lines (after 1925) was via a tunnel through the ridge west of the business area. There was a substantial amount of private right of way operation; virtually all lines were double track, and there was substantial four track mileage, mostly on two major routes, north to Sierra Vista, and south to Watts. One set of track was used by expresses, one by locals.

There were two stations in downtown Los Angeles, both near the heart of the business district: the Main Street station, at Sixth and Main, with an elevated platform in the rear for loading, and the Subway terminal, 4th and Hill (the two stations were about four blocks apart).

The lines can be summarized briefly:

A. Northern lines: These lines operated from the Main Street terminal, with about a mile of street running north and eastward before going on to private right of way. There were several major segments:

1. Pasadena, with three routes, the most important being the Pasadena Short Line. The Sierra Madre line was essentially an extension of these routes.
2. Monrovia and Glendora, eastward from Sierra Vista, a heavy traffic route, particularly west of Monrovia.
3. Alhambra—San Gabriel—Temple, running eastward between the Monrovia and San Bernardino line.
4. The San Bernardino line, the longest and the highest speed line, east from Los Angeles via Pomona to San Bernardino and Riverside. There were several extensions of this line, the most important being to Redlands and from Riverside southwestward to Corona.

B. The Southern Lines. These operated southward from the Main Street station, with only a limited amount of street running and high speed operation. The line had four tracks as far as Watts. The major rountes were:

1. Whittier—Fullerton, running southeastward as far as Fullerton and Stern.
2. Santa Ana, with a branch to Orange and to Huntington Beach.
3. Long Beach, the heaviest traffic line, 20 miles straight south from Los Angeles. This was the last line to operate.

An extension of this line ran via Huntington Beach to Balboa, along the ocean shore.

4. San Pedro, two lines, via Dominguez, sharing the track with the Long Beach line to Dominguez, and via Gardena.
5. Redondo, via Gardena and via Hawthorne, serving the area to the southwest from Los Angeles, with a secondary line from Hawthorne to El Segundo.

C. The Western Lines. These lines extended westward from downtown Los Angeles, from the Subway Terminal on Hill Street, except for the Santa Monica Air lines, which operated from the Main Street station via the southern main line as far as Watts. All of these lines except the Air line suffered from substantial street running except on their outer segments and could not maintain the speed of the lines in the othe districts. There were three sets of these of these lines:

1. Those turning south from the Subway Terminal, operating via Vineyard, toward the Pacific: to Redondo via Playa del Rey; to Venice and thence north to Santa Monica; to Santa Monica via Santa Monica Boulevard.
2. Those using the subway, going west via Sunset and Hollywood Boulevards to Hollywood, Beverly Hills, and Santa Monica: and the line going into the San Fernando Valley via Hollywood and the Cahuenga Pass.
3. The Glendale—Burbank line, north from the Subway Terminal to Glendale and Burbank, via private right of way much of the way.

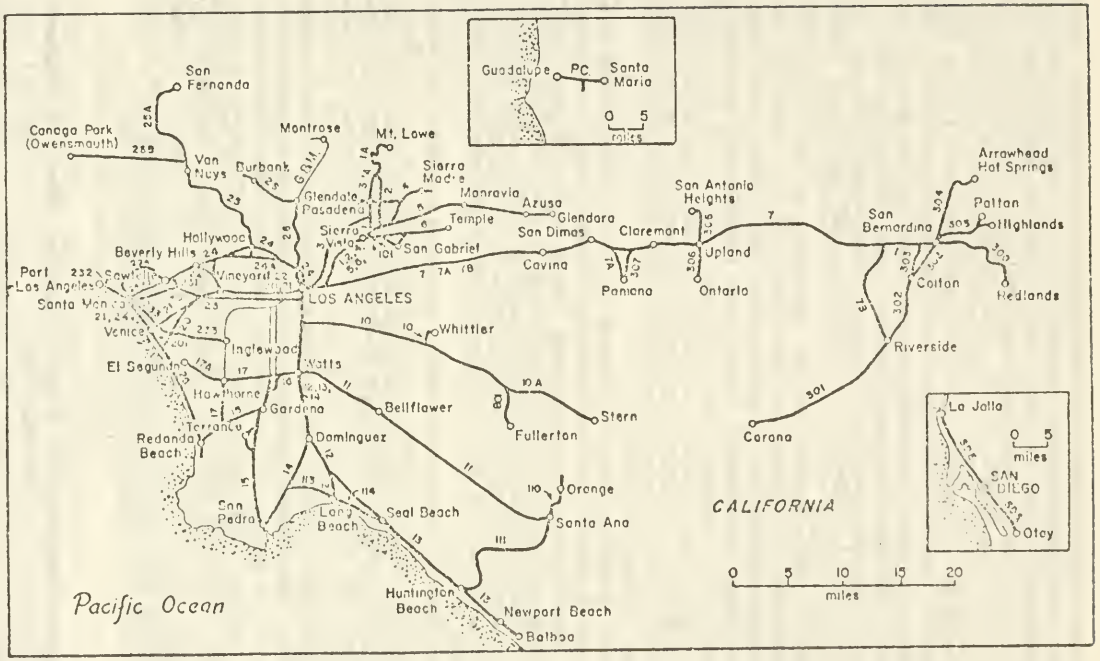
PACIFIC ELECTRIC RY.

1. Pasadena Short Line
1A. Mount Lowe
2. Pasadena-Oak Knoll
3. South Pasadena
4. Sierra Madre
5. Monrovia-Glendora
6. Alhambra-San Gabriel-Temple
7. San Bernardino
7A. Pomona
7B. Riverside

10. Whittier
10A. La Habra
10B. Fullerton
11. Santa Ana
12. Long Beach
13. Newport
14. San Pedro via Dominguez
15. San Pedro via Gardena and Torrance
16. Redondo via Gardena
17. Redondo via Hawthorne
17A. Hawthorne-El Segundo

20. Redondo via Playa del Rey
21. Venice Short Line
22. West 16th-Sawtelle
22A. Westgate
23. Santa Monica Air Line
24. Hollywood-Santa Monica-Venice
24A. West Hollywood (Colegrove)
25. San Fernando Valley
25A. San Fernando
25B. Owensmouth (Canoga Park)
26. Glendale-Burbank

101. Shorb
110. Santa Ana-Orange
111. Santa Ana-Huntington Beach
113. Long Beach-San Pedro
114. Long Beach-Seal Beach



201. Lagoon
231. Soldiers Home
232. Port Los Angeles
233. Inglewood

300. Redlands
301. Riverside-Corona

302. San Bernardino-Riverside
303. Colton
304. Arrowhead Springs
305. Patton-Highlands
306. Ontario-San Antonio Heights
307. Pomona-Claremont

P.C.: Pacific Coast Ry.
G.&M.: Glendale & Montrose Ry.

SAN DIEGO AREA LINES

SDE: San Diego Elec. Ry.
SDS: San Diego Southern Ry.

The decline of the Pacific Electric began in the 1920s with the coming of the automobile. Plans for further subway construction were abandoned and no equipment was purchased, except PCC cars for the Glendale—Burbank service in 1940. Gradually cutbacks in service began as the lighter traffic routes were phased out, primarily between 1938 and 1941. All remaining service was discontinued in 1950, except to Long Beach and San Pedro, Hollywood, Burbank, and Bellflower. The passenger service was sold to Metropolitan Coach Line in 1954, which bought them to convert to bus operation. This was implemented on the Hollywood and Burbank lines, but permission was denied by the state on the other three lines. In 1957 the lines were acquired by the Metropolitan Transit Authority, but the Authority abandoned the other lines immediately, and the Long Beach line in 1961. A portion of the trackage is still operated in freight service by the Southern Pacific, which has absorbed the Pacific Electric.

The decline of the Pacific Electric was the product of several factors. The growth of the automobile, of course, reduced traffic and also interfered with operation of the trains that ran on city streets. While the typically great width of Los Angeles area streets made street running much less difficult than in many cities, it nevertheless was a source of delay. The fact that most of the private right of way was at surface meant a very large number of grade crossings. But despite these physical limitations, the substantial amount of private right of way insured that the trains were largely free of the congestion that chokes streets and expressways at rush hours.

Another factor in the decline was the attitude of the Southern Pacific management. The Southern Pacific was the first major railroad system to commence to eliminate local passenger service (starting in Oregon in the 1920s) and later to regard all passenger service as a liability. Clearly the failure of the Pacific Electric to seek to modernize and adapt to changing conditions after 1925 was a reflection of the SP managerial attitude. The sale to a National City Lines affiliate was of course the final blow, although much of the service had been eliminated by that time.

Despite its limitations of some street running and grade crossings, the Pacific Electric system could have comprised a major ingredient in a highly efficient mass transit system for the entire Los Angeles area. The extensive private right of way would have insured separation of mass transit from automobile traffic, thus avoiding the delays encountered in rush hours by busses and lessening the congestion for automobiles. Even with a certain amount of street running, which, given the relatively wide streets in many area, offered no more hazard to car traffic than busses, the service would have been superior to bus service. Placing of the downtown Los Angeles sections—only a few miles—underground or overhead would have resulted in great improvement in operation at cost small compared to that of a new rapid transit system. The greatest problems would have been encountered with the lines serving Hollywood and Beverly Hills; more extensive subway construction, to allow these lines relief from street running, plus the long contemplated subway westward to the junction at Vineyard would have provided greatly improved service.

Exhibit 9.—Prepared Statement of Walter S. Gordon, Electrical Engineer, Tacoma, Wash.

My name is Walter S. Gordon, P.E., of the consulting electrical engineering firm of Gordon & Cross Engineers in Tacoma, Washington, am a professional engineer registered in the States of Pennsylvania, Washington, Oregon, and California. With 50 years experience in electrical design, construction and operation, including the electrification of the Milwaukee, the Lackawanna, and the Pennsylvania railroads. I am thoroughly familiar with the Milwaukee Road's pioneer 3000 Volt d-c electrification, and other electrifications in the United States and Europe having visiter there in 1931, 1968, 1969, and 1972.

The Milwaukee Road was electrified for 440 miles over the Belt, Rocky and Bitter Root Mountains between Harlowton, Montana and Avery, Idaho in 1915–17; and 220 miles over the Saddle and Cascade Mountains between Othello and Tacoma, Washington (the railroad's terminus on Puget Sound) in 1918–20, with the extension of electric operation into Seattle Union Station (which I designed) in 1927. I worked in its Electrfiication Department in

Seattle from 1925 to 1928, and have lived close to it in Tacoma since 1938, always keeping in close touch with its Electrical Engineers. The Milwaukee built West in 1906–09 with the idea of electrifying its lines west of Harlowton because of the economic advantages of applying hydroelectricity ("white coal") to the operating problems of heavy mountain grades and severe weather conditions.

Recently on 20 February 1973, when the Milwaukee Road announced it was de-electrifying, President Smith and Chairman of the Board of Directors Quinn were quoted as saying: "the electrification was for many years a boon to the Milwaukee's finances . . . The Milwaukee Road's electrification has long since paid for itself, and has rewarded the railroad many times over for the original investment through years of economical, dependable and almost trouble-free service."

For many years the Milwaukee Road was "the longest electrified railroad in the world," and its example spurred the adoption of 3000–3400 (and 1500) Volts direct-current by Italy, France, Spain, the Netherlands, Belgium, Russia, Chile, Argentina, Morroco, Japan, South Africa, the Dutch East Indies and other places. At least 17 countries sent delegations of railroad officials to visit the Milwaukee Road's electrification and observe its outstanding performance handling heavy passenger and freight trains over difficult mountainous terrain under severe weather conditions. One impressive fact was that for many years more than 11% of the total electric energy was supplied by regeneration from trains going down the mountain grades, an item of importance in these days of energy conservation. Diesel-electric locomotives continue to burn precious oil and pollute the atmosphere going down hill.

The Milwaukee's 3400 Volt d-c electrification is *not* technologically obsolete as claimed by the present management as one of the reasons they are "junking" their electrification. Many other 3000–3400 Volt d-c electrifications in other countries are extending their installations and purchasing modern d-c electric locomotives.

Exhibit 10.—Excerpt From Memorandum by Gordon W. Rogers, Re Monopoly Implications of the Universal Operation of American Railroads by Diesel Power

MEMORANDUM TO THE SUBCOMMITTEE ON ANTITRUST AND MONOPOLY, REGARDING MONOPOLY IMPLICATIONS OF THE UNIVERSAL OPERATION OF AMERICAN RAILROADS BY DIESEL POWER

(By Gordon W. Rogers, Machinery Designer, Research and Development Department, Lamb-Grays Harbor Co., Hoquiam, Wash., May 1973)

* * * * * * *

Section 8: *In at least one verifiable case, General Motors has aided and abetted, if not more directly instigating, the abandonment of a major railroad electrification, with diesel to be substituted.*

A. The New York, New Haven and Hartford Railroad:

The evidence of GM influence on the New Haven is given in Interstate Commerce Commission Docket Number 33332, Dated December 16, 1960 and August 30, 1961, as supplemented. All quotations in this subheading are from those documents unless otherwise noted.

The New Haven pioneered the world's first 11,000-volt, 25-cycle alternating current contact system, with construction beginning in 1906. Eventually the system grew to about 531 miles, including a short amount of 600-volt direct current track in New York City. About 1955 the road's management decided to abandon the electrification, with the exception of the multiple-unit commuter car operation, and in the following year it began to purchase a fleet of diesel locomotives specially designed to replace it. By the end of 1959 all its electric locomotives had been sold or retired and about that time several miles of catenary (trolley wire) were taken down. The reasons for the decision were:

1. The disadvantage of changing locomotives on through trains;
2. Lack of flexibility in use of motive power;

3. Necessity of scheduling freight trains during off-peak commuter hours to even out the electric power load;

4. Fear that the road's Cos Cob steam generating plant, which supplied nearly two-thirds of the electric power, might break down and leave the road stranded without power;

5. Belief that "if Cos Cob is perpetuated it will require an expenditure of over $20,000,000 to modernize it and then it will produce only 30% of our power requirements;" (Dec. 16, page 34)

6. "Belief on the part of the operating officials no longer employed by the New Haven that diesel-electric operations are more economical than electric operations and that a substantial cut-back in electric locomotive operations would make feasible the prompt abandonment of the Cos Cob power station;" (*Ibid.* page 35)

7. Belief that the electric equipment was "old fashioned and should be replaced in the ordinary course of dieselization." (Trains, August 1964, page 23.)

Noteworthy in the policy of changing from electric to diesel were:

(a) The management attempted to solve the locomotive problems without determining the causes of the problems. (Cf. Trains, August 1964, pages 23–24; and ICC Op. Cit. page 33.)

(b) The decision to de-electrify was contrary to the advice of at least two competent engineering firms who had studied the Railroad's motive power situation. (Cf. Dec. 16, pages 26, 31–33.)

(c) The advice of knowledgeable employees of the railroad itself was not sought. (Cf. Dec. 16, page 40)

(d) The policy was deeply influenced by the philosophy and the economic studies of General Motors. Regarding this, the ICC said:

"In disregarding the advice of independent engineering consultants, the New Haven appears to have relied almost exclusively on the advice of General Motors, the diesel-electric locomotive manufacturer. The savings anticipated from a progressive elimination of electric locomotive operations proved to be a mirage." (*Ibid.* page 27.)

The manner in which GM influenced the New Haven was described by the ICC as follows:

"In 1957 partial use of 30 FL–9 (diesel) locomotives reduced the load on Cos Cob from 137,364,000 kilowatt-hours to 112,176,000. In October of that year General Motors submitted a plan purporting to show how the use of 88 FL–9 locomotives would permit the New Haven to:

1. Junk all of its electric locomotives, including the ten purchased in 1955 at a total cost of $4,416,000;
2. Abandon Cos Cob;
3. Dismantle the power distribution system between Stamford and New Haven; and
4. Save $44,933,452, equivalent to a 16% return on the net cash investment and an annual average saving over a 12-year period of $3,744,454.

"The principal items of alleged savings were locomotive repair costs ($28,743,670) and the cost of energy ($13,813,671). These and other claimed savings over a twelve-year period would be partially offset by increased entrance fees ($762,069), due to the necessity of using two FL–9 locomotives in place of one electric locomotive.

"In estimating savings in repair costs of FL–9 locomotives as compared with electric locomotives, the General Motors report took the actual repair costs in 1956 of the electric and other locomotives to be replaced. The actual repair cost per unit was increased by 20 percent 'to reflect proper maintenance standards.' This cost comparison was unsound for two reasons. First, in 1956 the New Haven made a determined effort to overcome deferred locomotive maintenance, and, in fact, spent more money in 1956 to maintain its locomotives than in any year since 1950. And secondly, the comparative cost of maintaining new electric and the new diesel-electric locomotives would have been far more revealing.

"The estimated savings in repair costs were further inflated by the assumption that 88 FL–9 units would replace 138 old locomotives—67 electric road locomotives, 6 electric switching engines, 55 diesel road locomotives, and 10 diesel switching engines. Approximately 50 FL–9's would be required to replace 25 electric locomotives having more than twice the effective horse-power. In some miraculous way, therefore, 38 FL–9's would do the work of 48 other electric locomotives and, in addition, the work of 65 diesel-electric locomotives. . . .

"To say that 88 FL–9 units, with an aggregate rail horsepower of 126,000 will supplant locomotives in active service with a total rail horsepower of 288,260 (plus 16 switching engines) is manifestly absurd.

"In estimating savings in the cost of energy, the General Motors report contains numerous statistical infirmities which need not be elaborated. All of the estimated savings were based on the erroneous assumption that with the acquisition of 88 FL–9 units it would be feasible to abandon Cos Cob without making any major capital expenditure." (Dec. 16, pp. 35–36)

After the hearing, the ICC said:

"General Motors Corporation, an intervener, takes exception to that part of the recommended report finding that its estimates of savings to be derived from the locomotive purchase program were erroneous and inflated. We have considered intervener's exceptions but find them to be without merit.

". . . Actually General Motors attempted in its engineering study to construct an ideal plan of locomotive utilization based on the purchase of 88 new multipurpose diesels and the retirement of all electric locomotives, most of which were ready for retirement. We are unable to find that intervener's locomotive utilization plan was unsound. However, a seller of electric locomotives, we believe, could have constructed a similar plan involving the purchase of new electric locomotives and the retirement of old diesel-electric locomotives, and, with equal justification, could have estimated comparable savings. In other words, the huge savings held out by General Motors stemmed primarily from the locomotive utilization features of its plan rather than from the use of a particular type of equipment." (August 30, pages 15–16.)

It is consistent with other revelations in this Memorandum to point out the following fallacies in the New Haven's aforementioned reasoning:

1. Regarding the doctrine of flexibility, one historian of the New Haven has pointed out:

"The idea of eliminating the engine change at New Haven appealed tremendously to McGinnis' men, even though there is no reason why one fleet of power traveling twice as far between turnarounds should be any smaller than two fleets turning around twice as fast." (Jerry A. Pinkepank in TRAINS, August 1964, page 24.)

2. The convenience of not having to schedule freight trains in off-peak hours was offset by a marked rise in cost of the remaining electric power used because the low load factor made the generating facility run inefficiently much of the time. (Cf. ICC Op. Cit. Dec. 16, pages 39 and 42.)

3. Fear that the Cos Cob power plant might disastrously break down was not shared by the operating men who were most familiar with it. (*Ibid.*, page 40.)

4. "It appears that the McGinnis management was somewhat confused about the figures and often quoted 20 million dollars instead of 8 million as the cost of replacing Cos Cob's machinery. Actually, 20 million dollars was the figure given to the New Haven as an estimate of the cost of a power plant to replace *all* the present power supplies—Cos Cob and commercial." (Jerry A. Pinkepank in TRAINS, August 1964, page 23.)

5. The belief that the Cos Cob power plant could be retired by dieselizing was unrealistic because "it would be very expensive for the New Haven to purchase all of the 25-cycle power required to operate the commuter car fleet." (ICC Dec. 16, pages 39–40.)

6. Regarding the belief that diesel operation was more economical than electric, the ICC said:

"Each one of the EF–3's (electric) can do the work of three FL–9's or of three conventional diesel-electrics with horsepower equivalent to that of the FL–9's.

"The following cost comparison is quite revealing. An expenditure of approximately $180,000 will be required for major overhaul of six EF–3 locomotives. The New Haven's retirement of these locomotives, however, was prompted by the acquisition of 18 FL–9 locomotives costing approximately $5,000,000. The estimated annual repair costs for the renovated EF–3's is $36,000 per locomotive while the estimated annual repair costs for three FL–9's is $69,000." (*Ibid.*, page 41.)

7. Regarding the New Haven's disenchantment with the electric system on account of its old age, the ICC said:

"The electrical system was completed more than 45 years ago at the low construction prices and wages then prevailing. . . . In other words, the chief economic disadvantage of electric operations—the high initial investment in a

power distribution system—is of no concern to the New Haven. It has a system in being, bought at bargain prices, and practically paid for." (*Ibid.*, page 29.)

The nature of these fallacies reveals not only the carelessness of the railroad man gers who believed them, but also the influence of a general philosophy which exaggerated the virtues of diesel operation and down-rated the electrification, as well as the direct influence by General Motors noted by the ICC.

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THE INDUSTRIAL REORGANIZATION ACT (S. 1167)

(Ground Transportation Industries)

TUESDAY, APRIL 9, 1974

U.S. SENATE,
SUBCOMMITTEE ON ANTITRUST AND MONOPOLY
OF THE COMMITTEE ON THE JUDICIARY,
Washington, D.C.

The subcommittee met, pursuant to notice at 10 a.m., in room 1202, Dirksen Senate Office Building, Hon. Philip A. Hart (chairman of the subcommittee) presiding.

Present: Senator Hart.

Staff present: Howard E. O'Leary, Jr., staff director and chief counsel; Dr. David D. Martin, chief economist; Patricia Y. Bario, editorial director; Janice C. Williams, chief clerk; Peter N. Chumbris, chief counsel for minority; and Michael Granfield, economist for minority.

Senator HART. The committee will be in order. Because of the weather our first scheduled witness will be delayed.

The committee welcomes the very distinguished economist, Prof. Harold Demsetz from the Department of Economics, University of California, Los Angeles.

We will include in the record a biographical sketch of Professor Demsetz.

[The document referred to appears at the end of Dr. Demsetz's testimony as exhibit 1.]

Senator HART. Professor, your statement is very short, so we would welcome hearing it in full. Now, as you go along, if there's any footnoting you would like to do, feel free to do it.

STATEMENT OF PROF. HAROLD DEMSETZ, DEPARTMENT OF ECONOMICS, UNIVERSITY OF CALIFORNIA, AT LOS ANGELES

Dr. DEMSETZ. Thank you very much, Senator Hart.

As you said, I am professor of economics of UCLA, where I teach the graduate courses in industrial organization. I have testified once before the SEC, arguing that we move toward market-determined commission rates and away from the present arrangement. This is the second occasion on which I have testified, so I'm a relative novice at this.

Senator HART. I am sure, Professor, that you know you have now stopped me from being critical of what you are about to say, because your position before the SEC was absolutely sound.

Dr. DEMSETZ. I have the same ax to grind as you have We grind it a different way, Senator Hart. Thank you for inviting me to appear at these hearings.

Mr. Chairman and members of the committee. Thank you for inviting me to appear at these hearings. You are dealing with an important and complex problem—how best to maintain and foster the free and open competition that has been the mainstay of this Nation's economic progress. I am concerned with this problem also, for I fear that the policies of this Nation are undermining the operation of competitive markets and leading us into the shackles of an ever increasing regulation of our affairs. I am confident that you share my apprenhensions, and, therefore, that the main issue of concern here is how best to resist the tendencies of recent yars.

Senate bill 1167 is not the best nor even a good way to achieve the objective all of us seek. The premises on which it is based largely are unsubstantiated or false. The net effect of the bill, should it become law, would be to throttle further the competitive market forces that still operate.

The economic premises underlying the bill are clearly stated in its preamble:

> The decline of competition in industries with oligopoly or monopoly power has contributed to unemployment, inflation, inefficiency, and underutilization of economic capacity, and the decline of exports, thereby rendering monetary and fiscal policies inadequate and necessitating Government market controls subverting our basic commitment to a free market economy.

There never have been systematic and convincing theoretical or empirical demonstrations that oligopolistically structured industries contribute to unemployment, inflation, inefficiency, or the underutilization of capacity. Nor has it been shown that oligopolistic industries undermine monetary and fiscal policy. I cannot understand how such premises can be put forward as facts. At best they are myths; at worst they are nonsense. They are not generally found in basic textbooks where more widely believed and generally accepted propositions are likely to be referred to extensively.

The most fully studied of these is the assertion that oligopolistic industries contribute to inflation. Most of the evidence about this reveals that the structure of an industry has little relevance for changes in price levels. The most recent empirical examination of this issue, undertaken by Weston and Lustgarten,[1] indicates that increases in price levels have tended to be smaller for concentrated industries than for unconcentrated. The bill cannot be defended on the basis of these premises, and I move on to consider a more serious issue.

The bill presumes that market concentration and high accounting profits go hand in hand with monopoly power. This doctrine, which I have elsewhere called the market concentration doctrine, has been studied on many occasions. The data underlying these studies are very poor, but, nonetheless, many of them have found a weak but significant correlation between market concentration and profit rates. However, there have been a smaller number of studies that have

[1] Weston, J. Fred and Lustgarten, Steven H., "Concentration and Inflation," forthcoming in *Industrial Concentration: The Economic Issues* (Columbia Law School).

found no reliable correlation between these two variables. Whatever is the interpretation that can be given to such a correlation, the evidence has never been so strong nor the data so reliable as to provide a base for important legislation.

More recent studies have tended to undermine the older evidence supporting the doctrine. Prof. Yale Brozen[1] demonstrated that there is no persistent relationship between concentration and profit rates. He also showed that Prof. Joe Bain's initial correlation between concentration and profits resulted from the small sample of industries that he used; a much larger sample failed to reveal a correlation between profit rates and concentration. Several other recent studies[2] have failed to show such a correlation, although one, by Prof. L. Weiss, found a correlation between margins and concentration for the year 1963; this year, however, is atypical in the strength of such correlations and Weiss' results must be interpreted cautiously.

While more studies have found a correlation than have not, the trend in recent years has been to diminish the significance of this correlation. Modern studies have used techniques and variables not generally available to workers in past years; these studies have tended to refute the market concentration doctrine. All of this means that it would be dangerous to base legislation on a doctrine still hotly debated by leading economists, and not clearly supported by theory or evidence.

It would be difficult to give a clearly acceptable interpretation to a correlation between profit rates and market concentration even if future studies should firm up a belief in the existence of such a relationship. Firms that make basic improvements in products and cost control will grow and prosper in a competitive regime; the larger share of the market won by such firms insures that the industries in which they operate will tend to become more concentrated. At the same time, if we measure industry profit rates primarily by the profits earned by larger firms, then these industries will tend to record higher profit rates because of the competitive success of such firms. Since, unfortunately, most studies have measured industry profits by the profits of the larger firms in these industries, the correlation between profit rates and concentration is easily attributable to the superior performance of larger firms rather than monopoly power in concentrated industries. This superior performance may be found in basic technological, product, marketing, or managerial successes that may or may not be related to scale economies.

Some light can be shed on the merits of the notion that collusion and market concentration are correlated. Superior performance would lead to both the larger share and the higher profit rates of large firms in concentrated industries. But, and this is crucial, in such a case, other firms in the concentrated industries would not exhibit high profit rates. Alternatively, if collusion is the primary

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[1] Brozen, Yale, "The Antitrust Task Force Deconcentration Recommendation," *Journal of Law and Economics*, October 1970, and "Bain's Concentration and Rates of Return Revisited," *Journal of Law and Economics*, October 1971.

[2] Cf. Comanor, W. S., and Wilson, T. A., "Advertising, Market Structure, and Performance," *Review of Economics and Statistics*, November 1967.

explanation for the high profit rates enjoyed by large firms in concentrated industries, then other firms in these industries should also profit. Indeed, if only collusion were at work, we might expect the other firms in concentrated industries to earn higher profit rates than the largest firms because these other firms need not hold so rigidly to a collusive agreement.

I have examined the evidence for 1958, 1963, 1967, and 1970, the most recent years for which data are available.[1] In each of these years, there is no correlation between market concentration and rates of return for medium sized and small firms, and a moderate correlation for only the largest firms. This is shown in the following table:

TABLE 1.—CORRELATIONS BETWEEN RATE OF RETURN AND CONCENTRATION BY ASSET SIZE OF FIRMS

	Number of industries				
	94	116	116	116	76
Asset size	[1] 1958	1963	1966	1967	1970
$0 to $500	[2] 0.9	[3] −0.19	−0.09	−C.01	[2] −0.38
$500 to $5,000	.11	−.00	−.06	−.07	−.01
$5,000 to $50,C00	.14	.11	.04	−.C5	−.00
$500,000 to $100,000	−.01	.01	.09	.10	−.03
$100,000 and up	.03	.16	.16	.16	[3] .28

[1] Sample coverage for 1958 is small, and the data for 1958 must be interpreted with caution.
[2] Significant at 1 percent confidence level.
[3] Significant at 5 percent confidence level.

NOTE.—Concentration is based on 4-digit census industries weighted by employment to match IRS profit data. 1958 data are not yet complete, with 14 industries still to be tabulated. In addition, the sample coverage is poor, so that the 1958 results must be interpreted with great caution.

This finding suggests strongly that collusion alone cannot explain the correlations between profit rates and market concentration that tend to be present for the larger firms. It further suggests that there are real cost advantages of being a large firm in a concentrated industry. Thus, General Motors in recent years has consistently earned higher rates of return on capital or on sales than have its competitors in the automobile industry. It is difficult, perhaps impossible, to explain such comparative performances on any grounds other than the superior efficiency of General Motors. The advantages of substantial efficiencies such as these will be lost by the forced deconcentration contemplated in this bill. These results have been published and presented at conferences of leading economists and lawyers, and have not been refuted by subsequent analysis.

Nor is deconcentration likely to bring about significant price reductions, if any. Moderate sized firms in concentrated industries generally do not earn higher rates of return than in unconcentrated industries. There is, therefore, no sound basis for presuming that price reductions will be forthcoming if large firms in concentrated industries are broken into moderate sized firms. We thus stand to lose the advantage of large size without winning compensating benefits.

[1] Demsetz, H., "Two Systems of Belief About Monopoly," forthcoming in *Industrial Concentration: The Economic Issues* (Columbia Law School).

Although attempts to harden the market concentration doctrine into firmly held legal precedent or legislation have not yet succeeded, Senate Bill 1167 represents a serious move to make this unsubstantiated doctrine the law of the land. This bill would establish a rebuttable presumption that monopoly power was possessed and that reorganization of the industry was called for when four or fewer firms accounted for 50 percent—or more—of sales in any line of commerce in any section of the country in any year of the most recent 3 years preceding the filing of the complaint. Other conditions creating rebuttable presumptions of monopoly power would be an average rate of return above 15 percent on equity after taxes for any corporation over a period of 5 consecutive years out of the most recent 7 years preceding the filing of the complaint, or the absence of substantial price competition among two or more corporations in any line of commerce for a period of 3 consecutive years out of the most recent 5 years preceding the filing of a complaint.

Many technical objections can be raised about these criteria. When profits are measured, will research and advertising expenditures be treated as current expenses, as is done by accountants, or as depreciable assets, as is required to correctly measure profits? Should higher profits be tolerated in industries subject to greater business risk? For the newness of the products they produce? How is the competitiveness of prices to be determined in the absence of evidence of collusion? Does identicalness of price mean the same thing when products are highly substitutable as when they are not? How is substitutability to be determined other than by the identicalness of prices? And what will be the proper definition of the market? Is the coal industry placed in the soft or hard coal market or in the energy market?

I mention this abbreviated list of technical problems to convince you that the criteria you are applying are not well-defined, simple, objective, easily measured indexes. But these technical complexities are not the severest defects in the bill. There are two major defects that are quite independent of technical matters.

The first of these is that the bill will discourage beneficial competitive activity that is likely to run afoul of the arbitrary criteria proposed in this bill. A consequence of competition is that those who are successful will win market share and earn high profits. Thus, the effect of this bill will be to frustrate its stated objective—the encouragement of competition—whenever competitive activity begins to run the risk of triggering the bill. Like the Robinson-Patman Act, this bill will end up being used to protect competitors rather than to protect competition and consumers. How better to cartelize an industry than to insure its members that they need have little fear that efficient, innovative firms will be able to grow and prosper!

Those who seek the variety, adaptability, productivity, and protection offered by market competition must have faith that there is a steady stream of competitive pressure that disciplines those who best their rivals on a given day or even a given decade. The history of market economies provides overwhelming evidence that such faith is founded on fact. We must cease to be concerned when effective market competition actually shifts market share and profits.

Indeed, we should be pleased. And we certainly must stop interfering with competitive processes in anticipation of their consequences.

Such a cool and patient posture must accept the possibility of a modicum of market dominance and power for short periods of time in a few instances. Indeed, this development is to be welcomed when it is brought about by a firm that manages to better serve customers; firms that have lower costs will be able to enlarge their position in the market only by passing some or all of these efficiencies on to consumers in the form of lower prices. Such firms also will feel the force of competitive pressures, and these temporary strong positions are a small cost to bear in order to avoid the great risks inherent in this bill.

The second major defect of the bill is that it does not come to grips with the sole important source of monopoly and resource immobility in this Nation. Not only does the bill divert our attention from this source—the regulatory bureaucracies that congest Washington—even worse, it would expand them. The regulation of industry has created an extensive network of protectionism and rigidity, the effect of which is the strangulation of competition, reduced variety, and the impediment of resource mobility.

The Department of Agriculture, the Civil Aeronautics Board, the Interstate Commerce Commission, the Federal Communications Commission, and a host of other regulatory bodies have done remarkable jobs of confronting consumers with higher prices and few options. Cable and pay TV have been delayed, reductions in transport rates have been forestalled, and food prices have been increased. At my reckoning, the CAB has succeeded in maintaining interstate air fares about 70 percent higher than comparable distance intrastate fares over which it lacks jurisdiction. All of this and much more that is deleterious to the interests of consumers could not have transpired without the aid of our regulatory bureaucracies.

I do not believe that much can be done about this sort of deregulation, but let us at least make it easier for the Justice Department or some other agency not beholden to any particular industry to question whether the decisions of our regulatory tribunal are in the public interest and to contest them when it feels that they are not. I do not suggest that we abandon the search for private conspiracy, although I think it unwise for reasons already stated to commit resources to the task of reorganizing industry; these resources could be used more productively to finance efforts to keep our regulators in check and to insure that consumer interests are well represented in the decisions of these regulatory bodies. Unfortunately, the bill now before us already has diverted your attention from the larger problem.

Senator HART. Thank you, Professor.

On the business of the role of the regulatory agencies and whether they serve or disserve in the public interest, I think I am with you most all the way.

Dr. DEMSETZ. I welcome your agreement.

Senator HART. They are about as easy to restructure an industry, but, as in the case when they are talking about restructuring industry, industry moves in understandably to prevent it. And the in-

dustry regulated by regulatory agencies have learned to live comfortably with them, so they move in on those who try to restructure the regulatory.

Another point of this bill seeks to get some kind of basis from this—what do we call it—Commission on which to try to restructure the the regulatory agencies, too.

Dr. Demsetz. I commend that attempt.

Senator Hart. There is a section 203(a)2, which says the Commission will study each industry and develop plans that might make them more competitive and to make legislative recommendations to the Commission.

And certainly I commented that such regulations shall include substituting competition for our regulation wherever it is feasible.

I take it that you agree that that would be a desirable thing.

Dr. Demsetz. Yes, I agree in general that that would be very desirable. It's not quite clear to me whether the Commission you contemplate in your bill will undertake these activities only in those industries in which, to its satisfaction, it has become convinced that the presumption of monopoly power is beyond the shadow of a doubt or whether you will be disciplining the regulatory procedures in industries that fail to meet the criteria established in the bill.

Senator Hart. At least it's a beginning. We would ask for the report to include comment on regulatory basic phases of the economy.

Communications is one of them. Clearly that is knee-deep in regulation.

Dr. Demsetz. My impression is that the industries that are most protected by regulation—this is a generalization—are not found on your list of seven industries. That's not to say that there may not be some protection conferred upon some of them by some regulatory procedures.

Senator Hart. All right.

Dr. Demsetz. But that is the only hesitancy I have in endorsing that part of the bill.

Senator Hart. I think in a current or very recent issue of Business Week there's an article by Victor Kraemer. The caption says, "Is John Sherman's Antitrust Obsolete?"

And he suggests the creation of an Office of Antimonopoly Affairs with the executive branch, the Office of the President, and that the function of the office would be to develop a new Executive Order directing all Federal agencies to act to promote a free enterprise system that would require the Federal departments and bureaus to prepare antitrust impact statements whenever they suggest action that would significantly affect competition in the private sector.

How do you react to that?

Dr. Demsetz. My first reaction is that that's worthwhile exploring. Naturally, it's difficult to forecast how these things will actually operate, but I think that in general that's the kind of move that I would like to see—in fact, that I recommend on a few occasions now—that somebody be in power to represent the consumers in these regulatory proceedings. I understand the difficulty or reorganizing the regulatory network as well as the difficulty of reorganizing industry, but I believe that we are witnessing now, in the economics'

profession, a change in the tide in these affairs that might make it somewhat easier than had heretofore been the case to discipline the regulatory commissions. On the one hand people have become—economists have become—more suspcious of the older literature and the older evidence on the market concentration doctrine, and on the other hand, they have become more and more impressed with the failure of the regulatory system in the United States to produce results that are desirable, insofar as economists can contribute to your efforts I think that the task of disciplining the regulators may be somewhat easier now than was the case earlier and the task of reorganizing industry somewhat more difficult.

Senator HART. I remember when I was in college—it was in the middle thirties—one of the college debate topics was the proposition that socialism was better than capitalism or democracy and we argued the proposition that capitalism was better, democracy was better.

And I remember the basis theme was that there was no abuse, no weakness or failure, in our system that could not be cured by stringent regulation. That was in a period when there was some pretty obvious weaknesses in the system and I believed it at the time.

But again in the passage of time we do see the apparently inherent problems and disadvantages of that rigid regulation concept, but it sold papers then and we didn't know much about it.

Dr. DEMSETZ. The debate is still being carried on, and the recently recognized phenomenon of the effects of regulatory commissions, I think, really makes your side of the debate stronger rather than weaker. When a nation moves toward a more socialistic economy it is increasing the power of regulatory commissions. Since we've already found that the commissions don't do the job we want, we have even more evidence that the capitalistic system is superior.

Senator HART. Mr O'Leary.

Mr. O'LEARY. Doctor, as you probably know, the first industry which we scrutinized under this bill was the communications industry.

In essence, those industries focused upon the question of whether or not the technology and communications have change to such an extent that we might benefit from more competition and less FCC regulation in certain areas.

Do you feel that applying the bill in this particular area is wise public policy?

Dr. DEMSETZ. I think it's wise public policy to begin to reduce the power of the FCC in this industry, yes. I believe the industry would operate much more to the satisfaction of consumers if the FCC had less to say.

Mr. O'LEARY. We had testimony in those hearings from a number of small recent interests for the first few days and then the Bell System on the last day.

Specifically, we heard from specialized common carriers and terminal equipment manufacturers. They sought more competition and less regulation, but they indicated that for competition to work there would have to a major restructuring of the Bell System.

Among other things, they recommended that Bell's long-range division be made a separate firm and that A.T. & T. be forced to divest itself of Western Electric.

How do you react to those suggestions?

Dr. DEMSETZ. Well, my only reaction would have to be that they're worth studying. I really don't have an informed opinion on them right now, but since the present network has been created under the protective shield of regulation, unlike an industry that becomes concentrated without the protection of legislation, the industrial structure may not be efficient.

All I could say at this point is that the request by the small firms and terminal equipment manufacturers doesn't sound silly to me and that it's worth examining. But I have no conclusions right now as to whether or not I would agree with them after the examination.

Mr. O'LEARY. In that area, since the Government had a franchise that regulated monopolies for a number of years, it may have the responsibility of insuring that there is a competitive structure.

Dr. DEMSETZ. It may.

Mr. O'LEARY. Doctor, in your statement you discussed the preamble of the bill. At one point you state as follows:

> There has never been a systematic and convincing demonstration that oligopolistically structured industries contribute to unemployment, inflation, inefficiency, or the underutilization of capacity.

Back in 1958 Hal Curtis and the president of General Motors testified that GM calculated its price per unit on the basis of 80 percent of capacity.

In other words, its fixed cost, its variable cost, plus an estimated profit was spread over 80 percent of its capacity, but if the demand for autos exceeds 80 percent the company made a greater profit.

If the demand fell below 80 percent it made less. At the present time the demand is down and General Motors has laid off approximately 79,000 employees.

If GM had to react to this reduced demand by keeping those people on the job and substantially lowering the price wouldn't that contribute to the fight against inflation and unemployment?

Mr. DEMSETZ. That's a very complicated question. What you really are asserting there is that, "Wouldn't lower prices be lower prices?" It is true that prices would be lower where you lower them, but as a result they may be higher elsewhere.

But when we talk about fighting inflation we don't generally mean lowering prices anywhere below costs. Forcing companies to sell below cost would lead to a smaller real GNP than would otherwise be the case, and, given the supply money, to higher prices than would otherwise be the case.

Mr. O'LEARY. You mean, in a more competitive industry, wouldn't we see fewer people laid off with greater price reductions in a period of reduced demand?

Dr. DEMSETZ. I don't know what you mean by more competitive industry. More competitive industry than what? The answer to your question is that there is nothing in economics that I know about that empirically, or even theoretically, demonstrates that if there's a fall in demand for a product, and if the industry alter-

natively is considered to be monopolized and then competitive that there would be a large reduction in output when monopolized.

What happens is that the demand falls for both industries, the rate of output in both industries will fall, the amount by which the rate of output falls depends on how far the demand shifts and what the shape of the cost curves are. No deduction can be made that monopoly output will fall by a greater amount than competitive output.

Mr. O'Leary. To the extent that General Motors is able to adjust to this kind of situation by maintaining price and cutting back production, in your view that is not legitimate proof of market power?

Dr. Demsetz. No. If marginal cross remains relatively constant at defficient output rates then even a competitive industry would maintain price in the face of falling demand. You can't make any deductions about this unless you know how costs behave in the industry.

Mr. O'Leary. Doctor, with respect to prices in concentrated industry, we received testimony last year from Dr. McCracken who testified in opposition to the bill.

He and his colleague, Dr. Thomas Moore, did agree, however, that during the period of inflation prices in concentrated industries were slower in rising.

But once having risen they did not go down. Dr. Moore further indicated that this had a tendency to prolong inflation. Do you agree with that proposition?

Dr. Demsetz. No. Nor do I know of any systematic evidence that agrees with it. I'm not referring to episodic evidence where you give an example of a particular industry. I'm talking about broad-based statistical studies.

Mr. O'Leary. Doctor, in your statement you indicate that this bill presumes that market concentration and high accounting profits go hand in hand with monopoly power.

Although we used these criteria as indicia of monopoly power, we prefer to characterize the bill as being premised on the belief that highly concentrated industries' performance would be significantly improved.

Apart from the rebuttable presumption, do you believe this to be the case?

Dr. Demsetz. If you're asking whether the application of these indicia would lead to an improvement in performance, my answer is that in general, "No." If you're asking whether there exist some industries which happen to be concentrated whose performance could be improved, I suppose if I search my mind the answer would be "Yes." But whenever I search my mind on that issue the industries always turn out to be the regulated industries.

Mr. O'Leary. Other than the regulated industries, in your view, are there concentrated industries whose performance could be significantly improved?

Dr. Demsetz. Regulation is also a slippery thing. There are various kinds of laws which do protect industries, even those industries that are not regulated in the sense that we have been discussing

regulatory commissions. In those instances, I believe, improvements could be made by altering the laws.

Mr. O'Leary. Two of the industries that are often cited but I do not recall within the three rebuttable presumptions really—are the petroleum industry, which is not extremely concentrated and the steel industry, which is not characterized by high profits. There are those who some feel these to be industries with monopoly and oligopoly power. I take it you see my problem with respect to those industries?

Dr. Demsetz. Not with respect to concentration. I see in the petroleum industry some laws that I think impede the efficiency of the industry.

Mr. O'Leary. Doctor, as you might expect, we followed with interest your presentation and the colloquy that followed at Airly House.

You communicated there that you were in favor of appeal of the Sherman Act as it is presently being enforced. Later, you state as follows: "I do not suggest that we abandon the search for private conspiracy."

Do you favor the appeal of the Sherman Act, or what is it about the present enforcement that you object to?

Dr. Demsetz. At Airly House the Sherman Act was being used loosely to represent the whole bundle of antitrust legislation. In that context I think that the antitrust attention that has been directed to business practices and to market structure has had a net deleteriously effect on competition and has been a disadvantage to customers.

It is primarily those aspects of recent antitrust goings-on that I find not worth preserving. Whether you can get rid of these aspects without eliminating all of antitrust is a question that I leave to my lawmakers.

Mr. O'Leary. What do you mean when you say, "I do not suggest we abandon the search for private conspiracy?" What sort of private conspiracy should the antitrust laws or the Sherman Act reach?

Dr. Demsetz. Well, I think agreements to collude are fair game and should be prosecuted under some sort of antitrust provision, and I would not find it objectionable to make such agreements illegal, contrary to its practice in some countries where they have been both legal and enforceable in courts.

The kind of older searchings for collusive agreements, even though I think the courts have made some poor judgments and poor decisions, I would favor much more than the recent approaches which rely on structuralism and which attempt to fine time the business practices or firms; that is, attempt to judge whether a pricing policy is competitive or anticompetitive. I think that those things very often have led us down the wrong path and have prevented competition rather than protected competition.

Mr. O'Leary. At that same conference, Doctor, you advocated appeal of the Celler-Kefauver Act because you saw advantages to some of the mergers that are presently being forbidden. Am I correct that you feel that it is probably impossible to draft a law which distinguishes between good and bad mergers?

Dr. DEMSETZ. I think it would be very difficult, but I might add that that response to a question asked at Airly House is not a carefully studied response, and I don't feel as sure about that as the other antitrust issues we have just discussed. I think that it's very difficult to distinguish between a "good" merger or a "bad" one. The traditional and best protection against mergers which conceivably might lead to monopoly power is free and open entry into the industry. If the protective mantle of regulation is removed, competitive entry will be facilitated. I think that the protection offered by such competition is much more reliable than judgments made in court or by commissions.

Mr. O'LEARY. To the extent that you allow horizontal mergers are you not permitting the same effect which would occur as a result of explicit collusion?

Dr. DEMSETZ. Possibly. But you have greater confidence in the market test offered by competitive entry than I have in the wisdom of the courts in these matters.

If you remove legal barriers to open entry, I think most of the antimonopoly battle is won.

If you use legal barriers to restrict entry most of the battle is lost. The rest of the policy problems are of secondary and tertiary importance.

Mr. O'LEARY. Doctor, you recognized that there may be instances where monopoly power exists which is not the product of Government invention.

Would you give us some illustrations or instances in which we have been subjected to a modicum of monopoly power for short periods of time?

Dr. DEMSETZ. We are treading here on ground that is difficult to discuss in brief fashion, although I will attempt to discuss it because the words "monopoly power" and "competitive" are not very clear in any discussion. The real economy operates with frictions, there are costs to moving resources very quickly and it is not desirable to have them move so quickly that these costs become excessive. It may be that a company develops a new product that turns out to be very successful and, in view of mobility and information costs, some time may pass before competitors actually begin to enter the market. The cost of marshalling the resources and gaining the knowledge to compete prevents this from happening instantaneously. Now, we could differ as to whether we describe the dominant position temporarily possessed by the innovating firm as monopoly. It is difficult to make such a decision, and what I'm saying is that we will confront such instances.

If you chose to use the word "monopoly" to describe them, then I'm perfectly willing to accept your usage of that word to describe them. But I expect that market "dominance" of this sort will be of little consequence for public and that it reflects the normal workings of the competitive system. It is that kind of modicum of market "dominance," monopoly power, if you like, I would say a competitive success, that I would find quite acceptable and palatable. Indeed, this modicum of market power is probably the reward that we would have to offer in order to encourage the innovations to take place.

Mr. O'Leary. Doctor, by our calculations, the witness who will testify tomorrow, GM produces approximately 65 percent of city buses, in excess of 80 percent of locomotives, and in excess of 90 percent of all bus engines.

Also, by our calculations, these market shares have lasted since the 1950's. The city buses are going down somewhat and locomotives and bus engines going up.

Do you feel that General Motors has a monopoly power in any of these lines?

Dr. Demsetz. No.

Mr. O'Leary. What would be monopoly power?

Dr. Demsetz. Monopoly power would be a situation in which competitors were not able to offer their products because of legal barriers. General Motors, a year ago, had a much larger share of the domestic automobile market than it has today and if you would have asked the same question a year ago as to whether or not General Motors had monopoly power in the production of automobiles for the domestic market, my answer also would have been, "No." I would have said that because there were no legal barriers to competitors to produce for that market and we are now witnessing a very drastic shift in market share that may last for some time as a result of that competition. A year ago, by the conventional test of market shares, this would have seemed impossible. This merely confirms that too great a weight is given to market structure.

Mr. O'Leary. But there are no—as far as I know—legal barriers to the manufacture of locomotives. That is why bus engines——

Dr. Demsetz. That's why I said I don't think there's any monopoly power there.

Mr. O'Leary. It is not of any significance to you that these market shares have lasted for 20 years?

Dr. Demsetz. No. I think that is a demonstration that General Motors has been able to do the job better than actual and potential competitors. To penalize GM for doing so well is exactly the kind of thing which would lead to inefficiency rather than efficiency.

Mr. O'Leary. You don't believe that those high market shares may have forestalled entry by some new firms?

Dr. Demsetz. I don't believe so, no. I would say the low prices and superior products might make it difficult for new firms to enter, yes.

Mr. O'Leary. Doctor, with respect to the industries that are cited for study in this bill—namely, chemical drugs, machinery and equipment, electronic computing, communications equipment, energy, steel, motor vehicles, nonferrous metals—do you see monopoly power a legitimate concern with respect to any of those industries?

Dr. Demsetz. No. I might ask you to run through the list again, but on the first hearing, the answer would be "No."

Mr. O'Leary. Thank you, Doctor.

Senator Hart. Mr. Chumbris?

Mr. Chumbris. Thank you very much, Mr. Chairman.

Mr. Chairman, I have no questions this morning for Dr. Demsetz because we have with us, for his first hearing, our new economist for the minority.

He is a former colleague of Dr. Demsetz's and I now yield to Michael Granfield. He will ask the questions today.

Senator HART. Mr. Granfield?

Mr. GRANFIELD. Thank you very much for attending this morning, Dr. Demsetz. I would like to go back to your testimony with respect to table 1 in your evidence.

Now, to the noneconomist, I think the evidence may not be quite clear as to what it represents. I would like you to comment on what this evidence means with respect to evidence concerning tacit collusion in concentrated versus unconcentrated industries, particularly with the pattern of return of the table with large firms, medium-sized firms, and small firms.

Dr. DEMSETZ. The problem as I saw it was to attempt to distinguish between two possible explanations of the correlation between profit rates and market concentration that have been found in some other studies.

Mr. GRANFIELD. Okay.

Dr. DEMSETZ. One explanation was that, in fact, concentration brought collusion and collusion bred higher profit rates. Another explanation was that industries became concentrated because that was the efficient structure for them to have—that some firms had become very successful and innovative and had gained rather large market shares and high profit rates as a result: the structure of the industry reflected the efficient structure of the industry and the high profit rates observed were really attributable to the competitive success of the larger firms in the industry.

In order to try to separate these two possible explanations, I reasoned as follows: If there were collusion, explicit or tacit, in concentrated industries then the profit rates of most, if not all, of the firms in the industries, should be higher than in nonconcentrated industries. But if it was just the competitive superiority of the large firm that was producing the high rates of return in concentrated industries, then there would be no reason for smaller or moderate sized firms in those industries to have high profit rates also.

This table attempts to break down the data by size of firms. If you look at the table for each of the years, you'll find that while the largest size category exhibits some positive correlation that there is no general, persistent, or significant positive correlation for any size class or firm between market concentration and profit rates. This finding which has been exposed to criticism by my peers in the profession is in general inconsistent with the belief that it is collusion in the concentrated industries that is producing high profit rates.

Mr. GRANFIELD. In other words, if there indeed were explicit or implicit tacit collusion in concentrated industries, you would expect to find two things: moderate and small-sized firms in concentrated industries should, in general, earn a higher rate of return than moderate and small-sized firms in unconcentrated industries?

Dr. DEMSETZ. That's correct.

Mr. GRANFIELD. You have no evidence for that.

Dr. DEMSETZ. I find no evidence for that.

Mr. Granfield. Second, we would not expect to find a systematic relationship between rate of return and size of firm, if necessarily collusion, tacit collusion, was occurring in a concentrated industry.

Dr. Demsetz. That is correct.

Mr. Granfield. You found no evidence for that?

Dr. Demsetz. No; but this table does not report those data. There is evidence that the large firms, especially large firms in concentrated industries, earn higher rates of return than moderate sized and smaller firms in those industries.

Mr. Granfield. You have reported this result in another study.

Dr. Demsetz. That is correct.

Mr. Granfield. Okay. If we take the collusion hypothesis at its, say, most obvious implications, you have found no statistical evidence for it, whether there is explicit or tacit collusion?

Dr. Demsetz. That is correct.

Mr. Granfield. Okay, let me move on to another point.

This particular bill, Senate Bill S. 1167, really, I believe, seeks to attack tacit collusion because explicit collusion—the Sherman Act already is sufficient to deal with that, namely, the conduct test of collusion.

Dr. Demsetz. I'm not sure what you mean by the "conduct test." If there's explicit collusion, I think that the Sherman Act. I am not sure you are using the word "conduct" in the sense of conspiring. Are you?

Mr. Granfield. Correct.

Dr. Demsetz. The word "conduct" is used in different ways in economics.

Mr. Granfield. Now, let's assume that for whatever reason there is successful tacit collusion in concentrated industries, however accomplished—we will leave that out for a second, for the time being.

What would you expect to occur over time even if there were successful tacit collusion?

Dr. Demsetz. I would expect entry to take place, and firms within the industry also would seek to compete to expand. Finally, tacit collusion, I think, would break down. Competition also would take place in dimensions of the product other than just price.

Mr. Granfield. In other words, another test of this collusion hypothesis is: In the absence of legal barriers to entry, even if it were successful, it would attract entry and hence weakening and probably ultimately breaking down the collusive agreement.

Dr. Demsetz. That is correct.

Mr. Granfield. Do you have any evidence to present with respect to explicit collusive agreements that have occurred, historically, where entry occurred and undermined the collusive agreement?

Dr. Demsetz. Well, I did not come prepared to answer that question. I'd have to sit back and think about it.

Mr. Granfield. That shows I didn't prepare you.

Dr. Demsetz. True. Well, we have the electrical equipment manufacturers' case where there was an attempt to explicitly collude. But we know that that frequently was broken down by competitive actions of the members.

Did you have some particular industry in mind?

Mr. Granfield. Well, when was the electrical equipment conspiracy—ITE Corp. entered the circuit breaker industry in that, in fact, broke down the conspiracy and that part of the electrical equipment industry.

Let me go on and ask and deal with this problem that I think is an unfortunate use of words here—this concept of monopoly power.

You indicated that there may be instances where a firm enjoys monopoly power because of superior innovation. I want you to discuss a little bit more about that kind of monopoly power as opposed to the textbook concept of monopoly power.

Dr. Demsetz. I don't generally like the textbook discussions, so I'll contrast the two notions I have in mind: that is, the technical discussion of monopoly that is concerned with the shape of the firm's demand curve and legal restraint on entry.

At one extreme we have the competitive model, which we know is impossible to really realize in an active market. In that competitive model the firm is viewed as a price-taker. The firm can't effect the price of the product; it merely sells as little or as much as it wants at a given price. The more the demand curve shifts from the horizontal position with the firm facing a given price to one in which there is some price elasticity in demand, then technically I think one could say that the firm has some pricing discretion.

That could be called monopoly power in a technical sense.

We very seldom face perfectly substitutable products because of the nature of production, the nature of copyright and patent, which are legal, perhaps appropriate, grants of some degree of control. There are very few instances in which the competitive model that I've just described for you is a description of any kinds of short-run pricing phenomena.

What the competitive model really is, is a way of thinking about a problem, particularly, as to what would be the long-run consequences in industry.

If this technical distinction is set aside, then we can view the requirements of a social system as the provision or incentives that lead freely acting individuals to avoid imposing costs on others and to strive to produce that which will benefit others. In order to provide people with such incentives they have to be offered the carrot of making profits and be disciplined by the stick of making losses.

The carrot of making profits is offered if they succeed in innovating or in devising a new way to produce at lower costs; if they succeed in benefiting customers they profit because there is a natural time delay, perhaps several years, before competitors can imitate them.

We really have not examined the problem of what the natural time delay would be before imitation. There will be a period during which the successful firm may have some discretion over the price of the product, more discretion than will be the case in the longer run period.

I would not consider that monopoly power in the sense that should be of concern to this committee or of the antitrust laws in general. The kind of monopoly power that should be of concern

here is one where there are artificial barriers to competitors trying to compete away the profits of the successful firms.

By "artificial barriers," I mean costs that are imposed upon potential competitors in excess of the real cost of mobilizing the resources to compete with the successful firms. It's that kind of monopoly power which I think should be of concern here. Does that answer your question?

Senator HART. I wonder, as a noneconomist, if I could interrupt here to get a better handle on it. Should we or shouldn't we be concerned if, as a result of superior product and efficiencies and low price, there becomes just one manufacturer of cars—or you name some significant product—there is no Government regulation that impedes new entry.

And there is always the possibility of some new technology, unless you are minus, you're not going to get the dough to get in on that.

Dr. DEMSETZ. I am not quite prepared to accept that statement. Do you consider the industry that you've just pictured to me—which is now a one-firm industry?

Senator HART. The one firm emerging because of qualities still——

Dr. DEMSETZ. Yes. I understand. Do you assume it to be charging a monopoly price or a price above cost?

Senator HART. No. I'm just asking you without suggesting that they are abusing the customer by annually inching up the price just deliberately.

They just sit there as the sole source of a product, the use of which is important to every American. Now, is there any unease with that kind of private power?

Dr. DEMSETZ. I understand the question you're asking and I understand the discomfort that you or I might feel in such a situation—in a context in which you contemplate some catastrophic change of events that might make you want more than one source of supply. But in the ordinary, normal, and in my mind historically, characteristic way which markets operate I would not have any great fear of that situation if there were no barriers to entry.

This really gets to what your faith and my faith are in the competitive processes. If we don't have faith when the occasion arises whereby the consumer is penalized by the fact that there's only one producer, if we don't have faith that competition will arise or will always exist potentially to discipline that industry, if we don't have faith in that then we really don't have faith in the competitive system. The less faith we have the more concerned we would be with the situation you are conjuring up. The evidences that we have gives us every right to have a great deal of faith in the competitive system. I think you would be hard put to find a situation in the past where such an industry structure has come about and has resulted in dire consequences for consumers.

I don't know of any; maybe there is one somewhere, but I don't know of any. The competitive processes really seem to have precluded the problem.

What I would say is that I would feel even more comfortable if we always made sure that we kept open the door to competition

from other nations and did not erect any barriers to competition from there or at home.

I'm certainly not in favor of erecting any barriers now to protect the automobile industry from the competition it now faces.

So I think the situation you're conjuring up in terms of the recorded past is one that we should be concerned about, although I would never deny the ability of the person, an intelligent person, one with legal training, to conjure up a hypothetical which would make me squirm. If your hypothetical situation arose we could deal with it there. Why form a general policy to deal with such unlikely and infrequent possibilities?

Senator HART. Well, I have intruded on Mr. Granfield, but only in an effort to try and get a handhold on what to me is a slippery thing, the barrier to entry that is established by just the enormity of the capital required, forget steel and automobiles, and more esoteric newspapers.

Can you conceive of any substantial barrier to entry other than that created by Government regulation? The need for capital doesn't occur to you as one?

Dr. DEMSETZ. You and I are using "barriers to entry" in different ways. What you're talking about is a situation where the cost of producing a product is large.

When I say, "barrier to entry," what I mean is a situation where the cost of entering is higher than the cost of producing the product; for example, if a firm should have to overcome some kind of legal barriers to enter.

Now, it's quite true that the cost of producing a product may be high. The cost of producing steel by an efficient firm may be high in some absolute sense or even in some relative sense.

But that is not what I mean by "barrier to entry." All it says is that anybody, including the existing firms, must meet the test of the capital market. Even existing firms must pay a rate of return commensurate with the resources used in the industry.

Both existing firms and potential firms meet the capital market test if they're going to compete successfully, and they need to do it with resources of the magnitude that will produce output efficiently.

I think it's a mistake to think that this competition would come from the fellow on skid row. What would happen in the face of high profits is that Sears would enter the insurance business. Sears has the ability to tap capital markets just as well as any firm in any industry. There is a capital market that is willing to lend moneys if it feels that a rate of return sufficient to cover the cost of capital can be earned by the borrower. And that capital market is so huge that we can get vast industrial empires financed in relatively short time.

Senator HART. Ever tried to talk to anybody that tried to start a new newspaper in the metropolitan area—much less a new automobile?

Dr. DEMSETZ. Is that because of the cost of producing a newspaper? That wouldn't be so large. I don't think that that could possibly be the reason that they don't succeed.

Mr. CHUMBRIS. We went down that road when we had the Newspaper Preservation Act hearing in June of 1969, as to the inability

of New York City to get back beyond the two newspapers—the morning and the afternoon papers.

They had other problems.

Dr. DEMSETZ. The problems probably are not the difficulty of acquiring capital. The problem, if it is a problem, is that two newspapers plus the television media, plus the radio, give ample variety to most people in metropolitan areas. Persons are not prepared to pay the cost of maintaining three or four smaller newspapers. It's not the fact that there's such a huge amount of capital to acquire that keeps competitors out. If one of the papers didn't report the news generally, if one of the newspapers in such a city charged a price that was high relative to cost, then I think we would get new newspapers in the city.

Senator HART. Dr. Granfield.

Mr. GRANFIELD. Thank you, Senator.

Just in terms of the newspaper problem, I would argue that since I have been in Los Angeles I have seen more entries in the newspaper industry than I thought were conceivable.

There have been at least eight new neighborhood newspapers started and other publications which, on the Senate floor or in the Senate Chamber. I would not mention. But let's say they appealed to a distinct audience.

And I think that is what is happening in the publications field. Innovation has occurred and the product is being differentiated.

Dr. DEMSETZ. But this is one of those situations where we have to be extremely careful when you talk about what the market is. The advent of television and radio clearly has made it much more difficult to maintain any monopoly power over communication by newspaper, even it we had only one newspaper in the town.

Mr. GRANFIELD. Would you conclude now—with my question, Mr. Demsetz—with what you think the implications would be for the consumer if this legislation were to be passed.

Dr. DEMSETZ. I believe if this legislation were passed and enforced that it would be detrimental on average and in general to consumer interests; it would deter competition in those situations where the targeted criteria are likely to be triggered by competitive success.

There clearly is a danger of this in the bill. I think that we would all admit that. I happen to think that the danger is so serious that it overwhelms the advantages of the bill.

Mr. GRANFIELD. In fact, doesn't your evidence indicate that if production were to shift to these medium- and small-sized firms——

Dr. DEMSETZ. If deconcentration actually was triggered in a particular industry the cost of producing the product, according to my statistics, would go up as compared with the present situation in concentrated industries; this would be true on average and in general, but it might be the case in some particular instance.

Mr. GRANFIELD. Thank you.

Senator HART. Mr. O'Leary?

Mr. O'LEARY. I have no further questions, Mr. Chairman.

Senator HART. Doctor, as we anticipated, you've been interesting and stimulating and you will be widely quoted, I am sure.

Dr. DEMSETZ. Thank you very much. It was my pleasure coming here.

[The following was received for the record. Testimony resumes on p. 2291.]

MATERIAL RECEIVED RELATING TO THE TESTIMONY OF HAROLD DEMSETZ

Exhibit 1.—Vita for Dr. Demsetz

I. DATE AND PLACE OF BIRTH

1930, Chicago, Illinois, USA.

II. EDUCATION

Ph.D. and M.A. (Economics, 1959) and M.B.A. (1954) from Northwestern University. B.S. (Economics, 1953) from the University of Illinois.

III. PROFESSIONAL EMPLOYMENT

A. Academic

1. University of Michigan (1958-1960), Instructor to Assistant Professor, Economics Department.
2. University of California at Los Angeles (1960-1963), Assistant Profesor to Associate Professor, Economics Department.
3. University of Chicago, (1963-1972), Professor of Economics, Graduate School of Business and the Law School.
4. University of California at Los Angeles, 1972 to present.

B. Nonacademic

Consultant to the RAND Corporation (1961-1962) and Scientific Analyst for the Center for Naval Analyses (1963, while on leave from UCLA).

IV. PUBLICATIONS

(1) "The Nature of Equilibrium in Monopolistic Competition," *Journal of Political Economy*, February 1959. Reprinted in other publications.
(2) "The Effect of Consumer Experience on Brand Loyalty and the Structure of Market Demand," *Econometrics*, January 1962.
(3) "Economic Gains From Storm Warnings: Two Florida Case Studies," a RAND Corporation publication, July 1962.
(4) "Structural Unemployment: A Reconsideration of the Evidence and the Theory," *Journal of Law & Economics*, October 1961.
(5) "The Welfare and Empirical Implications of Monopolistic Competition," *Economic Journal*, September 1964.
(6) "Monopolistic Competition, A Reply," *Economic Journal*, June 1967.
(7) "Minorities in the Market Place," *North Carolina Review*, February 1965.
(8) "The Exchange and Enforcement of Property Rights," *Journal of Law & Economics*, October 1964. Reprinted in other publications.
(9) "Toward a Theory of Property Rights," *Papers and Proceedings of the AEA* May 1967. Reprinted in other publications.
(10) "Some Aspects of Property Rights," *Journal of Law & Economics*, October 1966.
(11) "The Cost of Transacting," *Quarterly Journal of Economics*, February 1968.
(12) "Do Competition and Monopolist Competition Differ?", *Journal of Political Economy*, February 1968.
(13) "Why Regulate Utilities?", *Journal of Law & Economics*, March 1968.
(14) "The Technostructure, 46 Years Later," a review article of Galbraith's *The New Industrial State*, *Yale Law Journal*, March 1968.
(15) "Comment on *Issues in Defense Economics*, Roland N. McKean, editor, Universities–National Bureau Conference Series, No. 20, 1967.
(16) "Information and Efficiency, Another Viewpoint," *Journal of Law & Economics* March 1969. Reprinted in other publications.
(17) "Perfect Competition, Regulation, and the Stock Market," in *Economic Policy and the Regulation of Corporate Securities*, edited by Henry G. Manne, American Enterprise Institute, 1969.
(18) "The Private Production of Public Goods," *Journal of Law & Economics*, October 1970.
(19) "The Regulation of Industry—A Reply," *Journal of Political Economy*, March/April 1971.

(20) "The Inconsistencies of Monopolistic Competition," *Journal of Political Economy*, May/June 1972.
(21) "When Does the Rule of Liability Matter?", *Journal of Legal Studies*, January 1972. Reprinted in other publications.
(22) "Wealth Distribution and the Ownership of Rights," *Journal of Legal Studies*, June 1972.
(23) "Theoretical Efficiency in Pollution Control, A Comment," *Western Economic Journal*, December 1971.
(24) "Production, Information Costs, and Economic Organization" (with Armen A. Alchian), *American Economic Review*, December 1972.
(25) "The Property Right Paradigm," (with Armen A. Alchian), *Journal of Economic History*, 1973 Proceedings.
(26) "Industry Structure, Market Rivalry, and Public Policy," *Journal of Law & Economics*, April 1973. Reprinted with some modification in *The Impact of Large Firms on the U.S. Economy*, Weston and Ornstein (Heath) 1973.
(27) *The Market Concentration Doctrine*, AEI–Hoover Policy Studies, 1973.
(28) "Reply to Professor Thompson," (with reference to my paper "The Private Production of Public Goods,") *Journal of Law & Economics*, 1973.
(29) "Joint Supply and Price Discrimination," *Journal of Law & Economics*, 1973.
(30) "Advertising In the Affluent Society," forthcoming in a volume to be published by the University of Chicago Press. Reprinted elsewhere.
(31) "Two Systems of Belief About Monopoly," forthcoming in a volume to be published by the Columbia Law School.
(32) "Where Is The New Industrial State?", *Economic Inquiry*, March 1974. Reprinted in style for non-economist in *The Alternative*, June 1974.

V. OTHER PROFESSIONAL EXPERIENCE

1. Testified before the Illinois Senate in 1968.
2. Testified on behalf of the U.S. Department of Justice before the Securities and Exchange Commission on the desirability of adopting market determined commissions for the organized trading of securities. (1968?).
3. Testified before the U.S. Senate Antitrust Subcommitte in opposition to a bill to reorganize U.S. industry, 1974.
4. Lectured (with A. Alchian) on economics for lawyers to distinguished law faculty during summers beginning 1970.
5. Lectured on economics for high school teachers at the State Teachers College, Monmouth, Oregon, Summer 1973.
6. Lectured on economics for college teachers at two G.E. Seminars.
7. Presented numerous papers at seminars and worksshops at various Universities and Conferences, both in the United States and abroad.
8. Organized two conferences at the University of Chicago, one on the economics of the regulated industries and the other (with Stan Kaplan) on the economics of conglomerates.

Senator HART. I should explain—not to limit anyone's time for discussion but by way of apologizing for anticipated interruptions and delays—I am obliged to recess about 12:30 in order to attend an earlier scheduled Policy Committee meeting, following which at 2 p.m. I am required to attend a closed markup meeting of the Patents and Copyrights Committee.

We welcome now the witness originally scheduled to open the hearing, Prof. Henry Manne, professor of law and political science, of the University of Rochester.

STATEMENT OF HENRY G. MANNE, PROFESSOR OF LAW AND POLITICAL SCIENCE, UNIVERSITY OF ROCHESTER, ROCHESTER, N.Y.

Dr. MANNE. Thank you very much, Senator. I hope that I didn't inconvenience the group by my late arrival. Whoever wrote that song about nice April showers was not thinking of upstate New York, where we had 6 inches of snow this morning.

Senator HART. Well, when people expect the Members of Congress to get home at the middle of the week, they always cite an airplane schedule that looks great.

Dr. MANNE. It doesn't always work that way.

Senator HART. But after a few years here you can't be very confident about it.

Dr. MANNE. Thank you.

The political and intellectual debate about the cause and effects of corporate size and industrial concentration has continued without resolution for nearly a century now.

Apparently, we are no closer to agreement today that we were during the murky and confusing debates on the Sherman Act over 85 years ago.

The subject still affords a happy hunting ground for anyone seeking simplistic and often sensational solutions to questions of vast complexity.

I should like, therefore, to isolate the few aspects of the industrial organization field on which there may be general professional agreement and address myself primarily to the question of how best to secure greater benefits of industrial competition in relation to what we know and what we do not know.

We may start any logical analysis of this subject by pointing out that a high concentration ratio could signify either that relatively large size firms are efficient or that they have engaged in monopolization or collusion of some sort.

It should be noted, however, that the efficiency argument does not in any sense mean that only one size of firm is optimal or will survive in a given industry.

A competitive industry may well generate firms in a variety of efficient sizes. Further, various combinations of numbers of large and small firms may occur in a competitive industry with all of them operating at high levels of technological efficiency.

But it is essential to understand at the outset a point many economists seem to ignore. There are economies of scale other than the purely technological ones relating to the size of a factory or the output of a given plant.

Competitive marketing strategies, management, labor laws, tax rules, safety regulations, communications, and a host of other issues may all lend themselves to economies of scale in firm size, as well as account for varying optimal sizes for firms within an industry.

Probably the single most significant nontechnological basis for large size relates to economies in complying with the myriad regulations affecting market contractual arrangements.

That is, we have by various market regulations often made it cheaper to handle production through intrafirm arrangements, thus swelling size, than through contracting in the open market.

An honest study of these costs, and the resultant effects, seems more overdue than another public debate over size and concentration.

It may not be remiss at this point to compare what we know about political parties to the issues in industry addressed by S. 1167. In the completely free political structures allowed by the U.S.

Constitution we have developed only two significant political parties.

And one of these, measured by party registration, is significantly larger than the other. Generally in the last 45 years it has achieved an overwhelming superiority of all votes cast.

It would seem, by all of the criteria used by proponents of the instant bill to judge the General Motors Corp. or IBM, that the Democratic Party should forthwith be reorganized into nine, or some other arbitrary number, of smaller, safer, more competitive, more innovative, and less politically powerful organizations.

Senator HART. I am tempted to say that you must not be a Democrat because we are organized into at least 90.

Mr. MANNE. That just proves how endemic competition really is.

How else, after all, can we expect our system of democracy to survive, competing interests to be recognized, and freedom to prevail.

I am, of course, merely paraphrasing some of the rhetoric used by economists who have previously testified before this committee.

But the analogy is in no sense far-fetched, and indeed the spectre of only two competing political parties in a nation whose central government has become as powerful as ours is more frightening to any thoughtful citizen than the vision of 200 large domestic corporations each competing in many ways for the consumers' dollars.

Yet no one with enough influence to be taken seriously has suggested that our political system is evil or that it exhibits monopolistic characteristics that could only be corrected by altering the structure of the parties.

Still it is a sobering thought. However, to return to industrial organization, the economic effects of monopoly power are twofold, and indeed the entire logical argument against monopoly, as opposed to large size per se, rests on these arguments.

One is that these firms are in a position to realize unwarranted high profits, and the second is that monopoly power causes an allocation of resources to their less efficient uses.

Unfortunately, the latter point, while it may express the more significant informed concern about monopoly, is not subject to any direct tests of which I am aware, since we do not have any nonmarket standards for determining allocational efficiency.

We are forced, therefore, by the nature of the data and techniques available, to limit ourselves to making comparative studies of returns in different industries and firms.

And even this must be done with a clear understanding that our statistical and accounting techniques for assembling this data and interpreting it are not terribly reliable.

Nonetheless the studies done to date strongly indicate that there is little or no significant correlation between industrial concentration and corporate profits.

To be sure, if one selects a particular year with peculiar characteristics, the figures can be made to appear otherwise, but in general, over a significant period of time, this lack of correlation seems well substantiated.

This is not to say, however, that no firm in a concentrated industry may not be realizing monopoly profits. The studies referred

to only indicate that there is no casual relationship between concentration on the one hand and monopoly profit on the other.

We are, it appears, as apt to find companies earning a higher than market rate of return in nonconcentrated industries as in concentrated ones.

Indeed, one thing on which there is unequivocal agreement among economists—a rare circumstance indeed—is that monopoly rates of return are realized regularly in some of the least-concentrated industries imaginable: those for personal services.

Members of the medical profession, many other licensed professionals, and members of strong craft unions in particular all appear to display this characteristic.

Again, as with political parties, it is rare to hear of remedial legislation being offered to remedy this clear monopoly problem.

In the industrial sector on the other hand, where remedies for unproved problems abound, monopoly rates of return, when they do occur, seem unlikely to persist for a significant period of time.

The reasons for believing this have little to do with the complex econometric industry models and concentration ratios so popular in this computer era.

To begin, unless entry into an industry is actually prevented by law or private coercion it is highly unlikely that new firms will not enter any industry in which some firms are presently and persistently realizing monopoly profits.

The information cannot be hidden for long. In this fashion, as the new firms increase total industry production, they compete down the monopoly profits previously being realized and will frequently be more efficient than the older firms.

This process of competitive entry is so powerful, and so irresistible without Government protection, that we need only consider one possible limitation to it as a complete solution to any monopoly problem, real or imagined.

There may be substantial nonproduction costs for entering an industry. These would mainly be entry costs associated with Government regulations, since any other costs should be considered merely capitalized costs of production applicable to any firm in the industry. To the extent that these artificial entry costs exceed the present discounted value of anticipated net revenues from production and sales, monopoly profits can persist.

In its most extreme form, when entry into an industry is made illegal—as when a certificate of public convenience and necessity cannot be acquired—entry costs become infinite.

Then any monopoly returns being realized by firms presently in the industry can be anticipated to continue indefinitely.

But it should be emphasized that merely because the most efficient size for a new firm is large does in no sense imply that artificially high returns to existing firms can persist.

Start-up costs are simply costs of production and the fact that they are high because the most efficient size plant is relatively large certainly does not imply any monopoly power in the existing firms.

There is no difference from an economic point of view in a large capital outlay for plant financed through periodic payments on

bonds and equivalent periodic payments made for raw materials in another industry with low start-up costs.

Each should be viewed as production costs. Yet some economists erroneously persist in referring to one of these as a "barrier to entry" and the other as a competitive cost.

The next reason for suggesting that S. 1167 addresses itself to a largely imaginary issue is the growing body of evidence that private firms are incapable of perpetuating a monopoly or cartel by private means—though the same evidence also shows that they have frequently made the attempt.

Recent historical works have made clear what economic theory had long implied about the perpetuation of monopolies: that it is prohibitively expensive to maintain a monopoly through purely private means.

Especially to be recommended to the members of the committee is the important work of Prof. Ellis Hawley entitled, "The New Deal and the Problem of Monopoly," Princeton, 1966.

About the only clear case one can imagine of long-term private exaction of monopoly rents are those in which racketeers use physical coercion to restrict competition and prevent entry.

Naturally we have no evidence about rates of return in such industries, but since such behavior is clearly illegal, its persistence would reflect largely a failure of law enforcement by governmental authorities rather than any evidence that private monopolization is normally persistent. In any event this type of behavior has not, at least in recent history, characterized any known efforts of large scale private industry in America.

Conventional business firms have much more frequently turned to the State or Federal Government for assistance when their private efforts to monopolize have failed.

Competition is after all the most dreaded and threatening process any business firm can confront. Before its power the mighty cringe and giants beg for surcease.

And when either the many or an influential few have "demonstrated a need for help," as the cliche has it, our Government has long shown its helpful readiness to respond.

In fact, in this function of protecting competitive firms from the harsh rigors of competition the Government has demonstrated a significant comparative advantage over the private sector, apparently because its coercive powers are so much greater.

But the reasons avowed for such protective legislation rarely describe honestly the actual motivation of either the industry seeking the protection or the Government officials granting it.

We are always told that Government regulation is adopted to prevent unfair competition, to protect the consumer from shoddy or unsafe products, to avoid monopoly pricing, to prevent fraudulent behavior, to conserve future supplies of goods, to save the environment, or to protect American producers and consumers from a foreign menace.

But we are rarely told the extent to which these regulations are encouraged or later supported for purely anticompetitive reasons.

More likely we are treated to homilies about Government-business partnerships and the social responsibility of corporations.

But who in politics will openly condemn the anticompetitive effects of the restraints Government puts on competition today?

Consider, just for starters, how much the public would benefit from free entry into transportation or the television industry; or from the repeal of tariffs and import quotas; or from a free market price for milk.

Yet the suggestion that we repeal these obvious restrictions on competition brings howls of protest from the interests presently protected and a strange silence from some of the same political representatives who express the most concern about the alleged monopolistic practices of big business.

Another reason that industrial monopolies are unlikely to persist in the absence of Government protection is that most industrial markets today are in reality international markets.

Few significant industrial items today involve such high transportation costs relative to price that the oceans provide a significant natural barrier to competition.

This fact alone makes most of the data presently used to describe concentration in American industries almost useless.

For instance, it is not uncommon to hear General Motors spoken of as having approximately one-half of the U.S. automobile market, with a clear insinuation that this statistic signifies monopoly power.

But the facts do not bear out the insinuation. While General Motors did, until recently, make about half the automobiles sold within the United States, and is naturally afforded some benefit over foreign competition by shipping costs, that does not tell us very much, since locational advantages are an important factor in any competitive situation.

It would be foolish even to try to act as if they did not exist. Still General Motors' fraction of free world vehicle production is approximately 22 percent; a figure that even the most ardent GM-baiters would not claim is sufficient to dominate an industry.

No one can honestly believe that the American automobile industry has not been subjected to intense competitive pressures from new entry in recent years.

In the period since World War II the total number of corporations offering distinctive styles, sizes, and qualities of automobiles in the American market has risen perhaps fivefold, and the survivors now account for over 1½ million vehicle sales a year.

Names like Volkswagen, Datsun, Toyota, and Volvo have become more common household words here than DeSoto, Edsel, Hudson, or Corvair.

These then are some of the reasons the various economic arguments against industrial concentration remain unpersuasive. There is, however, a "political" argument that should also be considered.

It is that some corporations are so large that they are able to "control" the Government, presumably as it were, to "buy" the protection, the subsidy, the transportation system, the war, or whatever they want from the Government.

The argument that companies like Standard Oil, du Pont, and General Motors run our Federal, State and local governments like

dictators is no longer simply a Marxist myth about the American system.

It has become common fare for television commentators, journalists, self-styled consumer spokesmen, and certain academics, all of whom speak with one voice—and a forked tongue.

Unfortunately, the energy utilized in making these assertions is about the only force behind them, and again it does not require complicated empirical studies to show the error, or perhaps the mendacity, for example, behind these assertions.

Has the automobile industry, for example, been more successful in Washington than the environmentalists?

Have the petroleum companies spent as much money lobbying for protective legislation as has the National Education Association?

Has the steel industry received as much bounty from our seemingly universal Federal welfare system as have the elderly, the uneducated, or those stricken with a strange desire to engage in farming?

One could go on like this almost endlessly. But to ask these rhetorical questions is sufficient to make the point.

There is simply no correlation between the concentration ratio in an industry, or the size of its firms, and the effectiveness of the industry in the halls of Government.

This scare argument about the political power of large corporations is a sham.

We all know that the institutions that influence policies in Washington are those that can deliver the votes or utilize their finances to secure votes.

And these are the very practices that large corporations are relatively weakest in performing, especially as compared to unions, farmers, consumer organizations, environmentalists, and other large voting blocks.

There is even less substance to this political argument about corporate concentration than there is to the economic ones.

Recently Senator Hart stated that "time is running out for those," like himself, "who would like to see competition given a real try in the marketplace."

However, to Senator Hart the reason competition has not been tried appears to lie in what he termed "the evident failure of the existing [structure of industry]."

That is, Senator Hart simply defines competition to preclude firms of a certain size, or industries with a certain concentration ratio.

Having asserted this definition, Senator Hart has, not illogically, proposed S. 1167, the Industrial Reorganization Act, to "make monopoly a per se violation [of the antitrust] laws and establish a special Commission and Court to oversee the restructuring of seven major industrial sectors of the economy."

The restructuring would take the form of super antitrust decrees ordering, among other things, substantial divestitures by firms in affected industries.

Senator Hart has argued in defense of this bill that it would allow the Government to intervene "only on a one-shot basis. It

would," he continued. "restrict industries where this would not sacrifice efficiencies.

"Then it would get [the Government] out of the market."

I should be the first to congratulate Senator Hart on the statement of this worthy goal of getting the Government out of the market.

Unfortunately, however, I do not think that the vehicle chosen will ever carry us to this brave new world. To be successful in this stated aim the following dreams would have to come true: The members of both the special commission and the court established by the bill would have to be satisfied merely to complete their assigned task and then abdicate their tremendous power and authority; they would have to know how to satisfactorily define and identify the limits of the industries to be restructured; the Government's regulation would not sacrifice significant efficiencies or economies of scale; and the incentive for new firms to enter an industry would not be diminished by the threat of a punitive response to success.

The lessons of history, economic theory, and practical politics argue overwhelmingly against every one of these assumptions.

No one can seriously believe that a Federal agency that has once tasted the addictive power of dissolving or restructuring the largest industries in America would quietly abdicate its political power when that job was done.

Such a group will develop its own political interests, alliances, obligations, and claims, and the very absence of concrete, objective economic standards of performance will guarantee that political criteria will prevail in their determinations.

By an iron law of bureaucracy this agency would do all in its power to perpetuate itself and expand its authority. And by a subsection of the same iron law, it would succeed.

We have yet to see in the history of American industrial regulation an agency dissolved or liquidated after its initial task was accomplished.

I see nothing in the proposed legislation suggesting that it is likely to happen here.

In the same recent speech Senator Hart alluded to the tremendous amount of resources that the petroleum industry has expended in gaining protection and subsidies from Congress.

He is correct, of course, but he seemed to overlook the fact that it takes two to make that bargain. And as we look around at various industries we are constrained to ask who has not done this. And more to the point, who has not succeeded?

It is unhappily almost impossible to name a significant industry in the United States that has not gained some degree of protection from the rigors of competition from Federal, State or local governments.

It appears, therefore, that the real costs of securing Government assistance or protection from competition are not very large, even though the economic costs to the public may be enormous.

Whatever the process is by which industries and firms achieve this governmental assistance we can only be certain that if it were made more difficult or more costly to gain these favors, less of this "political good" would be demanded in the political marketplace.

But the solution to inefficiencies created by Government controls cannot lie in still more controls. The politically responsible task ahead for Congress is to dismantle our existing regulatory monster before it strangles us.

We have spawned a gigantic bureaucracy whose own political power threatens the democratic legitimacy of government.

We are rapidly moving toward the worst features of a centrally planned economy with none of the redeeming political, economic, or ethical features usually claimed for such systems.

It is, as Senator Hart has stated, already late. In fact it may be too late. I have futilely urged the business community itself to stop seeking economic favors from the Government.

But, as should perhaps be expected by anyone who urges corporate social responsibility, I have gotten nowhere with this argument.

Now with a fearful sense that there may in fact be no one left to listen or to act, I would still urge this committee to forcefully reject any new regulatory gimmicks and to get down to the much more serious task of freeing American competition from its single most serious opponent, the U.S. Government.

Thank you.

Senator Hart. Thank you very much. You held no punches. I am grateful for it. You say that except where organized criminal musclemen have moved in, private firms are incapable of perpetuating a monopoly or cartel by private means.

Well then, do we need any antitrust laws?

Dr. Manne. Well, to follow the response of that question by Professor Demsetz, there certainly may be cases in which temporary monopoly and illicit gains may be made as a result of collusive efforts.

We don't find much evidence, as I suggested, however, that these collusions persist for any long period of time. Now, that is not to justify them and I think that some degree of warning in the form of something like the Sherman Antitrust Act certainly has a place in our spectrum of legislation.

Senator Hart. You would agree that it would be better to have Government include rather than wait for, what you describe as the natural course, the collapse of the monopoly?

Dr. Manne. Well, it is a tough question for me. I am not completely certain in my own mind. I think that the evidence to date on how the courts and the Antitrust Division and the Federal Trade Commission have behaved in relation to our existing antitrust laws is not reassuring.

If I were completely convinced that that legislation would be enforced in the future then I would probably have to conclude that we would be better off with no antitrust laws rather than that kind of enforcement of laws that might otherwise be justified.

Senator Hart. If you were to name one conspicuous example of—I forget the word you have used—inappropriate Trade Commission or Justice Department or court application of antitrust, what are those at the top of the list?

Dr. MANNE. Well, I think that we have certainly gone much, much too far, on almost any defensible theory, in our attack on mergers.

I think there are a number of perfectly valid reasons for mergers. I think that the extension into the general antitrust gambit of restrictions on tying arrangements, resale price maintenance, matters of that sort are not enconomically defensible.

Senator HART. What about reciprocity?

Dr. MANNE. I can't find any strong reason for believing that there is a significant monopoly problem with reciprocity.

Senator HART. Is there a problem with reciprocity?

Dr. MANNE. Not that I can see.

Senator HART. What if you were a guy trying to sell a product?

Dr. MANNE. One of the peculiar questions is why industry finds, in some instances, that a resort to barter rather than utilization of more direct and simple contractual forms, using money as the medium of exchange occurs.

I don't know of any good theories about that. I would suggest in some cases it may be as I have suggested in my statement, that regulatory impacts on certain kinds of contracts may make these arrangements the cheaper way for corporations to behave.

These reciprocal contracts can also be a kind of short term, temporary, or abbreviated form of merger or other arrangement with perfectly normal business connotations.

I don't see the argument in connection with reciprocity that certainly can be made about mergers, that any of them, prima facie, could be logically construed as the equivalent, as you suggested earlier, of a collusive arrangement.

I don't see that possibility with reciprocity.

Senator HART. Mr. O'Leary?

Mr. O'LEARY. I have no questions, Mr. Chairman.

Senator HART. Mr. Chumbris?

Mr. CHUMBRIS. I have just a couple of comments here, Mr. Chairman. You noted in your statement that General Motors had 22 percent of the free world production of vehicles.

The testimony we had in the last few days of our hearings showed also that General Motors has only 37 percent of the automobiles that are produced either in this country or in foreign countries and imported to this country, and at the present time General Motors has only 44 percent of the cars of American-produced corporations, down from the high of 52 percent that it had in the previous years.

Dr. MANNE. The figure that I asked my research assistant to dig up was total vehicles, so that this includes trucks, where the figure——

Mr. CHUMBRIS. I was just adding to what you had already put down. In other words, what you are saying is what General Motors produces both in this country and around the world amounts to about 22 percent of the free-world market?

You had a very interesting point, also on the political power of big business. It is a subject that comes up repeatedly in our hearings because we always are dealing with so many different indus-

tries. I don't know whether you have ever read his book but Professor Engler wrote a book on the "Politic of Oil."

It goes back into the early 1930's, and goes back into the early history of oil. I think your point is well taken that if there is this so-called political power in this country it is stronger in the hands of the labor unions—and for good reason as has been explained time and again—and more lately in the hands of consumers.

Take Ralph Nader, and Mr. Gardner of Common Cause. They have a tremendous clout not only on Capitol Hill but I would say in the operation of the National Government and even on the State level. I have always felt that business was really a bad fourth place, with Government being the largest, with labor unions giving them a good close run, consumerism coming in third, and big business a bad fourth.

Dr. MANNE. I am sure we are not in disagreement when I add for emphasis that I see nothing wrong with that. I think it is quite healthy to have all of these varied forces competing for political power in a system such as ours.

On the other hand, this bad fourth as you call it, has, I believe, received undue attention from the press and perhaps other avenues of publicity. There is commonly thought to be some sort of overwhelming power industry has almost to reach in, as one does at a retail counter in a department store, and buy any legislation or ordinance or rule that they want. I think this is terribly misleading and, incidentally, destructive of the public confidence in a system the public should perhaps have more confidence in.

Mr. CHUMBRIS. Just one other point. You refer to the eight Federal agencies. First let me preface with this remark:

Over the past 5 years, Senator Ervin, as chairman of the Separation of Powers Subcommittee, has held numerous hearings on the Federal agencies which the subcommittee felt were going beyond the scope of their legislative authority. Congress created those agencies for a specific purpose and some have gotten too independent.

Do you think that that might be a reason for some of the problems that you related in your paper, and as Professor Demsetz has also related?

Dr. MANNE. I think it is a tremendous problem. Agencies of various sorts developed, as I suggested, a kind of life and a lifestyle of their own.

They have become the most significant lobbyists, or at least among the most significant lobbyists, for their own interests and it is foolish not to think that agencies and the individuals within these bodies, do not have political interests just as clear as General Motors, or the UAW, or the petroleum industry, or anyone else.

They certainly do, and as they grow they tend to use their political power to improve their interest as they see it.

The effect of this, I find, is very often to go beyond what Congress normally intended. It is very difficult, then, for Congress to closely supervise the behavior of such agencies.

I happen to have studied most closely and do a great deal of my own research and writing in connection with one of the more ob-

scure of the major agencies that; is the Security- and Exchange Commission.

I think in case after case I could document that that agency has gone beyond the powers that were given to it in the enabling legislation. And yet the cost to committees and to the Congress to constantly supervise and correct these departures from the power granted and intended in the initial legislation is far too great to warrant the policing.

It is a cost problem not totally unlike the matter of entry into an industry. As a result, these agencies can persist in a kind of war against one faction or another in the private sector.

Mr. CHUMBRIS. Thank you very much, Dr. Manne. There are many other things I would like to take up with you but we have a time limitation and we have more witnesses.

I would like to yield briefly, Mr. Chairman, to Professor Granfield for some questions.

Mr. GRANFIELD. Dr. Manne, you tell us in your paper that you see monopoly power in certain professional service organizations, grafting in the medical profession specifically, and you list some others.

Is there one aspect of this monopoly power that they all seem to have in common, or what is it that leads to the pervasive monopoly returns for them?

Dr. MANNE. I think it is quite clear. There is a single thread that runs through every one of the examples that I gave here and many others that I can name and that is a restriction on entry into the industry.

Now, in general, those restrictions will never survive without the force of the Government behind them, and in most cases they simply take the form of licensing of a profession or the necessity of a certificate of convenience and necessity or something of that sort.

However, in some cases it becomes somewhat more complicated, though the effect remains the same. Often, for instance, the Government, either through action or inaction, simply provides a situation in which private, coercive power may be used to restrict entry.

Mr. GRANFIELD. So you would agree with Professor Demsetz that one test of the pervasiveness of a monopoly is in terms of their entry.

I want to relate now, to this: to exit and entry. Economists tell us when there are true monopoly returns taking place, even in the short run, you should expect entry into the industry.

Similarly, if we see exits from the industry it must mean that monopoly returns, no matter what the accounting figures tell us, must not be occurring.

I refer specifically here to the computer industry. Recently it has been alleged that monopoly profits were being earned in the computer industry, yet we have seen significant exits from the industry on the part of RCA and GE, who when they exited claimed they were earning something less than monopoly profits.

Would you agree that this is an indication that there are probably not profits occurring in that industry?

Dr. MANNE. I think that is so.

An entire industry may decline to the point where only one firm is left. Well, by a somewhat older and I think today somewhat outdated definitions of monopoly, we would say that was a monopoly industry simply because there was only one firm left.

On the other hand, that would certainly be no cause for concern, since indeed, by hypothesis here, we have stated that the entire industry was declining to the point that it could only support one industry.

If I recall correctly, there is, in fact, only one buggywhip company of any significance left in the United States.

Mr. GRANFIELD. One final question, which I think poses a very intriguing problem, is the relationship between political power and economic power and the purchase or the control of political influence, even with respect to partial monopolies such as tariffs or quotas.

Can you offer this committee an insight as to how a group effectively organizes itself to gain this kind of political power, what are the attributes of such a group, and what can it offer the political arena to gain this type of influence?

Dr. MANNE. I wish I knew the answer to that. I have no aversion to making money and I think if I knew how to do that I could become very wealthy.

We have seen some examples in recent years that are quite extraordinary in the methods used and the success they have had.

I have particular reference to the phenomenon known as Ralph Nadar. Again, I think this is a demonstration that it is possible, when you have a powerful and unique individual with tremendous skill and confidence, to develop this kind of political organization.

One of the difficult problems, however, seems to be that the organizations tend to occur on one side of the political spectrum. Again, I have not given much thought to this, but it is a matter that certainly would deserve greater attention.

It would seem to me that the interests of the public in gaining freedom from regulation and the inhibition of competition that both I and Professor Demsetz have referred to, somehow aren't protected.

Now, whether that is simply because the benefits are too diffused and the organization costs too high I don't know.

Mr. CHUMBRIS. Thank you, Mr. Chairman.

Senator HART. Your hesitancy to attempt to explain why any political force either succeeds or fails, your inability to answer that, I am sure doesn't give you any discomfort or shouldn't.

Nobody has ever really figured out how it works. I am trying to think of a relatively neutral area.

Dr. MANNE. I might even add that perhaps it is politically safer that we don't know how that happens. It seems to occur in almost random fashion, where organizations at some point, certainly are formed to answer felt-or-expressed public concern.

It might be unfortunate if we knew how to manipulate the public so skillfully that anytime anyone could specify an interest, he could formulate such a group.

Senator HART. Well, I have gone in many audiences and asked if anybody was in favor of permitting children to go hungry and

nobody has. Are you in favor of feeding the hungry children? Everybody is, so we aren't even able to do that which no one opposes and everybody favors. Why is that?

Dr. MANNE. Well, of course, there are still numerous questions of the methods to be used in allocating resources, the definitional problems, the responses of the individuals who are not involved directly in the process.

It is easy to say what you are in favor of.

Senator HART. Well, I cite the example only to highlight the enormity of defining what happens when you get into areas where there are people strongly for and strongly against.

When you move into that area then it is a small wonder we don't really know what makes it tick. Thank you very much, Professor.

Dr. MANNE. Thank you, sir.

Senator HART. Let us see if we can at least get the testimony of the next witness and his associates. Our next witness is William S. Billings.

I believe Mr. Billings is the principal owner of Eastshore Lines of San Francisco. He is accompanied by A. B. Allen of the American Pacific Stage Co. of Sacramento; Elwood L. Arneson, of Evergreen Trails; and David Sproul, of the American Pacific and Eastshore Lines.

I think all are operators of independent, intercity bus companies and it is my understanding Mr. Billings will testify as spokesman for the group. You and your associates are welcome to come up.

STATEMENT OF WILLIAM S. BILLINGS, PRINCIPAL OWNER, EASTSHORE LINES, SAN FRANCISCO, CALIF., ACCOMPANIED BY A. B. ALLEN, AMERICAN PACIFIC STAGE CO., SACRAMENTO, CALIF.; ELWOOD L. ARNESON, EVERGREEN TRAILS, SEATTLE, WASH.; AND DAVID SPROUL, OPERATING MANAGER, AMERICAN PACIFIC STAGE CO. AND EASTSHORE LINES; OPERATORS OF INDEPENDENT, INTERCITY BUS COMPANIES

Mr. BILLINGS. Thank you, Senator. Do you feel that we have time to read the testimony?

Senator HART. Certainly. Go ahead.

Mr. BILLINGS. All right.. I will skip the introduction as the Senator has already gone over that and if this procedure meets with your committee's approval, I will be the formal spokesman for the group, and all of us will participate in any responsese to be engendered by you, Mr. Chairman, or by your colleagues on this Subcommittee on Antitrust and Monopoly.

Our basic premise is that small business will be harmed if there is to be fragmentation of big business in the bus manufacturing industry.

We believe we have not been "mousetrapped" into becoming the customers of General Motors. Rather, we think the present situation arises purely from General Motors having built a better "mousetrap," one which has motivated the independent, intercity bus company to beat a path to GM's door.

There are two truisms. One: in today's bus operating field, small business is confined to intercity operations; and two, the products of General Motors' Truck and Coach Division meet the needs of small intercity operators to a greater degree than any competitively available product.

Recent urban transportation history has been that publicly owned transit authorities have supplanted almost totally those private local transit companies which died because of declining ridership.

Small business, intercity operations, have been and are similarly in jeopardy, suffering from the effects of an unequal contest in which the titans of intercity bus transportation have been able to dominate the long-haul, single, or family-fare market, as that market remains following the main meal of the private car.

Sharp inequities arise, also, in the use of Federal funds to enable charter competition from tax-sustained transit systems.

But these issues are largely extraneous to the sole consideration now before this committee. The question, as we understand it, is whether the functioning of the truck and coach division as an integral part of the General Motors Corp. is a help or a hindrance to our competitive system generally, and to the transportation industry per se.

A corollary of that inquiry is one that we perceive to be whether the functioning of the truck and coach division has created bounty or blight upon our national transportation scene.

We submit that the present corporate structure has had beneficent effects, and we submit, further, that divestiture of the truck and coach division would affect small business adversely.

One such adverse effect would be the great danger that, following divestiture, the successor company would not continue to produce highway coaches.

It is doubtful that independent operators who constitute the current aggregate market for that type of equipment create enough demand to achieve break-even, let alone profitable break-through, levels of highway coach production.

Because of the restricted character of the market we fear that coaches at the earliest possible moment wherein such discontinuance could be accomplished with any decorum.

The reason we feel the market is unprofitably narrow is that the titans of intercity bus transportation produce, within their corporate families, most of the equipment they operate.

We see no reason to anticipate that divestiture at GM would cause any change in the patterns of equipment acquisition by Greyhound and Trailways.

Bus-building profits for the truck and coach division are in the city transit field. Following divestiture the successor company would certainly wish to maintain GM's preeminent position in that field of transportation equipment supply.

Those who comprise the present market for city buses would have their needs accommodated, but intercity operators would be obliged, by contrast, to turn to sources which they have found not to be satisfactory.

We do not maintain that the types of equipment operated by Greyhound or Trailways systems have less passenger appeal than do GM buses.

In fact, if such buses have advantages, those advantages benefit the passenger, while militating against the independent bus operator.

Even if we were to convert our entire fleets and maintenance to produce such as those moving under Greyhound and Trailways colors our operating ratios would suffer.

We, in the private, independent bus operating family, have no hope of equipping our garages with the supersophisticated equipment needed to service non-GM buses.

Nor have we access to any patent use or other compensations which the two nationwide bus companies may enjoy by reason of the equipment they choose to operate.

We know simply that we wish not to be thrown on those narrow sources of supply. Our reluctance prevails at the levels, both of pricing and of customer relations.

Purchase price is not presently a really complicating factor in the evaluation process of competitively available non-GM equipment.

But parts costs and complexities are sharply negative quantities. Parts for the "Jimmy"—the diminutive term given to products of GM's truck and coach division—are readily available at or near the headquarters of independent bus companies across the country.

Parts for the alternative products are sharply regionalized, and their pattern of availability tends to throw the independent bus operator on the mercies of his major competitor at the maintenance centers of that competitor, the locations of which are determined by the strength of that competitor's need, therefore being placed where the competitor is strongest and the independent the least well placed to compete.

Either the independent will be obliged to rely on distant parts sources or he must be dependent upon his chief competitor, and become less competitive in the process.

That loss in competition can only mean that divestiture of the truck and coach division, a process designed to stimulate free enterprise and the competitive market, would instead have a directly opposite effect.

We see no way in which either Greyhound or Trailways can be made to be genuinely interested in facilitating the operating efficiency and convenience of their only real competition, the independent company.

Because of considerations such as have been cited here we ask that this committee lay aside any plan to impose divestiture of the truck and coach division upon the General Motors Corp.

If theirs is a monopolistic venture, we find it to be singularly benign. We have enjoyed excellent relations with a company that produces a superior product.

We believe that happy relationship may be continued if the company's present corporate structure is allowed to remain undisturbed.

We believe also that competitive free enterprise will be served in the process. Conversely, if divestiture should be required, we are

confident that the reverse of the anticipated result will ensue; that the failure rate among independent bus companies will rise; that competition in the local transit field will not thereby be ensured, but that competition will in fact be lessened both in the fields of bus manufacture and of bus utilization.

Mr. Chairman, we appreciate the opportunity to appear before you, and we will be happy to respond to any interrogation you or your colleagues may think to be appropriate.

I would like to introduce Mr. A. B. Allen here at my left and Mr. Elwood Arneson and Mr. Sproul.

Senator Hart. Thank you very much, Mr. Billings. Mr. O'Leary?

Mr. O'Leary. Mr. Billings, on page 3 of your statement, in the second paragraph, you state as follows:

> It is doubtful that independent operators who constitute the current aggregate market for that type of equipment create enough demand to achieve break-even, let alone profitable break-through, levels of highway coach production.

Mr. Billings. Yes. I feel, Mr. O'Leary, that would be one of the most serious results of the divestiture and I am basing this on the experience of other manufacturers, primarily the second builder of highway coaches up until several years ago, which happened to be the Flexible Corp., were not able to achieve enough volume of production to continue their intercity coach and dropped it in favor of concentrating on the transit- or city-type vehicle.

This especially happened after the Federal grant became available to the public agencies and the market for transit buses grew so large so swiftly that they discontinued a relatively small production line in order to concentrate on a more viable product and this, I am sure, would also affect any other manufacturer who would acquire the Truck and Coach Division of General Motors. I am sure they would be faced with this same problem, and that is really one of the most serious things that we are worried about.

Mr. O'Leary. Do you have any information that General Motors does not now recover their cost plus a reasonable profit on the buses they sell to you?

Mr. Billings. No, sir; I do not have that information. I, in fact, have not even consulted with any of the General Motors people on these details.

I am just expressing the thoughts that come to me through experience in watching the industry and reading the trade papers and being a member of the various bus organizations around the country and talking to other operators.

In fact, all of us here in this room that attended with me today are concerned that—and have been concerned that—the volume of production is so small that GM may take this same stand.

Fortunately, the demand has picked up, I believe, in the last year or 2, to enough that hopefully they will continue to make an intercity coach and they are also, hopefully, designing a new coach.

You see, the present basic coach has been in production since 1965 or 1966.

Mr. O'Leary. The Trailways bus, is that comparable in price to the GM intercity bus?

Mr. BILLINGS. When I last priced it several years ago, it was. However, the major components of that bus are foreign built and due to the devaluation process the coach has become more expensive, and I believe it is presently higher pricer than a GM product.

Mr. O'LEARY. The bus is built in Belgium, is it not?

Mr. BILLINGS. Yes, sir; it is.

Mr. O'LEARY. And it uses a GM diesel?

Mr. BILLINGS. Yes; it does at the present time.

Mr. O'LEARY. GM has always denied allocations made against the corporation that it subsidizes one product line with resources or revenues from another which prompts my question.

You have no evidence or information that they are doing this with respect to intercity buses, do you?

Mr. BILLINGS. No, I do not. I really do not have that knowledge.

Mr. O'LEARY. My question then is, If they are recovering their cost plus a reasonable profit, why wouldn't a divested truck and coach division likewise build intercity buses to satisfy the same demand that GM is now satisfying?

Mr. BILLINGS. Yes. May I be excused just one moment? Mr. Arneson has a question. May Mr. Arneson answer the question?

Mr. O'LEARY. Certainly.

Mr. ARNESON. Mr. O'Leary, the thought comes to my mind in this regard going to these coaches, the intercity coach and the city coach built by General Motors, when you get to the floor and below the floor the two vehicles are quite similar.

They might have a different final ratio for going down the highway and one might have an automatic transmission and the other mechanical, but a good deal of the engineering cost is not charged out to production of 300 or 400 intercity coaches.

This design cost is charged out to 3,000, 4,000, 5,000 or 6,000 vehicles, city buses, suburban buses, and intercity.

I think this is the one thing that we rely upon at the present time to really keep General Motors interested in putting intercity buses together and the buses are so similar under the skin, so to speak, the powerplants and all, air-ride suspension, and various other things—electrical is a very major maintenance in buses, with heating, the automatic this and air conditioning and all—that change some windows and change some seats and basically you have another vehicle.

Mr. O'LEARY. I am sure you gentlemen are aware that GM was sued for monopolization of buses back in 1965. The complaint was filed in 1956 in the eastern district of Michigan.

Mr. BILLINGS. Yes, I am not aware of the details of this suit but I am aware there was such a suit.

[Concerning the court action referred to, see exhibits 1 and 2 at the end of this group's testimony.]

Mr. O'LEARY. And by the terms of the consent decree entered into in 1965, GM agreed to supply diesel engines and transmissions to any bus assembler for a period of 25 years?

Mr. BILLINGS. Yes.

Mr. O'LEARY. So that they would still have an obligation to supply in the divested GM truck and coach assembly, would they not?

Mr. Billings. I would assume so.

Mr. Allen. Mr. O'Leary, I would like to join in here for a moment. First of all, what you have stated about the engines is correct.

The fact is MCI Coach has the GM diesel, the Eagle has a diesel, Crown Coach, and every other manufacturer including Flxible and any other person that builds buses, but the thing is why should we have to take second best?

Why should we have to take something that is less superior? An inferior product, in a sense. In other words, a rehashed General Motors coach when we can get the original, the superior, better product?

To serve the consuming public the transportation people, intercity people, why should we have to go for second best when we can get first and get it first hand?

Second, we have an engineering program that you talked about. We have the truck and coach engineers and if they need help they can draw on the engineers of the corporation which their cost would—for the small time that they would be involved in engineering that bus—be charged to the coach and as Mr. Arneson stated, it is Federal—the city buses, suburban buses, and transit buses.

Also, the corporation, or the truck and coach division consults with us, finds out what our needs are. Now, like some of these previous manufacturers, I am thinking of some that are not in business at the present time, had inadequate brakes, they had inadequate heating.

There are vehicles where an assembled—well, it was just assembled parts but it wasn't properly engineered. It didn't do the job.

Now, of course, everybody is concerned about cost. Now, actually as far as General Motors coaches are concerned, they are a very well-built coach.

The maintenance, the operation costs are very low because we can get longer mileage because of the superior engineering.

Also, we have the advantage if we have a GM coach that when it comes time—say that we have used the bus for the 9 or 10 years—we are all small operators, and when I say small operators we operate approximately 30 to 50 buses each so if somebody else is a little smaller than we are, and they need this coach, we can recover a substantial amount of our investment which is very necessary for us to continue on.

Now, if we get some other manufactured vehicle, we can't get rid of it. I have a situation where we have a small manufacturer that uses GM component parts. I can't give the bus away.

It is a good bus but it is to the place now where it should be replaced, and somebody else could use it, but we can't get rid of it because there is no demand for it.

So you run into this type of situation. So there are many, many reasons that it would be an adverse situation for the truck and coach division to be pulled away from the corporation.

They have a good product. Don't penalize the corporation and don't penalize us at the same time, and insist that we have to take an inferior product to serve our customers, your constituents.

Mr. O'Leary. Well, I am sure you are concerned. I think it is a legitimate concern but it is always one which pops up on the subject

of divesture, when the subject of divesture is proposed, because inevitably we are comparing a known situation with an unknown, are we not?

Now, you know what your situation is now. It is your opinion that it would be worse if General Motors were forced to divest itself of its bus production facilities but you don't really know that, do you?

Mr. ALLEN. Yes, I think that we could come into this and we could mention these in particular. You take the General American—well. I think they have manufactured tank cars—after the war in 1946, they built what is known as the Arrow Coach.

They had various engines in it, they had inadequate brakes, they had inadequate—in other words, it wasn't designed—I mean they tried to come into the market.

There was a great demand for buses after World War II so there were a lot of these coaches built. There were a lot of them used.

There are some of them still floating around today. But they didn't do the job. They were expensive to operate.

So if our expenses go up, we have got to charge the traveling public more money or we are not going to be in business very long. As the professor said, we have to have that incentive out there to make a profit.

Otherwise, we are not going to be around. Now, the same thing, there are other small manufacturers in California, there are small manufacturers back here, but they do not have the ability or the resources with which to build a better product.

We have a good product and a good example is that all the engines in the major buses that are manufactured today are the GM diesel.

Now, that engine has been out since the late 1930's, early 1940's. Now, their engineering must be good enough that their engineers have not been able to come up with a better engine or a more efficient engine to operate these buses so they are using the same thing so we have to take a rehash deal to get this so we do have engineering.

Mr. O'LEARY. Well, how do you know that you would not have the same plant in Pontiac building the buses, the same peoople who are now GM people assembling those buses equipped with the same GM diesel and components under a different corporate shelf?

Mr. ALLEN. Well, that is a matter of conjecture. I mean, whether it would be there or not. I don't believe that we are qualified to comment on that, but the likelihood is that there would be another plant or another facility that would be established to do this.

Would we have the resources of the engineering department of the corporation, the various facilities of the corporation? Would we have these in a smaller company?

Usually, if the volume is down then their cost would go up and we would not have the resources on which to rely upon.

Now, as far as the corporation is concerned, we understand that they are coming up with a new family of buses.

They have contacted myself and many other operators throughout the country and asked us what do you need? What does your customer need to make a better bus, a lower operating cost bus which would stand up and give you long service?

They are coming up with prototypes. They are investing a lot of money into this and they are consulting with us and trying to get what we need, not having some engineer come in and say this is what the industry needs.

They are consulting with us, and it is strictly a competition basis. Now, they have competition. It is very definitely competition here and there is no way, in my opinion, that they have a monopoly in the bus industry.

Actually, they are furnishing it to the independent operators because Greyhound and Trailways build their own buses.

If we want to buy an MCI bus we pull off a bus that is manufactured to the requirements of Greyhound Corporation. We don't have anything to say about it. We might be able to say we are going to have American seats, we are going to have Nashville seats, but everything else, it is just another Greyhound running down the road.

The same thing holds true with the Eagle. It is the same. We have nothing to say about it. At least here we have the opportunity to go in and tell them that we need this type of equipment.

They listen to us. They want to know what we need. What we need to make a better operation, to help us stay in business and make a profit so we can buy more buses.

Mr. O'Leary. Doesn't that all come down to the fact that you are happy with GM at the present time and you just don't know what the future will bring?

Mr. Allen. Well, Mr. O'Leary, I obviously must be happy with GM or I wouldn't be here. I am here at my own expense and we have not been consulted by GM on this.

We are concerned that we have a product. It is a good product. Why should they be penalized? Why should we be penalized?

Now, Mr. Billings here has used MCI's. Elwood here had the Eagles. I have used Arrow Coach. I have used the bus manufactured in California, and we invariably come back because we find out at the bottom line, GM makes money for us and this is the name of the game. We have to have a profit to stay in business and the people that make the best product are the people that are going to sell the product and the only way to sell it is that they have the product, they beat the competition.

And if anybody wants to get into the business, as I understand it, entry is the problem here, and anybody that wants to get into the bus business can get in the bus business as far as manufacturing is concerned.

There are many bus manufacturing companies here but they haven't had the product.

Mr. O'Leary. As long as they buy their diesel from GM.

Mr. Allen. They don't have to. There is Cummings diesel engine. There is Perkins. There are many others—Leland—diesel engines and the fact is I have had Cummings engines in some of my buses, other buses other than GM's, that I have bought but I found such engines to be very expensive and not adequate for the job.

They don't do the job that the GM engine does. So the thing comes in, I mean, are we supposed to get somebody else's that is not doing the job?

I mean, this is not the name—this is not the way it is supposed to be. In other words, you want to get the best product that you can get and you want the product that is going to make money for you and it is going to stand up and that is what we have to have in GM coach and GM diesel and actually it sounds as if we try to make it in here, actually you are going to make it more difficult and more expensive for the general public, is what it actually amounts to.

Mr. O'Leary. Well, it is glowing testimony for General Motors and it is appropriate that we should hear it. Thank you.

Senator Hart. Mr. Chumbris?

Mr. Arneson. Mr. Chairman, may I make one statement? It is very short. I know the time is late. I understand the new administration taking over GM, that it was going to be built next year in the same building or what it was because I have a career of over 40 years in the bus industry myself and my family actually started in it a good many years before that so I heard this from the time I was born, practically, but we know that there are changes.

We have seen in Flxible, we saw it in Fitzjohn, another defunct one, Mack, go on down the line.

Now, since 1954 the GM intercity coach, through 1974, there are many, many parts that were interchangeable. I run coaches as old as 1954's that are good, respectable buses, GM's.

I have kept them up. Interiors, exteriors, mechanical, and I still run them. They are serviceable equipment. We just move them, downgrade them, from first line service on long hauling intercity to short haul for commuter.

Right now I am hauling Navy Yard employees, but they are very presentable coaches with upholstery and the whole works but there are parts on them, many parts that fit the new equipment.

This cuts down on inventory and this is very important. Thank you.

Senator Hart. Mr. Chumbris?

Mr. Chumbris. Mr. Chairman, I know the time is short. I just want to close with this thought. As I review your testimony and the colloquies, there is the fact that you don't want to rely on getting your equipment from your competitors, and at the same time you are afraid that if there is a divestiture, the new corporation is going to concentrate on where the profit is, as you note in your paper—which is the city bus system around the country. You, however, are in the intercity business and it is less profitable.

Mr. Billings. Well, that is my primary concern of this whole legislation, or proposed legislation.

Mr. Chumbris. Mr. Granfield has one question.

Mr. Granfield. Just one point. Mr. O'Leary asked you if you would think that perhaps that the company that would arise from divestiture would be superior to the current GM bus company you deal with, and is it not your statement that if we believe that competition or survival of the fittest, GM has already survived the competition?

It has turned out to be the fittest in your terms and it is not conceivable to you that the company that would arise from divestiture would be more fit than the company that has already survived the competitive wars?

Is that an accurate paraphrase?

Mr. ALLEN. It is in one sense, but why should we have to go through the growing up of another competitor when we have already had a viable corporation now?

In other words, they didn't become the best bus manufacturer in the last couple of years. I mean, it has taken them many, many years to get to the position that they are today; so why should we have to go through that again?

Mr. GRANFIELD. I see no reason why you should have to.

Senator HART. Gentlemen, thank you very much. Fortunately, we are able to adjourn rather than recess. We will resume tomorrow morning at 10 a.m. in room 318 of the Russell Senate Office Building.

[Whereupon, at 12:40 p.m., the hearing was adjourned to reconvene at 10 a.m., Wednesday, April 10, 1974, in room 318, Russell Senate Office building.]

[The following was received for the record. Testimony resumes on p. 2323.]

MATERIAL RELATING TO THE TESTIMONY OF MESSRS. BILLINGS, ALLEN, ARNESON, AND SPROUL

Exhibit 1.—Excerpts from Court Proceedings, U.S. v. GM

In the United States District Court
for the Eastern District of Michigan (Southern Division)

Civil Action No. 15816

UNITED STATES OF AMERICA, PLAINTIFF
v.
GENERAL MOTORS CORPORATION, DEFENDANT

PRETRIAL PROPOSED FINDINGS OF FACT AND CONCLUSIONS OF LAW

* * * * * * *

30. In 1929 defendant entered into an elaborate arrangement with Greyhound which was of mutual benefit to both companies. Defendant agreed to manufacture and sell both standard and specially developed buses to Greyhound under a special pricing arrangement which had the effect of giving Greyhound lower prices than those charged by defendant to other customers. Greyhound and defendant agreed to work together to build an intercity bus incorporating the latest improvements, which bus would be available only to Greyhound companies. In fact, defendant agreed not to sell any buses to competitors of Greyhound without its consent. In return for this, Greyhound agreed to buy not less than 75 percent of its requirements from the defendant. This arrangement lasted for twenty-three years during a period in which each company became the largest and strongest competitor in its field. In 1952 when the arrangement terminated, both companies had achieved their respective monopolies.

31. In 1929 defendant acquired a substantial, but not controlling interest in Will Motors, the service company to the Greyhound system. Defendant agreed to sell parts to Will Motors at a price substantially lower than it sold parts to others. In consideration of Will relinquishing the manufacture of buses, defendant agreed to pay it 6½ percent of the selling price of all buses sold to the Greyhound system. As Greyhound controlled Will Motors, this was a rebate, and, therefore, a further reduction in the selling price of Greyhound buses. Furthermore, Will Motors and Greyhound promised to buy both General Motors parts and parts made by other manufacturers from the defendant exclusively. This arrangement lasted for twenty-five years.

32. In 1952, although terminating its manufacturing and requirements contract, Greyhound signed up for 500 specially built "Scenicruisers" totalling $14,400,000 plus engineering and development with options to purchase 2,000

additional number of cruisers. Again defendant agreed not to sell these buses to competitors of Greyhound without its consent.

* * * * * * *

77. Defendant acquired the power to control Atlantic Greyhound Lines, Inc., and its subsidiaries, and the United Cities Motor Transit Company and its subsidiaries, by acquiring and holding a controlling capital stock interest in these companies, by having officers and employees of defendant on their boards of directors, and by promoting their formation and assisting in their expansion. It acquired the power to influence the policies of Greyhound, National City Lines, Omnibus, City Coach Lines, and other operating companies, by purchasing substantial capital stock interests, having officers and employees of defendant own stock in such companies, having officers and directors of defendant on the boards of directors of those companies, and by promoting their formation and assisting in their organization and expansion, as further described in the following findings.

78. Defendant's acquired power to control and influence the policies of the aforesaid companies directly resulted in virtually the exclusive purchase by them of defendant's coaches and the foreclosure of any opportunity for competitors to sell their equipment to such companies. This exclusive purchasing over a period of years also resulted in standardization by the purchaser on defendant's buses and parts, which standardization continued long after defendant may have relinquished control or influence over the aforesaid companies, and had the effect of continuing to foreclose competitors from selling their equipment to the purchasers.

79. In December 1929, one month after defendant contracted to be a virtually exclusive supplier of buses to the Greyhound companies, it organized a holding company, the National Highway Transport Corporation (NHTC), to establish an intercity bus system in the southeastern part of the United States. At that time, Greyhound had not extended its lines to this part of the country, but two intercity carriers, Blue and Gray Transit Company and the Camel City Coach Company, operated in every state in the southeast except Florida. Defendant's purpose in organizing NHTC was to acquire for Greyhound operating lines in the Southeast, at the same time expanding GM's sales of coaches.

80. In 1930 defendant acquired a controlling interest in Blue and Gray and in Camel City and conveyed these interests to NHTC in return for NHTC stock. It caused the minority stockholders in these companies to exchange their stock for shares in NHTC. As a result of these transactions defendant controlled NHTC and likewise controlled Blue and Gray and Camel City. It placed I. B. Babcock, H. E. Listman, and H. C. Grossman, officers of Yellow, on the Board of Directors of NHTC, and it thereafter promoted the acquisition by NHTC of a number of other independent bus operating companies.

81. In 1931 defendant sold to Greyhound a substantial amount of its stock in NHTC and agreed to exchange the remainder of its stock in NHTC for stock in the Greyhound Corporation over a period of three years. In that year the name of NHTC was changed to Atlantic Greyhound Lines, Inc. Defendant retained operating control of Atlantic Greyhound until 1934, when it transferred all of its stock interest to Greyhound. From 1934 to 1937 I. B. Babcock, the president of defendant's Yellow, remained a director of Atlantic Greyhound and exerted a substantial influence on Atlantic Greyhound policy. In 1933, prior to the sale by defendant of its stock in Atlantic Greyhound, the latter company entered into a manufacturing and requirements contract with defendant and has continued to purchase virtually all of its bus requirements from defendant.

82. Defendant participated, through I. B. Babcock, H. C. Grossman, and H. E. Listman, and NHTC, in the organization of Capitol Greyhound Lines and the purchase of 50 percent of its stock by NHTC, then controlled by defendant.

83. In 1932 I. B. Babcock, an officer of Yellow, to further Yellow's interests, purchased and acquired one-fifth of the stock in World's Fair Greyhound, organized to provide coach service at the Chicago World's Fair.

In 1938, Yellow purchased one-fifth of the stock of Exposition Greyhound, Inc., formed for the purpose of providing coach service at the New York World's Fair. Fifth Avenue Coach Co. (a subsidiary of Omnibus) also held one-fifth of the stock, and three Greyhound subsidiaries held the remainder. Defendant's coaches were purchased exclusively in both instances.

84. After its success in direct intercity bus operation with Atlantic Greyhound, defendant embarked upon a plan to acquire control of local transit companies, to convert them to coach systems using defendant's coaches exclusively and then to sell them to local interests from whom defendant would obtain contracts for the future coach requirements of such companies. In 1932, defendant organized the United Cities Motor Transit Company as a wholly-owned subsidiary of Yellow, to acquire and develop these local transit companies. As in the case of Atlantic Greyhound, the operating committee of UCMT consisted of major officers of Yellow: I. B. Babcock, P. W. Seiler, H. E. Listman, H. C. Grossman, and D. L. Tate. M. D. Mills, formerly a regional sales manager for Yellow, was president of UCMT. All of UCMT's acquisitions were to be financed by defendant.

* * * * * * *

Exhibit 2.—Final Judgment, U.S. v. GM, Civil Action No. 15816

In the United States District Court
for the Eastern District of Michigan

Civil Action No. 15816 Entered 12/31/65

UNITED STATES OF AMERICA, PLAINTIFF
v.
GENERAL MOTORS CORPORATION, DEFENDANT

FINAL JUDGEMENT

Plaintiff, United States of America, having filed its complaint herein on July 6, 1956; and defendant, having appeared and filed its answer denying the substantive allegations of such complaint; and plaintiff and defendant, by their respective attorneys, having consented to the making and entry of this Final Judgment, without adjudication of any issue of fact or law herein, without this Final Judgment constituting evidence or any admission by either party hereto with respect to any such issue:

Now, therefore, without adjudication of any issue of fact or law herein and upon the consent of plaintiff and defendant, it is hereby

Ordered, adjudged and decreed as follows:

I

This Court has jurisdiction of the subject matter hereof and of parties consenting hereto. The complaint herein states a claim for relief against defendant under Section 2 of the Act of Congress of July 2, 1890, c. 647, 26 Stat. 209, entitled "An Act to Protect Trade and Commerce Against Unlawful Restraints and Monopolies," as amended.

II

The provisions of this Final Judgment shall apply to the defendant, its subsidiaries, successors and assigns engaged in the manufacture, sale, delivery or financing of buses or bus parts within the United States, and to their respective officers, directors, agents, servants and employees, when acting in such capacity, and to all other persons in active concert or participation with the defendant who shall have received actual notice of this Final Judgment by personal service or otherwise. The provisions of this Final Judgment shall not apply to the activities of defendant carried on outside the United States except for imports of bus parts other than replacement parts for buses produced by defendant outside the United States.

III

As used in this Final Judgment and for such purpose only:

(A) "Person" shall mean a person, firm, corporation, association, or any other legal entity;

(B) "Bus" shall mean a new, rubber-tired vehicle of integral construction (the chassis of which, if any, is assembled by the manufacturer of the body) having an internal combustion engine and a seated passenger capacity of twenty-one (21) or more adults and delivered in the United States. The term

"bus" shall not be deemed to include a vehicle sold primarily for school service;

(C) "Bus part" shall mean any new part of a bus or a new replacement part thereof.

(D) "Supplier of bus parts" shall mean a person (other than defendant) engaged in the manufacture of bus parts within the United States;

(E) "Bus operator" shall mean a person engaged, directly or through a subsidiary, in providing mass passenger transportation service for adults by bus over city or intercity routes within the United States;

(F) "Bus manufacturer" or "manufacturer of buses" shall mean a person (other than defendant) engaged in the final assembly of buses at the factory level: (1) within the United States, or (2) outside the United States and regularly engaged in the business of soliciting bus operators and delivering, directly or indirectly, buses for use within the United States.

IV

Defendant is hereby enjoined from:

(A) Owning any capital stock or other financial interest in any manufacturer of buses, or any bus operator; provided, however, that this provision shall not apply to an interest arising out of the conversion of a debt interest acquired incident to a sale or other credit transaction and disposed of within a reasonable period of time, or to the ownership of the obligations of any government entity;

(B) Thirty days after knowledge thereof, having or allowing to serve as an officer or director of defendant, as as a staff head or bus sales executive or bus sales representative of the GMC Truck & Coach Division any individual whom it knows to own a material share of the total outstanding stock of any manufacturer of buses or of any person whose principal business is that of bus operator;

(C) Thirty days after knowledge thereof, having or allowing to serve as an officer or director of defendant, or as a staff head or bus sales executive or bus sales representative of the GMC Truck & Coach Division any individual whom it knows to be an officer or director of any manufacturer of buses or any person whose principal business is that of bus operator;

(D) Entering into or maintaining any contract or agreement that any bus operator or manufacturer purchase all or any stated percentage of its requirements of buses or bus parts from defendant, or any source designated by defendant, or for a period of ten (10) years from the date of entry of this Final Judgment, entering into or maintaining any contract or agreement with a "bus operator co-conspirator" as defined in the complaint herein, which provides for or contemplates delivery of buses over a period exceeding twenty-four (24) months; or entering into or maintaining any contract or agreement with any purchaser which provides for or contemplates delivery of buses over a period exceeding twenty-four (24) months unless such contract or agreement entitles the purchaser to cancel any portion of such deliveries upon reasonable notice and upon payment of a reasonable cancellation charge;

(E) Entering into or maintaining any contract or agreement with any supplier of bus parts under the terms of which such supplier is prevented from selling bus parts to any bus manufacturer or bus operator; provided, however, that except as provided otherwise in Section V (G) of this Judgment, this provision shall not apply to any such part which is manufactured with tools, drawings or designs supplied or paid for by defendant.

(F) Financing the sale of defendant's buses or rendering any other financial assistance to any bus operator under terms and conditions which are not available to other bus operators similarly qualified as to credit rating, reputation with respect to repayment of debts, the degree of risk involved in the transaction, or any other factors normally taken into consideration in extending such credit; provided, however, that defendant may vary its terms and conditions to meet those offered by any person engaged in the manufacture, sale or financing of buses.

V

Defendant is hereby ordered to:

(A) Sell to any bus operator desiring to purchase a bus from defendant any bus model manufactured by it for sale, and deliver such bus within the limits of its established production schedule;

(B) Sell upon request, and deliver within the limits of its established production schedule on a nondiscriminatory basis, to any manufacturer of buses for original equipment installation in buses made by such manufacturer any model of engine or transmission manufactured by defendant and offered for sale by defendant for original equipment use, or offered in buses manufactured by defendant. Such sales shall be made on the following basis:

(1) Engines and transmissions shall be at the option of the purchaser either (a) in the basic form or forms with standard equipment as normally provided; or (b) with such optional equipment and application modifications (including deletions, additions, substitutions and engineering changes to adapt the engine or transmision to the bus manufacturer's vehicle) and in such quantities as the manufacturing operation involved normally provides;

(2) In the case of engines or transmissions also sold by defendant to commercial purchasers for installation in original equipment other than buses, the price, warranty, delivery schedule, and other terms and conditions to bus manufacturers shall be not less favorable after taking into account differences in form, optional equipment, application modifications and engineering changes than the prices and terms at which such models of engines and transmissions are offered by defendant to commercial purchasers for use in the most nearly similar application, which shall be deemed to be original equipment used in trucks, whenever applicable;

(3) In the case of engines and transmissions which are not sold by defendant to commercial purchasers for installation in original equipment other than buses, the price, warranty, delivery schedule, and other terms and conditions to bus manufacturers for such engine or transmission shall be not less favorable after taking into account differences in form, optional equipment, application modifications and engineering changes than the lowest price at which defendant sells such engine or transmission for replacement purposes, adjusted to arrive at an original equipment price level. For purposes of this provision, the adjustment to be applied to a replacement part price in order to arrive at an original equipment price will be the percentage of replacement price by which the original equipment price is less than such replacement price on the most nearly similar engine or transmission made by the defendant's manufacturing operation producing the item to be priced and sold to commercial purchasers on both a replacement and original equipment basis;

(4) The prices charged by defendant under this Subsection (B) for engines and transmissions which are also transferred from other divisions of defendant to the GMC Truck & Coach Division for installation in buses, and which are not sold to commercial purchasers, shall be not less favorable, after taking into account differences in form, optional equipment, application modifications, engineering changes, and other applicable charges, than the interdivisional billing values used at the same time in the transfer of such engines and transmissions to GMC Truck & Coach Division for installation in buses.

(C) Sell upon request, and deliver within the limits of its established production schedule on a nondiscriminatory basis, to any bus manufacturer bus parts for the maintenance, repair or replacement of any engine and transmission sold by defendant for original installation in a bus made by such bus manufacturer. Such sales shall be made on the following basis:

(1) The price, warranty, delivery schedule and other terms and conditions shall be not less favorable than on sales for such purposes of such parts to manufacturers of equipment other than buses. If such parts are not then currently sold by defendant to manufacturers of equipment other than buses, the price for such parts shall be established on the basis of the replacement price for such parts adjusted by the relationship between truck dealer or bus operator replacement price (whichever is less) and original equipment manufacturer replacement price on other similar parts made by the manufacturing operation producing the item being priced;

(2) This requirement shall not continue in effect for a longer time than the operation concerned is making such parts available to other customers after the engine or transmission in which they have an application is no longer in current production;

(3) This requirement shall not be for quantities greater than are reasonably needed to maintain or repair the engines or transmissions sold by defendant to such bus manufacturer for installation in original equipment;

(D) For a period of ten years from the date of entry of this Judgment, and also under the conditions described in Subsection V (J) hereof, sell upon request, and deliver within the limits of its established production schedule

on a non-discriminatory basis, to any bus manufacturer, for original equipment installation in buses made by such manufacturer, any bus part (other than engines and transmissions and parts thereof) manufactured by defendant and offered for sale by defendant for original equipment use, or then offered in buses manufactured by defendant. Such sales shall be made on the following basis:

(1) In th case of parts also offered to commercial purchasers for installation in original equipment other than buses: such parts shall be offered in the form or forms normally provided by defendant, and with such application modifications and engineering changes, and in such quantities, as are normally provided by manufacturers of such parts and as the manufacturing operation involved is equipped to provide on a normal operating basis; the prices and terms to bus manufacturers for such parts shall be not less favorable after taking into account differences in form, application modifications, and engineering changes than the prices and terms at which each of such components is offered to other commercial purchasers;

(2) In the case of parts which are not sold by defendant to commercial purchasers for installation in original equipment other than buses:

(a) Such parts shall be current model parts and assemblies listed in the GM Coach Master Parts Price List (not including interior and exterior trim and structural parts embodying styling features) and sold for replacement to bus operators;

(b) The prices and terms to bus manufacturers for such parts, f.o.b. the GMC Truck & Coach Division parts warehouse at Pontiac, Michigan, shall be not less favorable than the lowest price at which such items are sold to truck dealers or to bus operators; provided, however, that if a bus manufacturer shall order bus parts on a scheduled parts shipment basis, defendant shall price bus parts at the lowest price charged to truck dealers or bus operators less 15 percent. Scheduled parts shipment basis shall mean that the bus manufacturer submit a firm order to the GMC Truck & Coach Division Pontiac Office not oftener than once a month, between the first and the tenth of the month, with a reasonable lead time such as will permit defendant to produce the parts on a regular production run, and with shipment made in bulk to one destination in quantities not less than original equipment requirements for 25 buses.

(c) The prices and terms to bus manufacturers for such parts manufactured by other divisions of defendant and transferred to GMC Truck & Coach Division for use on buses, which parts are ordered and purchased on a scheduled parts shipment basis from the supplying division by such bus manufacturers in the same form in which such parts are transferred to GMC Truck & Coach Division shall be not less favorable than the interdivisional billing values used at the same time in the transfer of such parts to GMC Truck & Coach Division for installation in buses, adjusted for any material interdivisional allowance for tooling furnished by GMC Truck & Coach Division;

(E) For a period of ten years from the date of entry of this Judgment, sell upon request, and deliver within the limits of its established production schedule on a nondiscriminatory basis, to any bus manufacturer bus parts for maintenance, repair or replacement of any part (other than engine and transmission parts) sold by defendant for original installation in a bus made by such bus manufacturer. Such sales shall be made on the following basis:

(1) In the case of such parts also offered to other commercial original equipment purchasers, the prices and terms to bus manufacturers shall be not less favorable than the prices and terms at which such parts are sold to other original equipment manufacturers for such purposes;

(2) In the case of such parts not offered to other commercial original equipment purchasers and which are listed in the GM Coach Master Parts Price List, the prices and terms for such parts f.o.b. the GMC Truck & Coach Division parts warehouse at Pontiac, Michigan, shall be not less favorable than the lowest price at which such items are sold to truck dealers or to bus operators.

(3) This requirement shall not continue in effect for a longer time than the division of defendant concerned is making such parts available to other customers after the part in which they have an application is no longer in current production;

(4) This requirement shall not be for quantities greater than are reasonably needed to maintain, repair, or replace the bus parts sold by defendant to such bus manufacturers for installation in original equipment;

(F) So long as it engages in the manufacture and financing of buses, make available upon request, on no less favorable terms and conditions than it then finances purchases by operators of buses manufactured by defendant, financing of other bus manufacturers' new bus sales to bus operators similarly qualified, taking into account credit rating, degree of risk, and other factors normally taken into consideration in extending such credit; provided, however,

(1) That, if requested by defendant, the manufacturer-seller shall first have furnished to defendant a repurchase agreement satisfactory to defendant applicable to such transactions; and

(2) That defendant may vary the aforesaid terms and conditions in any particular transaction to meet those offered by any other person engaged in extending credit;

(G) For a period of ten years from the date of this Judgment, at the request of any bus manufacturer, authorize any supplier from which defendant is purchasing bus parts (not including interior and exterior trim and structural parts embodying styling features) manufactured by said supplier with tools, drawings, or designs supplied or paid for by defendant to furnish such parts to said manufacturer provided such bus manufacturer shall pay to defendant a proportionate share of the cost of said tools, drawings or designs.

(H) Nothing in the foregoing provisions of this Section shall be deemed:

(1) To require defendant to sell any model of bus or any bus part as to which any other person (excluding for a period of ten (10) years from this date of entry of this Final Judgment a "bus operator co-conspirator" as defined in the complaint herein) hereafter owns, otherwise than by purchase, assignment or license from defendant, patent rights or designs without such person's consent when required, which defendant will make every reasonable effort to obtain at the time defendant arranges for the use of such patent rights or designs; or

(2) To require defendant to use for comparison purposes any price to an original equipment manufacturer which is lower than the normal price to such class of customers to the extent such price (a) meets a price offered by a competitor, or (b) makes only due allowance for differences in the cost of manufacturer, sale or delivery resulting from differing methods or quantities in which such bus part is sold to such purchaser; or

(3) To require defendant to sell any bus parts if the intended applications are unsuitable and are not made suitable for the safe and efficient use of such items; provided that as to engines and transmissions defendant, at the request of the intended purchaser, will provide the assistance normally furnished to other customers in seeking to make such intended applications suitable.

(I) Grant to plaintiff, any bus manufacturer, supplier of bus parts, bus operator, or Canadian manufacturer of bus parts, making written request therefor, to the extent it has power to do so:

(1) A nonexclusive royalty free license for use in buses under any United States patent during the full term thereof owned by defendant as of the date of entry of this Final Judgment;

(2) A nonexclusive license for use in buses, under any United States patents during the full term thereof as may be granted to defendant during the period five years from the date of entry of this Final Judgment, royalty free for the period of the first five years from the date of issuance of the patent and thereafter at reasonable royalties;

(3) A nonexclusive license for use in buses under any United States patents during the full term thereof as may be granted to the defendant during the period beginning five years and ending ten years after the date of entry of this Final Judgment as reasonable royalties;

Provided, however, that in the case of each such license, other than to a bus manufacturer under subparagraph (1), the licensee thereof shall in return grant to defendant for use in buses a nonexclusive license on the same terms on which the licensee received its license from defendant under all patents during the full term thereof as may thereafter be issued to said license covering improvements on the invention disclosed and claimed in the patents licensed by defendant, except that in the case of a license under subparagraph (2) the grantback shall be on a reasonable royalty basis at any time the licensee is obligated to pay royalties.

(J) So long as this Final Judgment is in effect, the provisions of Subsections V (D) and (E) shall apply with respect to the sale of any bus part to a bus

manufacturer who orders such part to fulfill a contract issued under a competitive invitation to bid requiring the use of such part.

VI

After the third and before the tenth anniversary of the date of entry of this Final Judgment, upon a showing that the total annual deliveries of buses within the United States have substantially increased above the average 1964–1965 level of approximately 3900 buses per year and that no substantial additional competitor has entered the bus business, or at any time before such tenth anniversary, upon a showing that a substantial existing competitor has disappeared and has not been replaced by a comparable new entrant, plaintiff may seek from the Court on a single occasion (and if the first application be denied, on a second occasion) such other and further relief as is hereinafter provided.

(A) If, at the time of plaintiff's application for relief under this Section, defendant has a physically separate plant in the United States which is manufacturing or is capable of manufacturing a substantial number of buses of the types and specification then being made by defendant and which can be sold without impairing defendant's continuing capability to manufacture buses and other products in substantial volume, then plaintiff may request the Court to order defendant to offer such separate plant for sale, for a period of one year commencing ninety (90) days after the Court's order becomes final, to a purchaser satisfactory to plaintiff desiring to utility such plant for the purpose of manufacturing buses.

(B) The minimum price at which defendant shall be required to sell such plant shall be its fair market value as determined by the average of the appraisals of three qualified appraisers, of whom defendant and plaintiff each shall select one and the two thus selected shall, in turn, select the third. Defendant shall not be required to sell on credit terms, but shall convey title either to a purchaser desiring to utilize such plant for the purpose of manufacturing buses, or, at the option of such a company that does not desire to take title, to any other purchaser entering into a lease-back or other long-term real estate financing arrangement with such a company.

(C) If, at the time of plaintiff's application for relief under this Section, defendant has no such physically separate plant, then plaintiff may request the Court to order defendant (i) to create, within a period of not more than five years, such a physically separate plant capable of manufacturing a substantial number of buses of the types and specifications then being made by defendant, and (ii) to offer such plant for sale for a period of one year after its completion and otherwise in accordance with the terms of Subsection (A) and (B) of this Section, unless defendant shall show to the satisfaction of the Court that at rated capacity on a single shift operation the cost to defendant of manufacturing buses in such a physically separate plant would be substantially higher than the cost to defendant of manufacturing buses in existing facilities; provided, however, that plaintiff may nevertheless request the Court to order defendant to construct such a physically separate plant if plaintiff presents at the time of its application a purchaser willing and able to enter into a firm contractual commitment, when the Court's order becomes final, to purchase the proposed separate plant at cost upon its completion.

(D) Nothing contained herein shall require defendant to create or sell facilities for the manufacture of enginer, transmissions or any parts which defendant regularly offers for general sale to vehicle manufacturers if defendant shows that such engineers, transmissions, or parts, as the case may be, cannot be manufactured primarily for incorporation in buses manufactured by the purchaser at such separate plant as economically as they can be procured by the purchaser from other sources, including defendant.

(E) In a proceeding under this Section, it shall not be open to defendant to oppose relief on the ground that it has not violated Section 2 of the Sherman Act or on any ground not specified in this Section VI. Defendant shall be entitled to oppose the relief described in Subsection (A) or (C) of this Section on the ground that, upon the entry of the purchaser into the bus manufacturing business, either the purchaser, any other established bus manufacturer or defendant is not likely to be able to operate as a viable competitor in the sale of buses in the United States, or that defendant does not have the largest share of the bus market. The burden of proof as to any such defense shall be on the

defendant. Defendant shall also be entitled to rebut any evidence introduced by the plaintiff.

(F) In the event of a sale under this Section, (i) the Court may apply to defendant such of the injunctive provisions set forth in Section IV and V hereof for such period as it deems appropriate to promote competitive conditions; and (ii) unless defendant shows to the satisfaction of the Court that the purchaser has such technical resources for the manufacture of buses that further assistance would not be of material significance, the Court may order the defendant to provide technical assistance within the then existent technology of defendant's bus manufacturing operations in the design, construction and equipment of such plant and in establishing manufacturing methods and procedures. Such technical assistance shall be provided for such period of time and on such terms as the Court may deem appropriate between competitors, including free access to such of defendant's then existing patents and know-how arising out of defendant's bus manufacturing operations as the purchaser reasonably requires for manufacturing buses, subject to reasonable restrictions prohibiting the use of such patents or know-how for purposes other than manufacturing buses.

(G) In the event that defendant is ordered to offer such physically separate plant for sale under this Section and the offer is not accepted, then defendant shall be relieved of any further liabilities or obligations under this Section; provided that if at any subsequent time before the tenth anniversary of the date of entry of this Final Judgment defendant still possesses such plant in a physically separate state and plaintiff shows that market conditions have changed substantially since the date of the Court's order to offer such plant for sale, plaintiff may apply to the Court for a further order than defendant again offer such physically separate plant for sale for a period of one year commencing ninety (90) days after Court's order becomes final and otherwise subject to the terms and conditions of this Section. In the event that plaintiff applies for such a further order defendant may oppose such relief on any ground specified in this Section VI. In the event that a sale of such plant is consummated under this Section, then defendant shall be relieved of any further liabilities or obligations under this Section except as imposed by Subsection (F).

(H) Nothing contained herein shall require defendant to guarantee the financial success of the purchaser or the quality of its products, or to refrain from competing with all other bus manufacturers, including the purchaser, to the best of defendant's ability.

(I) Nothing in this Section VI shall be construed to impose any limitation upon the provisions of Section IX.

VII

The provisions of this Final Judgment or of any Court order pursuant to this Final Judgment shall be in full force and effect only so long as defendant engages in the manufacture and sale of buses but in any even for a period not longer than twenty-five (25) years from the date of entry of this Final Judgment, except that Court orders under Section VI, subparagraph (F)(i), may apply for the benefit of a purchaser under Section VI any of the injunctive provisions set forth in Section IV and V hereof for such period as the Court may deem appropriate.

VIII

For the purpose of securing compliance with this Judgment and for no other purpose:

(A) Any duly authorized representative or representatives of the Department of Justice shall, upon written request by the Attorney General or the Assistant Attorney General in charge of the Antitrust Division and on reasonable notice to the defendant made to its principal office, and subject to any legally recognized privilege, be permitted:

(1) Access during the office hours of said defendant to all books, ledgers, accounts, correspondence, memoranda, and other records and documents in the possession or under the control of said defendant related to any matters contained in this Judgment;

(2) Subject to the reasonable convenience of said defendant and without restraint or interference from it, to interview officers or employees of said defendant, who may have counsel present, regarding any such matters.

(B) Upon such written request of the Attorney General or the Assistant Attorney General in charge of the Antitrust Division, defendant shall submit such reports in writing with respect to the matters contained in this Final Judgment as from time to time may be necessary for the enforcement of this Final Judgment; provided that no information obtained by the means provided for in this Section shall be divulged by any representative of the Department of Justice to any person other than a duly authorized representative of the Executive Branch of the United States, except in the course of legal proceedings to which the United States is a party for the purpose of securing compliance with this Final Judgment or as otherwise required by law.

IX

Jurisdiction of this cause is retained for the purpose of enabling the parties to this Final Judgment to apply to this Court at any time for such further orders and directions as may be necessary or appropriate for the construction or carrying out of this Final Judgment or for the modification or termination of any of the provision thereof or for the purpose of the enforcement of compliance therewith and the punishment of violations thereof.

THEODORE LEVIN,
United States District Judge.

Dated: December 31, 1965

THE INDUSTRIAL REORGANIZATION ACT (S. 1167)

(Ground Transportation Industries)

WEDNESDAY, APRIL 10, 1974

U.S. SENATE,
SUBCOMMITTEE ON ANTITRUST AND MONOPOLY
OF THE COMMITTEE ON THE JUDICIARY,
Washington, D.C.

The subcommittee met, pursuant to notice, at 10 a.m., in room 318, Russell Senate Office Building, Hon. Philip A. Hart (chairman of the subcommittee) presiding.

Present: Senator Philip A. Hart.

Staff present: Howard E. O'Leary, Jr., staff director and chief counsel; Patricia Y. Bario, editorial director; Janice C. Williams, chief clerk; Peter N. Chumbris, chief counsel for the minority; and Dr. Michael Granfield, economist.

Senator HART. The committee will be in order.

I hope everybody observed that I walked in with all that material. They know better than to assume that I have read it, but we will read it in time.

Our testimony today shall be presented first by Dr. Henry Duncombe, and we welcome him. He is the chief economist of General Motors Corp.

And I believe we shall also hear from Harold Smith and William M. Spreitzer.

Gentlemen, you proceed in any fashion you would like. You have filed documents with us. They will be printed in the record.

STATEMENTS BY PANEL OF REPRESENTATIVES FROM GENERAL MOTORS CORP.; DR. HENRY L. DUNCOMBE, JR., CHIEF ECONOMIST; HAROLD L. SMITH, JR., VICE PRESIDENT AND GENERAL MANAGER, ELECTROMOTIVE DIVISION; WILLIAM M. SPREITZER, RESEARCH LABORATORIES; ACCOMPANIED BY ROBERT A. NITSCHKE, ASSISTANT GENERAL COUNSEL

Dr. DUNCOMBE. Thank you very much, Senator Hart. We have supplied for the record statements and the oral statement. With your permission, I will read the oral statement that we have, which is somewhat shorter than our record statement.

[Mr. Duncombe's prepared statement appears as exhibit 1 at the end of this panel's testimony.]

Senator HART. Before I forget, Senator Hruska had hoped very much to be able to be here, and may, but his attendance is required

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by another committee so he will be absent at least initially. Senator Hruska has approved our beginning in his absence.

Dr. DUNCOMBE. Thank you.

My name is Henry Duncombe, and I am chief economist of the General Motors Corp. With me are Mr. Harold L. Smith, Jr., vice president and general manager of the electromotive division; Mr. Robert A. Nitschke, assistant general counsel of the corporation; and Mr. William M. Spreitzer, head of the transportation and urban analysis department, which is a part of our research laboratories. We are pleased to be here today and to have this opportunity to give you our views on S. 1167, the Industrial Reorganization Act. as well as on the issues you raised, Mr. Chairman, in your letter of February 25.

At the outset, I would like to comment very briefly on a paper submitted to your subcommittee on February 26 enitled, "American Ground Transport," which contained a number of charges against GM which are essentially irrelevant to the subject of this hearing. We would not dignify these ridiculous charges with a refutation except for the fact that they have received an unwarranted degree of publicity and therefore merit a comment.

We had hoped that we had made our interest in mass transit clear when we publicly clarified this at least as long as 4 years ago during congressional hearings.

However, from time to time we still hear charges that GM is opposed to mass transit. Let me once again try to dispel this false idea.

For example, the charge was made that General Motors was responsible for destroying the street railway and interurban transit systems around the country.

This is not true. The charge is refuted by facts which are common knowledge within the transit industry.

Street railways began to be abandoned over 50 years ago for a number of reasons—none of them resulting from action by GM.

For one, these systems could not be economically extended to meet the transportation needs of people in expanding metropolitan regions.

They could only move people over fixed routes that could not be readily adapted to shifts in demand that normally occur in any growing and changing city.

Under these circumstances, patronage consistently declined, year after year, until the financial problems facing these systems became overwhelming and, in most cases, insoluble under the existing conditions.

The charge that GM destroyed all-electric locomotive transportation is also wrong. It is a known fact that all-electric locomotives were never used in the United States except in a few very high traffic areas that could financially justify the high cost for related equipment and power stations.

You may recall, Mr. Chairman, that Mr. Lundin, executive vice president of GM, testified on March 29 before Senator Bentsen's Subcommittee on Transportation in Detroit. I think it is worthwhile, for the record of this subcommittee, to quote a portion of his statement:

When General Motors developed the diesel locomotive, the result was to provide a means of replacing the much less efficient steam locomotive. This

actually revitalized the railroads of the United States at a time when, for many of them, this was desperately needed. We believe railroadmen recognize the contribution that General Motors has made to the railroads of the country.

Furthermore, General Motors did not use traffic reciprocity to sell locomotives.

We have always had a firm business policy against selling any of our products other than on their merits.

These and similar charges are as unfounded as the ludicrous assertion also made recently that GM helped the Nazi war machine prosper. It amazes us that, after so many years, we have had to remind anyone that the Nazi government took over our Opel plant before the war.

GM had no voice it its operation or management nor did we derive any benefits thereafter.

In this connection, Mr. Chairman, I would like to introduce for the record a letter recently received by General Motors Chairman R. C. Gerstenberg, from one of the few remaining GM executives with firsthand knowledge of the events prior to the war. This letter was written by Mr. Philip Copelin, and I think, assists in setting the record straight.

Senator HART. It will be received and printed in the record.

[The letter referred to appears as exhibit 2 at the end of this panel's testimony.]

Dr. DUNCOMBE. Thank you very much.

We are completing a detailed refutation of this charge, as well as a number of others contained in the document, "American Ground Transport."

Our statement, "The Truth about 'American Ground Transport'—A Reply by General Motors," will be submitted for the record.

["American Ground Transport" and "The Truth About 'American Ground Transport'—A Reply by General Motors" will be found as an appendix to this part.]

Dr. DUNCOMBE. Our refutation includes the following recommendation which I would like to quote:

We submit that this—"American Ground Transport"—has created an unfortunate situation whereby General Motors has in effect been indicted publicly without proper means of rebuttal. In our effort to remedy this unusual situation in a fair and equitable manner, we suggest that the subcommittee, after due deliberation, consider the following.

First: That all further distribution of "American Ground Transport" be suspended at this time;

Second: That this reply by General Motors be printed in the same manner by the Government Printing Office; and

Third: That this reply should immediately follow "American Ground Transportion" in the published record of these proceedings and should be bound with it if any further distribution by the subcommittee is undertaken.

In this connection, Mr. Chairman, we were pleased by your statement about the paper—and here I am quoting you—that "neither the subcommittee nor any member including the chairman necessarily subscribe to the ideas contained herein."

We hope this still represents your view.

Senator HART. Doctor, it does. I am not sure it will catch up with it, but I repeat, just as your testimony does not represent the position of this committee or any of its members, the testimony to which you refer captioned "American Ground Transport," of the witness, Mr. Snell, does not represent the position of this subcommittee or any member of it.

Now, the suggestions you made as to how to balance it, we will take into consideration. The thing is unusual in this sense—and, I

hope you will believe us—completely unintentional and unanticipated.

But in order to have available in printed form a large document that the witness Mr. Snell had delivered and, additionally, a similar written statement of testimony by Mr. Boyle, the staff had the documents printed at the Government Printing Office and were advised that the only way is to have gone through the batting practice there before.

I am giving you my impression of it.

Dr. DUNCOMBE. We appreciate that.

Senator HART. Before the documents were returned to us they were enclosed in a cover which gave it the appearance of officialdom.

I don't have it at hand, but it said something about "committee prints." Now, it does say, "presented to the subcommittee."

It was the position of the committee that the format clearly presents, as you describe it, an unusual situation. Let us try and balance it.

We, I am reminded, wanted that printed as expeditiously as possible in order that the testimony be made available to the affected companies.

I am told that as a result of this printing that these two documents were available to you and others interested a week before the presentation to the committee.

So the motive was to make a self-serving statement appraisal. The consequences were unanticipated. We will see what can do to balance this.

Mr. CHUMBRIS. Mr. Duncombe, may I suggest at this point that I quite agree with the position that the chairman has made and his explanation of the problem that confronted the subcommittee.

Unfortunately, when the idea was presented, I understand, to the staff, it seemed like a logical opportunity to get a volume of these printed documents. And I think the staff will agree that the minority was not advised at the time that this was done, and we did not know about it until just before the hearing.

And this is something unusual, because the majority, I must say, for quite some time now, have been very, very fair in their approach to matters such as this with the minority and with the ranking minority Senator on the subcommittee.

But, Mr. Chairman, I think that the suggestion by the witness, and the plan he suggests in his statement, would be an appropriate method to rectify the confusion that has been brought about by this document which, when I first looked at it, appeared to be a committee print. And somehow or another, the minority was not made aware of the request to publish the document. There is a procedure which requires the Senators to be aware of anything that is put out by the U.S. Government as a committee print.

So, it would seem to me that the suggestions made should be seriously considered, Mr. Chairman. And I am saying this now because Senator Hruska doesn't happen to be here so he could join in with you that we should do everything possible to see that a fair and unbiased presentation is made by this subcommittee and

try to rectify, if that is possible, the unfortunate procedure that was taken at that time.

Senator HART. We will consider it. We won't extend the housekeeping discussion problem more than another minute. But the third suggestion, that General Motors' reply be printed in the record of the hearing immediately following the document of Mr. Snell may present us with a problem in itself.

So, we will have to fret a little as to how we seek to make clear again that the publication is not the position of this committee or any member of it.

It was prepared in an effort to make available promptly the documents—the two documents. We managed to meet that obligation of fair presentation, but in doing so, it created an impression that this was a report of the committee.

We will see what we can do without finding ourselves next week charged with presenting a document that is General Motors' but has the appearance of being the position of the committee.

Dr. DUNCOMBE. Thank you very much.

Mr. CHUMBRIS. Mr. Chairman, I don't want to belabor this point either, but I believe the problem that the chairman is referring to is the fact that that document is already being published; is that it, Mr. Chairman?

Senator HART. No, partly that, but also whether it would in fact reflect the continuity of the hearing. We may be distorting the proceedings by that third suggestion. We will have to resolve that problem.

Mr. CHUMBRIS. Yes. In other words, you will take up this matter with Senator Hruska?

Senator HART. We will.

Proceed.

Dr. DUNCOMBE. Thank you very much.

[As noted before, the two documents, "American Ground Transport" and "The Truth About American Ground Transport—A Reply by General Motors" will be found printed as an appendix to this part.]

Senator HART. On that business of the use of the Opel plant in Germany as a resource for the development of war material by the Hitler government, that is a vivid reminder to us of the dilemma that we have in encouraging overseas investments by American firms, whether the Soviet Union—which once upon a time we thought was a menace, and I think all of us still have the feeling that it would not be one of our intuitive allies, if any contention developed—or anyplace else.

If American investment produces facilities other than in the continental limits of the country, that investor runs the risk of someday being charged just as you were, of tooling up and entering.

I am sure you have thought about this. What do you do? What do you suggest?

Dr. DUNCOMBE. We have expressed ourselves on what the proper position for a multinational firm must be, and I don't want to belabor this issue now.

Mr. Thomas Murphy, our vice chairman, testified both before Senator Ribicoff's subcommittee and again before the U.N. group of eminent persons.

I have his testimony, and I would be very pleased to include that for the record.

Senator HART. Tentatively, I think not, but let us ask the staff to obtain the citation to the document involving the U.N. presentation and the citation of the publication of the Ribicoff subcommittee at the time.

[For the testimony of Thomas Murphy, see "Multinational Corporations," hearings before Subcommittee on International Trade, Senate Finance Committee, 93d Cong., 1st sess.]

Dr. DUNCOMBE. He did go into that in very substantial detail.

Should I continue, now, Senator?

Senator HART. Yes, on page 5.

Dr. DUNCOMBE. Your bill deserves and has received our thoughtful consideration. We have filed, along with our statements prepared for this meeting, two related analyses which we would ask be made a part of the record of this hearing.

The first is entitled, "A General Motors Statement on S. 1167, the Industrial Reorganization Act."

The second is entitled, "Competition and the Motor Vehicle Industry."

Senator HART. I think I have indicated already, but let me make clear that the documents are to be printed.

[The two documents referred to appear as exhibits 19 and 20 at the end of this panel's testimony.]

Dr. DUNCOMBE. Thank you very much.

Speaking to the bill, it is our view that the implementation of S. 1167—or any bill founded on similar premises—would have far-reaching adverse effects on American consumers and workers.

It would reduce industrial efficiency and raise prices. It would effectively undermine incentives to growth and to improved productivity, and, in so doing, would reduce employment opportunities. The basis for these conclusions is fully set out in the document entitled, "A General Motors Statement on S. 1167."

Let me summarize them briefly.

This bill would establish still another Commission with extraordinary authority to restructure industries and firms, including those that have proven most successful in their competitive effort over the decades.

There is no reason to expect that all of the artificially restructured companies or industries would prove viable. There would be, as there always are, some firms that meet customer needs better than others; some that use technology more effectively than others; and some that see opportunity more clearly than others. In short, some firms would fail and some would succeed, if they dared.

I say, "if they dared," because if success produced returns higher than an arbitrary profit ceiling, if success involved a superior product at a similar price, or if success resulted in exceeding some predetermined four-firm "concentration ratio," the "reward" presumably would be another summons to court for another dose of surgery.

Thus, rather than being a one-shot, cure-all enactment of this bill, would lay a heavy blanket of disincentive over competitive

enterprise. Competitive striving for larger sales or lower cost would, of necessity, give way to a relaxed acceptance of the status quo.

The bill might achieve its goal of expanding the number of competitors but only at the cost of shackling competition. The consumer would be the loser.

For the professional economist, the term "oligopoly" has a number of meanings and not simply the narrow meaning implied in S. 1167.

Oligopoly theories proceed from a variety of defined assumptions to conclusions which are highly sensitive to, if not predetermined by, the assumptions. We can, for example, assume any number of sellers and that there are or are not substitute products; we can assume identical products—as most economic models do—or we can relax this assumption.

Obviously, the list of possible assumptions and combination of assumptions is limited only by the ingenuity of the theorist.

These are all interesting exercises and very often they give us new insights. None but the most naive, however, would claim that such constructs could encompass the manifold complexities and highly dynamic interactions of competitive reality, to say nothing of the particular circumstances that may surround an individual industry.

The fact is that industrial sectors and specific industries cannot be forced into the confining mold of assumptions from which theoretical analysis necessarily proceeds.

We take the strongest exception to the proposed fragmentation of much U.S. industry on the basis of any arbitrarily selected set of assumptions.

A principal purpose of our study entitled, "Competition and the Motor Vehicle Industry," which we have submitted for the record, is to demonstrate that competition does not depend on some arbitrary count of numbers of competitors or statistical abstractions called "concentration ratios."

In this study we discuss fully and factually a vast array of factors required for an understanding of competition.

The real world in which we must compete stands in sharp contrast to theoretical concepts which assume restricted consumer choice and limited competitive reactions.

The automobile buyer has as wide a choice of products as modern worldwide technology can provide. This choice encompasses all aspects of the transaction—price, product quality, performance, comfort, and size.

One of the earliest and certainly best publicized of competitive initiatives to achieve efficiency was the assembly line method of building cars and trucks. It was clearly evident that this was a more efficient way to produce a vehicle provided—and this is an important proviso—sales volume was adequate to support the investment. In the early days of the industry, many firms did not achieve this minimum volume and could not realize these economies. Thus, for technological reasons alone, the automobile industry quickly evolved toward a relatively large firm structure to achieve efficiency and lower cost.

S. 1167 quite properly recognizes the possibility that the cost of restructuring an industry—specifically the loss of the efficiencies of scale—could outweigh the presumed benefits.

As we have indicated, the adverse effects of the bill extend well beyond the complex arithmetic of costs to include fundamental disincentives to effective competitive effort. If a full accounting could be made, it is a virtual certainty that the cost to society of the bill would be high. The benefits, on the other hand, are largely conjectural and, we are convinced, illusory.

Let me stress that the efficiency of a business encompasses much more than technical factors. The management structure and management capabilities of any particular firm provide the mechanism for translating technological possibilities into market realities. Whether a firm develops capable employees, selects products for production which customers want, and produces these products efficiently depends primarily upon people, not technology.

In the two documents which we supplied, along with our oral statements, we have considered some of the types of economies which are related to the scale of production, multiplant operations, and vertical integration. These economies are, of course, interrelated and reinforcing. This makes it difficult, if not impossible, to isolate one and label it "scale economies"; another, "multiplant economies"; and so on.

There are, however, identifiable operations which are suggestive of magnitudes of the economies involved. To illustrate, there is no question of scale economies in body sheet metal stamping operations well beyond the point suggested by one of the witnesses appearing in February.

Our records indicate that we have actually obtained as many as 7 million identical major body panels from one set of dies—far greater than the 400,000-unit die life suggested in earlier testimony. A large part of our effort to standardize parts, such as inner door panels, reflects the desire to further realize these economies.

With respect to multiplant operations, there is no question that the coordination of stamping, foundry, and other manufacturing operations with multiplant assembly yields efficiencies. These partly derive from scale economies but beyond that include benefits from specialization, shipping cost reductions, better control of inventories, and, most important, more prompt and better service to the customer.

I stress this latter factor because there is no economy—regardless of the length of a run or the degree of integration—unless it translates into something of value to the buyer.

We may produce a one-cylinder car in the most efficient way possible, but if no one wants it, the entire exercise is economic waste. Serving the customer is a complex of interacting factors.

High production volume which yields scale economies in manufacture also supports a geographically well-distributed dealer organization for better customer service which translates into greater value to the customer. It is no less a part of "scale economies" than the narrow manufacturing notion in many accounting and economic texts.

Whether or not in-house production—vertical integration—is more efficient that outside purchase is influenced by three imported fac-

tors: The relative volume of output required; production specifications, that is, whether the component is unique in a production sense to the particular vehicle manufacturer or standardized; and the availability of the required skills and expertise. As a consequence of such considerations, high-volume passenger-car producers are typically more integrated than are low-volume, heavy-duty truck manufacturers.

Accordingly, General Motors obtains from outside vendors all basic materials and most standardized supplies, as well as items such as car and truck frames, tires, glass, textiles, most wheels, certain tools, dies, and manufacturing equipment. General Motors' outside purchases totaled almost $17.5 billion in 1973 or over 48 percent of total sales revenue.

Divestiture of some or all of the activities which, on the basis of long experience and continuing evaluation, have become part of the total General Motors production assembly and service system, can almost be guaranteed to entail "substantial losses of efficiency." These losses are self-evident in the proposals advanced by witnesses during your February hearings. Those who would toy with the savings and jobs of others should bear this fact in mind.

In your letter you asked us to respond to allegations, and here I am quoting from your letter, "that GM dominates the production of buses and locomotives and that such dominance resulted in the promotion of the automobile at the expense of other modes of ground transportation."

Further, you asked us to, and here again I'm quoting, "indicate the manner in which you have promoted the use of buses and locomotives." Mr. Smith and Mr. Spreitzer are here today to fulfill these two requests.

I will limit myself to the one brief comment on the allegation that General Motors production of locomotives and buses represents a "conflict of interest." It takes only a moment's reflection to appreciate that if the goal was to discourage locomotive and bus development General Motors would have avoided both markets. We did not take this route. In the case of locomotives, General Motors made high-risk investments to compete against steam engine producers who were convinced of the superiority of their products. In the case of bus manufacture General Motors produced a variety of gasoline, diesel, and trolley buses in accordance with the demands of transit operators. In both cases, General Motors was successful because it did respond to customer demand with better product values than its competitors were offering.

The fact is, of course, that in many passenger transportation systems the bus, the car, and the railroad provide complimentary services. There are exceptions to this, such as rail and bus commutation lines which, by providing an acceptable alternative, could reduce car use and highway congestion. However, even these systems are often used in tandem with other modes at both ends of a commutation trip. In the city itself, the bus or subway may be the principal mode for the work trip and for those who cannot or do not wish to drive. General Motors has long recognized that each transportation mode has a distinctive service to provide. Rather than there being a "con-

flict of interest," the demand of customers for each type of vehicle has represented a market opportunity we have been eager to serve.

As we have informed you, the question of whether Gneral Motors dominates the bus industry is involved in current litigation, and we are, of course, defending against this lawsuit. We have been advised by counsel about the impropriety of General Motors commenting on the issues in this case outside the courtroom, which is the only proper forum. However, in view of some of the claims made about our position in the bus business I think the subcommittee should know that in response to a Justice Department request, we recently supplied the figure of 43 percent as our share of bus sales in 1973 in the United States.

As to our interest in improving mass transit, Mr. Spretizer will address himself to the important steps that General Motors has taken to advance the development of urban transportation systems.

Let me state here, with all the force at my command, that General Motors has been fully as concerned to compete effectively in the manufacture and sale of products, such as buses and locomotives, as it has in the production of passenger cars and trucks. It just makes no sense to claim that we have achieved dominance as alleged during your February hearings in either of these product lines by deliberately making them so unattractive that they would not be purchased and used.

I believe, Mr. Chairman, that my remarks. and more completely the documents we have provided, deal with the questions on which you requested our views.

I would like to conclude with a discussion of the related issues of energy availability and small-car production which, as you had indicated in your letter, are of great interest to your subcommittee and which are clearly of great interest to the American people.

Up to the late 1950's a number of small cars were produced by U.S. manufacturers that failed for lack of demand. In the latter half of the fifties the economic climate changed and patterns of car demand shifted accordingly. Foreign producers made available a wide selection of small cars to American car buyers. These producers, with rapidly expanding home markets, were realizing substantial economies of mass production so that even a small market opportunity in the United States could be served efficiently. In addition, they had the competitive advantage of low labor costs—less than half those in the United States.

Furthermore, they enjoyed the advantages of low—and now almost nonexistent—import duties and the implied subsidies, which increased with the passage of time, of their own undervalued currencies. GM and other U.S. producers responded to this by importing smaller cars from European facilities and also by introducing in 1959 compact cars made in this country.

While the U.S. cars introduced in the late fifties were somewhat larger than the imports, they filled the need. Import sales declined from about 10 percent of total sales to about 5 percent in the mid-sixties when a revival of small-car interest was signaled by the rapid sales gains made by the foreign car manufacturers in this country, particularly this time by the Japanese.

Given this renewed challenge, U.S. producers responded in a variety of ways, including expanded production of small cars and increased imports from their overseas facilities.

The result is that the U.S. buyer in the seventies has had a wider choice of small cars, including U.S.-built small cars, than buyers any place else in the world. Moreover, the availability of these cars has been closely geared to the demands of customers.

For example, total stocks of GM smaller cars, such as the Vega and Nova, amounted to almost 110,000 on September 30, 1973—less than a month before the Arab oil embargo—and represented a 62-day supply at the then current selling rate. In contrast, there was a 47-day supply of intermediate cars, a 52-day supply of regular-sized cars, and a 42-day supply of luxury cars.

A review of the relationship of available stocks to demand throughout the first 9 months of 1973 supports the conclusion that General Motors was, in fact, producing closely in line with consumer demand and quite clearly had an adequate supply of small cars. In short, rather than being unresponsive, General Motors was meeting the market.

The embargo suddenly created great confusion and uncertainty in the minds of the consumers. Demand for full-sized cars declined sharply as buyers awaited some indications concerning availability of gasoline and the likelihood of rationing. We were confronted with an immediate demand for a product mix that no one had anticipated and could not be matched by corresponding instantaneous changes in our production schedules.

With respect to your question concerning General Motors plans for expanded small-car production, we are accelerating our programs to increase substantially our capacity to build smaller cars. We are planning to add models to our new small-car lines. We are also accelerating our work on programs to increase the fuel efficiency of our full-size cars, because we expect that there will be a continuing significant demand for these vehicles.

Last year, for example, sales of full-size cars in the United States totaled about 4.1 million units—almost 36 percent of total sales. Even with all the uncertainty resulting from the embargo, these full-size cars accounted for 27 percent of all sales during the first calendar quarter of 1974.

Admittedly, energy availability has added a new dimension to vehicle and engine design which we must meet. General Motors has announced its goal of a minimum of 15 miles per gallon on all cars, including its larger cars, on a city-suburban driving schedule. Of course, our smaller cars are already achieving substantially better mileage than this. In order to achieve this, near-term programs include modification of energy-using component systems such as the air conditioner, improvement of driveline efficiencies, and better mileage through the application of the catalytic converter system. Over the longer term, the current full-size car will be reduced in size and weight in order to achieve even higher standards of fuel economy.

To put some measure on this effort to increase our smaller car capabilities, I can tell you that since the Chevrolet Vega, which we

introduced 3½ years ago, and including our 1975 small-car program, General Motors will have spent more than $2 billion.

By model year 1975, which begins this fall, General Motors will have developed the capability of building more than 2 million small cars annually. This represents about a 70-percent increase over our 1973 production.

More to the point of your bill, it is very doubtful that a fragmented industry would be able, from either a financial or technological point of view, to accomplish the required realinement as rapidly as it is now being done. Larger firms bring experience with a wide variety of product designs and sizes, and this gives a measure of flexibility to the operations.

Even under the best of circumstances, changing the product mix requires a massive reequipment expenditure, and this extends all the way from basic engine components to body construction and assembly tools. Some small firms could no doubt accomplish this goal. It is likely that other small firms, with little or no experience in producing the newly required cars, could not accomplish it at all.

We at General Motors are keenly conscious of the need to meet consumer demand. This is the reason we exist. In spite of continuing awareness of growing energy problems and continual adjustments in our production schedules, there was no feasible way to plan for the emergency created by the Mideast War. We are adjusting rapidly. But as the current sharp decline in sales should make clear, consumer sovereignty is the continuing reality of our business. Sales can only be achieved by offering products which buyers want. This is what we have done in the past and what we plan to do in the future.

Thank you very much.

Senator HART. Thank you, Doctor.

I would suggest that perhaps it would be better if we heard from Mr. Smith and Mr. Spreitzer before we go into questions.

Dr. DUNCOMBE. Fine.

Senator HART. We may later in the day be interrupted by a phone call.

Dr. DUNCOMBE. Very good. Well, Mr. Smith is available.

Mr. Smith.

STATEMENT OF HAROLD L. SMITH, JR.

Mr. SMITH. Good morning, gentlemen. My name is Harold L. Smith. I am a vice president of General Motors Corp., and general manager of its electromotive division, which manufactures locomotives. I am an engineer by background, and was previously chief engineer of electromotive.

I am appearing here today in response to Senator Hart's letter of February 25 requesting testimony from General Motors on the manner in which it has prompted the use of locomotives. It is a privilege for me to appear and testify before the distinguished members of this subcommittee.

Senator HART. Mr. Smith, I have a very sneaky suspicion no one likes to appear before a Senate committee.

[Mr. Smith's prepared statement appears as exhibit 23 at the end of this panel's testimony.]

Mr. Smith. I'm enjoying it so far.

Senator Hart. Given this setting, I know I wouldn't.

Mr. Smith. General Motors' success in the locomotive industry and the reasons for it are an old story but one that bears a very brief retelling.

General Motors pioneered the development of the diesel road locomotive, which is generally recognized as the most important single contribution to railroad motive power in the last 100 years. Indeed, the staff of this subcommittee under Senator O'Mahoney, following its investigation of the locomotive industry almost 20 years ago, stated in its report, and I quote, that:

> The diesel locomotive revolutionized the railroad industry. General Motors can point to its entry into this field as an example of the operation of a progressive company at its best—entry into a new field, with a new product satisfying an economic need, and offering progressive reduction in the pricing of its products.

General Motors entered the locomotive industry in the early thirties with a new and revolutionary lightweight diesel engine developd by Mr. Charles F. Kettering at the General Motors Research Laboratories.

With this engine, for the first time, a commercially practical internal combustion engine of sufficiently high horsepower and sufficiently small size and weight was available for possible use in road locomotives.

The savings to the railroads from replacing steam with diesel power were indicated by a 1950 Interstate Commerce Commission study, which estimated that in 1948, a year when the railroads had a total net income of $750 million, the railroads saved over $342 million from only partial dieselization of their operations.

What the diesel locomotive has meant to the railroads was perhaps best summarized in 1955 by the then-president of the Pennsylvania Railroad, when he stated in a speech:

> The greatest single contribution to the economic and efficient operation of our railroads during my 40 years of association with the industry has been the development of the diesel locomotive. We all know the important part General Motors has played in that development * * *. I would guess that this development alone in saving the railroads a minimum of $500 million a year.

Senator Hart. That was about 15 years before the end of the railroad.

Mr. Smith. In addition to the lightweight diesel engine, another revolutionary innovation in the locomotive industry by General Motors was the application of automotive mass production techniques to locomotive manufacture. Utilizing know-how developed in the automobile industry, General Motors developed new manufacturing methods and factory controls suitable for locomotives, and there being few tools then available in heavy industry which were suited to high precision manufacture, even designed and built its own tools.

General Motors has continued its research and innovations in locomotives right down to today. In addition to a staff of engineers

and technicians at our division, who devote their total efforts to improving the performance and efficiency of our products, we are backed up by the full engineering and scientific resources of General Motors' central corporate engineering and research staffs in Michigan.

The great increase that electromotive has been able to make in the productivity of diesel locomotives has permitted the U.S. railroads to handle 31 percent more tonnage today than they did 10 years ago, with a locomotive fleet that has actually shrunk by 1,500 units during the same period.

The increased productivity of our locomotives is also illustrated by the combined improvement in the capacity and pricing of our equipment. Since 1948, due to general inflationary pressures, the general level of prices for machinery and motive products as measured by the Bureau of Labor Statistics' Wholesale Price Index has increased more than 100 percent.

Despite that increase in general prices, we are today making higher horsepower locomotives available to the railroads at less cost per horsepower than we did 25 years ago. For example, our current 3,000-horsepower general purpose locomotive is available to the railroads at about 15 percent lower cost per horsepower than our comparable 1,500-horsepower unit was in 1949. As I have said, this has been accomplished against a backdrop of continuously rising prices for all goods and services.

In the early period of diesel locomotive development, our competitors had no faith in the diesel and, in fact, ridiculed it. Their advertisements and speeches almost never failed to proclaim the superiority of steam power—even as late as the 1940's and after World War II—long after the superiority of the diesel had been proven.

As time went on, our competitors finally did produce diesel locomotives, but they failed to match the quality and value of our product. It was this superiority of General Motors' product and service that attracted the patronage of railroad customers with the largest share of the business.

It has been suggested at these hearings that General Motors coerced the railroads into buying its locomotives by awarding or withholding freight shipments over their lines. I have been with electromotive for over 25 years, and I can state flatly that if there is one thing that has been a creed at our division, it is that we sell our products solely on the basis of merit—price, quality, delivery, and service. This is a long-standing General Motors business policy, and it was applied specifically to railroad transactions in a general letter issued by Mr. Alfred P. Sloan, then head of General Motors, at the time when General Motors entered the locomotive business.

The record showing this policy and that it has been meticulously followed is shown in the booklet "The Locomotive Industry and General Motors," which was previously submitted to the subcommittee, and which I request be filed in the record of these hearings.

Senator Hart. This has been done.

[The booklet appears as exhibit 24 at the end of this panel's testimony.]

Mr. Smith. This policy was adopted long before "reciprocity" became a matter of legal significance. The reason for it was and is

simply that it is poor business to sell our products on the basis of trying to award traffic to a customer.

Under General Motors' decentralized system of management, an automotive division general manager is interested—because his pay depends upon it—only in efficient, smooth, and uninterrupted freight service to and from his manufacturing plants, and wouldn't even begin to think about routing traffic to benefit locomotive sales.

Furthermore, any traffic given to one locomotive customer would have to be taken away from another railroad customer. Since all railroads are either actual or potential customers for our locomotives, shifting traffic around every time one of them purchased some locomotives could only result in antagonizing all of our railroad customers. It seems obvious that "robbing Peter to pay Paul" would not be a wise locomotive sales policy for General Motors. The only practical policy to follow is to deal with the railroads strictly on the merits, with respect to both purchases and sales. And that is exactly what we do.

Anyone seeking to ascertain why General Motors has been so successful in selling locomotives would do well to heed a famous advertising slogan and "ask the man who owns one." The answer he would get is that General Motors' locomotives are the most efficient and economical to operate. These savings in operating costs, spread over the life of the locomotive, in effect are equivalent to a price advantage of tremendous proportions.

On railroad after railroad, operating cost records showed that General Motors' loomotives were superior, not only with respect to steam locomotives, but as compared with diesels and other types as well. Railroad cost studies showed that the cost of operating their fleets of General Motors' locomotives saved millions of dollars per year compared with their fleets of competitors' diesels. Typical average savings of General Motors' locomotives compared with other makes of diesels have been in the neighborhood of 10 cents per mile or more. Considering that a freight locomotive can be expected to operate 2 million miles or more during the course of its normal life, this represents a saving of $200,000 over its useful life—an amount approximating its initial cost.

In the face of the customer's obvious preference for a better product, it is no wonder that some of our competitors finally decided to get out of the locomotive business. Their locomotives simply did not warrant the customers' patronage, and the railroads did not buy them.

This has been admitted by officers of those companies. For example, an official of one of those companies has stated:

> * * * the judgment of those of us who had been in the company back in the diesel period was that General Motors had nothing to do with the Baldwin failure. It was our late start in the field and our inability to produce as good a competitive product.

The former president and chairman of the board of another competitor has stated:

> [American Locomotive Co.] maintenance costs were excessive, in comparison with the electromotive locomotives which had a margin and which were designed especially for road service. And they gave us terrific competition to the extent that we were practically eliminated from the field productwise.

One might also ask the Alaskan Railway and Amtrak, the National Railroad Passenger Corp., what locomotives they purchased. The Alaskan is owned and operated by the U.S. Government and Amtrak is a quasi-governmental corporation which does not haul any freight. Therefore, neither organization could be subject to any freight leverage. It is significant that 100 percent of the new diesel locomotives acquired by each of those companies have been General Motors units.

But I think probably the most convincing evidence for this subcommittee that General Motors has attained its position in the locomotive business solely on merit is the fact that some years ago two suits were filed by the Government against General Motors charging monopolization through the use of its freight traffic. After more than a decade of investigation, examination of records, and talking to railroad and locomotive industry personnel, the Goverment dismissed both suits prior to trial because of the lack of evidence.

I would now like to turn to claims that have been made before this subcommittee that General Motors promoted the use of diesel locomotives by the railroads in order to obtain greater automobile and truck sales.

This claim is so ridiculous that it hardly warrants discussion. I have already indicated in very general terms the overwhelming superiority of the diesel compared with the steam locomotive. I would simply add here that if it had been General Motors purpose to encourage railway passengers to travel by automobile instead of by train, the last thing it would have done would be to promote the diesel; rather, any purpose to discourage railroad travel would have been better served by not introducing the diesel, so that railroad passengers would have had to continue to suffer in trains pulled by steam locomotives.

Anyone old enough to recall railroad travel during the steam era will remember the ever-present cinders and soot from the coal being burned, the characteristic jerky starts and stops of the train and the frequent stops for coal and water service, and to change locomotives.

Passenger runs were the first road operations to be dieselized precisely because they did offer passengers through service, with faster, on-time performance.

A further strange claim made before this subcommittee is that by promoting diesels, General Motors prevented electrification of the railroads.

If the railroads could justify electrification at all it would have been when they were operating the very expensive and inefficient steam locomotives. Yet, there was no appreciable electrification trend in this country prior to the diesel era, even though electric locomotive technology was well-known. Thus, by 1934, just prior to General Motors entry into the locomotive business, and after electrics had been available for 40 years, there were less than 750 electric locomotives in operation in the United States, compared with over 47,000 steam units.

Obviously, factors other than General Motors promotion of the diesel must be responsible for the lack of electrification in this country. It stands to reason that if investment in electrification could not be justified even against the high costs of operating steam loco-

motives, the economics of electrification would look even less attractive when compared with the much lower operating costs of the diesel. In other words, dieselization was chosen by the railroads simply because it was much more attractive economically than either steam or electric operation.

Today, the overwhelming disadvantage of electrification in this country still is, as it always has been, the enormous capital investment required to install the electric power supply equipment. At current price levels, the capital cost for installing overhead electrification would run between $80,000 and $100,000 per mile of double track. Since it is not feasible to electrify unless a substantial length of line is covered—say 500 to 700 miles—it is apparent that a very sizable investment is involved. This investment, plus the purchase of the electric locomotives themselves, must be made before any advantage from electric operation could be realized.

The only reason electrification has not progressed in this country is because the railroads have not been persuaded that operating savings resulting from electrification would be sufficient to pay off the required investment.

In 1950, an indepth study of railroad motive power by the Interstate Commerce Commission stated as follows with respect to the high cost of electrification:

> Many studies of further main-line electrification have been made, but in all cases the cost of construction has been found to be very great and none of these projects have been undertaken.

More recently, in 1971, the Secretary of Transportation appointed a blue-ribbon Government-Industry Task Force on Railroad Electrification. Following a study the task force concluded that:

> * * * large scale electrification has been and is today beyond the financial capability of most of the Nation's railroads. * * *

That is why there were only approximately 220 electric locomotives operating on U.S. railroads as of the end of 1972, compared with about 27,000 diesel locomotives.

Of course, it may be in the future that a changed relationship between the price of diesel fuel and the price of electric power will make electrification more attractive than it has been up to now. Or perhaps a breakthrough in electric locomotive technology will change the present equations between the two types of power. If so, I would expect the railroads to switch their purchases from diesel locomotives to electric locomotives, when and if a net advantage of electrification is demonstrated, just as they purchased diesels in place of steam locomotives once the superiority of the diesel was established.

General Motors is working on various possible alternatives to the diesel for powering locomotives. We have experimented with a gas turbine engine: we have carried on extensive research with prime movers such as the Stirling and the free piston engines; we have submitted bids to railroads for all-electric locomotives on several occasions, and are currently building two prototype electric locomotives of advanced design.

Whatever the future may bring for railway motive power, whether diesel, all electric, gas turbine, or other engines, General Motors is striving to be in a position to offer the best available product for

the job at hand. This is necessarily so because General Motors has no means by which to dictate what its customers will purchase; it can only sell them products which merit their business and which they wish to purchase.

The claim has also been made to this subcommittee that General Motors forced the New Haven railroad to "convert" from electric to diesel power, thereby causing a loss of passenger and freight business, higher operating costs, and bankruptcy. Based on this one supposed example, the further claim is made that poor earnings of all other U.S. railroads are likewise attributable to their having dieselized rather than electrified, due to coercion by General Motors.

Attached to my statement is the affidavit of Mr. H. E. Hales, who was chief mechanical officer of the New Haven in 1956. Because many of the pertinent facts regarding the New Haven relate to internal railroad matters which are outside my personal knowledge, and for that matter outside General Motors' knowledge, we decided to ask an official of the railroad with personal knowledge of such facts to comment on the claims.

I believe Mr. Hales explains in his statement why the New Haven chose our equipment and he categorically denies that General Motors' freight shipments were involved; therefore, I will add only a few comments.

First, there was never any "conversion of the New Haven system from electric to diesel power," as claimed. The mainline from New York City to New Haven, Conn., is still electrified today, as it has been since before World War I. Beyond New Haven the railroad was never electrified, and therefore always utilized diesel or steam power.

Second, it is ridiculous to ask this subcommittee to believe that General Motors coerced the New Haven to purchase General Motors diesels, when in fact, the New Haven purchased seven times as many diesel locomotives from other locomotive manufacturers as from General Motors. Thus, at the end of 1956 the New Haven was operating a fleet of 408 diesel locomotives, of which only 50 were General Motors units.

Thereafter, from 1957 through 1968, when the New Haven was merged into the Penn Central, the New Haven took delivery of 110 additional diesel units. Sixty of these were from General Motors. It is difficult to see how the small percentage of New Haven diesels manufactured by General Motors supposedly brought about the railroad's downfall.

In regard to the claim that General Motors diesels caused the loss of passenger traffic to the New Haven, the 60 General Motor locomotives delivered to the New Haven between 1957 and 1960, which we designated FL–9's, were the first General Motors locomotives owned by the New Haven which were designed for passenger service. Since the New Haven's passenger business had been deteriorating for many years prior to 1957, the FL-9's could not have been the responsible cause.

The FL–9's were not standard locomotives, but were modified units incorporating a number of special design features specified by the New Haven. As explained in Mr. Hales' affidavit, the New Haven had requested all the diesel locomotive manufacturers to submit

designs for the special locomotives, but as it turned out, ours was the only design submitted that met their specifications.

Finally, I would like to comment briefly on references to certain criticism made by two hearing officers of the Interstate Commerce Commission.

Most of the hearing officers' criticism was directed at the New Haven management, and I will not comment on that since it does not involve General Motors. But the hearing officers also criticized an engineering study submitted by General Motors to the New Haven in 1957 indicating the horsepower savings we estimated the New Haven could realize by purchasing 28 addition FL–9 units, which added to the 60 units previously ordered would give them a total of 88 FL–9's.

Specifically, the hearing officers stated:

> To say that 88 FL–9 units, with an aggregate rail horsepower of 126,000, will supplant locomotives in active service with a total rail horsepower of 288,260—plus 16 switching engines—is manifestly absurd.

I don't think that estimate was absurd at all. The estimate reflects about a 2-to-1 horsepower saving, which is well within the range we typically find in replacing outmoded diesel locomotives with modern diesel units. When we were replacing steam with diesel power, the savings in terms of horsepower frequently were even on the order of 3 to 1 or more. In the case of the New Haven, the inability of its electric locomotives to operate outside the electrified zone provided a potential for large savings through the use of the highly flexible FL–9's.

The FL–9's could operate anywhere on the railroad, as diesels or as third-rail electric locomotives, and could be used for either passenger or freight service. This meant, for example, that an FL–9 could haul a train all the way from New York City to Boston or Springfield without an intermediate stop at New Haven—where the electrified zone ended—for a change of locomotives.

In contrast, when an electric locomotive was used, it had to be removed at New Haven in favor of a diesel, and the electric would then stand idle at New Haven to await the return of the train from Boston or Springfield, when it would be hooked up to the train again for the return trip to New York City. Mr. Hales noted that an electric might wait idle at New Haven for as much as 6 hours or more, depending on schedules. Not infrequently there would be as many as eight New Haven electric locomotives—of either 3,600 horsepower or 4,000 horsepower each—standing idle for hours at New Haven waiting for return trips to New York City. Obviously it doesn't take much horsepower to replace 30,000 horsepower which isn't doing any work.

My point is that horsepower ratings—which the hearing officers were looking at—don't mean anything. What counts is the utilization of the horsepower—the amount of work being done.

The full ICC saw this point when they reviewed the hearing officers' opinion. They stated that "we are unable to find that [General Motors] locomotive utilization plan was unsound," and went on to say in effect that the hearing officers' statement that 126,000 horsepower would not supplant 288,260 horsepower was true only "assum-

ing. of course, that 288,260 horsepower are required to meet the power requirements of the railroad."

That is exactly what I've been talking about. The New Haven could get by with much less horepower, provided it was working horsepower.

Thus, the Commission was consistent with its finding in a previous proceeding involving the purchase by the New Haven of these same FL–9 locomotives.

There the Commission had stated:

> Our investigation of the performance records [of the FL–9's] and inspection of the locomotives themselves shows that this type of locomotive is very well suited for operation on the New Haven's system.

Time does not permit me to respond further to these erroneous claims. But in concluding I would like to comment on the assertion that there is a conflict of interest in General Motors being in both the locomotive and the automobile business.

Apparently the theory is that there is more money in selling automobiles and that if we simply offer inferior locomotives to the railroads we can induce people to ride in automobiles rather than trains.

As an engineer I don't really understand the logic of this, since if we don't make good locomotives what will happen is that our railroad customers will take their business to someone who does. Americans choose among planes, trains, buses, and automobiles on the basis of their personal preference for a particular mode of travel—not on the basis of any manufacturer's wishes. But I think the record I have discussed clearly shows, better than any argument I can advance, that General Motors has never held back in its efforts to develop and manufacture the very best railroad motive power it could, and to give its railroad customers the products they want.

One can evaluate the strange theory that General Motors doesn't compete in locomotives so as to promote automobiles by taking a look at General Electric, which doesn't make any automobiles. They are a great company and a strong competitor wherever they do business, and today our two companies compete vigorously for diesel locomotive business. Yet we, who are supposed to be holding back in favor of automobiles, are doing a better job in terms of obtaining the railroads' patronage than General Electric, which could not be holding back. That does not look like General Motors has any conflict in selling locomotives along with automobiles.

If in the 1930's there had been a legal rule such as has been suggested here—that is, that an automobile manufacturer could not also make locomotives—General Motors' contributions to the railroads could not have occurred. Our expertise in engines, our techniques in mass production learned in the automobile business, could not have been applied to locomotives. Would it have been better for our country if the railroads had been forced by law to rely on the steam locomotive manufacturers? I think our record in the locomotive field supplies an obvious answer and strongly suggests that public policy should encourage a company that has made the contributions General Motors has to stay in—not get out of—the locomotive business.

I have appreciated the opportunity to present my views. Thank you.

Senator HART. Thank you, Mr. Smith.

Dr. Duncombe. Now, Mr. William Spreitzer.

Mr. Spreitzer has some audiovisual material that he would like to put on in just a moment or two.

Statement of William M. Spreitzer

Mr. Spreitzer. Good morning.

I am Bill Spreitzer from the transportation and urban analysis department of the General Motors Research Laboratories.

My responsibility is to administer the efforts of a group of scientists exploring ways of improving urban public transportation.

[Mr. Spreitzer's prepared statement appears as exhibit 27 at the end of this panel's testimony.]

My objective today is to respond to Senator Hart's inquiry about what GM has done to promote mass transportation. Our reputation in building superior buses and locomotives is well established and, in itself, demonstrates GM commitments in the area of public transportation. But in addition we have been working on ideas, concepts, and new technology for improvements in urban mass transportation. Our efforts have ranged from rail transit and bus transit to the new technologies which are now being considered as candidates for improvements in transportation as they might exist years from now.

While there have been a number of projects in GM which did not meet the requirements of technology or economics or the ultimate test of public demand, there have been a number of successes. Several will be discussed in just a moment.

GM has been interested in whatever types of propulsion systems might be best suited to transportation needs—whether they be electric, gasoline, or diesel propulsion. For example we have supplied transit vehicles with electric propulsion because such systems appeared to meet the needs of particular customers. During the 1930's, our coach company made trolley coaches for Kenosha and Milwaukee, Wis.; and Flint, Mich. It also built so-called all-purpose trolley coaches which were operated by hybrid propulsion systems, either gas-electric or diesel-electric. These vehicles could be operated with electric power from the trolley wire and when they reached the end of the line they could continue operations on conventional streets and roads with power generated from the gasoline or diesel engine.

Could I have the lights down now, please?

Senator Hart. Yes. Kill the lights for the period during which we see these slides.

[The following took place during a slide presentation.]

Mr. Spreitzer. The particular vehicles shown here were used at Public Service of New Jersey.

During the period from 1935 to 1937 our coach company supplied 356 of these vehicles to this customer.

GM also experimented in the late 1960's with a 35-passenger coach, shown here, using an electric generator, driven by a gasoline engine, to supply power to storage batteries, which in turn were used to propel the vehicle through an electric motor.

Some major GM innovations which contributed to improved bus transportation include:

Monocoque or integral construction; the two-cycle diesel engine which provided substantially lower operating costs; the automatic

transmission which provided operation more comfortable and safer for the passenger and eliminated gear shifting; air suspension which provided a smoother ride.

Such innovations led to the widespread customer acceptance of GM buses. But we have always had substantial competition.

Among our current competitors are:

Flxible, a division of the Rohr Corp.

AM General, affiliated with American Motors.

Eagle International—the U.S. outlet for bus and car.

Motor Coach Industries.

Highway Products.

Prevost Car—a Canadian manufacturer that has sold in the United States.

As may be determined from the statistics in Dr. Duncombe's statement, GM's competitors had 57 percent of the bus business last year.

Additional companies are entering the field. Some examples of companies which have either introduced or have announced their intention of introducing buses for sale in the United States are the following:

British Leyland.

Neoplan—West Germany.

Winnebago.

Otis Elevator Co.—their new electro bus division.

Westinghouse Electric Corp.

Flyer Industries—from Winnipeg.

You will note that the Otis, Westinghouse, and Flyer buses are electric powered.

And here is a picture of our new bus, which GM developed, the RTS–2, which will come out next year. A prototype of this new bus is parked outside the Senate Office Building for your examination. Work on this and other new bus designs has been underway since 1964.

In May of last year GM announced an expenditure of $32 million for tooling and equipment to produce this new line of coaches. Its key features are: Modular construction, expanded glass area, fiberglass exterior panels, a lower floor, a kneeling feature permitting the bus steps to be lowered to curb level, a real assistance to the handicapped and the elderly.

Transit operators have expressed great interest in the RTS–2. I would encourage you to take a look at it because it is an example of the final product that makes the systems attractive to the user.

Let me now explain more specifically the activities of the GM transportation and urban analysis department. It was organized in 1966, pulling together prior GM work in public transportation areas. The assignment was to do long-range work to help identify new transportation needs, potential solutions, and products. Any mode of transportation that would fill a social need would interest us.

Our transportation and urban analysis department presently has a staff of 29 people, with backgrounds in a variety of disciplines bearing on mass transportation.

A wide variety of transportation concepts has been reviewed and analyzed—from rail transit to innovative rubber-tired bus rapid transit.

Representative examples of some of these concepts are:

Rail ferry—an electrically propelled rail car train equipped to carry small buses or automobiles "piggyback."

Dual powered rail transit cars—a commuter rail car with a dual propulsion system, either diesel-electric or straight electric, reminiscent of the all-purpose trolley coaches built for Public Service of New Jersey in the 1930's.

Network cab—A HOVAIR GM-patented air suspended, electrically propelled "people mover" studied in the context of the downtown transportation needs of the city of Philadelphia in the year 1990.

Demand responsive jitney or Dial-a-Bus—the new familiar public transit small bus service that operates door-to-door, providing taxi-like service at buslike fares.

Bimodal bus—the forerunner of what the U.S. Department of Transportation now calls "dual mode transit"; essentially a Dial-a-Bus driver-operated on surface streets or highways and in an automated driverless fashion on fixed, special guideways completely separated from other traffic.

Two considerations are of particular significance with regard to these transportation concepts.

First, one major consideration is the question: How many people will really use that new or improved transportation system being proposed?" GM's approach to this question emphasizes consideration of individual attitudes and opinions obtained in home interview surveys. Attitudes toward a wide range of things like transit fare, comfort of seats, door-to-door service, assurance of arrival time and many other factors are collected from many different kinds of people for several different kinds of transportation. We want to find out how potential transportation system designs can be made more attractive to potential passengers.

The second consideration is that what is a good transportation system for one community may not be good for another. GM's approach to this problem is a computerized statistical evaluation of the significance of differences and similarities among cities affecting their transportation needs.

The final example today relates to improvements in transit bus operations being promoted by the U.S. Department of Transportation. GM justifiably claims credit for much of the current success.

In the 1960's, GM developed a new bus transit concept called Metro-Mode. This is a rapid transit system provided by an exclusive bus lane built into the freeway. It has some important advantages. It permits the buses to carry high volumes of passengers without getting tied up in rush hour traffic while enabling most passengers to avoid transfers.

The capital cost, as demonstrated by studies made by the Southeastern Wisconsin Regional Planning Commission, was about half that of rail rapid transit.

GM has promoted Metro-Mode through scores of speeches to transit systems, civic groups, highway departments, motor bus associations, city governments, and any interested group.

Brochures were also widely distributed, such as the booklet called Metro-Mode. A copy was attached to my testimony.

Since the 1950's, GM has distributed a series of promotional films which it prepared on bus transit. I would like to screen excerpts from the most recent version of those films, one called "Winning Ways." Copies of this film series were supplied to the Federal Highway Administration which has utilized some of the ideas and even borrowed actual scenes from the film in producing and distributing its own film on the subject throughout the country.

And now excerpts from the film, please.

Senator HART. Let me suggest there is need for a recess. The signal was just given that indicates that a vote has begun on the floor.

Let us take a brief recess.

Mr. SPREITZER. Very well, sir.

[Whereupon, a brief recess was taken.]

Senator HART. The committee will be in order.

That was a longer delay than I anticipated, but I waited on the floor while they tried to resolve the problem of how much time would be taken on the remaining amendments. And, I think they lost more time trying to save it.

Why don't we just go ahead.

Mr. SPREITZER. We were about to show the film, if we may, Mr. Chairman.

[The following took place during a film presentation.]

Mr. SPREITZER. Now, the context of the testimony at this point is, what has General Motors done to help promote bus transportation. You undoubtedly noticed that this movie stresses that the bus, as compared to the automobile, is a more efficient way of moving people in congested areas. The movie advocates that buses are entitled to special rights-of-way because one bus can carry up to 20 times as many people as two automobiles.

The GM films and booklets have been a major factor in the renewed interest in buses as an improved and flexible form of rapid public transportation. Metro-Mode is a good example of the corporation's commitment to the search for better transportation.

One final comment. General Motors has recently underscored its commitment to the achievement of better urban transportation systems my establishing a new GM transportation systems division which the chairman of General Motors has said—

> * * * will coordinate, intensify, and enlarge GM's activities in urban and public mass transportation systems. It will enable us to employ the full resources of General Motors toward participation in the overall transportation needs of the United States.

Among the expertise utilized in the new division will be that of the GMC truck and coach division in bus tranportation, electromotive division in rail transportation, Delco electronics division in guidance and control systems, Detroit diesel, Allison Division in power trains and the advanced scientific techniques of the GM research laboratories. The division will draw upon all of GM's capabilities in working closely with the Federal Government and munici-

palities to develop and implement the transportation systems these public agencies want and need.

GM's forte is hardware manufacturing and systems management. We are applying those talents to the continued search for better public transportation.

[End of film presentation.]

PANEL DISCUSSION WITH DR. DUNCOMBE, MR. SMITH, MR. SPREITZER AND MR. NITSCHKE

Senator HART. Thank you, sir. Gentlemen, thank you.

For the information of those whose schedules may be involved, I am afraid we are going to be interrupted periodically by calls to vote.

And, anticipating that, and knowing that at about 2:30, I will be required to attend an executive meeting of the Commerce Committee, hopefully for not more than 30 minutes. I would suggest that we attempt to continue through the noon hour. Hopefully, before it is dark, we can be out of here.

Is that all right with you, sir?

Dr. DUNCOMBE. Certainly, that is fine. We do have our bus parked outside. Any time it is convenient for you to see it, I would be very pleased to show it to you.

Senator HART. At one of those interruptions, I would like to.

Dr. DUNCOMBE. Fine.

Senator HART. Well, after all of that, I am not sure I can find where to begin.

The testimony was interesting, and I am sure that it still will be after the analysis of the formal statements that have been submitted.

Interesting and thoughtfully presented, I might add.

Dr. DUNCOMBE. Thank you.

Senator HART. Doctor, let me begin by citing from your prepared statement. You were talking about the bill and, more specifically, two of those who rebutted presumptions that are in the bill.

Senator HART. While I believe that consistently high profits are a reasonable or a legitimate indication of monopoly power, yet I do see that that presumption indeed might cause a misallocation of resource, as a company got to that fifth year, and saw that profit figure.

And, the incentive for profits is something that I do want to keep, and I would not want to destroy.

If I agreed to delete all three rebuttable presumptions, would General Motors support the bill?

Dr. DUNCOMBE. If you would agree to delete the bill we would support you.

Senator HART. If what?

Dr. DUNCOMBE. If you would agree to delete the bill we would support you.

Senator HART. We had testimony yesterday, or earlier in the hearings, from Dr. Demsetz and Professor Manne. They suggested that the Sherman Act should be repealed, except, as I recall it, for explicit persuasive agreements, such as the *Westinghouse/GE* case.

How do you feel about the Sherman Act. Do you think it should be repealed?

Dr. DUNCOMBE. No, sir. Certainly the provisions that prohibit restraint of trade, collusion, and conspiracies, we endorse as a matter of sound public policy.

The questions that arise in conection with whether or not monopoly existed, it seems to me, are much more open to question. But, as a general proposition, I would have to say that the thrust of the Sherman Act does serve the public interest.

I think that the problem that has arisen there, Senator, is that the courts have interpreted the act in so many different ways that the businessman today is very uncertain about what is and what is not acceptable in terms of the law. And here, it seems to me, there is the opportunity for the courts to clarify what the act means.

Senator HART. I was attempting, at least in part, in introducing this bill, and I return now to my suggestion that we eliminate from the bill these rebuttable persumptions, not necessarily to make more predictive the result in any court case, but to make the proceeding a more manageable, a better organized, a more thoroughly disciplined presentation of the issue of a monopoly.

If we do agree that restraints of trade, collusion, ought to be prevented, I would suggest that there is an appeal in the bill as we have drafted it, even to those whose only complaint now in the antitrust law is the uncertainty of court decisions.

It is just possible that, by a restructured court for this purpose, we might find a more reliable device.

Dr. DUNCOMBE. I think that your bill depends on these rebuttable presumptions. I cannot imagine that the administration of the bill would do anything but dampen competitive enthusiasm, and that the consumer will ultimately have to bear the cost of that.

I think that, by and large, American industry has performed extraordinarily well in supplying the American consumer, and has adapted extraordinarily well to changes in consumer wants:

The bill, unfortunately, would establish another Commission to monitor competitive enterprise, which, by and large, has done, as I said before, an outstanding job.

We have, in this country, the highest standard of living in the world. This is largely a result of business firms competing with each other in the hope of profit, a hope of profit that can only be realized if they serve the consumer well. You take that away from our system than I think that you have destroyed the basis for our system.

Senator HART. Well, let's look at another item that was mentioned by one or other of the professors yesterday. He said that he felt that reciprocity did not exist.

I think it was in the presentation of the diesel or the locomotive testimony.

As I understood it you said it would be legal, but it was a practice that the General Motors Corp. would not engage in.

Do you feel that reciprocity exists in certain areas of the business community, and should it be illegal?

Dr. DUNCOMBE. I do not believe it exists, and I think it does not exist for a very sound business reason, as Mr. Smith pointed out. It would simply not be good business for us to engage in reciprocity.

It is up to each of our car divisions to operate its business as efficiently as possible, and that includes the routing of freight.

Moreover, as Mr. Smith pointed out, this would be a game of "robbing Peter to pay Paul." And, you know, this is a game that is almost calculated to bring every railroad president in the country down on our heads. It simply would be a very big loss game for us.

I believe that reciprocity, by and large—I am not familiar with other industries, and I presume there could be exceptions to this—but, by and large, I would think that reciprocity would be poor competitive business, and not in the interest of the business itself.

Senator HART. But, beyond that, if, in fact, it exists in some section of the economy, should it be prohibited by law?

Dr. DUNCOMBE. You would have to examine the facts on that. I think that the overwhelming presumption is that if it exists at all it is going to be an extraordinarily minus factor.

Senator HART. Well, it is the concept that you buy from me and I will buy from you, that, if it exists, doesn't it have an adverse effect on competition?

Dr. DUNCOMBE. I doubt if it could exist very long, if it started.

Senator HART. Well, let's assume it does. Ought it be stopped?

Dr. DUNCOMBE. I do not think it is a valid assumption. I do not think it is valid that reciprocity can exist for very long. I think that, as a business proposition, it would die of its own weight.

Senator HART. Let's assume, in that not long period, some competitor was adversely affected. Now, is there an obligation of government to seek to prevent that?

Dr. DUNCOMBE. That would be a very high cost to pay for what I consider to be a very minor short-term deficiency. I do not approve of reciprocity, you understand me.

But, I would say that to invite the Government with its massive machinery and its extraordinary cost into this problem would be a misuse of the Government's resources.

Senator HART. Professor Manne criticized the Celler-Kefauver amendment to the antitrust law, saying that it resulted in the prevention of mergers that, in their judgment, would have been desirable.

Is it your position that, as presently applied, the Celler-Kefauver act is satisfactory. Or is it your view that different standards for mergers should be applied.

Dr. DUNCOMBE. I honestly have not looked into that problem adequately to give you a general answer to it, Senator Hart.

Senator HART. Narrowing it a little, in the past, many years ago, General Motors acquired the electromotive railroad cars and Winton Engine locomotives.

Do you have any opinion as to whether those acquisitions, had Celler-Kefauver been on the books, would have been either prevented by the law, or by corporate judgment, a decision made not to enter the market?

Dr. DUNCOMBE. Let's see, if I understand. The question is that if the Celler-Kefauver amendment had been on the books at the time when this was acquired?

No. I cannot speculate on that, sir, either. All we know is that the Winton Engine Co. was an extraordinarily small company; all the development that took place was General Motors development.

Senator HART. Yesterday, Dr. Demsetz and Professor Manne questioned whether or not monopoly power really could exist without some sort of barrier to entry that was Government imposed, Government regulation of some character.

Dr. Demsetz indicated he did not see a monopoly, or share the monopoly problem, with respect to the industries that we have enumerated in this bill.

Professor Manne indicated that, except where you have organized crime moving in, a monopoly could not be maintained through purely private means, private power.

Now, this bill, of course, is based on the premise that we do have a problem with monopoly, and shared monopoly.

Now, your testimony makes very clear that you believe the automobile industry is extremely competitive. Do you see a problem of monopoly or shared monopoly in any of the other sectors of the economy that we have enumerated?

Dr. DUNCOMBE. No, sir; I do not.

Senator HART. Now, under section 2 of the Sherman Act, there has to be proof, not only of the possession of the monopoly power, but of something else in addition.

That something else has been referred to as abuse, or intent, or, as in the *Alcoa* case, an element of deliberateness.

If there is monopoly power in some sector of the economy, does it make any sense to have to prove the deliberateness, the intent. Would it not be true that a monopoly power itself is the thing that we should be concerned about, and not how it happened.

Dr. DUNCOMBE. I think that I agree with Professor Demsetz, that instances of monopoly power are very hard to find, and that monopolies, if you can conjure up such a situation, are extremely short lived, because competition is always invited. And, if there is a monopoly profit situation, the inducements to get into the business are tremendous.

I think that our history demonstrates how rare the circumstance of monopoly is. And, particularly, when you have an economy that is as dynamic as ours, as subject to change as ours, the incidence of monopoly is certainly very, very low, if it exists at all. And, offhand, Senator Hart, I cannot think of a situation outside of the regulated industries, outside of the public utility industries, that I could say to you honestly today constitutes monopoly power.

Senator HART. Do you go so far as to suggest that that has been true for the past, as you emphasized today. How far back would you feel comfortable making that claim?

Dr. DUNCOMBE. Well, I guess——

Senator HART. Did we ever have a problem with monopoly?

Dr. DUNCOMBE. I am not that familiar with history. And, I certainly would never go so far as to make a sweeping statement of that sort. There may have been. I am not familiar with situations that I would call monopoly.

Even in the case of Standard Oil, for example, we have a very perceptive study of the *Standard Oil* case by Professor McGee, in

which he demonstrated, I think conclusively, from the economic point of view, that that decision was probably and still is an improper decision.

It is difficult to generalize, and I cannot think of a situation right now that I would call a monopoly, by which I mean an industry that was free from competitive pressure, or free from the threat of expanding competitive pressures.

Senator HART. Well, you cited the *Standard Oil* case. And, I recently took a clause from the *Alcoa* case. Do you have any judgement as to whether we are better off or worse off, as a nation, that we now have Alcoa, and Kaiser, and Reynolds, as a result of that action.

Dr. DUNCOMBE. I think it is a matter of indifference. I think it is a matter of indifference whether we have three or one in that case. I think that the competitive pressures on Alcoa were extraordinary. And, I think there were all sorts of competitive alternatives to aluminum. I think that those pressures existed when Alcoa was the sole producer of aluminum. I think that if Alcoa had conducted itself in a way that invited additional competitors, that the effect on the consumer, which is what we are really interested in here, would have been the same. You had competition, you had a company that was aware of competition, and you had it conducting itself in a way that has not hurt the consumer.

And, it seems to me that, unless you keep coming back to that, unless you keep coming back to the effect on the consumer and the services given to the consumer, there is no discussion here. It is only if we are demonstrating that somehow or other the consumer has been hurt in the process, that maybe there will be something to discuss.

But I have seen no evidence of the way the Aluminum Company of America—before the entry of others in that industry—I see no evidence that the consumer was disadvantaged by that.

And I think it for a very good reason. I think that Alcoa must have been keenly conscious of the fact that there were actual competitors in the form of other metals and that there were potential competitors in the business. And this, I think, is probably what was in the mind of Professor Demsetz yesterday.

Senator HART. It is a fair conclusion, I think to say that you believe that the action against Alcoa should not have occurred, because you say that it is a matter of indifference wheher there was or wasn't that action.

You have already cautioned against using governmental resources on insignificant things. So isn't it a fair conclusion from what you have said that it is your judgment that the *Alcoa* case should not have been brought?

Dr. DUNCOMBE. Yes, sir.

Mr. CHUMBRIS. Mr. Chairman, may I interject?

Senator HART. Yes.

Mr. CHUMBRIS. On this last point of monopoly power and the effect of monopoly power and the price impact on the consumer, Dr. White, when he testified before us in the first set of hearings, pointed out that from 1949 to 1972 the price of automobiles, considering changes for quality, rose 34.1 percent.

Whereas, all other products rose 78.8 percent, which is more than a 100-percent increase in price. That would justify, then, on that point alone—and there may be other factors—that the so-called monopoly power, if there was a monopoly power, did not reflect itself in the increases in prices.

The theory is that if you have monopoly power you can charge as high a price that you think the buyer can bear.

Do you agree with Dr. White's comments relating to Consumer Price Index on price increases?

Dr. DUNCOMBE. Yes, I do. I carry it one step further, because the automobile component of the Consumer Price Index prices out a constant car, just as a technical measurement problem.

But not only did you have that situation of a highly competitive and disciplined price record over that period, but you had at the same time the introduction of a whole array of smaller cars.

Now, if you took the actual average price and took account of the fact that a new group of smaller and lower priced cars were being introduced by the industry at the same time, the record would be more impressive.

But that gets into an extraordinarily complicated technical measurement problem. But I fully agree with that. I think that the record of this industry has been outstanding, and it has been outstanding in the face of very great cost pressures in terms of increased wage rates, in terms of increased prices for the materials that we buy—the steel, the glass, the nonferrous metals.

I think that the record in this industry is a reflection of the intense competition that goes on among the new car producer and in relation to the used car market and, of course, more recently, in relation to the imported car sellers. It is a reflection of all those competitive pressures.

Mr. CHUMBRIS. There was one other comment that Dr. White made, and he made it particularly in his book, "The Automobile Industry Since 1945." He stated that one of the reasons for General Motors' higher profit rate as to the other competitors in the automobile industry was due to the excellent management—with which I am sure most of you gentlemen would agree——

Dr. DUNCOMBE. We do, we do. I will go on record on that.

Mr. CHUMBRIS. One was the excellent management, and the other was the excellent use of the facilities of your corporation.

Now, the question comes up, if this bill became a law and General Motors was broken up in accordance with the suggestion of Dr. White that General Motors be broken into five corporations, one a conglomerate, and four other separate corporations where you would have Chevrolet in one corporation, Cadillacs and Pontiac in another separate corporation, and Oldsmobile and Buick in a third corporation, and the little Chevrolets in the fourth corporation.

Now, if that were done, and you had to distribute the excellent management and the excellent use of facilities of General Motors into five rather than into the one corporation that you now have—would there still be the excellent management and excellent use of facilities in each of the five corporations, or would it be so dispersed that you would lose that excellence in all five, or four of the five, or three of the five, or two of the five?

Dr. DUNCOMBE. You would destroy our management organization if you were to follow that course. The heart of the General Motors success, I believe, has been the management's ability to test the market, to understand the market, to adapt to the market, and to serve customers effectively.

Now, this is a management aspect of the business because you know that no fancy piece of machinery automatically results in low cost unless you have a product out there that people want to buy.

So that it is only to the extent that we have a management that has been able to supply cars that people want, to supply them efficiently, that General Motors has been able to earn a profit.

If you destroy that management organization, then there is no amount of technology that is going to make up for that. You are destroying probably one of the most significant innovations in management that is taking place, which has been the management development outlined essentially by Mr. Sloan.

Mr. CHUMBRIS. Mr. Chairman, I have no further questions. I think that Mr. Granfield would like to ask some.

Senator HART. Well, let me continue, then.

I read to you an excerpt from another comment. This is from an author who is not an antitrust lawyer, as we read him.

Dr. DUNCOMBE. I don't think he is an economist, either, as I read him.

Senator HART. After your comment on Alcoa, I think he would return the compliment.

This is his testimony before a Senate committee back in 1967:

> Where firms are few and large, they can, without over collusion, establish and maintain a price that is generally satisfactory to all participants. Nor is this an especially difficult calculation, this exercise of power. This is what we economists, with our genius for the neat phrase, have come to call oligopolistic rationality.
>
> And this market power is largely immune, or very nearly so. But if there are 20 or 30 or more significant firms in the industry, this kind of tacit pricemaking —this calculation as to what is mutually advantageous, but without overt communication, becomes more difficult—maybe very difficult.

He indicates that he thinks he sees this in certain industries including autos, tubeless tires, and so on.

> The same result can be achieved only by having a meeting or by exchanging information on price and cost, and price intentions.
>
> But this is illegal. What the big firm in the concentrated industry can accomplish legally and effortlessly because of its size. the small firm in the unconcentrated industry does at the pain of civil and even criminal prosecutions.

I take it that you see a situation like that, where there are just a few competitors and where no collusive agreement at all is involved.

And yet, a comparable accommodation of price per dollar has simply not existed. You just don't see that pattern at all?

Dr. DUNCOMBE. I certainly has never been able to observe it.

Senator HART. Mr. O'Leary?

Mr. CHUMBRIS. Mr. Chairman, on that point, we have argued that question quite often in this subcommittee because we have so many different industries involved.

For example, let's take the price of gasoline at gasoline stations. I remember back in 1957 when one of the presidents of one of the large corporations was before us. Senator Kefauver asked why is it

that when everybody is charging 31 cents a gallon—let's go back to those days—and your competitor moves it up to 32 cents, everybody else moves it up to 32 cents?

And the company president would say, "Well, we have been holding back price increases for quite some time, and since the market is moving up, it has been a long time since we have had an increase. So we will move up to 32 cents."

Senator Kefauver would say, "Well, why don't you, instead of moving it up to 32 cents, stay at 31 cents? Then you will get the share of the market?"

Then, his answer would be, "Well, the market works in such a way and is such a competitive market that if I stay at 31 cents and I get all the business, the first thing you know, they will be moving back to 31; if somebody then moves to 30 cents, everybody will be moving down to 30, and the first thing you know, we will be selling gasoline at no profit at all."

But that doesn't necessarily apply to your industry, as I understand it. At Chrysler, Ford, General Motors, and American Motors, for any given car there is a variation in the price of each of those models of cars.

Is that correct?

Dr. DUNCOMBE. Well, that is correct. And, of course, I think there is a great deal of misunderstanding about what is the price of a car. So many people on the outside will look at the sticker price of a car and say, well, that is the price. Well, that has nothing to do—or very little to do—beyond being an initial offering price.

It may represent the manufacturer's best judgment of what his car is worth, but the price at which that car is ultimately sold is a transaction price, and that is a price that is worked out between the customer and the dealer.

What happens over the course of a year is that there is intense price competition. It will take the form of special campaigns, for the most part, where the manufacturer will reduce the wholesale price, if he finds that his initial judgment on this particular vehicle was wrong. So that there is a constant, rather sensitive adjustment to price that goes on throughout the model year.

I suppose this year may be an extreme case, but it is typical in describing what actually goes on when the larger cars that we produced were not being sold. Our response—and I think the response of other manufacturers—was to introduce sales campaigns which effectively reduced the price from the manufacturer to the dealer, and from the dealer to the customer.

Now, this was straight out price competition that was going on, and that goes on almost every year. It is a way of adjusting more sensitively to what is happening out at the final point in the market than any method I have run across. It is an effective method. It results in a change in the transaction price.

Mr. CHUMBRIS. Thank you very much. Thank you, Mr. Chairman.

Senator HART. Mr. O'Leary?

Mr. O'LEARY. Dr. Duncombe, on pages 119 and 120, you speak of—I am referring now to this——

Dr. DUNCOMBE. The big one?

Mr. O'Leary. Yes. "Competition in the Motor Vehicle Industry." Of the 25 different lines of cars involving 10 basic body types which GM offers.

Dr. Duncombe. Yes.

Mr. O'Leary. You indicate that many of the same stampings are used throughout the same body shell.

Dr. Duncombe. Yes.

Mr. O'Leary. I take it by that you mean you would achieve economies and efficiencies by using the common stampings, say, of the compact line, Nova, Ventura, Omega, Apollo.

I think you make reference to distinguishing the front and rear ends so that the cars look different in appearance.

Then also, if I understand this portion correctly, you further indicate that there are some common stampings used from one line to another.

I take it that perhaps common stampings are used on the compact line and also in the sporty line, or in the intermediate line; is that correct?

Dr. Duncombe. Yes.

Mr. O'Leary. I think you make reference to the fact that a decision to use different doors on each of the four car lines would involve an estimated additional expenditure of over $60 million.

I believe that is in reference to the four compact cars. It is a very interesting section, and I gather that the trick is to utilize as much of the mass production economies and efficiencies as possible and still produce enough diversity to appeal to the consumer.

Dr. Duncombe. That is true.

Mr. O'Leary. Later in that section, you make reference to an attempt by Ford and VW to extend the production lines and to limit the variety of body styles of car lines for extended periods.

I am assuming, with respect to the VW, you are referring to the Beetle. Correct me if I am wrong.

Dr. Duncombe. Yes; that is right.

Mr. O'Leary. But, what about Ford? Which experience are you referring to there; the Model-T?

Dr. Duncombe. Yes.

Mr. O'Leary. You can have any color you want, as long as it is black.

Isn't the thrust of this section really that there are substantial economies which are gained by the volume of cars that General Motors produces?

Dr. Duncombe. That is the thrust, that there are economies in mass production if you have the products out there that have the desired characteristics and can be sold competitively in volume.

But volume is a consequence of what you offer in the marketplace; it is not a consequence of having a tool or a die. There is a capability of a certain number of units.

Mr. O'Leary. I understand. No matter how many stampings you make you have got to be able to sell that number of cars, or it doesn't do you any good.

Dr. Duncombe. Yes, sir.

Mr. O'Leary. You have made reference to Professor White's testimony about the statistics that he was able to obtain concerning certain dies that indicate, from one set of dies, that General Motors was able to get 7 million parts.

Dr. Duncombe. Yes, sir.

Mr. O'Leary. Just for curiosity's sake, is that hoods or fenders, or what?

Dr. Duncombe. That was the shroud of the car. The shroud is that piece of formed metal that is just before the windshield on the car.

But on other dies, the door pans, and outer roof panels, and so on, we have dies, a single set of dies, that have produced in excess of 2 million pieces, and are still being used. Now, it is not 2 million over 3 or 4 years.

Mr. O'Leary. Until the next model change came along in which that particular part would have to be altered.

Dr. Duncombe. Yes, if the design called for an alteration. Yes, sir.

Mr. O'Leary. And, you stamp out those parts for replacement purposes, as well as assemblage.

Dr. Duncombe. Yes, sir.

Mr. O'Leary. Isn't the thrust of this section really that General Motors could make cars cheaper, and still provide as much, and perhaps more variety than you presently do, if you had all of the domestic auto market.

In other words, if you could spread the economies you achieve by volume over, say, 9 million vehicles, instead of 5 million.

Dr. Duncombe. I think that the thrust of our whole piece here is, that because we have been able to produce these many cars in this volume, and offer a competitive value, we have been able to get this many units; it is a resultant of that fact.

In other words, it goes the other way.

Mr. O'Leary. I understand you have still got to win in the marketplace.

Dr. Duncombe. We still have to win in the marketplace: yes, sir.

Mr. O'Leary. But, wouldn't cars be cheaper if you could spread these economies over 9 million instead of 5 million?

Dr. Duncombe. I suppose that they would, yes.

Mr. O'Leary. Throughout your statement, and when I say that once again I mean "Competition in the Motor Vehicle Industry," you repeatedly make the point that competition is very stiff in the automobile industry.

On pages 98 and 99, you cite a number of non-GM spokesmen to make that point. On page 97, you state the evidence that U.S. automotive producers are vigorous rivals is overwhelming.

We have to conclude, do we not, that other firms are able to give you this competition, despite the fact that they do not have the same volume that you do.

Dr. Duncombe. Yes, that is true.

Mr. O'Leary. And, because of their lesser volume, you have certain economies and efficiencies that they do not have.

Dr. Duncombe. Because we have been able to sell the cars in volume, yes.

Mr. O'Leary. Right.

We have taken that which appears on page 120, and made a chart. I don't know whether, can you see that back there, Doctor?

Dr. DUNCOMBE. No, I cannot.

Mr. O'LEARY. Those numbers, Doctor, we got from Automotive News, and they do not include figures for your General Motors Canadian production.

This indicates that your large volume is in the standard, intermediate: those two lines, 1.6 million and 1.2 million.

And then we go to the luxury line, and the compact line.

You have also indicated throughout your statement that General Motors is in the process of shifting from the production of full-size to small-size cars.

Dr. DUNCOMBE. Well, we are increasing our ouput of small cars, yes.

Mr. O'LEARY. But the mix will be there.

Dr. DUNCOMBE. This is what the market demands.

Mr. O'LEARY. Right. The small car, does that mean the subcompact and compact, or does that extend upward.

Dr. DUNCOMBE. We are using the term to include the Vega and the Nova.

Mr. O'LEARY. I believe that Mr. Estes' speech indicates that GM will develop the capacity by the 1975 model year to build more than 2 million small cars.

Dr. DUNCOMBE. Yes, sir.

Mr. O'LEARY. You anticipate 2 million cars in these two lines?

Dr. DUNCOMBE. I think he included the sporty ones in that category, also.

Mr. O'LEARY. And, there will be a corresponding reduction, I assume, somewhere up in these lines.

Dr. DUNCOMBE. Well, that all depends on the market.

Mr. O'LEARY. Now, Doctor, we have prepared another chart.

Now that chart arbitrarily divides the figures which we had for the 1973 model year, and makes General Motors into three different automotive producers. The chart assumes the capacity for each of the three, in the subcompact and the compact line, of 350,000 vehicles per year.

The chart is inaccurate in that we keep your figures for the remaining lines. And, by that, I mean the personal luxury lines. In other words, without figuring in any shift from full-size cars to small cars.

You have indicated that competition in the automobile industry is stiff, and that other manufacturers who do not have your volume—they are able to offer a different number of lines and models, are they not, and still give you the stiff competition.

Dr. DUNCOMBE. Yes, sir, they vary of course.

Mr. O'LEARY. We have also prepared two other charts, one for Chrysler, and one for Ford. And, these charts do not reflect, as yours did, the different body shells. They are simply the categories into which Automotive News divides the Ford and Chrysler lines, being the subcompact, compact, et cetera.

[The charts referred to appear as exhibit 21 at the end of this panel's testimony.]

Mr. O'LEARY. My point, Doctor, is that whether it amounts to wise public policy or not, General Motors could be reorganized into three

different auto producers and still have pretty much the same volume as, say, Chrysler, could it not.

Dr. DUNCOMBE. Well, that is a hypothetical question. If you are talking about technical efficiencies alone you have one thing. But, as I tried to stress to you, the efficiencies that have come into operation have come through a management philosophy that has given us some economies, and has given us a method of operating which, I think, produces efficiencies.

Mr. O'LEARY. Your statement makes that clear. And, I am limiting it simply to efficiencies.

Dr. DUNCOMBE. To technical efficiencies only?

Mr. O'LEARY. Yes, sir.

Dr. DUNCOMBE. So that we are only talking about a part of the entire problem. That is what you are saying.

Mr. O'LEARY. That is correct. I am saying that the economies you receive by virtue of your volume are not such that that alone would preclude the reorganization of General Motors into three corporations, with the approximate volume of, say, Chrysler.

Dr. DUNCOMBE. You recognize that this is a very artificial approach, I am sure.

Mr. O'LEARY. I am not proclaiming that——

Senator HART. Well, given the figures, you know, what is the answer?

Dr. DUNCOMBE. What we are talking about here is the reorganization of the company by looking at only one part of the equation; which is an interesting academic sort of thing to do but has nothing to do with reality.

Mr. O'LEARY. That is fair enough.

Senator HART. Let me get back, if I can, to what I think is reality, and by asking this question I confirm the suspicion that you have that I couldn't run any company.

But you have described all these economies that you get by your substantially higher volume than any of your competitors.

Why don't you sell at a lower price and get still more of that market.

Dr. DUNCOMBE. Well, let me put that to you this way. The reason that we have volume is because we have been able to make cars that will sell in the market, that are attractive to people in the market, that will present good values to people in the market.

Senator HART. But at a lower price they would be even more attractive.

Dr. DUNCOMBE. You do not charge a profit at the beginning of a year. The profit that you make is the profit that comes at the end of the year when you see how well you have done, how efficiently you have run your business.

And you cannot say at the beginning of the model year, now I am going to charge a profit of $200 on a car. That is a nonsense way to go about it.

We have done exactly the same, looking at the market in the years 1973 and 1974. And I think, without betraying any secrets, I can assure you that the profitability of the business in these 2 years is going to be somewhat different.

You do not go ahead and price on that basis. You price on the basis of what you think represents a competitive value in the market. And, if that is, in fact, the case in terms of the numbers of cars that people will buy, you will make a profit. And if that turns out not to be the case, then you will not make a profit. The profit is a result of the things you have done, not a cause of the things you have done.

And this is one of the places, Senator, where so many people who are concerned as you are, about this problem, have got cause and effect mixed up.

We make a profit because we have done a good job, because people have bought our cars in volume. And this, it seems to me, is the key to it.

Every year for us, to use the common terminology, represents a brand new ball game because we are starting out not knowing what our competitors are going to be offering at the marketplace, not knowing what is going to be happening in the used-car market, not knowing what is going to happen in the business cycle, not knowing what consumers' attitudes are going to be, and we start the game all over.

Now, if the consumer is in a buying frame of mind, if incomes are rising, if we are in a rising cyclical period, if we have products that customers think have beat our competitors out, then we will make a profit. And, it will not be a profit if the reverse of those conditions is true.

Senator HART. Well, let's take a year where you are doing extremely well.

At the 3rd, the 4th, and the 5th month, why wasn't the decision made, "Well, given what we are making now we can further reduce the price and get more volume."

Dr. DUNCOMBE. I can give you a good example of that.

Our General Motors profit in the first 9 months of 1973 would have given us every reason to be extraordinarily optimistic about the year 1973. In the 4th quarter, following the oil embargo, any of the forecasts that we might have had in September of 1973 were washed right down the drain.

This is the sort of a risk that we always run. When we have a good year our earnings are higher. But, our business is very cyclical, and we have got to be prepared for the fact that we are going to have years when business is poor, when our profits are down, when we are forced to lay off employees; and this is a part of the reality of our business.

You know, there have been studies made of what you could call a risk-adjusted rate of return in business. I do not suggest this as being the final answer on the profit story. But, if you adjust, in major industries, for the risks that are involved, for whatever it means, you will find that the earnings of the automobile industry are among the lowest of those studied. We are a high-risk industry, and when we have a good year we hope we will have good earnings. That is the name of our game.

Senator HART. Well, I will ask, perhaps in a slightly different fashion. At some point in each year, you know pretty well—1973, in the last quarter, you remind me, you had an x factor.

But, you know halfway through a year that, at least up to that point, it is a profitable year, the economy is strong, all the signals look good.

And, you have told us about the benefit that you get from volume. And, in the middle of that good year, by reducing further the price, it seems reasonable to me to conclude that you would further increase the volume and ultimately be in a better position, in terms of yield.

I may be wrong on this, and if so you can correct me. I am not aware of any significant price reductions—as of a cost, a board corporate policy anyway—during the good years.

Dr. DUNCOMBE. Oh well, there are. But they take the form of these campaigns. And these go on in good years as well as poor years. Generally, they will be focused, of course, on the cars that are not moving.

Even in a good year you have cars that are selling at high volume, and some cars that are not. And so you are constantly adjusting your price through the sales campaigns.

The other side of the coin is that very often your better competitive strategy is to include as standard some component of the car that you were offering before as an optional item. And this very often is done, too.

And that is a competitive strateegy that the people who are familiar with the marketing side of the business have to decide upon.

Offhand, I can think of very few years when the industry was not, in some way, reducing prices on some models as a competitive requirement, even in good years.

Senator HART. Well, I will wind up then with this.

You have described the intensive competition that is given you by Ford and Chrysler, whose volumes are a fraction of yours.

Again, as a noneconomist, it just cries out to me that if they can do it at that price, at double and triple their the volume you could sell at a lower price and still make money? Still make a sound management?

Dr. DUNCOMBE. Well, as I said to you at the outset, I assume that you are referring to the fact that we have earnings that are somewhat higher than those of our competitors. Those earnings do not come about for any reason other than that we have already, in the marketplace, highly competitive values. We have those there already.

Senator HART. All of those things are in place. They are all in place. Perhaps, not quite the skill as yours by the other competitors. Everything is there, but you have got this enormous volume advantage.

Given all those certainties why doesn't it follow that a lower price would be in order?

Dr. DUNCOMBE. It does not follow at all that a lower price would be in order.

Senator HART. Would a lower price increase your sales?

Dr. DUNCOMBE. No. I think it would be met immediately by our competitors.

Senator HART. Well, is that why you do not reduce it?

Dr. DUNCOMBE. As I said before, we do reduce our price. This is going on throughout the entire year, and we are reducing them on

those cars that are not competitive. And that is the only reason that we have; the only incentive that we have to reduce the price on a car is when we have made a misjudgment on a car, and we feel that that car must be brought into competitive alignment.

Mr. CHUMBRIS. While we are on that point, Mr. Chairman, a moment ago we were talking about the fact that from 1949 to 1972 the automobile industry generally moved up 34 percent while all other products moved up 78 percent. I think I gave that figure.

Dr. DUNCOMBE. Yes.

Mr. CHUMBRIS. Now that does not necessarily mean that every car that the four competitors sold each moved up 34 percent. And, I imagine, without giving away any trade secrets, that there was a variance as to the prices of the different cars that you make, and Ford makes, and American Motors makes, and Chrysler makes, to how much it goes up or how much it might go down to meet competition. Am I accurate in that?

Dr. DUNCOMBE. Yes.

Mr. CHUMBRIS. And that would have a bearing on your answer to the chairman's question, wouldn't it? I think that Chrysler put something in the record when they testified, that General Motors averaged 7.2 percent on sales, Ford second with 4.2 on sales, Chrysler, 2.7 percent on sales, and American Motors, 5 percent on sales.

Now, even in that category, you wouldn't average 7 percent on sales on every one of your various number of models, and neither would Ford, or Chrysler, or American Motors. Would that be accurate?

Dr. DUNCOMBE. That is accurate; yes, sir.

Mr. CHUMBRIS. All of this has a bearing, then, on what the managerial decision would be, made by you, by Ford, by Chrysler, and by American Motors.

Not only that, but by the people who advise, the head of the spectrum as far as the decisionmaking. For instance, the general manager of Oldsmobile will say, "Now look, we are not moving too well on some of our models. We ought to reduce the price a little bit to see if we can have greater competition with American Motors," let's say, "in the small car category."

American Motors is giving you tough competition in small cars, aren't they?

Dr. DUNCOMBE. Yes, indeed.

Mr. CHUMBRIS. Are they the leaders? As I understand it, they are the leaders.

Dr. DUNCOMBE. Well, they are not the leaders. American Motors was in the fortuitous position of being a major factor in the small-car end of the business. I think that, of course, when we talk about that segment of demand they certainly are an important factor. Always have been.

Mr. CHUMBRIS. Thank you very much.

Senator HART. Mr. O'Leary.

Mr. O'LEARY. Doctor, Mr. Chumbris has just underscored a point which you had made; namely, that you do receive stiff competition from foreign manufacturers.

Dr. DUNCOMBE. Yes.

Mr. O'Leary. And, I think the point bears mentioning that not all of those foreign manufacturers have your volume. Toyota is 1.6 million; Nissan, 1.4 million; Volkswagen 1.3 million; but you also get competition from firms such as Toyo Kogo; and Mazda with a volume of 465,000; Honda, 256,000; and Volvo, 252,000.

Dr. Duncombe. Yes, sir.

Mr. O'Leary. Mr. Chairman, I would ask that this list which gives the home country production of 1973 and 1972, from Automotive News, to be inserted in the record.

[The list referred to appears as exhibit 22 at the end of this panel's testimony.]

Mr. O'Leary. Dr. Duncombe, your colloquy with Senator Hart, with respect to the risk involved in deciding what to charge for a vehicle when you do not know how many cars you can sell.

Back in 1958, Harlow Curtice told the subcommittee about the concept of standard volume. As I understand it, it was that General Motors figured a target price on 80 percent of its capacity; namely, that it spread its fixed cost and variable cost plus an estimated profit over 80 percent of its capacity.

If the demand for cars was such that it exceeded 80 percent of GM's capacity it made more money. If the demand were less than 80 precent then it had a lower profit per unit.

Is that pretty much the same way that you still do it.

Dr. Duncombe. Mr. O'Leary, I don't think he said that. I know that you raised this question with Chrysler, so I——

Mr. O'Leary. I am speaking from memory, so feel free to correct me.

Dr. Duncombe. Yes; I would like to refresh your memory on that. And I would like to, if you don't mind, read exactly what it was that he said in this connection.

He said:

> A manufacturer will soon be in a very precarious position if all he does is recover his total costs without making a profit on his operations. His position is further aggravated when the cost of replacing his capital equipment and tools is greatly increased by inflation. He will be unable to finance the continuous development of his product so necessary in today's markets. So it becomes essential for him to run his business efficiently, not only in order to recover his costs, but also to make a profit, so that the business may grow and prosper.
>
> But no manufacturer can make the decision as to price without regard to competitive prices and the wishes of his customers. If his price is too high relative to the prices charged by his competitors, he will lose volume and slip behind in the competitive struggle.
>
> Our practice has been to set prices that are fully competitive and which we hope will be attractive to our customers. Then we try to increase our profit by reducing our cost below what we had calculated they might be with no certain knowledge as to what the volume would be in each line.
>
> The only way that a company like General Motors can even stay where it is competitively is to work as aggressively as possible to better its position. To relax for a moment would be only to lose position. For a period of 4 years in the early 1920's one company sold between 55 and 60 percent of all automobiles in the American market. If offered the lowest priced car in the industry, yet could not withstand the competitive drive of all companies. This could happen again. Therefore, there can be no compromise between full aggressive competition and loss of competitive position through any tendency to rest on one's laurels.

General Motors has no assured market. We have no protection against competition nor do we have any guaranteed rate of return on our capital. We buy our materials and parts in the same markets.

And so on.

I think the point is just that, ultimately, in this industry it comes down to competition aggressively seeking the favor of the customer.

At one time or another some 2,700 different makes of cars have been on the market. Today maybe a handful of those original 2,700 have survived. The others have vanished. Why? Because their products did not have sufficient appeal to this one person, the customer.

So that in talking about these problems, about the interaction of cost and competitive price, the only thing that a manufacturer can do is, obviously, to get some sort of a measure of his cost. I have referred to the concept of standard volume as a cost test, where you try to look at your cost changes without the influence of volume being present.

Now, you can take 80 percent of your capacity, or you can take 90 percent of capacity. I believe today when we are looking at these problems that it is higher, probably in the area of 80 percent. But that doesn't make any difference. What you are really trying to do is figure out some way to see what is actually happening to your cost without regard to the changes in volume, either up or down, that you might have.

You know, if you just took cost into account, you would get ridiculous results because if you forecast lower sales for next year and ground that into your cost equation you would get higher prices, which, obviously, is a completely uncompetitive—well, you simply couldn't exist on that basis. So you take account of cost, but you can't take account of cost without also being very concerned about the market, what your competition is doing.

Senator Hart. Let me interrupt for a vote. The second signal has just rung.

[Whereupon, a brief recess was taken.]

Senator Hart. We will be in order.

Mr. Granfield. Mr. Chairman, if I may, I think I can help clear up this very perplexing problem with volume, cost, and why General Motors would not reduce—or at least some of the reasons they may not reduce—their price at the end of a given model year.

For me, the economist, that is difficult enough to understand, and I think that for the layman it is virtually impossible.

Specifically, I refer to the fact that the firm sets its cost levels depending upon planned volume and rates of volume in conjunction with the absolute level of output.

Now, if a firm plans for the production of 2 million units and decides to increase that dramatically at the end of a model year, they will not produce those additional units at the same cost they produced that 2 millionth unit.

Their cost would begin to rise very dramatically if they exceed planned capacity. Now, the economies that are achieved by General Motors do not occur in 1 year.

We made comparative unit costs in 1958 versus 1968 and found that they can produce 7 million units cheaper in 1968 than in 1958, but they could not experience that increase in units at the cost

they produced them in 1968 in 1958 because innovations have occurred and they have a higher planned volume in 1968 than 1958.

So I think there is somewhat of a misinterpretation of the evidence. It is not clear that General Motors could increase output at lower unit cost in any one given model year because they must do long-range planning, and their costs depend on planned volume, the rate of volume that you produce as well as the level of output.

And all of these are complex interacting factors. And to state that because in 1 year they are able to produce x number of units at low cost per unit does not mean they can repeat that in following years because of this problem of planned capacity.

Thank you, Mr. Chairman.

Senator HART. Do I still understand that the fellow who has five times the volume of somebody else has economies that the other fellow doesn't?

Mr. GRANFIELD. He may, sir.

Senator HART. I am asking the witness.

Dr. DUNCOMBE. That all depend upon what his technology is.

Senator HART. It must not be bad if he can survive with one-fifth of the volume.

Dr. DUNCOMBE. You are referring now to American Motors?

Senator HART. Some of these others.

Dr. DUNCOMBE. I would like to come back to a comment that Mr. O'Leary made about import volumes and prices and the survival there which I believe is a factor that I wanted to talk about.

Now, the imports, when they came into this country, came in on a very competitive basis. The reason that they were able to come in on a competitive basis was in large measure related to the exchange rate valuations that had been established at Bretton Woods and only adjusted slightly thereafter.

And they were highly competitive. In fact, they were so competitive this was one of the reasons that American producers simply could not offer a competitive value under the circumstances of the advantages that the European producers had, not only in terms of volume, because that was their main market, but also because they had what amounted to a subsidy arising out of the Bretton Woods exchange rate system.

Now, most of the American manufacturers, at least General Motors and Ford, went ahead to compete in that market, but to do it in our case, at our Lordstown plant, involved a very high capital expenditure and highly automated equipment.

I wanted to make this point because it is not correct to say that the Japanese could produce and compete in this market on those small volumes unless they had very low labor costs and their labor cost were 25 percent of yours, and unless they had the advantage of a very substantial undervaluation of the yen that existed, at least up to the time of the Smithsonian Agreement.

Now, since that time I think that the price picture has changed almost 180 degrees. I have some figures here which I think might make that point, if I can find them readily. I don't want to take too much time.

To illustrate this, in model year 1971, before the Smithsonian Agreement went into effect, the VW economy Beetle was selling for $289 under the Vega two-door sedan of the comparable models.

In the current 1974 model year the VW economy Beetle is selling for $240 more than the Vega. There has been a price change in this period, a competitive improvement for us, almost a switch from a $300 disadvantage to a $250 advantage, about $534.

And this is entirely a result of the exchange rate readjustments that have taken place. Now, when they talk about the automobile industry being slow in getting into the small-car market, the fact was that given all of these competitive disadvantages that we had and the advantages that they had, I think it is remarkable that the industry was willing to take on the challenge as quickly as it did.

I just wanted to add that to your comment, Mr. O'Leary, about these volume relationships that you were mentioning.

Mr. O'Leary. Doctor, while we are on that subject, your volume, "Competition in the Motor Vehicle Industry," includes a table of total hourly cost, including supplementary benefits in General Motors' operations.

Dr. Duncombe. Yes.

Mr. O'Leary. That includes your operations in the United States, your operations in West Germany, United Kingdom, and France. Is that correct?

Dr. Duncombe. Yes, sir.

Mr. O'Leary. And then the one for Japan, there appears a star, and it says, "Average for Japanese automotive industry."

Dr. Duncombe. Yes.

Mr. O'Leary. Those are rather difficult comparisons to make when you get to the Japanese, are they not?

Dr. Duncombe. Yes, although that is not the reason that we use the average. These others, of course, are General Motors subsidiaries, and we can make valid hourly cost comparisons, including supplementary benefits because we know what they are, and we can cost them out. In the case of the Japanese, we do have an investment, but we don't have the same access to the hourly cost figures.

Mr. O'Leary. The subcommittee was kind enough to subsidize a trip on my part last fall to Japan, and I was told by both the Nissan and Toyota, for example, that their employees have a lifetime contract, that they cannot be fired and they cannot be laid off in periods of reduced demand.

Also, companies over there appear to be rather maternalistic with respect to building of housing and things like that. It becomes very difficult to try and figure in those benefits.

Dr. Duncombe. Right.

Mr. Chumbris. You might add for the record, Mr. O'Leary, so the public won't misunderstand, they subsidized your trip because you attended an international antitrust conference for a 4-day period.

Mr. O'Leary. Thank you.

Dr. Duncombe. That is nice. I might speak to my boss about that one of these days. However, you are right; some of these comparisons are difficult to make. And maybe the Japanese is one of the most difficult.

The other thing, you will notice, is that the hourly cost in the countries outside the United States has increased at a faster rate than they have in the United States over this period. But in spite

of that the dollar differences, the actual dollars of cost per hour, have increased. And I think that this is one of the interesting things. I have heard it said so often that pretty soon this advantage that you have in the United States is going to be erased. It is going to take a long time to erase it because ours keep going up, too.

Mr. O'Leary. Dr. Duncombe, I am grateful for that portion of Mr. Curtice's testimony that you read into the record.

Well, I think he did make reference to a standard volume concept which, at that point, was 80 percent of capacity. You mentioned in your response something to the effect that perhaps that it shifted to 90 percent of capacity.

Dr. Duncombe. It doesn't matter what percentage you use. All you are interested in is getting a sort of test of what has happened to your cost on some constant basis. You could take 2 percent, for example, if you wanted to.

Mr. O'Leary. You do project some volume in deciding—and I am sure you take a number of other factors into consideration—what your prices will be at the outset, do you not?

Dr. Duncombe. What we have to do in this is to evaluate all subfactors. We have to evaluate what has happened to our cost.

As Mr. Curtice said, we have to take a very hard look at the market. We have to make some judgments, and this is among the more difficult things to do, as to what our competitors are going to do.

All of these are factors that ultimately have to be considered. It is not a mechanistic process. And I really don't know how this methodology developed, unless people were actually looking for a methodology in this area. I suspect that many of them may have been looking for an easy answer to probably one of the most extraordinarily difficult problems in any manufacturing industry and certainly in our industry.

Mr. O'Leary. Doctor, if I might shift to Mr. Spreitzer for a moment?

Dr. Duncombe. Surely.

Mr. O'Leary. Mr. Spreitzer, with respect to the demand for mass transportation, does General Motors see a greater future for the role of the bus as opposed to, say, the electrified mass transit such as presently being constructed in Washington?

Mr. Spreitzer. The future is somewhat unclear in that respect, and I would, I think, prefer not to try to make any projections or speculate about the future.

Mr. O'Leary. Have you entered into any contracts at the present time to supply electrified mass transit equipment to any cities or municipalities?

Mr. Spreitzer. To my knowledge, we have no contracts at the moment.

Mr. O'Leary. Am I correct in assuming that you have not built any electrified mass transit equipment in the past?

Mr. Spreitzer. No. From the testimony it is clear that we have built electrical equipment in the past, and in the more recent past it was a part of our continuing research and prototype development programs.

Mr. O'Leary. Have you sold this equipment to any municipality or city?

Mr. SPREITZER. The equipment referenced in the testimony was sold to a number of public agencies; yes, sir.

Mr. O'LEARY. In your presentation I think the final slide depicted a new GM bus called the RTS–2.

Mr. SPREITZER. That is correct.

Mr. O'LEARY. This is the bus which is outside?

Mr. SPREITZER. That is correct.

Mr. O'LEARY. Your critics have alleged that this bus and its predecessor, the RTX, are put together for show and not for production, and that your city buses have undergone little change since the 1950's. Would you tell me why the RTX did not go into production, and when you expect the RTS–2 to go into production?

Mr. SPREITZER. I would expect the $32 million investment in tools and equipment belies that criticism, but the total business opportunity in the bus transit area, as it is in the entire transit area, has not been all that great over the last 17 years. It is very, very difficult for an organization to justify the expenditure of resources for a business opportunity that isn't there, until there are signs that it is going to develop.

Mr. O'LEARY. You were indicating that there simply is not the demand for this product at the present time.

Mr. SPREITZER. No; only that there has not been the demand over the period of time, 15 to 20 years, up until now. It is common knowledge.

Mr. O'LEARY. Mayor Bradley of Los Angeles recently testified before the House Public Works Committee that he has been forced to go to manufacturers in Mexico for buses because of the lack of availability in the United States. What reaction do you have to that testimony?

Mr. SPREITZER. I have no personal knowledge of that particular subject.

Dr. DUNCOMBE. May I comment on that, Mr. O'Leary?

Mr. O'LEARY. Certainly.

Dr. DUNCOMBE. We did hear about Mayor Bradley's comment on this. We have not seen any official transcript of his testimony but we did see the article that appeared in the Los Angeles Times, and so we did try to find out what we could about it. We asked our GMC Truck and Coach Division to provide us with a summary, which I would like to read to you.

A misunderstanding may have arisen due to the newspaper report of testimony by Mayor Bradley of Los Angeles given on April 5, 1974, before the House Public Works Subcommittee. We have not as yet received the official transcript of the testimony, and all statements made herein are based on the article appearing in the Los Angeles Time of April 6, 1974.

In summary, it was reported that the Southern California Rapid Transit District needs 1,400 additional buses . . .

This is the reference that you have?

Mr. O'LEARY. That is correct.

Dr. DUNCOMBE [continuing].

. . . Immediately, and that GM and other bus assemblers would be unable to supply these buses. We have examined our files on this subject and the facts are as follows:

In June 1973, we received a communication from the Southern California Rapid Transit District asking us what steps we could take to expedite the

delivery of 1,500 coaches which might be required to meet certain guidelines of the Environmental Protection Agency under a proposed plan contemplating substantial reduction is automobile travel by May 31, 1975.

SCRTD stated that under EPA plans, some 18 other urban areas simultaneously need to increase their bus purchases in the same proportion.

We replied that we estimated that it would take about two years to complete delivery under such circumstances, which was approximately within the time frame of the EPA deadline.

The SCRTD did not communicate with us further with respect to ordering such quantities of buses.

In January 1974, just 3 months ago, we received a communication from SCRTD asking what steps we could take to expedite the delivery of 300 new buses to respond promptly to the energy crisis.

The SCRTD expressed the opinion that the energy problem would create a dramatic increase in usage of public transportation.

We advised that we were considering increasing transit coach production, but were concerned about the availability of certain components.

Our reply emphasized that the transit industry could make a substantial contribution to expedite deliveries by reducing the proliferation of options and specifications which varies between each individual order.

In the absence of such action by the transit agencies, the entire bus manufacturing industry finds it necessary to build coaches only after receiving an order, as there is no feasible way to anticipate the many variations required for each customer.

Since that last exchange of correspondence, SCRTD opened bids on March 29, 1974, involving the purchase of only 100 buses, with an option to purchase an additional 100 buses.

GMC was the low bidder, and we responded that the delivery of the first 100 coaches would commence within 6 months following receipt of an order, and be completed 30 days thereafter.

The second 100 units would be completed within 30 days additional.

With respect to the reported statement that a nationwide shortage of buses exists, no such shortage exists at the present time, nor has it for years.

If additional demand does materialize, GMC will, of course, make every effort to further increase its daily production, which has already been increased substantially this year.

Now, I think that that is an honest statement of the facts. While he may have said 1,400 or 1,500 buses, the fact is we had an order for 100 buses, which we had promised to deliver in 6 months.

Mr. O'Leary. Dr. Duncombe, during the testimony this morning, I was thumbing through this volume that you filed this morning, "The Truth About 'American Ground Transport'—A Reply by General Motors."

I had not read it completely. I note on page 33 you indicate that Pacific City Lines, a company which General Motors had an investment in, purchased Pacific Electric's operations in Glendale in 1941, in Burbank in 1944, but that these were local bus lines.

Mr. Snell's volume alleged that Pacific City Lines also purchased and converted from interurban rail to bus. The system in Fresno stopped in San Jose.

Do you have any information as to whether that allegation is correct?

Dr. Duncombe. I don't, but I would like to make a comment, if I may.

As you know, we were deeply disturbed about the misstatements, the falsehoods in that document, and we submitted it with that in mind. However, we came down here to respond in good faith as to our views on the legislative proposals before the subcommittee, and the economic theories behind it.

The matters that were raised by the study of "American Ground Transport" were essentially peripheral, we believe, to the main issue before the subcommittee.

I have broadly outlined in my statement our convictions that there was no substantive charges therein. We have submitted for the record today the detailed rebuttal to which you have referred.

If there are further questions by the subcommittee after the staff has had an opportunity to analyze our rebuttal, we will endeavor to answer them insofar as they do not impinge upon our New York bus litigation.

However, no one here, and that includes myself, is prepared to do so for this reason. The study consists of some 67 pages and 500 footnotes. It deals with matters stretching back 50 years or more and involved people who are long dead or retired. To respond to your questions on Mr. Snell's document to the extent that we have, required a tremendous amount of research, and we have no witnesses to these matters. The result is that we have had to look at the record.

The witnesses here today, Mr. Smith, and Mr. Spreitzer, and myself, are simply not prepared to deal with the matters in Mr. Snell's document or in our rejoinder.

Mr. O'Leary. Doctor, I just have one other question in connection with it.

Page 32 of your rebuttal reads as to the fact that Pacific Electric was purchased by Metropolitan Coach Lines, and then it states, "which had no connection whatever with GM."

We went into this matter last Thursday with Professor Hilton from UCLA. That statement is not quite correct, is it?

Dr. Duncombe. I honestly don't know. I am really not prepared to answer your questions on that.

I think that everything that we have included in this volume that we have submitted to you is factually accurate.

[See exhibit 30 at the end of this panel's testimony for further comment on the above.]

Mr. O'Leary. Doctor, we introduced a form 10K from the Securities and Exchange Commission, filed in 1946, indicating that the president of Metropolitan Coach Lines was a substantial shareholder in Pacific City Lines, in which GM owned a substantial interest, and that the president of Metropolitan Coach Lines, Mr. Jesse L. Haugh, had acted as the president of some 15 subsidiaries of National City Lines through the 1940's.

And I would be happy to make copies of those documents available to you to see what reaction, if any, you had.

Dr. Duncombe. We would like to have those. We appreciate that.

Mr. O'Leary. It is your testimony in your oral presentation that streetcars generally went out of existence for a variety of factors, but pretty much as a result of natural economic forces, people moving to the suburbs and things like that.

Is that correct?

Dr. Duncombe. Yes, sir. And I might add that that is not only my testimony, but that is the consensus of practically everyone who has the slightest familiarity with this subject.

Mr. O'Leary. The decision in the court of appeals for the seventh circuit in the criminal *National City Lines* case cites a provision between National City Lines and its suppliers, including General Motors, which reads as follows:

> That City Lines and their operating companies would not renew or enter into any new contracts with third parties for the purchase of such products or change any then existing type of equipment or purchase any new equipment using any fuel or means of propulsion other than gas.

Dr. Duncombe. Excuse me just 1 minute.

Mr. Nitschke. I think you will find the answer to that, Mr. O'Leary, in our volume, "The Truth About American Ground Transport."

Mr. O'Leary. Well, as I say, since it was filed this morning, I didn't have an opportunity to read it.

Dr. Duncombe. We hope that you will.

Mr. Nitschke. I can't find the spot here, but it points out that it is almost incomprehensible that that would have been something that General Motors would have extracted from a bus company since we were selling diesel buses. And if we required them to use only gas, he couldn't operate our buses. It points out that the fact is that that was a provision in a contract with National City Lines put in by Midwestern Oil Co. It only applied to some cities in the Midwest. And when they commenced buying diesel buses for these cities, the provision was ignored.

Mr. O'Leary. Would it be fair to infer from the inclusion of such a provision that the suppliers were not as confident then that streetcars were on the way out?

Dr. Duncombe. I don't know that you can infer anything. I would like to repeat what I said before. I don't believe any of us at the witness table are competent to comment on that, on either Mr. Snell's allegations or General Motors' rebuttal, but we will try to answer your questions, and, if after you have read it, you would like to ask or address some questions to us on this, we will do our very best to see what we can bring together in the way of an answer.

I remind you that we are going back some 50 years on many of these things. The files are very musty.

Mr. O'Leary. Turning to Mr. Smith, sir, you have stated on page 12 of your testimony that the dieselization was chosen by the railroads simply because it was much more attractive economically than either steam or electric operation.

Isn't it fair to say that, at the present time, railroad experts differ with respect to which is superior, electric or diesel motorcar?

Mr. Smith. At the present time?

Mr. O'Leary. Yes.

Mr. Smith. That situation is changing some as the relative economics of diesel operation versus electric operation are changing. There are some differences there.

Mr. O'Leary. I am sure you are familiar with Mr. John W. Baroner, who is currently serving as special assistant to the Federal Railroad Administrator.

In a recent article, "Prospects For Railway Electrification, United States," he indicates that diesels are not as attractive economically as electrics.

More specifically he states that "all electric locomotives will outperform in every respect." He notes that electric locomotives cost about one-fourth to one-third as much as diesels, that they cost less than one-half to maintain and operate, and that one electric can do the work of two or three diesels.

Given the sufficient density to make electrification economic, do electrics outperform diesels in the manner he described?

Mr. SMITH. I think those statements are really terribly general, and that no general answer can be given to that question. Each specific operation needs to be studied with regard to the factors that exist on that operation.

Mr. CHUMBRIS. If you had an opportunity to take those generalizations and answer them specifically, if you desire——

Mr. SMITH. I believe I am familiar with Mr. Baroner's paper, and it is very recent. I can just say, again, that you cannot generalize on each question of the relative economics of dieselization versus electrification. You have to look at specific operating conditions.

Mr. O'LEARY. Mr. Smith, isn't it true that a report prepared for the Federal Railroad Administration in 1973 by the Pan Technology Consulting Corp. concluded that the electrification of approximately 40 percent of the high density mainline routes would result in the saving of some $360 million.

Mr. SMITH. That certainly was not included in their conclusions. I haven't read the entire report. Whether that statement is contained in the body, I can't say, but that was not in their conclusions.

Mr. O'LEARY. I am referring to that which appears under the title "Executive Summary," the first portion of this report, if you would care to take a look at it.

Mr. SMITH. Yes.

Mr. O'LEARY. I am simply asking what reaction, if any, you have to that.

Mr. SMITH. Yes, I am familiar with that. That was a report that was prepared by this consulting engineering firm and submitted to the committee—Government-Industry Task Force on Railroad Electrification—but that particular conclusion of a consulting engineer was not accepted and was not included in the final report of the committee.

Mr. O'LEARY. During the first set of hearings we received testimony from the Japanese National Railways concerning their bullet train system of commuter rail trains.

Why is it that the Japanese possess this system, which certainly appears to be superior to ours, and we do not?

Mr. SMITH. I can't answer that in detail. I believe it is a matter of national policy on the part of the Japanese Government to install such a system.

Mr. O'LEARY. Mr. Smith, on page 19 of your oral statement, you indicate that most——

Senator HART. I wish very much I didn't have to do this, but given the nature of the 2:30 Commerce Committee session I will be even more embarrassed if I was out-flanked at that meeting.

So I will have to call a recess at this point.

Dr. DUNCOMBE. We still have high hopes of showing you our bus.

Senator HART. Yes, when I finish that meeting.

Let me suggest a recess until 3:30.

[Whereupon, at 2:25 p.m., the subcommittee recessed, to reconvene at 3:30 p.m. this same day.]

AFTERNOON SESSION

Senator HART. Gentlemen, we may not be making very orderly progress here, but I am delighted to report that the one mission that caused me to go over and stay in the Commerce Committee meeting was accomplished.

We got a nomination that has been stalled in there for several months.

We will come to order.

Mr. O'Leary?

Mr. O'LEARY. Mr. Smith, when we adjourned, I believe that I was making reference to page 19 of your oral statement in which you stated at the top of the page:

> Most of the hearing officers' criticism was directed at the New Haven management. I will not comment on that since it does not involve General Motors.

Didn't the hearing examiners in the ICC criticize the New Haven management for buying General Motors diesels?

Mr. SMITH. As I remember reading that, their criticism was that they did not—more thoroughly evaluate our report to them, our recommendation to them.

Mr. O'LEARY. That area of disagreement surrounded the savings which could be realized by the New Haven from going to General Motors diesels, did it not?

Mr. SMITH. I believe it did.

Mr. O'LEARY. The hearing examiner, with respect to the representations as to savings, and the ICC both concluded that the General Motors Corp. was not guilty of any fradulent misrepresentation, but characterized your efforts as mere puffing, did they not?

Mr. SMITH. Yes. I might say, however, that we don't agree with that in the sense that subsequent followup on the operation of our locomotives on their property indicated that they performed as we had said they would in our report to the railroad, and that their operating costs were lower than we had forecast.

Mr. O'LEARY. Your statement makes reference to Mr. Sloan's letter which appears on page 48 of the booklet.

That letter is dated February 15, 1935, and I suggest that it exhibits a great sensitivity to General Motors' position as both the manufacturer of locomotives and a shipper.

Despite General Motors' policy as enumerated in that letter, would it not follow that railroads would also be sensitive to this situation?

Mr. SMITH. As to what situation, exactly?

Mr. O'LEARY. Well, the fact that, in addition to making locomotives, General Motors was the largest shipper of freight.

Mr. SMITH. I am sure they know this is true.

Mr. O'LEARY. I forget whether this is contained in Mr. Spreitzer's testimony or Mr. Duncombe's. But in one of those statements it is

indicated that General Motors has 43 percent of the bus sales for 1973 in the United States.

Dr. DUNCOMBE. I suggested that, yes, that we had reported this figure to the Department of Justice.

Mr. O'LEARY. Does this figure include intercity buses, schoolbuses, microbuses, charter buses, tour buses, and airport buses?

Mr. NITSCHKE. I think, perhaps, I should answer that.

It is the definition that the Department of Justice required in the bus consent decree, and the definition is of integral buses with seated passenger capacity of 21 or more.

Mr. O'LEARY. Mr. Nitschke, will you agree that General Motors possesses a substantially larger share of the city bus market?

Mr. NITSCHKE. I am not sure about that. I think probably a lesser share because we think that there are many buses that are in the market that are excluded from the Government's definition. For example, it would exclude all of the foreign buses because they are made with body and chassis—it would exclude minibus that is used here in Washington because its seating capacity is less than 21. It would exclude any buses that are body and chassis manufactured in this country that are used for transit service.

Mr. O'LEARY. Would you supply the subcommittee the figures which you used and the data which you used in arriving at the 43-percent share?

Mr. NITSCHKE. Yes, we will.

[For the information requested see exhibit 30 at the end of this panel's testimony.]

Mr. O'LEARY. Mr. Chairman, I have a number of items that I would like to submit for the record.

But I think I should get the reaction, probably, of Dr. Duncombe before submitting one in particular, and I make reference to an article which appeared in the Business Week, dated March 16, 1974, entitled "The Small Car Blues of General Motors."

Quoting from one portion of that article, Doctor:

> The production cost difference between a Chevrolet Caprice and a Cadillac Coupe de Ville with comparable equipment is $275 to $300. But the selling price differs by $2,700, giving GM a $2,400 gross profit on the Cadillac.

Dr. DUNCOMBE. Well, I read that, and I don't know where in the world he got that figure. And it would be very nice—I'll be very pleased if we would make that much profit on a Cadillac. I just don't know where the figure came from.

Mr. O'LEARY. Would you like to tell us approximately what that gross profit figure is?

Dr. DUNCOMBE. I don't know what it is. I suspect, this year, with the volume down as much as it is on the Cadillac, it is very substantially less than that.

Mr. O'LEARY. Thank you. Mr. Chairman, I would like to submit this Business Week article, and another article, which I am sure you gentlemen have seen, and which appeared in the New York Times, the Sunday section a couple of weeks ago.

If you have any comment with respect to that article, I would be glad to receive it. Also, I have here a packet of exhibits which we have used throughout the course of these hearings.

Some have already been introduced into the record. I would like to submit the rest of them for the record.

Senator HART. They will be received.

[The two newspaper articles referred to appear as exhibits 28 and 29 at the end of this panel's testimony.]

Mr. O'LEARY. I have no further questions.

Mr. SMITH. I would like to comment on that New York Times article, if I might, Mr. O'Leary.

As I remembered it, it created the impression, at least, that the locomotive division of General Motors is opposed to railroad electrification. I would like to just take this opportunity to state our position that we are certainly not opposing or negative to railroad electrification.

We believe that some day that is probably going to come in this country, and the question is when. We think of ourselves as locomotive builders, not wedded to the diesel locomotive.

We are building the diesel locomotive right now because it is the most economical and most efficient form of motive power. If those economic factors should change toward electrification or toward any other form of motive power, we would expect to remain locomotive builders and respond to the market with what it demanded at that time because we now see factors in the economic climate of the United States that are moving in favor of the economics of electrification.

We are very active in the development of a straight-electric locomotive in our division at this time. That is all.

Senator HART. Again, a signal to vote has appeared. We will have to recess.

[Whereupon, a brief recess was taken.]

Senator HART. We will be in order.

Mr. Granfield?

Mf. GRANFIELD. Thank you, Mr. Chairman.

Mr. Chairman, I would like to return now to the subject, I think, that remains perplexing to us, which is this whole issue of the economies related to the GM experiences from large volume production, and why these economies may not, at first glance, be passed on to the consumer in terms of lower prices.

Earlier I indicated that the key to this problem may well be that in a given year General Motors plans for certain rate level of output, and to exceed that in any 1 year would force them to incur much higher unit cost than on those units which constituted that amount over planned volume which they thought they would experience.

This is often referred to as going past—or a certain level of capacity where costs begin to rise inordinately.

I also indicated that what we would expect to find that as planned volume grows year after year that this is where the true cost savings would occur, and that what I would expect is that General Motors, over time, with respect to automobile production would be incurring lower and lower cost relative to the general price level in the economy.

Mr. Chumbris indicated that, in fact, the price of an automobile has risen considerably less than the average price level.

I attribute this to General Motors passing these cost savings on to the consumer.

Doctor, do you want to comment more on that?

Dr. DUNCOMBE. Well, just to comment briefly, you have stated the issue very well, Dr. Granfield.

What happens is this, that any particular time, at any given time, our capacity to produce cars is relatively fixed. The technology is also relatively fixed. So that when we get to a certain point within this fixed structure of technology and plant, further increases in output do not entail in the short run reductions in cost, but rather increases in cost. Anr this is part of the problem now. In the long run, we can adapt to the expanding volume that takes place, and with the technology that is then feasible we çan lower cost and prices go down.

Mr. GRANFIELD. So, if I interpret you correctly, your response to the chairman's question as to why don't you pass these cost savings on in terms of lower prices to the consumer is that, in fact, you have done that, and you continue to do that because of the competitor's pressures that you face.

Dr. DUNCOMBE. We are just about as low at any particular time as we can be.

Mr. GRANFIELD. But the key here to understand is that this is a year-to-year price decrease as opposed to occurring all in 1 year.

Dr. DUNCOMBE. That is correct. As a matter of fact, the changes don't take place in our structure even within a year. Normally, there is a period of planning over 2 or 3 years to expand to capacity.

Mr. GRANFIELD. So we see the solution, and the paradox is a very simple one. In fact, you are doing what our distinguished chairman indicates you should do, passing these cost savings on to the consumer in terms of lower prices.

Dr. DUNCOMBE. I think that shows up in the price indexes.

Mr. GRANFIELD. And I think that the data for the truly evaluated model, the road and track, which I have read into the record, indicates that the prices charged for a 1950 Chevrolet versus a 1973 Chevrolet has fallen by more than 150 percent if you include the cost of servicing the automobile.

In other words, today you are not going to the gas station every 1,000 miles for an oil and grease change.

Also, any information which you have on this particular subject would be most welcome to the subcommittee.

Let me go on to another issue. At least part of the bill that we are deliberating here indicates that firms and concentrated industries are very successful at engaging in tacit collusion.

And one evidence of this is that you oligopolists all charge the same price. I would like you to comment on what would happen to a collusive agreement if you could only agree on price. Assuming you could do that.

Dr. DUNCOMBE. Assuming we could do that, the product competition would be tremendous. I recall seeing in another industry, and this is a news account so I don't have it exactly, but there was an

understanding that the international airlines would stop serving dinners and would serve sandwiches, and this was agreed to. But pretty soon the competition in the sort of sandwiches they were serving became actually tremendous because each airline attempted to outdo the others in the fanciness and the elaborateness of what they refer to as sandwiches.

Now, in the automobile industry the opportunities for changing the product, for giving more product are practically limitless.

That is inherent, I believe, in any highly engineered and highly technical product. So that what happens is that you don't have a situation where you can look just at price and say this is the price. You can only look at it in terms of what the product is in relation to the dollars that are being asked for. It is really a value concept. That is a significant concept.

And in the automobile business, of course, that includes a whole array of factors, including the service factor that you mentioned, as well as other factors that go into providing the customer with satisfaction.

I tried to stress that in my oral statement because when we look at it in the automobile industry it is the satisfaction of the customer, and that includes all the elements of the vehicle that we are trying to sell. That is the key factor.

Mr. Granfield. Now, to my knowledge at least, you would add, if this is incorrect, in studying collusive agreements, both successful and unsuccessful, there is no collusive agreement that I know of that has ever relied on price as the monitoring device.

Normally, they divide up the market because it is so difficult to monitor price, and the only way you can usually restrict output and monitor that so that someone doesn't cheat and produce more than its designated level of output is to somehow divide up a market geographically, or at least they do not rely on price as the collusive device.

Dr. Duncombe. That just is outside my camp. I know that, as a practical matter, collusive agreements have not worked. I know, as a practical matter, they have not been used in the automobile industry whether you refer to them as conscious parallelism or whatever, because there are so many ways that competition can manifest itself in the industry that monitoring is virtually out of the question. Even assuming that there was a desire, which there isn't. The desire in the automobile industry is to beat the other fellow out. And this, of course, is the name of this game.

Mr. Granfield. OK, let's turn to a direct implication this bill seeks to accomplish, and, in turn, refer to Mr. O'Leary's charts.

He indicated that it seems feasible based on planned economies that we could divide up the industry such that everyone was approximately the size of Chrysler.

Now, it is my understanding that Chrysler has not earned a normal rate of return in this industry, and the basic reason that Chrysler has not is that GM has such a low competitive price based on Chrysler's cost that it holds those profits down.

In other words, the low cost pricing strategy of General Motors is what prevents Chrysler from earning a higher rate of return.

If we were to divide the industry along Chrysler's size lines and deny the economies you experience, is it not at least distinctly possible that prices would rise significantly to the point where Chrysler and your similar Chrysler type or size firms would be the earning the rate of return, absent collusion, which you would regard as acceptable.

In other words, I am saying that Chrysler admits, through looking at their rate of return data and their statements concerning the advantages that you have, that, indeed, there are significant cost savings involved in a firm the size of General Motors.

Dr. DUNCOMBE. Well, I suppose that is a fair speculation; yes, sir.

Mr. GRANFIELD. What I am really getting at is that if, indeed, Chrysler is not earning the same rate of return, and if, indeed, we accept this committee's judgment that you are charging the same price, although we have no evidence for that, or that you may well be charging the same price, you still have lower costs than Chrysler.

That is the only thing that can explain your higher rate of return, and it must mean that if you go to the Chrysler-size firm, your cost will go up, and prices in the industry would go up.

Dr. DUNCOMBE. I think that is a fair presumption.

Dr. GRANFIELD. Let me just deal with one final brief comment here on whatever price means.

You indicated this morning how prices of cars do change rather dramatically over the year. They specifically change model by model based on what you expect it to sell, what you produced, how dealers are getting rid of inventory, the kind of pressures they put upon you, and so forth.

There are also other dimensions to price. One of which is, when a consumer buys a car, what can he resell it for. Traditionally, General Motors products have the highest resale value in the used car market.

Further, the consumer worries about design, quality control, the kind of service reliability he gets from the people who will service his car, and so forth.

Consumer Reports, as you well know, evaluates different model lines, and it is my understanding that General Motors always doesn't come out to be the winner on the bottom line which says the best value per dollar, for the consumer dollar.

I think this indicates that, indeed, although you may have certain technical economies, these can be compensated by superior style, superior service, or just simple consumer preference.

Dr. DUNCOMBE. Or superior durability. It is quite true that our cars do command a higher price in the used car market. And this has been traditional, although it is not, of course, in every line. But the durability and the styling has given those cars a special premium on the market.

Mr. GRANFIELD. My final questions are referring to your experience with National City Lines.

You have indicated that, perhaps, you are not as knowledgeable as you could be about this, but I would like to try one or two questions on you.

Dr. DUNCOMBE. I really did not respond to these because I just am not familiar with it. I don't have the familiarity with it.

Mr. GRANFIELD. OK, then, thank you, Mr. Chairman.

Senator HART. We are rescued, is as much as there is another vote that has just been signaled.

Well, I think we are finished. And I want to conclude by thanking you and the company for the thoroughness with which you have prepared your remarks, the detail into which you have gone, and the fashion of the presentation.

I apologize again for the, what must have seemed, most inexcusable interruptions. It is unavoidable. And it is why it is literally true that we generally defer judgment until we have seen the record because until we have seen that record we don't know half of what has gone on.

Dr. DUNCOMBE. Yes, sir. Could we suggest that you can see the bus at any time this afternoon?

Senator HART. Yes. If you are game to lead off right now, we can do it.

Dr. DUNCOMBE. Fine.

[Whereupon, at 4:35 p.m., the subcommittee adjourned, to reconvene at 10 a.m., Thursday, April 11, 1974, in room 318, Russell Senate Office Building.]

[The following was received for the record. Testimony resumes on p. 2663.]

MATERIAL RELATING TO THE TESTIMONY OF DR. DUNCOMBE, MR. SMITH, AND MR. SPREITZER, GENERAL MOTORS REPRESENTATIVES

Exhibit 1.—Prepared Statement of Dr. Duncombe

PREPARED STATEMENT OF DR. HENRY L. DUNCOMBE, JR., CHIEF ECONOMIST, GM CORP.

My name is Henry L. Duncombe, Jr., and I am Chief Economist of the General Motors Corporation. With me are Mr. Harold L. Smith, Jr., Vice President and General Manager of the Electro-Motive Division, Mr. Robert A. Nitschke, Assistant General Counsel of the Corporation, and Mr. William M. Spreitzer, Head of the Transportation and Urban Analysis Department, Research Laboratories. We are pleased to be here today and to have this opportunity to give you our views on S. 1167, the Industrial Reorganization act, as well as on the issues you raised, Mr. Chairman, in your letter of February 25th.

At the outset, I would like to comment very briefly on a paper submitted to your Subcommittee on February 26th entitled "American Ground Transport" which contained a number of charges against GM which are essentially irrelevant to the subject of this hearing. We would not dignify these ridiculous charges with a refutation except for the fact that they have received an unwarranted degree of publicity and merit a comment.

We had hoped that we had made our interest in mass transit clear when we publicly clarified this at least as long as four years ago during Congressional hearings. However, from time to time we still hear charges that GM is opposed to mass transit. Let me once again try to dispel this false idea.

For example, the charge was made that General Motors was responsible for destroying the street railway and inter-urban transit systems around the country. This is not true. The charge is refuted by facts which are common knowledge within the transit industry.

Street railways began to be abandoned over fifty years ago for a number of reasons—none of them resulting from action by GM. For one, these systems could not be economically extended to meet the transportation needs of people in expanding metropolitan regions. They could only move people over fixed routes that could not be readily adapted to shifts in demand that normally

occur in any growing and changing city. Under these circumstances, patronage consistently declined, year after year, until the financial problems facing these systems became overwhelming and, in most cases, insoluble under the existing conditions.

The charge that GM destroyed all-electric locomotive transportation is also wrong. It is a known fact that all-electric locomotives were never used in the United States except in a few very high traffic areas that could financially justify the high cost for related equipment and power stations.

You may recall, Mr. Chairman, that Mr. Lundin, Executive Vice President of GM, testified on March 29 before Senator Bentsen's Subcommittee on Transportation in Detroit. I think it is worthwhile, for the record of this Subcommittee, to quote a portion of his statement.

"When General Motors developed the diesel locomotive, the result was to provide a means of replacing the much less efficient steam locomotive. This actually revitalized the railroads of the United States at a time when, for many of them, this was desperately needed. We believe railroadmen recognize the contribution that General Motors has made to the railroads of the country.

"Furthermore, General Motors did not use traffic reciprocity to sell locomotives. We have always had a firm business policy against selling any of our products other than on their merits.

"These and similar charges are as unfounded at the ludicrous assertion also made recently that GM helped the Nazi war machine prosper. It amazes us that, after so many years, we have had to remind anyone that the Nazi government took over our Opel plant before the war. GM had no voice in its management nor did we derive any benefits thereafter."

We are completing a detailed refutation of this charge, as well as a number of others contained in the document, "American Ground Transport." Our statement, The Truth Tbout "American Ground Transport"—A Reply by General Motors, will be submitted for the record. Our refutation includes the following recommendation which I would like to quote:

"We submit that this (American Ground Transport) has created an unfortunate situation whereby General Motors has in effect been indicted publicly without proper means of rebuttal. In our effort to remedy this unusual situation in a fair and equitable manner, we suggest that the Subcommittee, after due deliberation, consider the following:

First: that all further distribution of "American Ground Transport" be suspended at this time;

Second: that this reply by General Motors be printed in the same manner by the Government Printing Office; and,

Third: that this reply should immediately follow "American Ground Transport" in the published record of these proceedings and should be bound with it if any further distribution by the Subcommittee is undertaken."

In this connection, Mr. Chairman, we were pleased by your statement about the paper that "neither the Subcommittee nor any member including the Chairman necessarily subscribe to the ideas contained therein." We hope this still represents your view.

Your Bill deserves and has received our thoughtful consideration. We have filed, along with our statements prepared for this meeting, two related analyses which we would ask be made a part of the record of this hearing.

The first is entitled, "A General Motors Statement on S. 1167, The Industrial Reorganization Act," the second is entitled, "Competition and the Motor Vehicle Industry."

Speaking to the Bill, it is our view that the implementation of S. 1167—or any Bill founded on similar premises—would have far-reaching adverse effects on American consumers and workers. It would reduce industrial efficiency and raise prices. It would effectively undermine incentives to growth and to improved productivity, and, in so doing, would reduce employment opportunities. The basis for these conclusions is fully set out in the document entitled "A General Motors Statement on S. 1167—The 'Industrial Reorganization Act.'" Let me summarize them briefly.

This Bill would establish still another commission with extraordinary authority to restructure industries and firms, including those that have proven most successful in their competitive effort over the decades. The associated systems of distribution and the nature and extent of firm integration and patterns of consumer choice would be determined, at least initially, by regulation without regard to past competitive performance.

There is no reason to expect that all of the artificially restructured companies or industries would prove viable. There would be, as there always are, some firms that meet customer needs better than others; some that use technology more effectively than others; and some that see opportunity more clearly than others, whether through vertical integration, an expansion of product lines, or more effective distribution and marketing. In short, some firms would fail and some would succeed, if they dared.

I say, "if they dared," because if success produced returns higher than an arbitrary profit ceiling, if success involved a superior product at a similar price, or if success resulted in exceeding some predetermined four-firm "concentration ratio," the "reward" presumable would be another summons to court for another dose of surgery.

Thus, rather than being a "one shot" cure-all, enactment of this Bill would lay a heavy blanket of disincentive over competitive enterprise. Competitive striving for larger sales or lower cost would, of necessity, give way to a relaxed acceptance of the *status quo*. The Bill might achieve its goal of expanding the number of competitors but only at the cost of shackling competition. The consumer would be the loser.

Equally serious, in our view, is the tendency to paste labels such as "oligopoly," "monopolistic competition," and "shared monopoly" on large segments of American industries and to presume that having labeled these industries in this manner their sins are self-evident. To the general public, I am quite sure, these terms have an ominous ring. Anything that has been stamped "oligopolistic" must be bad.

For the professional economist the term "oligopoly" has a number of meanings and not simply the narrow meaning implied in S. 1167. Oligopoly theories proceed from a variety of defined assumptions to conclusions which are highly sensitive to, if not predetermined by, the assumptions. We can, for example, assume any number of sellers and that there are or are not substitute products; we can assume both the nature and degree of competitive response; we can assume identical products—as most models do—or relax this assumption; we can assume that unit costs change in a variety of ways as volume expands; we can assume that buyers respond to price changes in many ways, we can assume identical products—as most models do—or relax this assumption; we informed or not informed. Obviously, the list of possible assumptions and combination of assumption is limited only by the ingenuity of the theorist.

These are interesting exercises; often they give us new insights. None but the most naive, however, would claim that such constructs could encompass the manifold complexities and highly dynamic interactions of competitive reality, to say nothing of the particular circumstances that may surround an individual industry. No doubt, we will continue to benefit from the ongoing discussion of the logic and the ongoing refinement of theory; but—and I would underscore this—the significant issues raised by S. 1167 cannot be resolved by the application of any of these theories that ignore market realities.

The fact is that industrial sectors and specific industries cannot be forced into the confining mold of assumptions from which theoretical analysis necessarily proceeds. It is in this area that much vigorous controversy now exists. As you recall, Mr. Chairman, some of this controversy was reflected in the record of the Subcommittee's hearings last spring. We take the strongest exception to the proposed fragmentation of much of U.S. industry on the basis of any arbitrarily selected set of assumptions.

A principal purpose of our study entitled "Competition and the Motor Vehicle Industry," which we are submitting for the record, is to demonstrate that competition does not depend on some arbitrary count of numbers of competitors or statistical abstractions called "concentration ratios." In this study we discuss fully and factually a vast array of factors required for an understanding of competition. These include the dynamics of our markets, the multidimensional character of competition, and the roles of technology, distribution and marketing. The real world in which we must compete stands in sharp contrast to theoretical concepts which assume—as S. 1167 has done—restricted consumer choice and limited competitive reactions. The automobile buyer has as wide a choice of products as modern worldwide technology can provide. This choice encompasses all aspects of the transaction—price, product quality, performance, comfort and size. Moreover, these choices have been made available through competitive business organizations, each of which has adapted its methods of

production to its volume prospects, its management's abilities, and its styles of organization. In the hope of profit, each has sought to achieve efficiencies consistent with its current state of development. Those that have succeeded in the quest have survived. Those that have not include many formerly distinguished automotive nameplates.

One of the earliest and certainly best publicized of competitive initiatives to achieve efficiency was the assembly line method of building cars and trucks —pioneered by one of General Motors' competitors. It was clearly evident that this was a more efficient way to produce a vehicle provided—and this is an important proviso—sales volume was adequate to support the investment. It is a truism that mass production techniques require mass markets. In the early days of the industry, many firms did not achieve this minimum volume and could not realize these economies. Thus, for technological reasons alone, the automobile industry quickly evolved toward a relatively large firm structure to achieve efficiency and lower cost.

Over the years, expanding markets have continuously opened up new opportunities to improve efficiency as technology advanced, management methods improved and multiplant efficiencies could be realized. Within this context whatever success General Motors has achieved has only come from superior performance within a vigorously competitive framework. We have described these advances in some detail in our study.

S. 1167 quite properly recognizes the possibility that the cost of restructuring an industry—specifically the loss of the efficiencies of scale—could outweigh the presumed benefits. As we have indicated, the adverse effects of the Bill extend well beyond the complex arithmetic of costs to include fundamental disincentives to effective competitive effort. If a full accounting could be made, it is a virtual certainty that the cost to society of the Bill would be high. The benefits, on the other hand, are largely conjectural and, we are convinced, illusory.

At the outset, let me stress that the efficiency of a business encompasses much more than technical factors such as the scale of production, multiplant operations, or vertical integration. The management structure and management capabilities of any particular firm provide the mechanism for translating technological possibilities into market realities. Whether a firm develops capable employees, fashions them into an effective team, selects products for production which customers want, and produces these products efficiently depends primarily upon people, not technology.

General Motors, starting in the early 1920's developed an effective management system consisting of decentralized operations but subject to coordinated overall policies and directions. This management system has, of course, been flexibly adapted to changing conditions with the passing of the years but it has retained its underlying philosophy and has resulted in an organization which I believe is generally conceded to be highly efficient.

More important from the standpoint of S. 1167, the unitary structure of General Motors results in plants and divisions which are highly integrated and rely for many important business functions on Central Office direction and staff. Illustrative of this are the activities in areas such as personnel, public policy, research, environmental activities, safety and finance.

In the two documents which we supplied, along with our oral statements prior to the hearing, we have considered some of the types of economies which are related to the scale of production, multi-plant operations, and vertical integration. These economies are, of course, interrelated and reinforcing. This makes it difficult, if not impossible, to isolate one and label it "scale economies"; another "multi-plant economies"; and so on. There are, however, identifiable operations which are suggestive of magnitudes of the economies involved. To illustrate, there is no question of scale economies in body sheet metal stamping operations well beyond the point suggested by one of the witnesses appearing in February. Our records indicate that we have actually obtained as many as 7 million identical major body panels from one set of dies—far greater than the 400,000 unit die-life suggested in earlier testimony. A large part of our effort to standardize parts, such as inner door panels, reflects the desire to further realize these economies.

With respect to multi-plant operations, there is no question that the coordination of stamping, foundry and other manufacturing operations with multi-plant assembly yields efficiencies. These partly derive from scale econo-

mies but beyond that include benefits from specialization, shipping cost reductions, better control of inventories, and, most important, more prompt and better service to the customer.

I stress this latter factor because there is no economy—regardless of the length of a run or the degree of integration—unless it translates into something of value to the buyer. We may produce a one-cylinder car in the most efficient way possible, but if no one wants it, the entire exercise is economic waste. Serving the customer is a complex of interacting factors. High production volume which yields scale economies in manufacture also supports a geographically well distributed dealer organization for better customer service; it makes possible efficient spare parts distribution from a network of well located facilities and the same scale economies that reduce the cost of the product initially carry over into many of the areas of service parts. These considerations all translate into greater value to the customer and are no less a part of "scale economies" than the narrow manufacturing notion in many accounting and economic texts.

Vertical integration opens up other areas for the more efficient use of resources. The extent to which in-house manufacture of parts or components affects General Motors' total performance, obviously depends on its comparative efficiency when measured against that of outside vendors. For this reason, General Motors makes for its own use those items that cannot be procured more efficiently from outside suppliers, consideration given to such factors as quality, delivery performance, and alternative uses for its resources.

Whether or not in-house production is more efficient is influenced by three important factors—the relative volume of output required; product specifications, that is, whether the component is unique in a production sense to the particular vehicle manufacturer or standardized; and the availability of the required skills and expertise. As a consequence of such considerations, high volume passenger car producers are typically more integrated than are low-volume, heavy-duty truck manufacturers. This generalization applies with equal validity to motor vehicle manufacturing operations abroad as well as those in the United States.

Vertical integration takes on added importance as a consequence of the establishment of a variety of safety and emissions standards by the Federal Government. They have put new demands on product engineering, development and testing of the vehicle and its components. Safety standards, for example, trigger a chain reaction of modifications in frame, engine and suspension designs to preserve acceptable performance and handling of the vehicle. The warranty, which the manufacturer must give, goes to the operation of the entire vehicle. Government standards, therefore, can be met most efficiently and with the appropriate warranty if the manufacturer assumes full responsibility for the design, production and testing of safety and emission systems.

Accordingly, General Motors obtains from outside vendors all basic materials and most standardized supplies, as well as items such as car and truck frames, tires, glass, textiles, most wheels, certain tools, dies and manufacturing equipment. General Motors' outside purchases totaled almost $17.5 billion in 1973 or over 48 percent of total sales revenue.

Divestiture of some or all of the activities which, on the basis of long experience and continuing evaluation, have become part of the total General Motors production assembly and service system, can almost be guaranteed to entail "substantial losses of efficiency." What is sometimes overlooked by theorists is that firms are not inanimate structures made up of so many building blocks but rather than an organization, such as General Motors, is a living organism made up of people whose long associations and team spirit are an important ingredient for the success of the whole. This is evident in the proposals advanced by witnesses during your February hearings. Those who would toy with the savings and jobs of others should bear these costs in mind.

In your letter, you asked us to respond to allegations "that GM dominates the production of buses and locomotives and that such dominance resulted in the promotion of the automobile at the expense of other modes of ground transportation." Further, you asked us to "indicate the manner in which you have promoted the use of buses and locomotives." Mr. Smith and Mr. Spreitzer are here today to fulfill these two requests.

I will limit myself to one brief comment on the allegation that General Motors production of locomotives and buses represents a "conflict of interest" which favors its motor vehicle business. It takes only a moment's reflection to appreciate that if the goal was to discourage locomotive and bus development General Motors would have avoided both markets. We did not take this route. In the case of locomotives, General Motors made high-risk investments to compete against steam engine producers who were convinced of the superiority of their products. In the case of bus manufacture, General Motors produced a variety of gasoline, diesel and trolley buses in accordance with the demands of transit operators. In both cases, General Motors was successful because it did respond to customer demand with better product values than its competitors were offering.

The fact is, of course, that in many transportation system configurations the bus, car, railroad, airline, and truck provide complementary services. There are exceptions to this, such as rail and bus commutation lines which, by providing an acceptable alternative, could reduce car use and highway congestion. However, even these systems are often used in tandem with other modes at both ends of a commutation trip. In the city itself, the bus or subway may be the principal mode for the work trip and for those who cannot or do not wish to drive. General Motors has long recognized that each transportation mode has a distinctive service to provide. Rather than there being a "conflict of interest," the demand of customers for each type of vehicle has represented a market opportunity we have been eager to serve.

As we have informed you, the question of whether General Motors dominates the bus industry is involved in current litigation and we are, of course, defending against this lawsuit. We have been advised by counsel about the impropriety of General Motors commenting on the issues in this case outside the courtroom, which is the only proper forum. However, in view of some of the claims made about our position in the bus business, I think the Subcommittee should know that in response to a Justice Department request, we recently supplied the figure of 43 percent as our share of bus sales in 1973 in the United States. That percentage is based upon the Department's narrow definition of what is to be included in the market and would be substantially smaller if, as we believe proper, the buses of all manufacturers were included. As to our interest in improving mass transit, Mr. Spreitzer will address himself to the important steps that General Motors has taken to advance the development of urban transportation systems.

Let me state here, with all the force at my command, that General Motors has been fully as concerned to compete effectively in the manufacture and sale of products, such as buses and locomotives, as it has in the production of passenger cars and trucks. It just makes no sense to claim that we have achieved dominance as alleged during your February hearings in either of these product lines by deliberately making them so unattractive that they would not be purchased and used.

I believe, Mr. Chairman, that my remarks and more completely the documents we have provided, deal with the questions on which you requested our views. Before introducing my colleagues, I would like to conclude with a discussion of the related issues of energy availability and small car production which, as you had indicated in your letter, are of great interest to your Subcommittee and which are clearly of great interest to the American people.

Throughout the post-World War II period, as you may recall, industry offerings have included a number of smaller cars, even though they met with little commercial success. They included, for example, a U.S.-made Crosley, Henry J, Willys Aero, and Hudson Jet. General Motors' planning for the introduction of a small car immediately after World War II had advanced to the tooling stage but the evident lack of customer interest resulted in the cancellation of this project. By the mid-1950's only the American Motors Rambler remained.

In the latter half of the fifties the economic climate changed and patterns of car demand shifted accordingly. Foreign producers made available a wide selection of small cars to American car buyers. These producers, with rapidly expanding home markets, were realizing substantial economies of mass production so that even a small market opportunity in the United States could be served efficiently. In addition, they had the competitive advantage of low

labor costs—less than half those in the United States. Furthermore, they enjoyed the advantages of low—almost non-existent—import duties and the implied subsidies, which increased with the passage of time, of their own under-valued currencies. GM and other U.S. producers responded to this by importing smaller cars from European facilities and by introducing in 1959 compact cars made in this country.

While the U.S. cars introduced in the late fifties were somewhat larger than the imports, they filled the need. Import sales declined from about 10 percent of total sales to about 5 percent in the mid-sixties when a revival of small car interest was signalled by the rapid sales gains by the foreign car manufacturers in this country, particularly this time the Japanese.

Given this renewed challenge, U.S. producers responded in a variety of ways, including expanded production of small cars and increased imports from their overseas facilities. But regardless of the different product strategies, the result is that the U.S. buyer in the seventies has had a wider choice of small cars, including U.S.-built small cars, than buyers any place else in the world. Moreover, the availability of these cars has been closely geared to the demands of customers.

For example, total stocks of GM smaller cars, such as the Vega and Nova, totalled almost 110,000 on September 30, 1973—less than a month before the Arab oil embargo—and represented a 62 days supply at the then current selling rate. In contrast, there was a 47 days supply of intermediate cars, a 52 days supply of regular sized cars, and a 42 days supply of luxury cars. A review of the relationship of available stocks to demand throughout the first nine months of 1973 supports the conclusion that General Motors was, in fact, producing closely in line with consumer demand and quite clearly had an adequate supply of small cars. In short, rather than being unresponsive, General Motors was meeting the market and doing this in spite of the lower labor costs, scale economies and exchange rate subsidies which, historically, have given overseas producers a substantial competitive advantage.

A review of industry stocks during the first nine months of 1973 also supports the conclusion that new car availabilities were well adjusted to what the consumers wanted and were buying. Not only was the supply of small cars adequate to meet demand but there is every indication that they were being effectively advertised and promoted.

The embargo suddenly created great confusion and uncertainty in the minds of the consumers. Demand for full-sized cars declined sharply as buyers awaited some indications concerning availability of gasoline and the likelihood of rationing. We were confronted with an immediate demand for a product mix that no one had anticipated. This dramatic, almost overnight, shift in consumer demand towards smaller cars was without precedent in the history of the industry and could not be matched by corresponding instantaneous changes in our production schedules.

With respect to your question concerning General Motors plans for expanded small car production, we are accelerating our program to increase substantially our capacity to build smaller cars. We are planning to add models to our new small car lines. We are also accelerating our work on programs to increase the fuel efficiency of our full-size cars, because we expect that there will be a continuing significant demand for these vehicles. Last year, for example, sales of full-size cars totaled about 4.1 million units—almost 36 percent of total sales. Even with all of the uncertainty resulting from the embargo, they accounted for 27 percent of all sales during the first calendar quarter of 1974.

Admittedly, energy availability has added a new dimension to vehicle and engine design which we must meet. General Motors has announced its goal of a minimum of 15 miles per gallon on all cars, including its larger cars, on a city-suburban driving schedule. Of course our smaller cars are already achieving substantially better mileage than this. They also will be improved in the future. In order to achieve this, near-term programs include modification of energy-using component systems such as the air conditioner, improvement of driveline efficiencies and better mileage through the application of the catalytic converter system. Over the longer term, the current full size car will be reduced in size and weight in order to achieve even higher standards of fuel economy.

Following the introduction of our subcompact car, the Chevrolet Vega, in September of 1970, we converted our Ste. Therese plant in Quebec from full-size cars to Vegas, and have recently increased its capacity further.

We have temporarily shut down our South Gate plant in California in order to convert it to the two-shift production of Vegas for the 1975 model year. We also have been increasing our capacity to build compact Novas, Omegas, Venturas and Apollos. By the beginning of the 1975 model year, we will have converted facilities at Tarrytown, Leeds and Willow Run. At Norwood and Van Nuys, we will also have increased our capacity to build the sporty Chevrolet Camaros and Pontiac Firebirds.

To put some measure on this effort to increase our smaller car capabilities, I can tell you that since the Chevrolet Vega, which we introduced 3½ years ago, and including our 1975 small car program, General Motors will have spent more than $2.0 billion.

By model year 1975, which begins this fall, General Motors will have developed the capability of building more than 2 million small cars annually. This represents about a 70 percent increase over our 1973 production.

The redesign of full-size cars to reduce exterior dimensions and weight involves every component and part in the vehicle. But we are convinced that this is necessary to meet the demands of customers for adequate interior dimensions coupled with a high level of fuel economy. These major design changes take time but our projects are now well advanced.

More to the point of your Bill, it is very doubtful that a fragmented industry would be able, from either a financial or technological point of view, to accomplish the required realignment as rapidly as it is now being done. Larger firms bring experience with a wide variety of product designs and sizes, and this gives a measure of flexibility to the operations. Even under the best of circumstances, changing the product mix requires a massive re-equipment expenditure, and this extends all the way from basic engine components to body construction and assembly tools. Some small firms could no doubt accomplish this goal. It is likely that other small firms, with little or no experience in producing the newly required cars and without the facilities for testing and the redesign of hardware, could not accomplish it at all.

We at GM are keenly conscious of the need to meet consumer demand. This is the reason we exist. In spite of continuing awareness of growing energy problems and continual adjustments in our production schedules, there was no feasible way to plan for the emergency created by the Mideast War. We are adjusting rapidly. But as the current sharp decline in sales should make clear, consumer sovereignty is the continuing reality of our business. Sales can only be achieved by offering products which buyers want. This is what we have done in the past and what we plan to do in the future.

Exhibit 2.—Letter From Phil W. Copelin, Former GM Executive, to R. C. Gerstenberg, Chairman, GM, Re Statements Made in "American Ground Transport"

New York, N.Y., April 5, 1974.

Mr. RICHARD C. GERSTENBERG,
Chairman,
General Motors Corp.,
New York, N.Y.

DEAR DICK: I'm writing this letter to you because I am outraged by the recent charges by Bradford C. Snell, of the U.S. Senate Antitrust and Monopoly Subcommittee Staff, that GM assisted the Nazis in World War II. I hope you will be able to make these comments of mine a part of the public record. The charge, of course, is false, and in my opinion, malicious. Since I am one of the relatively few people still around who had first-hand knowledge of the events of that time, I feel obligated to set my recollecions down not only for whatever purposes General Motors feels they can be of benefit, but because I feel Mr. Snell's remarks and inferences are libelous to me and to my colleagues of that era who are no longer alive to defend their honor and their patriotism.

At the outbreak of World War II I was an assistant general sales manager at General Motors Continental, Antwerp, Belgium. When the invading German

army was approaching Antwerp in May 1940, at the request of the Belgian Government we removed to the Bordeaux area of France not only every vehicle on wheels but also as many movable tools as possible and in addition every member of our American personnel and more than 100 key Belgian employees.

Likewise, before the fall of Paris to the Germans in June 1940 our Gennevilliers assembly plant was dismantled to the extent possible and all American and key French personnel moved to the area of Limoges in what was to become the "Unoccupied Zone."

These moves were made in the hope of being able to establish some sort of operation in support of the retreating allied armies. However, events moved too fast and when the Franco-German armistice was signed all American personnel from our Belgian and French operations, except the undersigned, were immediately evacuated to the U.S.A.

Because the United States was not at war with Germany (and would not be until almost 18 months later) GM felt that some representative should be in contact with our Belgian and French subsidiaries. In August 1940 I was able to obtain the necessary American diplomatic clearance and German military visas to return to Paris and Antwerp. On arrival in these cities I found that instead of being considered "impeccable Nazis" (Mr. Snell's words) the German authorities were furious with GM for having removed personnel, vehicles, tools and material from our plants before they took them over. I found that *prior to the invasion* the German Government had appointed one Edward Winter, an important Berlin auto dealer, as "Custodian of General Motors properties in occupied areas." Winter had in turn, within hours of the occupation, staffed the plants with German civilian and military managers and was operating them as repair depots and spare parts warehouses in support of the German armed forces. I was never allowed to set foot in the plants. Many of our loyal Belgian and French employees were not given employment because they had left with the American management and a number were judged so severely that they were sent to slave labor camps in Germany. On January 1, 1941, I returned to the United States, and in April of that year I joined the U.S. War Department.

With respect to Adam Opel in Germany, I recall that almost all the GM American management at Opel were reassigned in the fall of 1939 shortly after Germany invaded Poland (and two years before the U.S. itself was involved in the World War). GM employment records will confirm this fact. Once the American management had left, GM had virtually no control over the Opel activities.

Furthermore, it is not true, as Mr. Snell asserts, that Americans served on the Opel board of directors throughout the war. After Germany declared war on the U.S., all the American directors left the Opel board. Again, the records will support this fact.

After joining the War Department on April 10, 1941, I served both in the Quartermaster Corps and Ordnance Department until February 1942 when I was assigned to duty in The Middle East and later in The China-Burma-India Theatre.

At some point in late 1941 or early 1942 I was asked by the Office of Strategic Services (OSS) to gather intelligence information for the OSS from various GM employees formerly in the Opel management who were now back in the United States. (These individuals include Mr. Osborn, Mr. Hoglund and Mr. Evans.) This information was incorporated in a report to the OSS Coordinator of Information, dated January 9, 1942. The report, while wide-ranging in nature, included discussions of the types of military production commencing at the Opel facilities; estimates of various capabilities of the German armed forces; estimates of critical materials production and availability in Germany; estimates of the size of the German labor supply; and a description of the political organization existing in industrial plants.

GM also provided information with respect to manufacturing firms in Germany which were believed especially critical to the German war effort. This included the firm name, location, products manufactured, and pertinent additional remarks about each. A concluding paragraph in the report with respect to these industrial facilities is worth quoting in full.

"Messrs. Osborn, Hoglund and Evans were of the opinion that each of the [described German] plants produces such a large proportion of the total output of articles which they manufacture that the destruction of any one of these plants would be a most serious blow to the German war machine. If further information along this line is desired, Mr. Osborn suggested that Mr. Otto Mueller at present with Ternstedt Division of the General Motors Corporation at Trenton, New Jersey, knows more about the distribution of the manufacture of aircraft and automotive components in Germany than anyone in this country at the present time. Mr. Mueller is a naturalized American of German origin who served as an executive engineer at the Opel Werke for several years prior to August, 1939. His position was such that he had occasion to visit a great many German Plants and to be familiar with their productive capacity, processes, methods, etc." Surely, this makes quite clear where GM's allegiance was in World War II.

It is most difficult for one who participated directly in the foregoing events to remain silent in view of the Snell accusations. I, therefore, hope that in some small way I have helped in making the record historically correct.

Yours faithfully,

PHILIP W. COPELIN.

Exhibit 3.—Letter From M. M. Mooney to Senator Hart Re "American Ground Transport"

New York, N.Y., February 11, 1974.

Hon. PHILIP A. HART,
U.S. Senate,
Washington, D.C.

DEAR SENATOR HART: The attached memorandum details a series of libels, one of which has been repeated, in part, in the document printed by your committee on Anti-Trust & Monopoly.

I was under the impression that the kind of smear involved went out of style sometime in the fifties.

Cordially,

MICHAEL M. MOONEY.

Enclosure.

February 11, 1974

A SERIOUS LIBEL: THE RESULT OF SLOPPY RESEARCH

There are any number of books dealing with the history of Germany in the 1930's, or with German-American relations during the period, or with the affairs of German or American Intelligence before and during World War II. Some of these works suggest that my father, James D. Mooney, was pro-Nazi, or sympathetic to the Nazis, or "taken in" by Nazi propaganda, or some variation of such a theme. *The Game of the Foxes*, by Ladislas Farago, made such suggestions.

They are false.

Recently, because there is a growing interest in how multi-national corporations work (there are presently hearings before Senator Hart's Committee in Congress), and because there are a number of studies on the topic underway—some financed by foundations, and some proposed as books to publishers, and because James D. Mooney was President of General Motors Overseas, some of the original libels and slanders of more than thirty years ago are being disinterred from archives, repeated, and spread once again.

When the libels were first made, James D. Mooney never bothered to reply to them. The record of his life and of his achievements, he thought, were self-evident; but, since they are now repeated as "history," this memorandum traces the sources of the original libels, and describes the circumstances.

I. A SHORT BIOGRAPHY

James D. Mooney was born in 1884 in Cleveland, Ohio, and died in Tucson, Arizona in 1957. He is survived by his widow, six children, and twenty grandchildren.

His father, James Mooney, was also born in Cleveland in 1851, was one of the organizers of the National Iron Molder's Union, was elected to the Ohio Legislature in 1883 and was an officer of the Knights of Labor.

Mooney attended Case Institute of Technology (Class of 1908), spent four years gold prospecting in Mexico as a Mining Engineer, subsequently worked for Westinghouse, Hyatt Roller Bearings, and McGraw Hill. He volunteered for the Army in World War I, served as a Captain in the Artillery in France.

After the war, he managed Delco Batteries in Anderson, Indiana, and then because of his association with Mr. Alfred P. Sloan at both Hyatt and Delco, he joined the General Motors Corporation in 1920. He was named President of the General Motors Overseas Corporation; and then subsequently, a member of The Board of Directors of the General Motors Corporation, and a member of G.M.'s Executive and Administrative Committees.

According to Peter Drucker, and others, in a real sense he organized and then operated the first multi-national American *operating* company. His methods, and his theories, were subsequently copied and studied.

He was the author, among many other books, of a classic study in the theory of organization: *The Principles of Organization*, Harper & Row, New York. The book has continued to be used as a text or a source in every part of the world, including the United States War College, the colleges of the Papacy, and at great numbers of business schools. It identifies how organization works in every hierarchal structure.

Some historians of management credit Mooney with the theories which Alfred P. Sloan used to organize General Motors both nationally and internationally. In any case, his responsibilities over a period of twenty years in Europe—from 1920 to 1940—in supervising the plants and products of General Motors gave him a wide range of acquaintances in both business and politics, intimate and detailed information on men and circumstances, and a profound understanding of the issues which were eventually to lead to war.

His constant travel, his fluency in languages, and his clan for life won him a wide assortment of friends—John Watson, the psychologist, for example; Theodore Dreiser, the novelist; Judith Anderson, the actress. In the complicated politics of the 1930's both in Europe and in the United States, it is important to note that Mooney was a somewhat unusual Director of General Motors.

He was the only Director with any background—and hence any sympathy—with the aims of labor; especially in the great strikes of 1936–37. He was the only director who was a Democrat. Gilbert Seldes once claimed that Joseph P. Kennedy and James D. Mooney were the two "largest industrial contributors" to Franklin D. Roosevelt's campaigns in 1932 and 1936.

Maybe so; maybe not. Whatever the calculations on contributions may have been, there is no question that Mooney shared the aims of the New Deal, that he wrote a book urging Roosevelt's election, and moreover shared friendship with some members of Roosevelt's kitchen cabinet, especially Morley, Moley, Farley, Frank Hanegan and Basil O'Connor.

II. GENERAL MOTORS IN EUROPE

About 1928 General Motors Overseas bought Adam Opel, A.G., manufacturers at the time of Germany's most popular car. The Company maintained control of Opel until about November 1939, when it had to be abandoned to the Nazi Government. General Motors resumed control of Opel after the war in the "war claims" procedures.

General Motors Overseas also owned Vauxhaul Motors, one of the three largest British auto manufacturers. The Managing Director of Vauxhaul was Nicholas Vansittart, whose brother, Sir Robert Vansittart, was Deputy Secretary for Foreign Affairs, and then head of British Intelligence.

After the election of Hitler war was a constant threat to Europe. Mooney spoke out again and again; and published again and again on the threat and catastrophe of war, from 1930 onwards.

But he did more. In 1937, while continuing to serve as President of General Motors Overseas, he accepted a commission at a Lt. Commander, United States Navy Reserve.

He had easy access to any member of the German Government as a result of his position with General Motors. He also had access to any kind of

production information necessary—from lead times to production figures on anything from steel, to ball bearings, to spark plugs. He was a trusted source for British Intelligence. He thought by accepting a commission in the U.S. Navy his intelligence activities would be less "unofficial".

III. AFTER THE "KEY PERIOD"

In 1940 Mooney was named head of the group of General Motors Executives responsible for converting G.M. to defense production. Then, in 1942, he resigned from General Motors to go on active duty with the Navy, ending up in 1944 as Chief of the Advanced Base Division, and on Admiral King's staff, and, in effect, applying the principles of organization to the enormous task of logistics and planning not only in the production of war materials but getting them to the landings in the Pacific and Normandy.

After the war he returned to General Motors for a year, then was named Chairman and President of the Willys-Overland Corporation. In 1950 he retired and managed a small consulting service until his death.

IV. THE "ORIGINAL" LIBELS

On Friday, August 9, 1940, "PM," the afternoon New York tabloid ran a photo on Page 1 with a caption asserting that Hitler had just bestowed a medal on an "American Industrialist."

A three part series of articles followed, alleging that Mooney was a friend of the Nazis. The series claimed that Mooney was a friend of "the mysterious Gerhart Westrick," and that Mooney was "Westrick's guest at a celebrating dinner at a leading hotel here after Hitler's conquest of Paris."

"PM" did similar articles on Henry Ford, Charles Lindbergh, and Thomas J. Watson of IBM. The assertions of PM, were picked up and repeated by The New Leader, and then others. They were lies.

In one instance, Harper's Magazine quoted a portion of the original caption as an example of lively writing. Upon being apprised of the facts, Frederick Lewis Allen of Harper's immediately wrote an apology.

The "PM" libels are worth examining in some detail. The caption on page one said "Hitler Has Just Bestowed" . . . "the Order of the German Eagle. . ." The impression being given that it was a recent event, that is 1940, and in

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Actually, the picture in question was taken August 10, 1938, two years previously, at the offices of the German Consulate in New York. The original showed Mooney shaking hands with the acting German Consul, Gustav Miller. "PM" cropped Miller out.

Mooney did meet "the mysterious Westrick" once, on July 16, 1940 at lunch in the course of commercial discussions with a German accredited for that purpose by our State Department. Mooney never met Westrick before, or again.

Mooney was presented with "The Order of the German Eagle" at the German Consulate in New York on August 17, 1938. He did not accept it, but forwarded it—over the weekend—to the Department of the Navy on August 22, 1938. The Navy forwarded it to the State Department, and after Mooney's death in 1957, The State Department sent the medal to his widow.

But the medal is a nice case, and reveals a larger story. When the medal was suggested in 1938, Mooney asked Navy Intelligence if he should accept it. They said there was no point in turning it down; "accept it, and we will keep it for you."

"PM" was libelous in its articles, dishonest in its captions and the croppings of its photographs, and fraudulent in its dates. During the recent hearings before Senator Hart's Committee investigation, staff notes the medal as evidence of cooperation between General Motors and the Nazi regime. The source cites "PM," but adjusts the date to 1938.

V. INTELLIGENCE ACTIVITIES AND EMISSARY FOR THE PRESIDENT

Because of his wide acquaintances, Mooney made an ideal emissary for President Franklin D. Roosevelt to both the British and German Governments. From 1938 to 1940 Mooney made successive trips, and continental ones, and

after the war had begun, at some danger, to Germany and Britain. Some of these could have been described as "peace missions;" some were intelligence missions; some were combinations of both in that war aims and capabilities are often inseparable.

The last of these missions was simultaneous to the mission of Summer Welles in 1940. Mooney's part in this last trip had been described by Louis P. Lochner, Pulitzer Prize Winner, and A.P. Bureau Chief in Berlin, in his book "On My Own," MacMillan & Co., New York, 1956.

It is an easily available source, and Mr. Farago should have checked it.

Further, during the entire period, 1937–1945, Mooney was an officer of the U.S. Navy. The National Archives should contain complaints from President Roosevelt to Mooney that the length of Mooney's coded messages from the cruiser "Trenton" stationed off Lisbon should be shortened. The reports were jamming the Navy's coded transmission facilities. I have copies of the President's request. As an expert on War Intelligence, Mr. Farago could presumably have found the same.

The National Archives should also contain the orders of Rear Admiral W. S. Anderson, Director of Naval Intelligence, in reference to OP. 16, to Captain T. C. Kincaid, U.S. Naval attache in Rome, and to other Naval officers at various European stations. I have copies of the Kincaid covering letters, but not the others. Perhaps, Mr. Farago might do better.

Admiral Paul Pihl, now retired, is, I believe, still alive and was Naval Attache in Berlin during the critical years of 1937–1940. The archives of Colonel Truman Smith, U.S. Army attache in Berlin, are, I understand, at Yale University.

The point is that much of the necessary materials to avoid repetition of the original "PM" libels are easily available, or previously published. In 1940, Mooney made no reply to the "PM" libels because "PM" was a scandal sheet anyway, there was no point in doing so, and his continuing work for General Motors, The Department of the Navy, and The President of the United States, was sufficient evidence of his innocence not only of the smears themselves, but what the swears were designed to effect: that somehow American businessmen were in league with Hitler's agents.

Which is false. It is also scandalous. It is also lazy and stupid research.

Exhibit 4.—Letter to R. C. Gerstenberg, GMC, From C. G. Stradella, Re "American Ground Transport"

945 Hillsboro Mile,
Pompano Beach, Fla., April 10, 1974.

Mr. Richard C. Gerstenberg,
Chairman,
General Motors Corp.,
Detroit, Mich.

Dear Dick: Recently it came to my attention through articles in the press and conversations with friends that, during some U.S. Senate Subcommittee hearings on the automobile industry, a document was filed which charged General Motors, among other things, with aiding the German government during World War II. Since the matter was of sufficient interest and concern to me, I reviewed the portion of the document dealing with these charges. The document is entitled, "American Ground Transport: A Proposal for Restructuring the Automobile, Truck, Bus and Rail Industries" by Bradford C. Snell.

This charge is completely false and the contrary can be supported strongly by facts within my knowledge. As you may recall, I was transferred from Vice President, GMAC Overseas, to General Motors Overseas Operations Division of General Motors in 1942 and served there as Finance Manager and in various other capacities from 1942 to 1952. Practically, from the beginning of United States' involvement in the war, GM Overseas personnel assisted the U.S. military by providing intelligence and strategic information with respect to the Adam Opel facilities in Germany for use against the German government.

Since I personally played a key contact role in certain of these intelligence activities and since there probably are not many people availablle having direct

knowledge of GM's contributions in this respect, I thought it might be important and helpful to give you my recollection of these activities for GM's records and for whatever use you can make of them.

First, let me say that the statement in the document on page 22 to the effect that "GM for example, was in complete management control of its Russelsheim war plane factory for nearly a full year after Germany's declaration of war against the United States on December 11, 1941" is completely absurd. This can be documented by the fact that Mr. C. R. Osborn and Mr. E. S. Hoglund, who constituted the key American management at Opel immediately prior to the war, had both returned to the United States by 1941, and no other Americans remained at Opel.

As to my specific part in the place, I was called into "Ed" Riley's office in late 1942 or early 1943 and was introduced by him to Col. Edward L. Barlow who, I was informed, represented U.S. military intelligence in New York and who had been assigned to contact General Motors Overseas Operations with respect to its German companies. "Ed" was, at the time, General Manager of GMOO and, by the way, had commanded a U.S. Destroyer in European waters in World War I. Jokingly, he said in his introduction that, as a Dartmouth man, he thought it a good idea to put two "Yalies" (Barlow and Stradella) together on a project he was about to authorize. He then explained in further detail Col. Barlow's general request and authorized me to furnish him with any and all information available that might be of assistance to U.S. military operations against Germany.

At the outset I gave Col. Barlow the names of several GMOO employes who, I had reason to believe, could provide information which would be of interest to him and I also assisted in arranging the contacts. On a number of occasions during 1942 and 1943 I met with Col. Barlow in my office and gave him detailed information pertaining to the Adam Opel facilities at Russelsheim and Brandenburg. This information included drawings and blueprints of Opel facilities which Col. Barlow indicated would be useful for strategic bombing purposes. My discussions with him included specifying the location of particular portions of both Opel facilities, such as power plants, the destruction of which would provide the most effective disabling of any activity carried on.

The complete willingness to cooperate in the destruction of these properties is, of course, totally incongruous with Mr. Snell's charges of assistance to the Germans.

Following the transfer of the information, we inquired often as to its eventual effectiveness and the results of any military activity based upon it.

One day (I cannot place the time exactly), as a result of our continuing interest, Col. Barlow met with a small group of us who had been involved and showed us an air photo of what was left of the Brandenburg truck plant (an important military support) after its bombing by the Air Force. It was a hole in the ground—no more. The statement on page 22 of the Snell Report, referring to the Postwar period, and the fact that "Meanwhile, GM's truck plant in Brandenburg, East Germany (and Ford's facilities in Hungary) have more than likely become substantial factors in these Communist economies" is laughable and a reprehensible inference. The Russians salvaged from Brandenburg what was left, including some machines, fixtures, and even portions of the building structure. So GM obviously had nothing to do with whatever postwar progress has been achieved by Russia or East Germany where the Brandenburg truck plant once stood. This is the degree of substance behind Mr. Snell's statement.

While the Russelsheim properties were severely damaged, the destruction was not as massive as at Brandenburg.

I am glad to report that, just before writing to you, I made contact with Ed Barlow who now resides in Horseshoe, North Carolina. (He also maintains an apartment in Princeton, New Jersey.) I told him generally of the contents of this letter to you and said that he might eventually be asked to confirm or otherwise comment upon some of my statements involving him. He replied that he would be happy to do so.

If this is to be helpful in any way, I shall be pleased. You know that you may call upon me further if you wish.

Most cordially,

CHARLES E. STRADELLA.

Exhibit 5.—Letter to Bradford C. Snell From Robert Engler, City University of New York, Re "American Ground Transport"

THE GRADUATE SCHOOL AND UNIVERSITY CENTER,
New York, N.Y., April 8, 1974.

MR. BRADFORD C. SNELL,
Assistant Counsel,
Senate Antitrust Subcommittee,
Washington, D.C.

DEAR MR. SNELL: Your committee is to be commended for raising questions about the political implications of the international negotiations of private corporations with one another and with governments.

The temptation when referring to international industrial giants as multinational corporations is to accept somehow the notion that they are indeed international bodies transcending petty and transient national loyalties and rivalries and are working on the frontiers of technology, marshalling knowledge, skills and capital toward a global harmony.

The reality is that we have an economy dominated by giant corporations which are insufficiently accountable to consumers or citizens. Most of the so-called multinationals are American-based. Their economic power has become political and social power, helping to shape basic community, national and international public policies.

The Committee Print on *American Ground Transport*, released in February, triggers memories of corporate dealings that were to have a major impact upon American and world development. I. G. Farbenindustries, Germany's goliath chemical combine, and Jersey Standard made agreements for dividing up the world oil and chemical business. Beginning in 1926, these arrangements were to keep Jersey's natural petroleum at pegged rather than competitive levels in Germany so as to ease the entry of the more expensive synthetic fuel, made from coal, which I.G. Farben was developing as part of its contribution to German autarchy. In 1938, I. G. Farben acted for the German government to "borrow" tetraethyl lead from the Ethyl Export Corporation which was owned by Jersey Standard and General Motors. (The international political climate was not conducive to direct American dealings with the Nazi government.) Earlier, I. G. Farben had purchased from Jersey Standard high grade aviation fuel for stockpiling. It also received from the American corporation the process for producing tetraethyl lead. Using plans from the Ethyl Gasoline Corporation, a tetraethyl plant was erected by a German corporation owned jointly by I. G. and General Motors and Jersey Standard subsidiaries. Standard's German subsidiary helped design facilities for aviation gas refining for the Wehrmacht as late as 1939. An I. G. Farben document found during World War 2 declared that ". . . without tetraethyl lead the present method of warfare would be unthinkable. The fact that since the beginning of the war we could produce lead-tetraethyl is entirely due to the circumstances that shortly before the Americans had presented us with the production plants complete with experimental knowledge." The Jersey marriage to I. G. Farben was also instrumental in the delay of the development of synthetic rubber in the United States on the eve of the United States entry into World War 2. Jersey officials explained such relationships by citing benefits to the United States through patents received from Germany. It was also said by corporate officials that "the company cannot constitute itself judge of the rights and wrongs of international problems" and "technology has to carry on—war or no war. . . ." (For a full documentation and discussion, see Robert Engler, THE POLITICS OF OIL, University of Chicago Press, 1967.)

One appreciates any easing of the cold war and the opening of healthier relations with the Soviet Union, just as one is wary of new efforts to crank up the mobilization machine and the national anti-communist hysteria. But the exact terms of any detente certainly bear close examination as to the likely impact upon the national economy, foreign policy and national security and also as to the meaning for the rest of the world who may have reservations about agreements between the two great powers. Thus, when General Motors moves to build trucks and other industrial plants for the Soviet

Union citizens have the right to know how such agreements relate to broader policies of the United States and also how such plants may fit into the Soviet Union's economic development and military mobilization plans. Oil company relations with the Soviet Union need similar review.

The intervention of ITT in Chilean affairs and in the shaping of United States policies toward Chile are current reminders of the power of corporations as political institutions. We need to know much more about the multinational corporation impact upon currency exchange, the tax structure, employment at home and resource development at home and abroad. Any congressional activity which removes the cloaks of secrecy, national security or "proprietary information" from these private governments is a welcome step in the direction of the restoration of responsible public government.

We should be seeking the ideal of an international world order. But certainly not one where profit-gathering corporations are sovereign. In the interim we must seek domestic controls which hold the economic activities of private corporations accountable to large public policies. Much of the economic bigness we are attempting to deal with flows not from any technological determinism, but from specific corporate practices. Where the price is the loss of the ability of people to preserve their autonomy and their cultures and their livelihoods, then the time is overdue for direct challenge to corporate power and for the development of alternative economic institutions.

These remarks are necessarily fragmented, but I do hope they are helpful.

Sincerely yours,

ROBERT ENGLER,
Professor of Political Science.

Exhibit 6.—Statement of Gregory Grossman, Re U.S.-Foreign Business Relations

STATEMENT OF GREGORY GROSSMAN, PROFESSOR OF ECONOMICS, UNIVERSITY OF CALIFORNIA, BERKELEY

Regarding relations between American business and the Soviets, it is imperative to bear in mind the distinction between private profit and the national interest. There is no doubt that such relations can be quite profitable, in the short and in the long run, to American business firms and banks. The Soviets themselves are prepared to see to this, for, on one hand, they fully recognize that Western firms will not as a rule cooperate with them otherwise, and on the other hand they look for major political gains by creating strong vested interests in powerful circles in the advanced capitalist countries. (Of course, many individual deals can go sour for the Western partner; it is rumored that this has been the case with FIAT's involvement in the construction of the automotive plant at Toliatti, USSR, in recent years.) The American national interest is something else again.

In economic terms, the United States probably stands to gain relatively little from greatly expanded business relations with the USSR. The Soviet market for our exports is likely to remain comparatively small and probably quite unstable over the long term. Indeed, it is likely to be very small, except with very large loans and credits from us to the Soviets, which are a dubious proposition politically (as will be argued in a moment), and whose ultimate repayment to us poses serious problems in any case. We can surely use certain raw materials and some technology that the Soviets may sell us, but at least in the case of strategic raw materials the prospect is also politically dubious. At the same time, the Soviet interest in economic relations with us is very great indeed.

The Soviet interest is great because—in terms of their national priorities (among which industrial-military superiority over the U.S. remains paramount despite the siren songs of Soviet leaders)—they can very well use vast amounts of our goods, especially machinery and equipment, a great deal of our technology, and massive amounts of our capital. It must be noted that the Soviet economy is currently going through a crucial and difficult period.

Beginning with about 1970, it is able to add to its industrial labor force at an annual rate that is only a fraction of that in the fifties and sixties. It is stepping up the already expensive program of self-sufficiency in grain and animal proteins. It has embarked on another very expensive program of large-scale motorization. But for political reasons, the additional capital resources can not be obtained either from the military effort (given both the confrontation with China and the domestic power of the military) or from the consumer, to whom the leadership is seriously committed. Thus, Western goods, technology, and capital are to play a major role in carrying the Soviet economy and the Soviet leadership through their present difficult circumstances.

Should we cooperate with the Soviet leaders in this enterprise—an enterprise with aims of the grandest historic proportions, as just mentioned? There may be more than one answer to this question, but surely the answer to be chosen should emerge from careful and conscious calculation of the national interest in view of all the attendant risks and opportunities, and not left to the sum total of commercial and financial activities of business firms mindful only (and properly so) of their own profits and losses. And elementary logic dictates, in view of the unequal national interests of the two sides in economic relations with one another, that we use our economic cards in a careful and measured way as a means towards a stabler and more peaceful world, and not throw them away by a hands-off policy in regard to Soviet-American trade (with large credits and credit guarantees on the part of the Export-Import Bank at that!).

Among the relevant considerations are also the following. First, the benefit to us from the import of materials from the USSR should be seriously weighed against the leverage that it will give the Soviets vis-a-vis us. This would seem to be particularly true of large amounts of energy. (The counterargument that the Soviets would be reciprocally dependent on us for grain does not hold, because they are now making every effort at huge expense to avoid just this, and because even if they continue to import our grain, our own bargaining power will be tempered by the vested interests of the many grain-growing states and farmers' groups in this country.) Second, the equipment and technology that we turn over to them may have significant military importance, both directly and also indirectly by releasing their production capacity and engineering resources for other purposes. Third, it is doubtful, as is sometimes assumed, that massive amounts of our capital will induce them to diminish their military effort. It is at least as likely that the resources so placed at their disposal will only make it easier for the Soviets to continue the military program on the present huge scale, in the absence of an international arms-limitation agreement.

Perhaps of even greater concern to us should be the prospect that large loans and credits to the Soviets, as well as other forms of economic relations, will create in this country a strong set of vested interests vulnerable to manipulation and exploitation by the Soviets at some future points. The Soviets are great masters at this sort of thing, but whether they do it subtly or clumsily, the results may be unfortunate for our national interest and for international relations. And lastly, we should bear in mind that close economic relations between us and the Soviets have major implications for Soviet-Chinese and Soviet-East-European relations. All these considerations are much too complex and much too portentious to be left to the incidental resolution by means of letting our business do what comes naturally to it. To repeat, *some* expansion in economic relations with the USSR is in our national interest so long as it advances our foreign policy goals, but it should be a carefully weighed and measured expansion.

Exhibit 7.—List of U.S. Firms Business Holdings in Germany (October 1944)

FOREIGN ECONOMIC ADMINISTRATION, LIBERATED AREAS BRANCH, ECONOMIC INSTITUTIONS STAFF

BUSINESS HOLDINGS IN GERMANY OF UNITED STATES FIRMS—OCTOBER 1944

ADAM OPEL

1. Name, Adam Opel AG.
2. Address, Russelsheim-a-Main, Germany.
3. Type of business, production, assembly, sale of cars, trucks and automotive products.
4. Volume of output, 80,742 cars and trucks.
5. Value of output, RM 183,369,000.
6. Estimated annual capacity, 150,000 cars and trucks.
7. Name and address of American interest in (1), General Motors Corporation (Overseas Operations) 3044 West Grand Boulevard, Detroit 2, Mich.
8. Name and address of foreign organization (through which American interest is held), none.
9. Total value of interest reported by (7) in (1), $52,002,562.
10. Proportionate interest reported by (7) in (1), 100 percent.
11. Proportionate interest of persons other than (7) in (1), none.
12. Organizations allied with (1).

Name	*Address*
Frigidaire GmbH	Wibestrasse 12, Berlin NW 87, Germany.
Opel Automobil Versicherungs AG	Russelsheim-a-Main, Germany.
Gameinnützige Opel-Wohnbau Gesellschaft mbH	Russelsheim-a-Main, Germany.

Name	Address	Citizenship	Office
Wilhelm von Opel	Wiesbaden, Germany	German	Chairman, board of directors.
Alfred P. Sloan	New York, N.Y.	United States	Director.
James D. Mooney	Oyster Bay, Long Island, N.Y.	do	Do.
John Thomas Smith	New York, N.Y.	do	Do.
Karl Luer	Frankfurt-a-Main, Germany	German	Do.
Franz Belitz	Munich, Germany	do	Do.
Graeme K. Howard	Detroit, Mich.	United States	Vice-chairman, board of directors.
David F. Ladin	Melbourne, Australia	do	Director.

Exhibit 8.—Library of Congress Translation of Resolution Re Handling of Enemy Property, Adam Opel A. G. Company

THE LIBRARY OF CONGRESS.
Congressional Research Service, Washington, D.C.

[Translation—German]

HANDLING OF ENEMY PROPERTY; HERE, THE ADAM OPEL A.G. COMPANY IN RUSSELSHEIM A. MAIN

RESOLUTION

On the motion of the Reich Commissioner for the Handling of Enemy Property, dated November 13, 1942—II 920/0.1—Prof. Dr. Carl Luer, Head of the Hesse Chamber of Economics, located in Frankfurt a. Main, and pursuant to the Decree of January 15, 1940—RGBl. I S. 191—as amended by the 3rd Regulation of April 9, 1942—RGBl. I S. 171—and the General Instruction by the Minister of Justice of June 20, 1940—German Justice, page 728—is, in accordance with Paragraph 12 f.p. of the Decree of January 15, 1940, appointed Administrator of the Adam Opel A.G. in Russelsheim a.M.

The authority of the board of directors shall not be affected by this administrative decision and shall not rest during the period of administration.

The activities of the administrator shall, therefore, be limited and exercised within the field of authority carried out so far by the board of supervisors and the general meeting. The administrator shall not be authorized to represent the company.

The administrator shall supervise the management. He may at any time request the board of directors to furnish a report on matters pertaining to the company or keep himself posted on matters pertaining to the company in any other way if he so desires. In particular, he himself or his deputy may at any time inspect or examine the books, the papers as well as the portions of the company's assets, that is, the company's cash as well as the stocks of shares and merchandise.

The administrator shall be assisted and advised by a counsel who shall be appointed by the Reich Commissioner for the Handling of Enemy Property. He shall discuss with the counsel all important matters prior to asserting or not giving his assent to the measures taken by the board of directors. If the administrator does not give his assent to a measure taken by the board of directors it remains for the Reich Commissioner for the Handling of Enemy Property to make the decision. In cases of a disparity of views between the administrator and the counsel the administrator shall ask for the decision of the Reich Commissioner for the Handling of Enemy Property and abstain from making his own decision until the arrival of the Commissioner's decision.

The administrator shall be obliged to ask for the assent of the Reich Commissioner for the Handling of Enemy Property in all matters of importance. This shall apply in particular to such matters as stated in No. 21, Section 2 and 4 of the General Instruction of the Minister of Justice, dated June 20, 1940. After consultation with his counsel he shall also submit to the Reich Commissioner the annual balance sheet prior to its final version.

The administrator shall be charged to inform the Reich Commissioner for the Handling of Enemy Property of matters pertaining to administration in regular three months intervals and to submit his first report on January 1, 1943.

BECHSTEIN, PFANNSTIEL, LEUN,
Darmstadt, November 25, 1942,
Provincial Court of Appeal, 1st Civil Senate.

For the execution signature Secretary of Justice.

Exhibit 9.—Excerpt From Annual Report (1967) of Foreign Claims Settlement Commission Re GMC and GM Overseas Corporation

FOREIGN CLAIMS SETTLEMENT COMMISSION OF THE UNITED STATES

Annual Report to the Congress for the Period January 1-December 31, 1967

IN THE MATTER OF THE CLAIM OF GENERAL MOTORS CORPORATION AND GENERAL MOTORS OVERSEAS CORPORATION

Claim No. W–10619—Decision No. W–21487

Claim based upon loss due to claimant's failure to receive proceeds of bills of exchange covering shipments of merchandise to Poland held to be a debt owed to claimant and therefore not compensable where suit brought and agreement entered into by claimant for excess amount over judgment entered by court.

PROPOSED DECISION

This claim in the revised amount of $41,362,995.85, under Sections 202(a), 205 (b) and (c), Title II of the War Claims Act of 1948, as amended, is based upon the loss, damage and destruction of certain improved real property and personal property owned by Adam Opel AG and by N.V. General Motors Java Handel Mij., wholly-owned subsidiaries of GENERAL MOTORS COR-

PORATION located in Germany and Java, and upon the loss of certain improved real property and personal property owned by claimant, General Motors Overseas Corporation, in Shanghai, China and Manila, Philippines during World War II.

I. russelsheim plant

Adam Opel AG had its main manufacturing plant at Russelsheim, Germany which was placed under the control of the German Enemy Property Custodian on November 25, 1942. The record before the Commission shows that the Russelsheim plant sustained severe war damage as a result of allied bombing raids in 1942 and 1944.

II. brandenburg

The record indicates that Adam Opel AG operated a plant in Brandenburg, Germany prior to World War II, which was placed under a German administrator as enemy property on November 25, 1942. This plant has been located in the Soviet controlled area of Germany since the end of World War II.

Exhibit 10.—Excerpt From Automotive News, October 1973, Re American Construction of Truck Facility in Russia

TRUCK WATCH

(By Jack Walsh)

The Russians apparently are determined to get an American truck manufacturer involved in the planning and construction of a heavy-truck facility in their land.

They've already struck out twice, once with Ford and more recently with Mack. Now they're working on General Motors, and a spokesman for the company has admitted that preliminary discussions are under way.

The truck plant, according to reports from Moscow, would be built in Siberia at a cost of more than $2 billion. Target date for the project has been set for the early 1980s.

Sources in the Soviet capital say this plant would be even larger than the one the Russians are building themselves, with the aid of Free World subcontractors, on the Kama River about 600 miles southeast of Moscow.

The Kama plant, now nearing completion, would be the world's largest truck facility if production plans are realized—150,000 heavy trucks and 150,000 engines a year.

So the Siberian project is even a more ambitious project, with the trucks it produces designed to help the Soviets exploit vast natural resources in that land.

Last April, a group of about 20 GM executives and engineers, headed by Harlow W. Gage, general manager of the Overseas Operations Division, laid the groundwork for the discussions during meetings with members of several Soviet ministries.

The company said presentations made to the Russians at that time also covered other products such as earth-moving equipment, household appliances and locomotives.

Russia's bid to interest Ford in the construction of the Kama plant came when the U.S. was fighting in Indochina, and although Ford indicated an interest, it backed down when government officials objected on grounds that it didn't want Ford-built trucks to be used by Communist forces in Vietnam.

Some time later, the Soviets turned to Mack. The company was interested, too, but the deal fell through when U.S. approval of an export license was not received by a specified date.

After the preliminary agreement was terminated, nearly a billion dollars worth of export licenses were approved for American subcontractors for the Kama projects.

At the time that the Mack agreement was terminated, it was hinted by then Commerce Secretary Maurice Stans that the truck maker never really considered the Kama project.

Zenon C. R. Hansen, Mack's chairman, disputed this suggestion, pointing out that the company had applied for an export license, and that the deadline was twice extended. That was proof that Mack was interested, he contended.

Hansen felt that Mack's move for the export license actually opened the way for approval of the other subcontractors' applications.

Exhibit 11.—Excerpt From the Wall Street Journal, Sept. 24, 1973, Re Proposed Russian Truck Plant

GM Is Holding Talks About a Truck Plant Planned in Russia

Detroit.—General Motors Corp. said it is engaged in "preliminary discussions" with the Soviet Union about a truck plant in Russia.

GM wouldn't give any details of the talks, but presumably the facility under consideration would be separate from the massive truck plant the Soviets are building on the Kama River.

The U.S. auto maker, without giving any hint of the current status of its negotiations, noted that it had previously made presentations to the Russians about such other products as household appliances, locomotives and earthmoving equipment, without any visible sign of success.

A number of other U.S. companies were involved in the early Kama River deliberations. In 1970 Ford Motor Co. considered a bid to help establish a huge plant capable of producing 150,000 trucks a year. But when U.S. defense officials indicated some opposition, Ford quickly pulled back.

Mack Trucks Inc., a subsidiary of Signal Cos., also was a prime candidate to build a truck plant in the Soviet Union, but that deal also fell through. The Soviets have since gone ahead with the Kama River plant on their own, subcontracting out to Western companies for the specific services and equipment they need.

In the years since the first approach to Ford, however, the U.S. and the Soviet Union have been striving for a detente in their relations that could make it easier for an American company to cooperate with the Russians in a truck plant.

In recent months, for example, Occidental Petroleum Co. has signed a number of multimillion-dollar agreements with the Soviet Union covering a range of projects, including chemicals, fuel and trade centers.

Exhibit 12.—Prepared Statement of Jack L. O'Donnell

Statement of Jack L. O'Donnell, Supervisor of Program and Design Section, Department of Public Works, City of Baltimore, and registered professional engineer

Your Subcommittee's recent efforts to determine the factors responsible for the miserable state of U.S. transportation today is very welcome, but about thirty years too late.

An unforgetable example of General Motors' contribution to this decline and the arrogance with which it was carried out was forcibly brought home to me in Oakland, California in the summer of 1953. Because of my knowledge and interest in transportation, I had been invited on a Saturday morning tour of Key System's Emeryville Shops where major maintenance was performed on the fleet of 88 transbay rail cars. National City Lines had taken over the Key System in 1946 and by this time had replaced all Eastbay local lines with G.M. buses. The shopman assigned to take us around was knowledgeable and courteous. He explained that the rail cars were far superior to the buses and much more pleasant to work on. Men with less seniority were having to work on the buses and he was afraid they all would be working on the buses if the Company's efforts to eliminate the five transbay rail lines were achieved. During the tour our guide met and introduced us to a National City Lines official. Now, over twenty years later, I do not remember his official capacity of name. However, he did not share our enthusiasm for the cars and a good natured discussion ensued. During this discussion, the NCL official admitted

that the City Lines' main objective was to convince civic "leaders" that the electric railway was obsolete and allow all lines to be replaced with G.M. buses. While discussing the resulting poorer service and loss of patronage, he further admitted that on the average a rail line lost about 20% of its former patronage after conversion to bus operation. Then he boasted, "So what! If they won't ride in G.M. buses, they will probably buy a Chevy so we can't loose."

Exhibit 13.—Letter to Senator Hart From George M. Smerk, Indiana University, Re National City Lines

INDIANA UNIVERSITY,
Bloomington, Ind., March 19, 1974.

Senator PHILIP A. HART,
Chairman,
Subcommittee on Antitrust and Monopoly,
U.S. Senate,
Washington, D.C.

DEAR SENATOR HART: I am writing this letter in response to a request from Mr. Bradford C. Snell, Assistant Counsel of the Subcommittee on Antitrust and Monopoly. He asked me to express some thoughts on the situation existing between National City Lines, a mass transit holding company, and its financial backers, which included General Motors, Firestone, and other firms involved in the manufacture of supplies and equipment for the provision of urban mass transportation service by means of motor bus. This is in connection with some of the points made by Mr. Snell in his presentation to your subcommittee, entitled *American Ground Transport*, on February 26, 1974.

I have touched on this issue in past writings, primarily in the search for the reasons for the decline of the mass transit industry in the United States. I have made copies of these passages. One is the introduction to U.S. v. NCL that appeared in *Readings in Urban Transportation;* the other is from *Urban Transportation: The Federal Role.* [See appendixes 1 and 2 to this letter.]

It seems apparent from the material contained in *U.S.* vs. *National City Lines* that NCL had an aiding interest in the profit potential of the substitution of motor buses for streetcars. There is little doubt that, since NCL was financed by motor bus manufacturers and suppliers, that the overall profitability of mass transit services was looked at from a different viewpoint than might be true for a transit firm that had obtained capital from other sources outside the transit equipment and supply industry.

Apart from the issue of NCL's violation of the Sherman Act because of its relationship with suppliers and backers, a major question is whether or not NCL was mainly interested in enjoying profits from the main business of a transit firm—carrying people—or in the overall profitability of a transit industry that was to be dependent upon the product of the backers of NCL. It is, obviously, very much in the spirit of competitive private enterprise to adopt a technology that can cut costs, if at the same time to produce or service received by the public is as good or better than through the use of a different technology. Undoubtedly, there were properties taken over by NCL where the continuation of rail transit was inappropriate to the volume of traffic or where the property was so badly deteriorated that, even given sufficient capital to upgrade facilities and equipment, the return on investment would not be such to make investment in transit attractive. Even so, one would expect that NCL, or any other transit firm that was properly interested in profiting from carrying passengers, would have carefully costed out the alternative of retention of rail service, with necessary improvements to upgrade service standards or control costs, along with the substitution of motor bus or trolleybus for existing rail service. Certainly, one would expect a normal private enterprise to wish to have a variety of manufacturers of transit equipment of all types bidding for the business of supplying equipment and expendable supplies. A firm wishing to make profit from the provision of transit service would wish to have the flexibility to buy the best equipment and supplies at the lowest price possible. Surely, no firm with the long run interest of continuing successfully in its supposed main line of business would wish to have its hands tied: to tie itself to the products of a few suppliers on a long-term basis is absurd.

It is reasonable to suppose that a company interested not in the wholesale changeover from one mode of transit to another, but in carrying passengers, would have aggressively marketed its services to the public and would have paid careful attention to the use of technology that was attractive to the public.

From the viewpoint of attempting aggressively to sell transit service to the public, the transit operator should consider the vehicle—bus, subway, streetcar, or trolleybus—as a part of the product mix that he would combine with a price and various types of promotional activity to provide a service package to the public. There is no evidence of a definitive nature, to my knowledge, that would lead one to conclude that the motor bus was always the proper mode for the transit operator attempting to present his wares—his package of service—most effectively and economically to the public almost without exception throughout the United States.

One would have suspected that, barring some outside reason such as the desire to have the motorbus dominate transit, a transit firm would have wished to utilize all modes and technologies of transport available. The reason for providing a blend of transit modes goes beyond cost considerations. A firm wishing to profit from hauling passengers would necessarily be considered with the amount of service it was called upon to deliver—that is, capacity considerations—and the attractiveness of the equipment to patrons and potential patrons.

There is some evidence that NCL did attempt for a time to promote or market its transit service. There is also evidence that, beginning about a quarter century ago, NCL's efforts at trying to sell transit to the public declined. The policy of the company became one of trying to hold the front on cost and raising fares rather than trying to expand the market for its service. There was an inevitable diminution in patronage. Obviously, much of the loss in patronage was a result of the blandishments and usefulness of the private automobile, but some of the erosion in patronage was undoubtedly due to the operating policies of NCL, and other transit firms, that alienated patrons and potential patrons by means of a lacklustre package of service. It must be remembered that a part of the package of service offered the public is the vehicle utilized to carry the passengers.

Whether or not NCL was improving the quality of service, and thus attracting more patronage, by changing over transit operations from streetcar to motor bus is an important question. This is difficult to answer particularly when much of the switchover took place from twenty to forty years ago. It is a matter, in many instances, of comparing apples and oranges. Service may well have improved in cases where ancient, unpleasant, functionally obsolete electric cars utilizing poorly maintained track were replaced by new buses operating on a freshly paved street. By the same token, comparisons would be unfair between a transit route using ancient, noisy, undependable, nonairconditioned buses, vs. new, airconditioned, air suspension streetcars operating on a new track. At the moment there is no definitive evidence that the public liked the motor bus better than the electric streetcar or trolleybus, or vice versa. One can look at aggregate data and make a generalization that transit patronage fell off most quickly in the late forties and especially in the early 1950's, when most severe cutbacks in rail service was carried out. The situation is clouded because there were other forces at work—the five day week, television changing family entertainment practices, and so on—so that on the basis of existing, available information no definite conclusion can be drawn. The situation would clearly be suspicious if, under roughly comparable service conditions, the substitution of motor buses for other forms of urban mass transportation led to sharper drops in transit patronage than would have been expected from the secular trends in patronage for a given transit property or the industry as a whole.

Another factor to consider is the impact of NCL and its policies as a training ground for transit managers. A firm as large and widespread as NCL is likely to have spawned many alumni who left NCL to work for other transit firms, taking with them the practices and policies of their mentors. The impact on the industry would have been to make additional firms behave as NCL did.

In summary, there is no indication that almost universal substitution of the motor bus for other modes of urban mass transportation was the proper

practice to use in maintaining a service that would continue to be attractive to transit patrons. Indeed, it is likely to have acted—along with other factors such as higher fares and longer headways—to discourage transit patronage and have spurred urban travelers to use automobiles for their trips.

It is of some interest that the Toronto Transit Commission is almost universally acclaimed as the best transit system in North America. As a matter of policy in Toronto all modes of transit are utilized where it is felt they can perform best. Feeder lines and the more lightly patronized routes are served by motor bus. More heavily traveled lines are served by trolley bus. Electric streetcars serve the busiest surface routes; major corridor services are performed by rapid transit lines. Indeed, the practice in Toronto has been to convert the most heavily patronized streetcar lines—such as Yonge Street and Bloor-Danforth—not to motor bus, but to rapid transit. Toronto has enjoyed a steady growth in transit patronage over the years.

I hope this information is of value in the work of your subcommittee.

Cordially,

GEORGE M. SMERK,
Professor of Transportation.

Appendix 1

[From "Readings in Urban Transportation," Bloomington, Ind., University Press, 1968]

UNITED STATES V. NATIONAL CITY LINES, INC., 1951

Automobile competition in the 1920s and the beginning of the widespread movement of people to the suburbs, away from the lines of public transportation, were capped by the general business decline of the 1930s. Falling revenues and failing ridership coming as a result of general unemployment meant that cost-cutting was necessary if public-transport companies were to survive.

During the Depression the wholesale substitution of buses for streetcars began. In earlier times buses had been used as feeders to streetcar lines and as extensions of lines into sparsely settled suburban territory. As revenues plummeted during the Depression, public-transport concerns were forced to defer maintenance on their cars and right-of-way. Equipment on many weaker lines was soon in a deplorable state, matched only by the catastrophe that was the track itself. To help diminish the fixed costs necessitated by a railway, even heavily traveled streetcar lines began to be replaced by buses. Evidence of the poor economic health of the industry is given by the fact that streetcar services in some towns were frequently terminated by the same cars that had been used to inaugurate electric railway service thirty or more years earlier. Streetcar abandonments stopped during the Second World War, but continued even more rapidly when hostilities ceased.

The switch to buses was heavily promoted by the firms that manufactured these vehicles. It became obvious in some places that the real profit to be gained by a public-transport operation came not in the provision of service to the public, but in providing the vehicles and the supplies needed by those vehicles. An interesting case in point is found in the next reading, which is a court decision in the matter of a public-transport holding company. One should not only note the findings of monopoly and collusion between National City Lines and some other companies, but also realize that such activity had a generally deleterious effect upon urban mass transportation, aiding and abetting the decline of the industry.

United States v. National City Lines, Inc., et al., 186 F2d 562, p. 565.

Appendix 2

[From "Urban Transportation: The Federal Role," Bloomington, Ind., University Press, 1965]

Another strong factor in the decline of public transit was the policies of public transit holding companies, such as National City Lines. This particular company "in 1938 . . . conceived the idea of purchasing transportation systems in cities where streetcars were no longer practicable and supplanting the latter with passenger buses."[39] At about the same time a series of agreements was worked out with General Motors, Firestone, Standard Oil of California, Federal Engineering Company, Mack Truck, and Phillips Petroleum to supply capital to National City Lines and its subsidiaries, American City Lines and Pacific

City Lines. This capital was used to purchase control or financial interest in local public transit companies "to further the sale of and create an additional market for the products of supplier(s) . . . to the exclusion of products competitive therewith."[40]

Ten-year contracts for buses and supplies were made only with the companies furnishing capital through purchase of National City Line securities. Even in cases where National City Lines sold their interest to another company, the purchasing company had to agree to buy from the same suppliers on the same long-term contract basis. At the time indictment was brought in 1947, National City Lines owned or controlled 46 transit systems in 45 cities in 16 states. In 1946 over $11 million of the suppliers' products had been purchased. In the period from 1937 to May 1, 1947, more than $37 million in purchases had been made. One may seriously question whether the transit companies were being operated so much for the public interest as for the profits accruing under the monopolistic schemes.[41] Street railways and trolley bus operations, even if better suited to traffic needs and the public interest, were doomed in favor of the vehicles and material produced by the conspirators.*

Exhibit 14.—Statement of Harry F. Brown

STATEMENT OF HARRY FARNSWORTH BROWN, CONSULTING ENGINEER AND FORMER CHIEF ELECTRICAL ENGINEER FOR THE NEW YORK, NEW HAVEN & HARTFORD RR.

BACKGROUND

I joined the New Haven Railroad in January 1910 in the electrical engineering department after serving two years after graduation with the General Electric Co. in the test department at Schenectady. On the railroad I served as draftsman, assistant engineer, assistant electrical engineer, engineer of electric traction and finally as chief electrical engineer in 1948.

The New Haven Railroad's first experience with diesel electric locomotives began in 1931 and was confined entirely to diesel electric switching locomotives. They were called "oil-electric locomotives" in those early days and were regarded as electric locomotives carrying their own prime mover or power plant. Not until 1942 (during World War II) did the New Haven Railroad purchase any line haul or road type diesel electric locomotives. However, I had from 1931 until 1942 and then until 1951 to study the relative economics of diesel vs. steam locomotives and vs. electric locomotives.

In 1948 I went to Spain on a leave of absence from the railroad to study the electrification of the sections of the Spanish National Railways (RENFE) under the auspices of the Westinghouse Electric International Co. Since that date, all of the lines studied plus many more have become electrified. In 1951 at the invitation of the French National Railways (SNCF) I went to France to attend a conference at Annecy on the proposed electrification of some of the French railway lines with commercial frequency (50 cycles) at 25 kv. Both of these trips to Spain and France gave me a wide acquaintance with European railway engineers. I had already had a broad acquaintance with U. S. electrical engineers as having been from 1935 to 1940 chairman of the Electrical Section of the AAR. In 1951 on my return from the Annecy conference I had an offer from the Westinghouse Electric International Co. to represent them as consulting engineer in various foreign countries if I cared to leave the New Haven Railroad. In the summer of that year I lost my wife and I thought the change in employment would be to my greater advantage than remaining with the New Haven Railroad. I left at the end of 1951 taking up employment with the Westinghouse International Co. as a consulting engineer. During the next two years I traveled for that company extensively in South America, in Western Europe, in Asia Minor and in Africa, visiting principally the countries of Peru, Chile, Argentina, Uruguay and Brazil in South America, spending five months in each of 1952 and 1953 in these South American Countries. Chiefly in an endeavor to promote further interest in railway electrification.

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* The companies were found guilty of violating section 2 of the Sherman Act by the U.S. District Court for the Northern District of Illinois, Eastern District. The U. S. Court of Appeals upheld the decision and the U.S. Supreme Court refused certiorari.

with the Westinghouse International Co. as a consulting engineer. During the with a special reference to the rectifier type electric locomotives, I spent considerable time in South Africa, Rhodesia, Belgian Congo and Egypt, Turkey, Yugoslavia, Spain, France, Italy, Switzerland, Holland, Belgium and England.

While in South America, I was impressed by the large amount of undeveloped water power existing in the "back country" which could be utilized to furnish electric power to any new railroad regardless of traffic density. These roads could be laid out to develop the resources of the back country by combining the rails with contact wire in a 3-wire system to supply power for the development of mines and other manufacturing plants for developing the countries' resources. During the late part of 1953 the Westinghouse Co. suddenly decided to give up all further attempt to promote railway electrification. It is an open secret, but can not be proved by any existing evidence that I have other than hearsay, that they were forced to make this stand by the threatening attitude of GM who regarded the railway diesel manufacturing and application as their "captive market." In 1954 the Westinghouse Co. publicly announced their retirement from manufacture of any further electric and diesel electric motive power and sold their 23% interest in Baldwin-Lima-Hamilton Locomotive Corp. and have withdrawn entirely from this railway field. However, the rectifier locomotive type was their contribution to further railway electrification development in Europe.

At the end of 1953 I left the Westinghouse International Co. and went with the consulting firm of Gibbs & Hill Inc. This firm had been consulting engineers not only for most of the electrified railroads in the U. S. but had been consultants also for the New Haven Railroad in the improvement and development of the Cos Cob power plant and associated connections with other electric utilities. In 1954 during my initial work with Gibbs & Hill I outlined several technical papers for the AIEE. The principal one was *Railway Electrification. How, When & Where Can It Compete with the Diesel.* This paper received fairly wide publicity in this country and abroad. I outlined in that paper my thoughts of light traffic railway for developing the resources of the areas through which the railway traversed. This was picked up by the Russians and in 1955 during a visit to Paris I was informed by some of the Russian engineers that this was the system, somewhat amplified, that they used for the Trans-Siberian Railroad. In this paper, I also noted that there was a simple "rule of thumb" with respect to the question of whether steam should be replaced by diesel or electric motive power: In the long run, the costs of conversion from steam to diesel would exceed the costs of electrification, regardless of traffic density, for the simple reason that the electric locomotive would have two or three times the life of the diesel locomotive. I suggested in the 1954 paper that the economic life of the diesel was limited to about 15 years. I derived this value from my knowledge gained on the New Haven Railroad of maintenance costs of the various types of motive power—steam, electric and diesel—gathered in the period from 1931-51 on the New Haven Railroad where I was in a position to make careful comparisons of these costs.

The Chesapeake and Ohio Railroad picked up this statement of 15 years life from this 1954 paper and wanted to know if we could verify such a short life and furnish to the Internal Revenue Service (IRS) accurate statements substantiating such a short life which would be invaluable to that railroad for tax deduction purposes, i.e. depreciation. I took this matter up with my principals at Gibbs & Hill to make such a verification study of the economic life of the diesel electric locomotive from data on their railroad and from other railroad which I secured plus data which I already had from the New Haven Railroad. The result of this study indicated that diesel locomotives in line haul or road service had an economic life of from 12 to 14 years and in yard or shunting service had a much longer life of about 18 years.

I personally helped the C & O argue this case for tax deduction purposes before the IRS in 1956 in Washington and at that time, after due consideration, the IRS allowed the C & O to use an economic life of 15 years for depreciation of road locomotives and an economic life of 20 years for yard locomotives for tax purposes provided they would write these locomotives off their books in these above periods of time; but they also said they would not allow any other railroad to do this until each railroad made new studies to substantiate these low economic life values. However, by 1962 the record was fairly

clear from statistical evidence on all the railways, and the IRS announced that they would allow a 15-year economic life on all diesel motive power regardless of use provided such equipment was retired on the company books. I was told by the C & O tax officials that this decision was based for the great part on the study Gibbs & Hill made under my direction for the C & O.

In the meantime, claims were being made by General Motors that the railways had saved one billion dollars annually by substitution of diesels for steam motive power. They were using a general figure of 30% return on diesel investment which could be written off in 3 years, and their statements were completely accepted by our railroads and by our banking and many other leading financial institutions. I came to the conclusion that if we were to promote electrification of steam railways in the United States, we must first of all disprove GM's claims of enormous savings from dieselization. So in 1957 I started to work on the paper which two years later resulted in the paper presented in 1960 before the Institution of Mechanical Engineers in London. I knew that such a paper could never be published in the United States. I had had too many instances of technically being blocked in the AIEE and ASME by the diesel manufacturing industry. At any rate, this paper did result in quite a broad discussion in England and elsewhere in Europe and did result in the final decision of the British Rails to electrify rather than to dieselize their railways. This was the paper debated in the English parliament.

SUMMARY OF STUDIES ON DIESEL VERSUS ELECTRIC MOTIVE POWER FOR RAILROADS

For the past 63 years, I have been professionally involved in railway engineering. As Chief Electrical Engineer for the New York, New Haven & Hartford R.R. when I left, at the end of 1951 after 42 years of service, and then as consulting engineer for the Westinghouse Electric International Co. for two years endeavoring to promote railway electrification, especially the rectifier type of electric locomotives, in Europe, South America, Asia Minor and Africa, and later as consulting engineer for the internationally known engineering firm of Gibbs & Hill Inc., I have had ample opportunity to study the comparative economies and long-term effects of diesel versus steam and electric locomotive operation.

Many of my conclusions in this regard have been detailed in two major studies: (1) a paper presented before the American Institute of Electrical Engineers in New York in 1954 entitled *Railway Electrification, How When & Where Can It Compete with the Diesel* and (2) a study entitled *Economic Results of Diesel Electric Motive Power on the Railways of the United States of America*, which was presented before the Institution of Mechanical Engineers in London in 1960 and reprinted in the 1961 Proceedings of that institution. That study was not only awarded the George Stevenson prize by that institution but was debated in the British Parliament and became a significant factor in Great Britain's decision to electrify its railroads. Previously, in 1955, the Soviet Union decided to electrify the Trans-Siberian railway using some of the schemes outlined in my 1954 study combining railway electrification with commercial use of electric power originally developed for use on South American and African railways.

Briefly, both studies demonstrated that diesel motive power costs more than twice as much as either electric or steam power which it replaced. More specifically, diesel locomotives last only half as long as electric or steam locomotives (15 years versus 30 years) and, being vastly more complicated and more delicated pieces of machinery, are substantially more expensive to own, operate and maintain in working order. Regarding efficiency, the diesel is far less efficient than the overall efficiency of electric power plus the electric locomotives. As to steam efficiency, the steam locomotive development was stopped right in the middle of its later developments by the development of the diesel. The steam locomotive is capable of being developed further to at least the overall efficiency of the diesel electric locomotive.

The increased costs associated with dieselization have not failed to leave their mark on this nation's railroads. What other utility in this country can afford to renew its principal operating equipment every 15 years, as the railways have done with their diesel motive power? Further, by 1969 when I

stopped recording the diesel units purchased by the railways, over 46,000 diesel electric locomotives had been purchased by the Class I railways, based on ICC statistics, and the total in use at the end of 1969 was only 27,000. What other utility has such a low rate of overage return on its investment? What other utility has in recent times suffered from incessant bankruptcies and general decline instead of growth? Dieselization, I submit, combined with other products made by the diesel manufacturers for highway use were the most important factors responsible for the demise of America's railroads.

Exhibit 15.—Excerpt From The Economist, Dec. 10, 1960, Entitled "How Profitable Are the Diesels?"

How Profitable Are the Diesels?

The difficulity of making reasonably accurate long-term economic assessments of railway investment has run right through the present protracted argument about whether the Transport Commission should complete its plan to electrify the London-Midland main line between Euston and Manchester and Liverpool. The choice, which is now said to have involved the Treasury as well as the Ministry of Transport and the commission, must presumably be between, on the one hand, going ahead with the conversion to electrification south of Crewe and, on the other, of operating the entire route with diesel locomotives.

Any rational decision of this kind ought, in theory, to involve calculating and comparing the economic rate of return to be expected for the investment put into either system (though, by now, the outlay already incurred on the electrification scheme can hardly be treated as if it had not been made). British Railways' ability to make this sort of sober accounting exercise utterly failed to impress the Select Committee on Nationalized Industries earlier this year, and it also seems to have shocked the people who make decisions in the Ministry of Transport into a state of near paralysis. Both systems, as main-line traction, are entirely new to this country. Moreover, railway engineers tend to coalesce into two militant groups. One points to the experience of French Railways, whose adoption of an electric system drawing power direct from the national supply at commercial frequency determined the commission's choice of the very same system five years ago. The other, almost as inevitably, bases many of its arguments for diesel traction upon American practice, where by now diesels have almost a complete monopoly of railway operation.

The paper read to the Institution of Mechanical Engineers last week by Mr. Harry F. Brown of Gibbs and Hill, a New York firm of consulting engineers (he was formerly with the New York, New Haven and Hartford Railroad) has offered a timely warning against accepting these overseas claims for a particular mode of traction too readily. From a detailed analysis of the operating and cost statistics of all Class I railways in the United States and from other information, Mr. Brown makes a very convincing case for his argument that most of the claims put forward there for the superior economy of diesel locomotives just do not stand up. Many of the operating gains originally attributed to the diesel, he argues, have in fact stemmed from other factors. And by calculating what it would cost the same railways to run their services with steam locomotives (a notional exercise that Mr. Brown claims is liable to only a marginal degree of error), he reckons that the net savings in operating costs that can properly be claimed for the diesel are in fact lower than the increase in capital charges. Only in shunting and goods yards, he argues, has the diesel been a cheaper form of traction, largely because of its superior performance at slow speeds and its economy when idling.

When American railways began their rapid conversion to diesel traction, shortly after the last war, the new locomotives were naturally used first on the services for which they were most suited: that is on long passenger runs and on routes with stiff gradients. But at that time of comparison the stock of steam locomotives on American railways was the oldest they had ever had: over 40 per cent had been built before 1915.

It was from this period, however, that the figure of 30 per cent as the return on investment in diesels emerged to become entrenched, at least in the United States, in the "conventional wisdom" of locomotive engineering. Since then, as diesels supplanted steam throughout that country for all types of service, the intensity with which they have been used has fallen. The "30 per cent return" also included the large savings made in labour and other costs from the running of longer and faster trains—on the grounds that these came from the multiple-unit operation of diesel locomotives. Mr. Brown demonstrates that this particular claim was almost wholly wrong. In the face of road competition, American railways had been losing short-haul traffic, abandoning short trains on branch lines, and concentrating their passenger and freight schedules into longer and less frequent trains for more than two decades before the diesels arrived. In fact, longer trains created a demand for motive power of greater horse power: motive power, by itself, did not create the longer trains.

Between the wars the maximum horsepower capacity of new steam locomotives in the United States was raised from less than 2,000 hp to as much as 6,000 or 7,000 hp. The postwar diesels, none with a rating much above 2,000 hp, have had to be used in tandem or in threes in order to produce the same tractive power. If the increased length and the higher loads of trains since 1945 had resulted from the introduction of diesels alone, Mr. Brown argues, then the subsequent reduction in the number of train miles ought to be closely proportional to the increase in the number of diesel locomotives per train. The statistics do not bear this out.

Mr. Brown's calculations of the net savings in operating costs actually achieved by the diesel locomotive inevitably rest upon the validity of his hypothetical computations of comparable steam costs. He grants that there are savings in fuel, crews' wages, engine shed expenses, and in water charges, but he argues that in road service, as distinct from shunting operations, the higher cost of repairs and depreciation charges more than offset these savings—even before adding in the higher interest charges on the larger amount of investment needed to operate diesels. It will probably be difficult to fault Mr. Brown's comparison of repair costs since these are based, for diesels, upon studies made of more than 3,000 locomotives of different ages actually in service and, for steam, upon even ampler, though somewhat earlier, records adjusted for the intervening change in price levels. Diesel repair costs are both higher and rise more steeply with age. This has led American railroads to start depreciating their diesel locomotives over 15 years (20 for shunting) instead of the 20 and 25 years they originally fixed, and as against the 30-year life generally assumed for both steam and electric locomotives. Since diesels cost more than twice as much per horsepower as steam engines, and as they have now been found to have about half the service life, the capital charges of diesel operation are markedly higher.

Mr. Brown originally made this analysis in preparation for an assessment of the respective advantages of diesel and electric traction in the United States. There, the lack of a national grid has so far limited any wider interest in electrification; there, too, the railways were largely persuaded to adopt diesels by the manufacturers, in contrast to Britain, where the manufacturers were induced by the railways to make diesels. The comparison of fuel prices is somewhat different here, too; railway wages are much lower, and featherbedding nothing like so bad. Nevertheless, there are relevant lessons from this account of American experience for British railwaymen—and for British politicians.

As the first main-line, and largely experimental, diesel locomotives went into service only about three years ago, it is still too early for British Railways to know what their repair costs and their life will actually be; but can it be prudent, for instance, to depreciate them over a period of "about forty years" which the commission says is its present practice? And after Mr. Brown's impressive attempt to distinguish between the economies attributable to the diesels and those due to other operating changes in a period when traffic is still declining, can railwaymen here continue to argue that the full advantages if diesel (or electric) traction are not to be seen only in lower operating expenses but also in the opportunities the new traction offers of changing the way in which the entire railway system is operated? Do these changes depend solely upon the form of motive power used?

Exhibit 16.—Table of Approximate Railroad Miles and Degree of Electrification

ELECTRIFICATION

[Approximate railroad route mileage and degree of electrification of major North American and foreign rail systems.]

	Railroad route miles	Electrified (percent)
United States	207,000	(1)
Soviet Union	84,000	25
Canada	41,000	—
France	23,000	25
West Germany	19,000	29
Japan	17,000	40
Mexico	15,000	(1)
Poland	14,000	17
Britain	13,000	16
Italy	12,000	47
Switzerland	9,000	99
Sweden	7,000	60
Norway	3,000	57
Netherlands	2,000	52

[1] Less than 1 percent.

Source: Government Industry Task Force Report, 1973.

Exhibit 17.—Statement of John W. Barriger

"The Prospects for Railway Electrification" Statement Submitted by John W. Barriger

My name is John W. Barriger. Since last July I have served as Special Assistant to the Federal Railroad Administrator, Honorable John W. Ingram, in the Department of Transportation. My railroad career began in June 1917, 57 years ago, in the Altoona Shops of the Pennsylvania Railroad. This long service has brought me the informal title of "Dean of [the present generation of] American railroad men."

I have headed five railroads. The first was as Federal Manager of the Toledo Peoria & Western Railroad, which was taken into government control on March 22, 1942 in order to end a strike characterized by violence. Subsequently I have been President of the Monon Railroad, the "Hoosier Line" of Senator Hartke's state of Indiana, 1946–1952, the Pittsburgh & Lake Erie Railroad, 1956–1964, the Missouri-Kansas-Texas Railroad, 1965–1970, and finally as Chief Executive Officer of the Boston & Maine Railroad, 1971–1972. In addition, I have been Vice President of the New Haven and the Rock Island Railroads and also the Union Stock Yards & Transit Company of Chicago. I have been a Director of the Alton and the Chicago & Eastern Illinois Railroads.

Between 1927–1941 I had extensive experience in railroad financial and corporate work, starting in the statistical department of Kohn Loeb & Co. of New York, fiscal advisers to many railroads, and for eight years, 1933–41, was Chief of the Railroad Division of Reconstruction Finance Corporation under the Honorable Jesse Jones as its Chairman or Administrator. While with R.F.C I handled $1½ billion of railroad financing and actively participated in all of the railroad reorganizations of that period. These interest-paying loans produced a substantial *net* profit for the Treasury Department. R.F.C. loans financed the completion of the Pennsylvania Railroad electrification between Philadelphia and Wilmington and then between Wilmington and Washington. The year 1942 was spent as Associate Director, Office of Defense Transportation, when Honorable Joseph B. Eastman was its Director.

In its financing of railroad improvements and developments, the R.F.C. was an active advocate of the diesel locomotive and streamlined trains. Between 1933 and 1939 it financed all of them except those purchased by railroads other than the Burlington, Santa Fe and Union Pacific which were able to acquire them without Federal assistance. In 1954 Mr. Jones asked me to prepare an account of RFC's cooperation with railroad purchases of these then new types of equipment. A copy of that comprehensive statement is available if this committee would care to have it.

For two years, 1944–45, I was Manager of Fairbanks Morse & Company's Diesel Locomotive division. When with the Monon, "the Hoosier Line", I made it, by 1948 or 1949, the first completely dieselized Class I railroad. These significant factors prove my friendly attitudes toward the Diesel electric locomotive. The addresses I have made over the past thirty years have paid my respects to the diesel locomotive in terms of warm praise and frequently asserted that the economies derived from it helped decisively in enabling the railroads to adjust to the inflationary pressures of post World War II years. These factors are mentioned in advance of what I shall say about the electric locomotive potentials of the future in order to attest my long-standing friendship for the diesel and recognition of its importance in the past and now.

However, just as many railroad men in the 1930's and 1940's were so wedded to the steam locomotive that they were blinded against the then newer form of motives power—the Diesel electric—and resisted the transition to it, so now there is such prejudice on many railroads in favor of and complacency with the Diesel and its shortcomings that the all-electric locomotive may not be getting the widespread understanding and recognition of its advantages that it deserves. It is to call the attention of the Antitrust Subcommittee of the Senate Committee on the Judiciary to the importance of electrifying the heaviest density railroad lines that comprise only 10% of the mileage but on which half of the railway freight service and nearly all railroad passenger service is produced that I am submitting this statement.

The section on railroad electrification in my book entitled "Super-Railroads", published in 1956, which, while not so stated therein, was actually a report prepared for the Secretary of Commerce, Honorable Sinclair Weeks, in 1955, contained the following paragraph:

"Any future scarcity in the supply of liquid fuel or marked increase in its price * * * would accelerate and extend the expected ultimate trend toward electrification. It seems unlikely that coal will ever again run the railroads of this country as a boiler fuel for steam locomotives, but it may well provide a considerable part of railway tractive effort of future decades in the form of central-station power used by electrified railroads."

Now the contingency of future scarcity of liquid fuel and technological "break throughs" in railway electrical engineering are revitalizing interest in railroad electrification because locomotives are the only means of transportation that can be powered by coal through using wires to carry central station power to locomotives. Highway, waterway and airway transport, for the foreseeable future, must use scarce liquid fuel exclusively. Past comparisons of fuel economics for railroads have been based on diesel oil at 10¢ or a little more per gallon and electricity at 1¢ to 1.4¢ per kilowatt hour. While electric power has increased comparatively little in price, fuel oil has gone up to between 25 and 55¢ per gallon and may continue to spiral.

Early expectations for rapid electrification of the principal railway main lines were not realized partly on account of the high investment requirements of this capital intensive but always capital starved industry and partly because of certain technological or other handicaps adversely affecting railway electrification systems of the past. These handicaps have been eliminated by technological and related engineering developments since the completion in 1938 of the last railroad electrification, the extension of the Pennsylvania Railroad main lines between Paoli, at the end of the Philadelphia suburban zone, and Harrisburg. Now electrification offers magnificent opportunities for an advance to new peaks of railroad service, economy and efficiency. Let us now consider these important developments.

1. The several terms "transmission lines" or "system" and "distribution system" are used in this paper. The distinction between them should be pointed out. Transmission lines carry the high voltage current, 66,000 volts, 110,000 volts or even higher, to sub-stations where transformers reduce the voltage to the 11,000 volts carried in the distribution system serving the catenaries that feed the pantagraphs on the locomotives. In d.c. installations, the substations reduce the high tension a.c. current to the lower voltage used in an a.c. motor that drives a direct current generator producing the power of 600 or 660 volts carried in a third rail distributing system or the 1,500 or 3,000 volts (d.c.) current transmitted by a catenary.

The type of current, whether alternating or direct, used in the traction motors of the electric locomotive determines the basic characteristic and classification of the electrification system, whether a.c. or d.c.

The higher the voltage the more efficiently and economically power can be transmitted. Through the use of transformers it is a relatively simple and efficient process to change the voltage of alternative current, up or down, but changing the voltage of direct current requires expensive and power consuming rotating machinery. Moreover, direct current cannot be economically transmitted over more than short distances. It is very much more economical and satisfactory to transmit alternating current to locomotives than direct current. However, direct current motors have the much more desirable operating characteristics than alternation current ones for traction purposes. Therefore until recently railroad electrifications have been placed between the horns of the dilemma of which form of power to use on the locomotives. Generally, alternating current, at 11,000 volts in the catenary, has been chosen for long distance electrifications and direct current for short haul suburban installations using 600 or 660 volt direct current picked up from a third rail, or 1500 volts from a catenary. The Milwaukee Railroad's 1914 electrification, totalling 660 miles, used 3,000 volt direct current distributed by a catenary. This is now an obsolete system.

All of the alternating current electrifications, of which the Pennsylvania's between New York-Washington-Harrisburg, and the New Haven Railroad's between New Haven and New York were the most important, used 11,000 volt electricity. However, the a.c. traction motor was never as satisfactory as the direct current one and was restricted to 25 cycle electricity (i.e. 25 alternations per second). Commercial current must be 60 cycle in order to avoid flicker in electric lights, but the lower rate of alternations was necessarily chosen for railroad traction in order to reduce the power losses caused by electrical back pressures in the motor, called "hysterisis", induced by the alternations of the current. The a.c. motor required use of a commutator, an undesirable but essential feature unless the so-called synchronous motor was used in which the motor revolutions are synchronous with the alternations of the current. This type of traction motor, however, was unsatisfactory in most instances because locomotive speeds were restricted to 14 or 28 miles per hour. This lack of flexibility was objectionable, and only the Norfolk & Western's electrification between Iager and Bluefield, W. Va. used synchronous traction motors.

It became apparent that railroad electrifications would not go forward on a large scale until electrical engineering progress solved the problem of providing the best of the worlds of alternating current transmission to the substations and pantagraphs, but using direct current traction motors. This had not been accomplished at the time of the PRR electrification in 1938, and neither had the problem of using voltages higher than 11,000 in the catenary distribution system. Now these former difficulties have been removed. Fifty-thousand volt current can be distributed in the catenaries and the characteristics and voltage of the current can be transformed on the locomotive from a.c. to d.c. at the voltage meeting the operating requirements of the direct current traction motor. This is done through recently developed silicon rectifiers carried on the locomotive.

2. Another prior handicap to electrification that has been removed is the necessity for railroad companies to provide their own transmission lines along the lengths of the electrified railroads, partly because in the past those using alternating current traction motors were liminted to 25 cycle alternations, and partly because of the absence then, but not now, of comprehensive power transmission "grids" that could supply railroad sub-stations with current without the necessity of building railroad-owned transmission lines to reach power stations. The national power "grid" now will eliminate the expensive necessity of building railroad-owned transmission lines except in a few sparsely developed areas of the west. Another reason why railroad-owned transmission lines were required in the past, but no longer are, is because railroad electrifications, if using alternating current, as most did, were restricted to 25 cycle current, while the commercial frequency was 60 cycles. This difference also necessitated some railroads in the past providing their own power stations to generate 25 cycle electricity. These disadvantages no longer exist.

3. The recent successful introduction of 50,000 volt electrical pressures in the distribution system and the catenaries permits using wires of much reduced cross section and hence lighter weight. This provides important construction economies. Such advantages can be further aided by using highly standardized components in the electrical distribution system. The European and Japanese experience, methods and standards afford advantageous examples for the future construction of railway electrifications in North America.

4. Prior problems of smoothness of control of operation of the motors of electrical locomotives have been corrected by the thryristors and choppers developed for railway service in Sweden and Switzerland.

Some of the important advantages of the all-electric over the diesel electric locomotive are summarized as follows:

1. It has been estimated that an electric locomotive can perform up to three times as much work as the diesel electric of the same horsepower due to having continuous access through the catenaries to all of the electric power that the traction motors can use in the higher ranges of speed. Diesel engines can only supply the power consumption necessities of the traction motors in the lower ranges of speed. For high speed heavy haulage two to three times as much locomotive horsepower is required as would be sufficient if all electric locomotives were used.

2. Since all-electric locomotives have no moving parts except motors and wheels which are rotating, while diesel engines, like steam locomotives, develop power through reciprocating motion and their cylinders are exposed to high temperatures, the useful life of electrics exceeds that of diesels by factors of 2 or 3 with consequent advantages in comparative depreciation charges. Similar gains are recorded with regard to maintenance for the electrics. The higher level of maintenance required by diesels reduces by at least 10% their availability as compared to electric engines. Electric locomotives can be run almost continuously between stated inspection periods and lose no time for taking on fuel and water. Compare the lifetime performance of Pennsylvania's CGI electric locomotives built in 1935–1938 with diesel electrics, now in the "third generation."

3. Factors of adhesion, the ratio between the weight on driving wheels and the maximum tractive effort that can be produced before wheel slip occurs, is higher for electric than for diesel locomotives especially now with the use of thryristor-chopper controls on all-electric motive power.

4. All-electric locomotives will permit the elimination of the very heavy diesel engine and electric generator necessary to provide power for the traction motors and also the fuel tanks which are now becoming of large and heavy proportions to accommodate long runs without refueling. These combined relative savings in weight have important economic advantages accruing to all-electric locomotives.

5. Noise pollution of Diesel engines is considerable but electric locomotives are virtually noiseless, except for their compressed air pumps which do not have a high noise level.

6. Electric locomotives eliminate the air pollution of diesel engines and while central electric generating stations have their pollution problems, these are more readily susceptible to control and are reduced in quantity by reason of their fixed location rather than representing thousands of separate movable sources. When electric locomotives are standing idle they consume no power. Generally Diesel locomotives must keep their Diesel engines running even when not working for long periods of hours in order to avoid maintenance problems arising from alternate heating and cooling of the Diesel engines which causes water leaks and thermal cracks.

7. Diesel electric a.c. locomotives must provide diesel engine and electric generator capacity sufficient to meet the fuel requirements of the continuous rating of their motors. However, not all locomotives are running at one time or at fuel rated capacity. The actual electric power consumption of the Pennsylvania's fleet of electric locomotives during their peak usage in World War II never exceeded 25% of the rated capacity of the locomotives and rarely went above 22%. Properly installed electric generating capacity of 17% of the rated motor capacity of electric locomotives would meet the power necessities of a large scale electrification. There are close to 50,000,000 hp. of diesel locomotives on the North American continent. Giving effect to the superior characteristics of the all-electric locomotive to meet overloads of 100% for a 15 minute period and about 50% for one hour, half of the nation's total of rail produced freight transportation measured in ton miles and all of its passenger miles could be provided by around 12 million horsepower of electric locomotives, and probably no more than 3½ million horsepower of installed central station generating capacity would accommodate their maximum continuous power requirements. This total is not quite 2% of the present central station capacity of the electrical utilities, and as the heaviest rail power requirements are during off-peak hours of commercial demands, only around two million horsepower

of additional generating capacity would be needed to electrify half of the freight and all of the present rail passenger requirements of the United States.

8. In order to provide tractive effort and horsepower for long sustained high speed freight and passenger runs, much extra diesel locomotive capacity must be added to trains at considerable additional expense. The overload capacity of the all-electric when drawing central station power obviates such wasteful, although presently unavoidable, use of diesel electric motive power. This is the basis of the statement that each horsepower of all-electric locomotive capacity can do the work of two or three horsepower of diesel capacity. The cost of electric power generated in relatively small capacity diesel engines is high compared with central station power. (Incidentally, railroads don't know what it costs to generate electricity on locomotives.) That is the reason diesel engines are not used to generate power for buildings, factories, hotels and other structures as was once the case. Central station power has taken over nearly all requirements for electricity used at fixed locations. Now central station power should come into its full present potentials for driving railway locomotives.

9. One of the handicaps to electrification up until the diesel was in general use was the necessity of electrifying many yard, industry and branch line tracks in order to eliminate all steam locomotives in order to obtain the full benefits of this expensive improvement through removal of steam locomotive repair and servicing facilities. In the pre-Diesel era, these would have had to be kept in use for steam engines in switching service and for use on branch lines and in yards, but no longer will they have to be electrified because the diesel can now be used for these related but less intensive services. These other tracks which need not be electrified since small diesel locomotives can serve them is an assist from the diesel towards the electrification of heavy density main lines.

10. The cost of lubricants for diesel locomotives is from three to four times as much per mile as for all electric locomotives.

11. One of the principal limitations of the steam locomotive was the necessity for hauling its boiler, fuel and water along with its machinery for converting energy into tractive power and pulling power. While the Diesel engine does not suffer all of the disadvantages of the steam boiler, it nevertheless suffers seriously by comparison with the electric locomotive that draws its power from a wire.

12. While custom built electric locomotives constructed in small numbers cost more per horsepower than diesel locomotives, if mass produced in large volume, first cost of all-electric locomotives will be lowered from one quarter to one third less than Diesels of the same rated tractive capacity. Electric locomotives require transformers and thryristor-chopper controls but these are much less expensive to build and install and weigh much less than the Diesel engine and the electric generator that are eliminated.

13. High tension alternating current must be generated as three phase electricity; i.e. three separate alternating currents are generated, simultaneously 120 degrees of circular measurement apart (1/3rd of a circle). Three phase current requires three separate circuits, hence three wires on high tension transmission lines, but great complications arise from using three phase current on a locomotive. Hence, railroads using a.c. motors use the "split phase" system which takes the power from only one wire or phase of the three phase system. Different sections of an electrification used different phases of the current. This inevitably led to "unbalance" of the electrical load, a complicating factor. The split phase must still be used to transmit a.c. to the locomotive pantagraph over one wire but the increasing use of electricity and the improvement of electrical engineering has reduced the problem of the unbalanced load of a split phase installation to minor proportions. This is another "plus" for future electrifications.

14. There are over 400 horsepower of Diesel locomotive capacity per mile of railroad in this country. This may be considered as "power density"—a term related to traffic density. This power density per mile, of course, is very much higher than the average on the heavy density lines. The investment in this diesel motive power density is a very large dollar amount on a per mile basis along the principal routes. The savings in the investment in Diesel engines and generators on those lines permitted through electrification, after adjusting for the costs of transformers and thryristor-choppers needed on all electric units but not on Diesels, would make a considerable contribution to the overall investment requirements for electrification.

Fernand Nouvion of Paris, the former Director of Electric Traction Research of the French National Railways and generally recognized as one of the world's foremost authorities on railway electrification said in 1971, "the electric railway almost invariably operates on a plan which is just not accessible to the diesels. It is far from certain that a diesel will ever be produced that equals today's electric locomotives, and from this point of view the modern diesel can be disregarded as obsolete before it is built. Indeed, because it is so much superior to the diesels, the performance of modern electrics is suspect in North America." Another authority remarked in 1972 that "the recent generations of electric motive power given rise to doubts as to the credibility of the specifications when viewed by the railroads on the North American continent." Nouvion computed, some years ago, the following fuel factors to measure the yearly energy requirements per rail miles representing the minimum required to justify electrifications:

PER ROUTE MILE

On double-track lines: 1,410,000 lbs. of coal, or 360,000 Kwhr of electricity, or 26,600 gallons of Diesel fuel.

On single-track lines: 950,000 lbs. of coal, or 240,000 Kwhr of electricity, or 16,900 gallons of Diesel fuel.

Changes up to the present time in the price of fuel oil would considerably reduce the quantity of Diesel oil marking the economic point of transition from Diesel to electric motive power.

These considerations have led the French National Railways to electrify their main lines and to Dieselize the others. This has proved to be highly advantageous.

Converting the Diesel fuel data for a double-track line indicates that daily consumption of 73 gallons per mile of line provide economic justification for electrification, while an average daily burn of 46 gallons does so for a single-track route. The heavy density lines of railroad in the United States will meet those tests.

There are a number of persons who for one reason or another are not merely indifferent but are actually hostile to the idea of railroad electrification. Accordingly they derive satisfaction and reassurance from the several de-electrification projects that have occurred; e.g., removal of the Norfolk & Western, Virginian and Milwaukee installations among those of some length and the discontinuance of the electrification at the Cleveland Union Terminal and through the Detroit River Tunnel as well as the interurban electric systems around San Francisco and Los Angeles. There were special reasons for each of these developments that have no relevance to the future projects that should receive serious consideration now that the past handicaps outlined in this paper have been removed and will release the potential advantages of electrification to those railroads which have the courage and initiative to capitalize on them. Should this Committee wish to have a review of the de-electrification projects included in this paper, such details can be added as a supplement. They are omitted herein only because they have no bearing upon the main subject and consequently would merely extend an already overly long discussion.

The rapid electrification of rail mileage all over the world and the impressive proportions of electrified route mileage in foreign countries should also raise questions in the United States as to why it has lagged so far behind in this basic railroad development.

Seven billion dollars has been spent in Dieselizing the American railway. Five billion dollars, or less, will pay for the electrification of the 25,000 miles of heavy density lines having the traffic necessary to justify it. A problem that has deferred electrification, in addition to ones outlined, is that dieselization could proceed in easy stages, a relatively few locomotives at a time on a number of railroads. Electrification must be applied to long stretches of line and the work must be completed before any of its benefits can be realized. Therefore, Federal fiscal assistance may be essential to go forward with electrification. The justification for it is that railroad electrification is an essential prerequisite to the technological breakthrough necessary to enable the railroads to keep in step with the economic progress of the last quarter of the 20th century.

Exhibit 18.—Excerpt From "A Study of the Antitrust Laws," Part 6, Hearings Before the Subcommittee on Antitrust and Monopoly, 1955

Senator O'MAHONEY. Mr. Burns?

Mr. BURNS. General Motors Corp. is the dominant company in the bus-manufacturing industry, including both city and inter-city type buses. In 1925 the Yellow Truck & Coach Manufacturing Co. was organized, in which GM held a controlling interest. In September 1943, GM acquired all of the assets of Yellow Truck & Coach, and the company then became an operating division of GM. It is reported that GM now has in excess of 75 percent of the bus-manufacturing business in this country.

Some of the practices and arrangements engaged in by GM in the motorbus business were involved in criminal and civil suits brought by the Department of Justice in 1947 in Los Angeles, Calif. The defendants in these suits were National City Lines, Inc., Pacific City Lines, Inc., Firestone Tire & Rubber Co., Phillips Petroleum Co., Mack Manufacturing Corp., Standard Oil Company of Californit, Federal Engineering Corp., General Motors Corp., and certain individuals. This subcommittee is interested in determining what the facts were in this case and what the effect of the practices engaged in by GM and the other defendants were on competition in the bus industry. We are also interested in finding out what the effect of this litigation ultimately was with reference to the economics of the bus industry, and whether General Motors had obtained advantages which could not be dissipated by court action.

Mr. William C. Dixon, formerly Chief of the west coast office of the Antitrust Division, Department of Justice, who had supervision over these cases, will now explain the issues and facts involved.

Mr. McHugh will interrogate Mr. Dixon.

Mr. MCHUGH. Mr. Dixon, do you have a prepared statement?

STATEMENT OF WILLIAM C. DIXON, FORMER SPECIAL ASSISTANT TO THE ATTORNEY GENERAL, AND CHIEF OF THE WEST COAST OFFICE OF THE ANTITRUST DIVISION, DEPARTMENT OF JUSTICE

Mr. DIXON. Yes. I will be glad to read it at this time for the record, Senator.

Senator O'MAHONEY. Thank you, Mr. Dixon. Do you have copies of it?

Mr. DIXON. Yes, I have a copy.

Mr. MCHUGH. We will probably interrupt from time to time to ask questions.

Mr. DIXON. That is all right. If you have any questions about my statement, don't hesitate to inquire concerning it.

My name is William C. Dixon. I reside at 1915 East Mountain Street, Pasadena, Calif. I am an attorney and I am currently engaged in private practice, specializing in antitrust and trade-regulation matters, with offices at 417 South Hill Street, Los Angeles, Calif.

I have been requested by this committee to appear before you to give you such information as I can concerning a criminal and civil antitrust case which the Government brought against the National City Lines, Inc., and other defendants, including General Motors Corp., in the United States District Court for the Southern District of California, Central Division, on April 9 and 10, 1947, respectively. I am, of course, glad to supply any information possible in connection with these cases which may be of assistance to this committee.

By way of background, I should perhaps state that I am a member of the bars of California and Ohio and of the United States Supreme Court. I was appointed a Special Assistant to the Attorney General in April 1944 and assigned to the Antitrust Division of the Department of Justice. I resigned from the Department of Justice in January 1954 for the purpose of reentering private practice. While with the Antitrust Division I was Assistant Chief of the General Litigation Section of that Division and was chief trial counsel for the Government in many litigated antitrust cases, including the first cartel case, that is, *United States* v. *National Lead Company et al.*, which was released for trial by special Presidential order prior to the termination of the war in 1944. I was appointed chief of the west-coast offices of the Antitrust Division in 1946, and while serving as such was chief trial counsel for the Government in the so-called exclusive dealing cases which established the illegality of certain dealer exclusive dealing practices by the Standard Oil Company of California and the Richfield Oil Corp. While chief of the west-coast office of the Antitrust Division, I also personally conducted the grand-jury proceedings in the National City Lines, Inc., case, in which, I understand, your committee is interested.

Mr. MCHUGH. Mr. Dixon, I wonder if at this point for the record you will explain just what the National City Lines Corp. is.

Mr. DIXON. The National City Lines Corp. is a holding company which was established in the middle thirties for the purpose of purchasing and operating local transit systems throughout the various cities of the country. It was primarily, as I have suggested, a holding corporation at its inception. Do you want me to go into the history of what happened?

Mr. MCHUGH. Briefly can you tell us how extensive were its operations?

Mr. DIXON. Well, at the time these cases were tried, Senator, the National City Lines Cos. and its subsidiaries were operating local transit systems throughout the various parts of the country from coast to coast.

In the East they were operating the Baltimore Transit Line, in the Middle West the St. Louis Public Service Co., and in the South

they were operating several local transit systems in Texas, Oklahoma, and various other parts of the country.

Senator O'Mahoney. Was this an operating company as well as a holding company?

Mr. Dixon. No; Senator. It was primarily a holding company.

Senator O'Mahoney. You used the word "operating" too.

Mr. Dixon. Yes. The technique was to go out and buy up a local transit system and then, of course, keep that operation separate from the rest of the other operations through a separate subsidiary company. Their principal operations, however, were in the west coast area where——

Senator O'Mahoney. I am trying to get the picture of the structure of this holding company. Where was the holding company incorporated?

Mr. Dixon. I have forgotten, Senator, the State of incorporation, but I believe it was Delaware.

It was the result of the plan of the Fitzgerald brothers in the thirties who conceived the idea of buying up and operating local transit systems throughout the country who, from their point of view, were not affording good transportation service to the areas in which they were operating, and as you may recall during the thirties, there were several transit systems throughout the country that could be acquired at fairly reasonable rates.

The buses were just beginning to become used for local operating purposes, and the old streetcar was rapidly going out of use in many cities. That was the atmosphere in which this project was conceived and developed.

As I suggested, their principal operations in the thirties were centered in the west coast area where, through the formation of Pacific City Lines in 1938, that being a wholly owned subsidiary or controlled subsidiary of the National City Lines, a large number of local transit systems which were then being operated by the Southern Pacific Railroad were purchased under a package deal and put into the Pacific City Lines.

Now, the money used to make those purchases was furnished in part by the supplier defendants that were named in a criminal action that you have asked me to discuss with the committee. In other words, the technique was to go out and secure from suppliers of buses, petroleum products, and tires, money which would be invested in these companies, the subsidiary companies of which the operating and holding company was the National City Lines, Inc.

The other main subsidiary was the Pacific City Lines that I have mentioned, and then subsequently in 1943 the American City Lines.

But by putting money or making so-called investments in the preferred stock of these companies, the defendants named in the criminal proceeding secured in effect all of the motor-bus business of the operating companies, the tire business went to the Firestone Tire & Rubber Co., which furnished part of the money for these companies and purchases, and then the petroleum products business went to the company in the area in which the company furnishing the money operated.

Mr. McHugh. Mr. Dixon, did this plan for obtaining capital originate with the National City Lines officials or did the idea originate with various suppliers?

Mr. DIXON. Well, from the record in the case it would appear that the plan originated with the Fitzgerald brothers, and when they were unable to finance further acquisitions by the sale of stock to the public, they conceived the idea of approaching suppliers of products and getting them to invest "money" in these companies, with the understanding that that money would be used exclusively for the purchase or acquisition of additional local transit systems.

And as those companies were acquired, the previous suppliers immediately lost the business if it wasn't under contract, and the buses then went to the General Motors, petroleum products went to Standard of California in the west coast area in which it operated, in the Middle West area it went to the Phillips Petroleum Corp. And then all of the tire business for all of the companies went to the Firestone Tire & Rubber Co.

Mr. MCHUGH. Mr. Dixon, have the National City Lines been acquiring buses from other bus manufacturers previous to the time that interested the General Motors Corp. in this plan?

Mr. DIXON. Oh, yes. The local bus systems which were thus acquired through the means and methods that I have just described in many instances were being supplied with buses that were competitive to the General Motors products, such as Twin Coach and some other companies that furnished at that time that type of bus for local transit operations.

Senator O'MAHONEY. Who were the Fitzgerald brothers?

Mr. DIXON. Well, Senator, all I can tell you about the Fitzgerald brothers is that they were the ones that conceived that idea that I have just described, of acquiring local transit companies and operating them, and sold a sufficient number of, shall we call them, investors on the idea of putting money into that company to get them started. I believe the stock sold by the National City Lines Co. in the first instance was sold to the public generally.

Senator O'MAHONEY. It is a distinguished name. Where did these gentlemen come from, from what State?

Mr. DIXON. I am sure they don't come from your State, Senator. I really can't answer that question.

Senator O'MAHONEY. I wasn't concerned about that.

Mr. MCHUGH. Do you know, Mr. Dixon, where the headquarters are at the present time?

Mr. DIXON. Yes. The headquarters of National City Lines, I understand, are in New York City.

Mr. MCHUGH. Are the Fitzgerald brothers presently operating the National City Lines Cos.?

Mr. DIXON. As far as I know, they are still operating the holding company and subsidiaries of that company, although there are very few subsidiaries left as such.

Mr. MCHUGH. Do you want to continue with your prepared statement, Mr. Dixon?

Mr. DIXON. Prior to the bringing of the criminal and civil cases aforementioned, numerous complaints had been received by the Antitrust Division from various suppliers of buses, petroleum products, and tires to the effect that they had either lost business which they had theretofore enjoyed with the National City Lines operating companies, or had found it impossible to sell the local transit systems con-

trolled and operated by the National City Lines, Inc., or its subsidiaries, because of the apparent closure of those markets to their products after National City Lines, Inc., acquired control of the local transit systems to which they had theretofore sold or were endeavoring to sell their products. As a result of these complaints and a grand jury investigation by the Government as to the reason for the apparent closure of such markets to competition, the grand jury, sitting in the southern district, central division, of California, returned an indictment on April 9, 1947, charging the National City Lines, Inc., and several other companies, including General Motors Corp., who were supplying the local transit systems controlled by National City Lines, Inc., with buses, tires and petroleum products, with a violation of sections 1 and 2 of the Sherman Act. Mr. H. C. Grossman, assistant secretary of General Motors, was named an individual defendant in the indictment.

Mr. McHugh. Did this case involve only what is known as the city or urban type bus, Mr. Dixon?

Mr. Dixon. Yes; the bus involved in this case was that which is used by local transit systems in providing transportation facilities within the area in which they have an operating franchise. It does not involve the so-called intercity type of bus of the Greyhound type that is perhaps more familiar generally to the public.

The grand jury charges in count 1 of the indictment that, beginning on or about January 1, 1937, the defendants named therein, including General Motors, had engaged in a combination and conspiracy to eliminate and exclude all competition in the sale of motor buses, petroleum products, tires, and tubes to the local transportation companies then or thereafter owned or controlled by National City Lines, Inc., or any of its subsidiaries. Count 2 of the indictment charged the defendants, including General Motors, with having knowingly, wilfully, and unlawfully combined and conspired to monopolize that part of the interstate trade and commerce of the United States that consisted of the sale of motor buses, petroleum products, tires, and tubes used by local transportation systems in those cities in which National City Lines, Inc. owned, controlled, or might thereafter acquire a substantial financial interest.

In that connection I might digress for a moment to say that after this combination got into operation, they really began to expand. I think just about the same time this indictment was returned, National City Lines, through one of its subsidiaries, had acquired the control of the key transportation system operating in the Oakland and San Francisco Bay area, and it had also become substantially interested in the transit operations in St. Louis and Baltimore.

Mr. McHugh. Mr. Dixon, at the time that this case was filed, was the National City Lines, Inc., the largest single transit system in the United States?

Mr. Dixon. Well, I would say this: It is perhaps the largest holding company controlling and operating local transit systems in the United States. I don't know of any comparable corporation or group that operates in the same manner on a national basis.

The grand jury particularized the conspiracy charged by alleging that General Motors and the other supplier-defendants furnished money and capital to National City Lines, Inc., and its subsidiaries, which money and capital was to be utilized by National City Lines,

Inc., and its subsidiaries to purchase or secure control of local transit systems located in the various cities of the United States. In return, National City Lines, Inc., and its controlled local transportation companies agreed not to renew any of their then-existing contracts to purchase buses, tires, tubes, and petroleum products with companies other than the named supplier-defendants without their consent, or to dispose of any interest in any operating company without requiring the party acquiring the operating company to assume the obligation of continuing to purchase its requirements from the supplier-defendants, including General Motors. The grand jury also charged that National City Lines, Inc., and its local controlled transportation companies would not change or alter the equipment then being used by them, or purchase new equipment so as not to be able to use the products of the defendant-suppliers.

The indictment alleged that the total amounts furnished by the supplier-defendants to National City Lines, Inc., for such purposes exceed $9 million, of which General Motors Corp. furnished over $3 million, and that the total sales of motor buses by General Motors to the National City Lines, Inc., operating companies for the years 1936 to 1946, inclusive, exceeded $25 million. All of the supplier-defendants, including General Motors, were to receive stock in National City Lines, Inc., or its operating companies for the money made available.

Under the conspiracy charged, General Motors was to furnish approximately 85 percent of all the motorbuses required by National City Lines, Inc., and its operating companies as of August 2, 1939. General Motors and Mack Manufacturing Corp. were to share equally in 85 percent of all new motorbus business of any of the National City Lines' operating companies, thereafter acquired. The remaining 15 percent was reserved for emergency purchases or for disposition as agreed upon by General Motors and Mack Manufacturing Corp.

The indictment thus charged, among other things, that the nationwide market for motorbuses which might be required by any of National City Lines' operating companies had by agrement been allocated and divided between General Motors and Mack in the percentages before referred to. This to the exclusion of all competition from the manufacturers of other buses which might be utilized by the local operating companies then controlled by National City Lines, Inc., or which it might thereafter control or secure a substantial financial interest in by reason of the money made available to it by General Motors and the other conspiring suppliers.

Mr. McHugh. Mr. Dixon, can you tell us when the arrangements between National City Lines and General Motors were first entered into?

Mr. Dixon. The arrangements charged here in the indictment were entered into in the year 1938 insofar as General Motors is concerned. Some of the other companies that were indicted came into the combination a little later than that.

But the Pacific City Lines Co., which was one of the big acquisitions in the west coast area, was formed in 1938, and at that time General Motors, Standard Oil of California, and I believe Firestone, were the only suppliers in the initial stages of that incorporation and enterprises that purchased any stock.

Mr. McHugh. Did these supplier-defendants then enter into separate contracts with the various National City Lines subsidiaries?

Mr. Dixon. Yes. The basic contracts which were introduced in evidence imposed an obligation on National City Lines, Inc., to cause any of its subsidiaries which it then owned or controlled or might thereafter acquire to enter into contracts with the suppliers named in the indictment.

As I said, these two other corporations, Pacific Lines, Inc., and American City Lines, Inc., both of which were formed at the times I have mentioned through National City Lines, Inc., to which the different suppliers contributed; in other words, the Mack Manufacturing Co., for example, did not contribute anything to the American City Lines so-called investment or enterprise. But that is another story, unless you want us to go into it at this time, the reason for it.

Mr. McHugh. Not at this point. Mr. Dixon, in the event the National City Lines disposed of any of its operating companies, was it obliged to require the persons assuming this interest to also assume the obligations under this contract, to purchase from these suppliers?

Mr. Dixon. Yes; that was part of the basic or underlying contract, this so-called "investment" type of contract which was entered into at the time the money was made available to the National City Lines, Inc., and the companies that I have just mentioned, the Pacific City Lines and the American City Lines.

Mr. McHugh. What type of stock, Mr. Dixon, did the General Motors Corp. acquire in any of these subsidiaries of National City Lines?

Mr. Dixon. Well, it was generally preferred stock which was callable at par, $50, and in many instances some common stock. But the preferred stock investments were ultimately called in practically all of the companies that I have mentioned where the suppliers made this capital available for the purposes I have indicated.

Mr. McHugh. Did any of these supplier-defendants or any combination of them ever acquire a controlling interest in any of these National City Lines companies?

Mr. Dixon. Well, yes, there was this Pacific City Lines transaction that I have mentioned which is quite involved, but very interesting to this extent: that in its initial phases there were several other individuals who put capital into that company when the operating lines which were then being operated by the Southern Pacific Co. were sold to Pacific City Lines.

Including among those, as I recall it, was a subsidiary or at least a company in which some of the Greyhound officials were purportedly interested, who took 35½ percent of the stock, 37½ percent I believe it was, and National City Lines took 37½ percent of the stock of Pacific City Lines, and the balance was taken by the three suppliers, Standard Oil of California, General Motors, and Firestone Tire & Rubber Co.

The total investment at the time of the incorporation and subsequent to the incorporation of Pacific City Lines was in excess of $2 million, of which General Motors put in more than $800,000, Standard of California more than $800,000, Firestone in excess of $250,000, and the Mack Manufacturing Co. put $300,000 into that company in 1940, but it subsequently disposed of its interest to General Motors, Firestone,

and Standard Oil of California in 1942, I believe it was, when it apparently wasn't getting any business out of this so-called investment.

Mr. McHugh. Mr. Dixon, do you know when and what the circumstances were under which the General Motors Co. got into the bus manufacturing business?

Mr. Dixon. I am not personally familiar with that except through knowledge which I have got through the case.

It wasn't important to the determination of this case, but it was my understanding that General Motors became interested in the manufacture of buses in the late twenties when they made a substantial stock investment in the Yellow Truck & Coach, that they gradually increased that investment or stock control until they had enough of it to apparently decide, in 1943, to merge that corporation in with the General Motors Corp. So, in 1943, I believe it was, all of the assets of Yellow Truck & Coach were transferred to the General Motors Corp.

Mr. McHugh. Do you know, Mr. Dixon, whether the National City Lines contracts were with the General Motors Corp. or were they with Yellow Truck & Coach?

Mr. Dixon. These contracts in their inception were with the Yellow Truck & Coach Co., which was at that time a controlled subsidiary of General Motors.

The contracts, however, were naturally assigned to General Motors in 1943, when all of the assets of Yellow Truck & Coach were transferred to General Motors, and the Yellow Truck & Coach became merely a holding or a shell corporation which was ultimately dissolved.

The criminal, as well as the civil case, was naturally vigorously opposed by all defendants. The criminal case was transferred by the California district court to Chicago for trial on August 14, 1947, over the vigorous opposition of the Government. The transfer was made by the court on the ground that the case could be more conveniently tried in Chicago. Following the transfer of the criminal case to Chicago, the California district court dismissed the civil complaint on the grounds of forum non conveniens, or for substantially the same reason. The ruling in the civil case was appealed to the Supreme Court by the Government. The Supreme Court reversed the dismissal order of the district court and remanded the civil case to the district court for further proceedings. In the meantime, section 1404 (a) of the Judicial Code became effective. This section granted a district court the right in the exercise of its discretion to transfer a civil case to another jurisdiction on grounds comparable to those urged by the defendants in the criminal case. The district court, on motion of the defendants, accordingly granted their motion to transfer the civil case to the district court at Chicago, which transfer was thereafter effected when the Supreme Court denied the application of the Government on May 31, 1949, to review the order of transfer issued by the district court in the civil case.

The criminal and civil cases accordingly found their way to the district court at Chicago, where they were to be ultimately tried and disposed of. While acquitted of the charge of violating section 1 of the Sherman Antitrust Act in the criminal case, the defendants were all found guilty on March 11, 1949, after a jury trial of violating sec-

tion 2 of the Sherman Act. The Court of Appeals for the Seventh Circuit unanimously affirmed this conviction on January 3, 1951. The Supreme Court denied the defendants petition for certiorari on April 3, 1951, thus bringing the criminal case to a final close. Various proceedings thereafter followed in the civil case. The district judge finally rendered an opinion in the civil case on September 15, 1955, which calls for a final judgment which should bring the trial of the civil case to an end in the district court.

In view of the fact that the district court of California transferred both the criminal and civil cases to Chicago, the pressure of pending litigation in California prevented my active participation in the trial of the criminal case. It was, however, vigorously and successfully prosecuted by members of the staff of the Los Angeles office who were under my direct supervision and with whom I was constantly in contact during the trial of that case. The defendants unsuccessfully appealed their conviction in the criminal case, the court of appeals holding, among other points, that the conviction verdict on count 2 of the indictment was sustained by clear and convincing evidence. I hope the foregoing will give you some idea of the nature of the charges made against General Motors in the criminal and civil cases, as well as the extent to which these charges were vigorously and vehemently opposed without avail during a period of protracted and extended litigation.

Senator O'Mahoney. The effect of what you are saying was that eventually both the criminal and the civil cases were transferred to Chicago. You were not able because of other commitments to participate in the trial of the criminal case. It was, however—now I am using your words on page 6—

vigorously and successfully prosecuted by members of the staff.

Mr. Dixon. As previously indicated, under the General Motors-National City Lines, Inc., contracts, General Motors was to receive 85 percent of all the motorbus business of the National City Lines operating companies owned or controlled by National City Lines as of August 2, 1939.

I might digress for a moment there to say that in connection with this Pacific City Lines deal which was instituted in 1938, there was no written contract until later because the oral understanding was, of course, that the suppliers would get all of this business. They being the incorporators of the Pacific City Lines, there was no reason for any contract at that time.

The National City Lines operating companies were, however, permitted under the contracts to purchase the remaining 15 percent dollar value of its bus requirements as secondhand equipment. Eighty-five percent of the bus business of the operating companies acquired by National City Lines, Inc., after August 2, 1939, was to be divided equally among General Motors and Mack Manufacturing Corp., with the exception, as I said, that this contract applied only to the National City Lines operating companies at that time, and it did not apply to the subsidiaries, Pacific City Lines and the subsequent company, American City Lines.

General Motors was thus to receive substantially all of the bus business of the operating companies controlled by National City Lines, Inc., at the time the General Motors-National City Lines agreements

were entered into, and was to share 42.5 percent of all the business of any new local transit companies thereafter acquired by National City Lines, Inc., with the Mack Manufacturing Corp.

The division of the bus business between General Motors and Mack before referred to did not, however, apply to some of the companies which were thereafter acquired by National City Lines, Inc., in the west coast area. General Motors was to get, and did secure, 85 percent of all the business of these companies with the privilege accorded such companies of acquiring the remaining 15 percent of their bus requirements as used equipment if they desired to do so.

This was made adequately clear in the contract between National City Lines, Inc., and Mack Manufacturing Corp., dated August 1, 1939, which provided that National would, insofar as legally possible, cause such operating companies as were thereafter formed or acquired by National, "except subsidiary corporations of Pacific City Lines, Inc.," to purchase 42.5 percent in dollar value of the new bus equipment requirements for such companies. The Pacific City Lines, Inc., was the National City Line, Inc., holding company subsidiary in the west coast area. The bus supply contracts entered into between General Motors and National City Lines, Inc., were to run for a minimum period of 10 years and were extended from their operation date for additional periods of time with some of the agreements being extended to January 1, 1953.

Mr. McHugh. Why wasn't Mack permitted to participate in the City Lines contract?

Mr. Dixon. I can't answer that except to say that they apparently got no substantial amount certainly of business in the companies controlled by Pacific City Lines and they subsequently sold their stock interest in that company to General Motors and the other two suppliers that I have mentioned.

If it is of interest at this time in connection with Mack, I think the decision of the court just published or just released by the district court in Chicago points out that in the last 7 years of this contract which Mack Manufacturing entered into for the National City Lines Co. itself, they secured less than—I think it was about $875,000 only of business during the last 7 years that contract was in effect.

Mr. McHugh. And the contracts provided that they were to get 42½ percent of the business of these after acquired companies?

Mr. Dixon. That is correct.

At the time the contracts before referred to were entered into between National City Lines, Inc., and General Motors, the operating companies of National City Lines, Inc., were securing buses from several suppliers. These suppliers were naturally foreclosed from furnishing any further equipment to such companies after these contracts became effective. Representatives of competing suppliers indicated during the trial of the criminal case that they could not sell competing buses to the operating lines controlled by National City Lines, Inc. The president of that company, that is, National City Lines, is reported to have told one competitive bus supplier who had demonstrated its product to the Los Angeles Transit Lines: "Well, I don't think there is any point in our operating your buses * * * you know our setup with General Motors, and they are probably going to build 50 or 55 passenger buses; and if they build them, we will prob-

ably have to buy them. I think your bus as good or better than any other bus, but with this tieup we have, it is just out of the question. You just might as well take your bus to some other property with whom you can probably do some business."

The extent to which General Motors controlled the bus business of the local transit systems of National City Lines, Inc., is evident from a letter written by the president of the Pacific City Lines, Inc., to General Motors. This National City Lines' subsidiary found it necessary, due to the inability of General Motors to furnish its requirements of buses during the war, to secure buses from other sources. The buses secured from other sources exceeded the 15 percent which it was authorized under the contract to acquire from sources other than General Motors. The president accordingly suggested that General Motors acknowledge the necessity for such purchases and that this variation in the contract be made up to General Motors after the close of the war by 100 percent purchases until the contract amount is fulfilled (R. 1771). General Motors made it clear in its reply that it expected Pacific City Lines, Inc., to first contact it to find out whether General Motors could furnish the buses required by that company before it looked elsewhere for its needs. The General Motors reply stated:

We suggest, before you make any additional outside purchases, that you first contact us to find out whether or not we are in a position to supply your needs (R. 1772).

The prices which the operating——

Senator O'MAHONEY. You said above:

The president—

meaning the president of——

Mr. DIXON. Of the Pacific City Lines.

Senator O'MAHONEY. Of the Pacific City Lines—

accordingly suggested that General Motors acknowledge the necessity for such purposes——

Mr. DIXON. For such purchases.

Senator O'MAHONEY (continuing):

for such purchases and that this variation in the contract be made up to General Motors after the close of the war by 100 percent purchases until the contract amount is fulfilled.

Do I understand from the sentences which follow that General Motors made no acknowledgment of the necessity for purchases outside of the percentage?

Mr. DIXON. They did acknowledge the necessity of the purchases, Senator, and of the fact that they could not supply this need of the Pacific City Lines insofar as buses were concerned at the time the buses were required by that company.

They made it clear, however, by this letter in reply to the inquiry from Pacific City Lines that they approved these purchases in excess of 15 percent; that if they ever felt it necessary in the future to secure buses on an emergency or any other basis from any other source, that they first contact General Motors before they made any such purchases because the contract clearly gave General Motors the right to 85 percent of all of the bus requirements of this company, and the 15 percent remaining was merely inserted, and intended to apply to purchases of used buses.

In the operations of the National City Lines companies, one of the techniques and procedures which were resorted to was to frequently sell these buses from one subsidiary to another, so that that was the reason for this 15 percent provision, because those buses were obviously used buses.

Senator O'Mahoney. But I understand then that General Motors made no issue of the fact that prior to the time the president of the Pacific Lines made the suggestion, to which you referred, it had exceeded the 15 percent, but merely responded that in the future, before any purchases above the 15 percent were to be made from other sources, application must first be made to General Motors.

Mr. Dixon. That is true, Senator. But I think it is also my recollection at this time—I will have to consult the record on that point—that they went along with the suggestion of Pacific City Lines that this deficiency be made up in establishing the quota or any question about whether they were complying with the contract requirements.

Senator O'Mahoney. In other words, after the close of the war they make up the deficiency?

Mr. Dixon. They wanted the difference; that is correct.

Senator O'Mahoney. All right.

Mr. Dixon. The prices which the operating companies were to pay General Motors for the buses purchased from it were supposed to be competitive with other bus supplies. In fact, the president of National City Lines, Inc., testified during the trial of the criminal case that it was generally understood that the buses which were purchased by the National City Lines, Inc., operating companies were to be bought at competitive prices. He admitted on cross-examination, however, that the operating companies did not compare prices with other suppliers in making such purchases.

Mr. McHugh. Mr. Dixon, in this connection, what recourse did the National City Line operating companies have even if it could be shown that General Motors' prices were too high as long as the contract obligated them to purchase 85 percent of their requirements from General Motors?

Mr. Dixon. Well, I would say the answer to that is almost obvious; they had no recourse because they were bound to comply with the provisions of the contract imposed upon them as a subsidiary company by reason of the basic contract between General Motors and National City Lines, Inc.

Mr. McHugh. So in substance would you say the provision concerning the requirements in this percentage obliged them to buy these requirements from General Motors almost irrespective of competitive prices?

Mr. Dixon. Oh, definitely; I would say that was the situation generally with reference to the purchases.

General Motors thus acquired substantially all of the bus business of the operating companies of National City Lines, Inc., by making so-called stock "investments" in National City Lines, Inc., or subsidiary companies which were formed pursuant to agreements between National City Lines, Inc., and the supplier defendants, including General Motors. General Motors as well as the other suppliers, usually secured preferred stock in the National City Lines, Inc., subsidiary companies when they made capital available to National City

Lines, Inc., to acquire new local transit systems. The suppliers who made these so-called "investments" themselves apparently recognized the obvious fact that they were buying the stock only as part of a larger deal which gave them the business of the operating companies (R. 1234). As the representative of one of the defendants indicated in discussing the deal with one of the suppliers:

> We are all in the same boat and we want to do what is the wise and safe thing under the circumstances (R. 1236).

The proceeds of the stock purchased by the suppliers was used in the further purchase of properties, all of which was to greatly increase the motor-coach requirements.

If I might digress there for a moment, it was clear that it was the policy of the Fitzgerald Bros. to eliminate the streetcar and to establish motorbus systems of transportation whenever they went in and took over the local transit systems, and that is the reason for the previous statement.

One of the supplier companies purchasing the stock appeared to question the "investment" nature of the transaction, for it indicated that it had put the stock which it was acquiring in the name of two of is employees who were acting as nominees.

If I might digress there for a moment, too, when time is available and you go into the transactions under which the Los Angeles Transit System was acquired, you will find that the Standard Oil Company of California committed itself to make $1 million available by oral agreement, and the stock was taken in the name of a subsidiary company—this is all part of the record—so that it would not appear of record in the name of the Standard Oil Company of California.

Assistance was given to the American City Lines, which was the company which acquired the control of Los Angeles Transit System by the Standard Oil of California lending its assistance in making a $5 million loan available from the Bank of America to complete that purchase.

The so-called stock investments of General Motors in the operating companies also placed it in a position where it and the other supplier defendants were able to and did assume the active management of some of the companies for temporary periods (exhibit 149, R. 1633–1637).

It would unduly extend this statement to further detail the innumerable transactions between General Motors and National City Lines, Inc., concerning its so-called "investments" in the National City Lines companies.

The opinion of the court of appeals, which affirmed the guilty verdict in the criminal case, found the evidence adequate and sufficient within the requirements of the criminal law to sustain the conviction of General Motors and the other defendants named in the indictment. The affirming of the convictions and the refusal of the Supreme Court to review the ruling of the court of appeals effectively ended the criminal case.

As this committee well knows, the purpose of the Government's civil suit in an antitrust proceeding is to secure effective relief in the public interest against illegal practices alleged in the Government's complaint. After the affirmance of the conviction of the defendants in the criminal case, some of the defendant-suppliers, including Gen-

eral Motors, disposed of their so-called investments in National City Lines, Inc., and its operating companies, in an apparent effort to make the issues in the civil case moot. Some of the requirements contracts were also abandoned or canceled. Others expired through the lapse of time during the protracted and extended litigation. National City Lines, Inc., entered into a consent decree with the Government on December 14, 1954, in which it agreed to do its best to cancel the exclusive supply contracts then outstanding, and to request bids under certain conditions when new supplies and equipment were required by its operating companies.

Senator O'Mahoney. What is the meaning of the phase "to do its best to cancel"?

Mr. Dixon. Well, that is a hard question to answer, Senator.

Senator O'Mahoney. Were these contracts not invalid?

Mr. Dixon. Yes, Senator, these contracts were obviously illegal; and the court so held in its decision, and in the decision which it rendered on September 19, 1955, it ordered canceled the only remaining contracts then still in effect which, while I was not with the Government at that time and cannot speak with reference to what the facts were, it is my understanding that the Standard Oil of California petroleum supply contract to the Los Angeles City Lines and the various other companies was still in effect, and the Firestone Tire & Rubber Co. contract I believe, was also; but I think all of the other contracts had lapsed, you might say, rather than being canceled.

Mr. McHugh. Mr. Dixon, excuse me, are you saying those contracts were in effect at the time of the trial of the civil case even after the entry of the consent judgment against National City Lines?

Mr. Dixon. These contracts I have just described I believe, according to the opinion of the court released on September 19, 1955, were still in effect at that time.

Even after the conviction in the criminal case, I think the record shows that some of these contracts were extended, even to digress for a moment, the initial contract, Senator, with the supplier, was for a minimum period of 10 years; in other words, this market for these products was closed to all competition for a period of at least 10 years under these contracts.

The contracts also provided for their renewal and extension. I think one of the petroleum supply contracts in its initial execution was for a period of 15 years.

But these contracts, even when they expired, and they were entered into in the first instance in 1939, that would mean that the 10-year period would end in 1949, and by that time the criminal case was already on the docket; the General Motors contract on buses, for example, was extended by agreement; the Firestone contract was extended; the Standard Oil Co. of California oil contract was extended.

This is all a matter of record; so that after the determination of the criminal case on appeal, the Government went in in the civil case and filed a motion for summary judgment on the theory that the criminal case had determined the illegality of the practices alleged in the civil complaint.

Senator O'Mahoney. Are we to understand that after the judgment in the lower court from which the defendants appealed, the defendants nevertheless continued to carry out the contracts which had been, in

effect, held to be invalid and illegal because of a violation of the Sherman Antitrust Law?

Mr. DIXON. I think your statement is substantially correct, Senator, to this extent: That the court had not yet in the civil case had an opportunity to rule——

Senator O'MAHONEY. I understand that.

Mr. DIXON (continuing). To rule upon the illegality of these contracts, and it only did so on September 19, 1955

Senator O'MAHONEY. In this civil case. But in the criminal case it had been determined?

Mr. DIXON. It had been determined.

Senator O'MAHONEY. Determined.

Mr. DIXON. That is correct.

Senator O'MAHONEY. And the contracts under the criminal verdict were invalid——

Mr. DIXON. That is right.

Senator O'MAHONEY (continuing). A violation of law, violation of the antitrust law?

Mr. DIXON. Correct.

Senator O'MAHONEY. And yet they were not effective?

Mr. DIXON. The criminal case, in other words, Senator, did not operate per se to cancel the illegal contracts between General Motors and the National City Lines, and between the other suppliers and National City Lines. Is that your question?

Senator O'MAHONEY. Yes, that is the question.

Mr. DIXON. So the Government was required, you see, to proceed in the civil case to have those contracts declared illegal, and to endeavor——

Senator O'MAHONEY. You see the point, Mr. Dixon, is this: That you are a lawyer, you sat in this case, and other lawyers who are familiar with the antitrust law understand perfectly.

But the lay reader does not understand, and that is why I want you to put it into this record in terms that are understandable by the lay reader of what the gap in the antitrust law is which makes a criminal verdict ineffective to enforce itself.

Mr. DIXON. Yes, Senator, I see your question and I understand it.

The purpose of the criminal suit against the supplier defendants and National City Lines, Inc., was to establish the criminal illegality under the criminal section of the Sherman Act, of the acts which the defendants were alleged to commit, to have committed, and which the jury found that they had committed.

Senator O'MAHONEY. What was the punishment?

Mr. DIXON. Well, I blush, Senator, to answer that question.

The corporations secured the maximum fine of $5,000, which is the maximum penalty imposed, as you know, under the Sherman Act, at that time.

Congress has since raised it to $50,000, but at that time, it was $5,000.

The individual defendants, all of whom were convicted, and they were the treasurer of the Standard Oil Company of California, the assistant secretary of General Motors, and various other officials of the other corporate defendants, when the court go around to imposing sentence on the individual defendants, he very quickly, and as part of his sentence, fined them the magnanimous amount of $1 each.

So that the fine imposed on the individual defendants in this case was hardly the amount that anyone would be fined for a very minor traffic violation.

The reason, apparently, why the court did that—that the court had in mind was that in imposing that very nominal fine, it was that he appeared to feel—and I stress this because I naturally do not purport to speak for what the judge did—that this is in the nature of an economic crime and, therefore, it is not in the same category of another type of crime. It might be for that reason the sentence imposed was of a nominal amount.

In enforcing the antitrust laws——

Senator O'Mahoney. Well, until, as a Nation, we begin to realize that economic crimes of the magnitude described in your testimony this morning are recognized for what they are, as crimes that affect the livelihood of unnumbered persons, families, homes, and communities, it will be very difficult for us to do economic justice in this country and in the world.

Mr. Dixon. I think you are——

Senator O'Mahoney. I think it was the recognition of this fact that made this Congress increase that penalty. It was not sufficiently increased, in my judgment, but it was increased, and I am moved to make another observation: That the court might have had in mind that some of these officers who were named as defendants were carrying out plans that were imposed upon them by higher executives whom they could not disobey except upon pain of losing their jobs.

Mr. Dixon. If I may comment upon your last remark, Senator, I think that is one of the big problems of antitrust enforcement.

It is difficult in a large corporation, in particular, to determine where the responsibility for these acts actually should be placed, and that was always the problem in any antitrust criminal proceeding.

It is almost a gesture, nothing more, to indict a corporation without indicting some of the officials of that corporation, because a corporation cannot be put in jail. There is no personal stigma attached to it, and the maximum punishment was a $5,000 fine at that time, now $50,000, which some have referred to as a license to violate the law.

Senator O'Mahoney. Would you see any objection to an amendment of the antitrust law which would make it mandatory upon the court, upon finding a verdict of guilty, to impose the same fine upon the individuals concerned as upon the corporations, or would such a law make it more difficult to secure convictions?

Mr. Dixon. No; I do not think it would, Senator, because the jury are usually instructed, as you probably know, that the matter of sentence is not a matter for the jury to determine in considering the guilt or innocence of the individual defendants.

But it would certainly, perhaps, act as a little stronger deterrent, shall we say, on the part of some individual officials if they felt that they were to have that fine imposed that was imposed upon the corporation, although I venture the suggestion that in all instances where any fine is imposed that it is paid by the corporation rather than the individual against whom the fine was assessed.

Senator O'Mahoney. Well, that would also suggest an effective means of making the individual pay the fine by amending the law to the effect that any corporation officials who used corporate funds

to pay a fine levied in any criminal case against an officer or an employee of the Government should be trebly punished for that offense, or some similar provision.

Mr. Dixon. Well, that would certainly tighten up and give more force to the sanctions that Congress, I am sure, intended to put back of the enforcement of the antitrust laws.

Senator O'Mahoney. In the 20 years in which I have been studying this problem in the Senate, I have yet to find any executive of any great corporation do anything but proclaim his belief in the antitrust law, "antitrust laws should be maintained," and then they go on to defend free enterprise; but the laws are ineffective.

I am sorry to have interrupted you.

Mr. Dixon. All right, Senator.

Mr. McHugh. Did the conviction in the criminal case constitute a finding that the contracts entered into in and of themselves were illegal, or was it merely a finding that there was an illegal conspiracy among these supplier defendants, the National City Lines, to monopolize this trade, and contracts were among the devices employed?

Mr. Dixon. The decision in the criminal case operated to adjudicate, as a matter of law, the charges made by the Government in the civil case that section 2 of the Sherman Act had been violated by all of the defendants.

That would indicate clearly that, to answer your question, the next step would be, as it always is in a civil case, what relief is the Government entitled to, the illegality of the acts having been determined.

Now, the question of relief, of course, is where you have to consider what the situation is at the time the relief is requested.

The court found in the decision I have just mentioned that was released on September 19—and I hardly see how he could have done otherwise—that any contracts involved in the criminal case or the civil case that were comparable to the same charge, that were part of this combination and conspiracy, were necessarily illegal and, therefore, had to be canceled as being in violation of the antitrust law, and he so ordered in his opinion of September 19, 1955.

Mr. McHugh. Then the conviction in the criminal case did not constitute a specific finding that the contracts were illegal; and is that the reason why these contracts were perpetuated beyond that point, making necessary the filing of a civil case?

Mr. Dixon. Well, if I may venture this comment, I am certain that the lawyers for all of the defendant companies in the civil case were aware of the effect of the finding and the judgment in the criminal case, but they also knew that that finding did not operate per se or automatically to cancel these contracts.

Therefore, the position of some of the suppliers that I have mentioned was, "We won't cancel them. We will wait until the court forces cancellation."

That is why National City Lines entered into the consent decree; and the decree provided, Senator, as you inquired into a few minutes ago, that they should use their best efforts to get those contracts canceled.

But only the court can order their cancellation in the civil case. They are not canceled per se as the result of the adjudication in the criminal case.

Mr. McHugh. Mr. Dixon, in the consent judgment that was entered against National City Lines there were no specific contracts that were ordered canceled in their terms?

Mr. Dixon. That is correct. The court would be without jurisdiction, for example, to cancel a National City Lines supply contract of the type we are discussing here between National City Lines, Inc., and, say, Standard Oil of California, with whom they had this contract, or with General Motors, or with Firestone Tire & Rubber Co., or with the Phillips Petroleum Corp.

The decree to that extent did not mean very much, Senator, again answering your question.

Senator O'Mahoney. I know. But that is a strong indication to a Congress which is convinced that the antitrust laws should be strengthened that gaps like that should be plugged without much delay.

You have on pages 7 and 8 told the story of the reported conversation between the president of the National City Lines, Inc., with a competitive bus supplier, and this you put in quotes:

> Well, I don't think there is any point in our operating your buses. * * * You know our setup with General Motors, and they are probably going to build 50- or 55-passenger buses; and if they build them, we will probably have to buy them. I think your bus is as good or better than any other bus, but with this tieup we have, it is just out of the question. You just might as well take your bus to some other property with whom you can probably do some business.

Was that typical?

Mr. Dixon. I would say without question, Senator, that that is typical, and it could be amplified many times.

Senator O'Mahoney. Well, it means, then, that if it is typical this transit-line official who made this statement was saying that a better bus could not be purchased by his line because of the illegal contract, the criminally illegal conspiracy, in which General Motors had participated to force the purchase of the General Motors buses.

Mr. Dixon. That is correct.

Senator O'Mahoney. I think that is a matter to which all who believe in local free enterprise or competitive enterprise had better take notice.

Mr. Dixon. I join a hundred percent in voicing the same sentiment, Senator, after endeavoring to enforce the antitrust laws for a period of 10 years.

Do you want the rest of the statement?

Senator O'Mahoney. Oh, yes.

Mr. Dixon. According to a decision rendered on September 19, 1955, the district court in Chicago in the civil case, General Motors now holds no "investment" in, and has no requirements contracts with, any local transit company in the National City Lines system.

While I have no knowledge of the present supply situation of the National City Lines operating companies, I venture the suggestion that the greater part of all new bus equipment acquired by such companies will probably continue to be General Motors equipment, even under any bidding procedure which may be applicable to the purchases of buses in the consent decree before referred to. This for the reason that I have failed to notice any competing bus equipment on the streets of my home city, Pasadena, or that fast-growing metropolis of the West—Los Angeles—where both local transit systems are still controlled by National City Lines, Inc.

Mr. McHugh. Mr. Dixon, criminal suit was filed in 1947 and the convictions were obtained in 1949, I believe you stated?

Mr. Dixon. That is correct.

Mr. McHugh. Why was it that the civil suit then was not disposed of until 1955?

Mr. Dixon. Well, the Government and the defendants and the court made it necessary or required the criminal case to proceed to trial first, ahead of the civil case.

Therefore, the civil case was, in a sense, off docket, until the criminal case was disposed of.

The Government had no objection to that proceeding even though the burden of proof required of it in the criminal case is greater than that required of it in the civil case; because of the law which would make a guilty verdict or judgment in the criminal case determinative of the same issues in the civil case, so that the Government would not have to try the same issue twice, in other words, the Government could try the criminal case and lose that case, and then proceed to try the civil case and win it, without prejudice to its loss of the criminal case.

However, if it won the criminal case, then it had the advantage of winning that case and presumably effectively and quickly disposing of the civil case.

However, our efforts to get action on the—that is, the Government's efforts to get action, quick action, determinative of the civil case by a motion for summary judgment—was not very successful due to the apparently clogged docket in the district court at Chicago at that time, and the fact that the Government as well as every other litigant in a civil case has to take its place in line and wait for a judge who can hear its case.

But every effort was made to press it for adjudication by the methods that I have just indicated.

The record speaks for itself in that respect. It was only this year in September that the matter was finally disposed of, and the final order is not even in the civil case as of now, as far as I know. Does that answer your question?

Mr. McHugh. Yes.

Were there negotiations for settlement then proceeding between 1949 and 1955, as far as the entry of a consent judgment is concerned?

Mr. Dixon. Well, yes; there were some negotiations instituted by National City Lines, Inc. to dispose of the civil case, and those negotiations ultimately resulted in the consent decree which it entered into with the Government in 1954, I believe. You have the date, December 14, 1954.

However, the other defendants in the case refused apparently to negotiate or enter into any consent decree, claiming there was nothing which could be accomplished by such a decree since they had sold their stock and had—the contracts which the Government complained of were no longer in effect.

In other words, their defense to the Government's effort to secure a determination of the civil case was that there is nothing now for the court to decide, because everything which the Government seeks in the civil case had been accomplished, namely, the stock had been sold, the contracts are either no longer in effect or have been canceled and, therefore, the whole issue is what the lawyer calls moot, and if that is

true then, of course, the court cannot enter any injunctive order in this type of case.

Mr. McHugh. Mr. Dixon, what type of relief was the Government seeking against these supplier-defendants besides the cancellation of the contracts and obliging them to dispose of their stock interests?

Mr. Dixon. Well, the Government was requesting the court to order the defendant—I mean the National City Lines—to purchase equipment in the future by competitive bidding, that being the only way in which the Government felt that this market, which had been foreclosed to competition for so many years, could be, shall we say, reopened to competition.

That was in a limited sense or in a sense granted to the Government in the consent decree.

The other relief requested dealt with the cancellation of the contracts, the divestiture of the stock interests, general injunctive prohibitions against the resumption of the practices complained of, and the court said that General Motors had testified it had no intention of entering into any contracts like this in the future, and therefore, there was no reason to make any order against General Motors, and that since the other contracts had lapsed, there was nothing to cancel, except the two contracts I had mentioned some time ago, namely, the one apparently against or to which Standard Oil of California and the Firestone Tire & Rubber Co. were parties.

So that in its opinion, which it rendered on September 19 of this year, it ordered those contracts canceled if they were still in effect.

Mr. McHugh. Was the General Motors contract in effect at that time.

Mr. Dixon. It was not, according to the opinion of the court that I have just referred to.

Mr. McHugh. Mr. Dixon, do you know whether the provisions——

Senator O'Mahoney. Was it in reality?

Mr. Dixon. That, Senator, is the $64 question. I expect——

Senator O'Mahoney. You ended your statement by saying in Pasadena you have seen none but General Motors buses.

Mr. Dixon. And in Los Angeles, that is true, too, Senator.

Mr. McHugh. In the consent judgment that was entered against National City Lines, Mr. Dixon, was there any provision in their requiring National City Lines to purchase buses through a competitive bidding method?

Mr. Dixon. Well, that is rather a difficult question to answer. I would rather it be asked of someone from the consent decree section of the Department of Justice who participated in this decree.

As a lawyer, it would appear that the consent decree might possibly require it. But there are so many things which may be done under the decree with reference to specifications and so forth that, as a practical matter, I am certain that if National City Lines wanted to specify General Motors buses they, General Motors buses, would be the only ones on which any bid would be submitted.

Senator O'Mahoney. Mr. McHugh, I suggest that you insert in the record at this point the consent decree of December 1954.

Mr. McHugh. Senator, it will be made part of our permanent record.

(The document referred to follows:)

[¶ 67,917] United States v. National City Lines, Inc., et al.

In the United States District Court for the Northern District of Illinois, Eastern Division. Civil Action No. 49 C 1364. Dated December 14, 1954.

Case No. 890 in the Antitrust Division of the Department of Justice.

SHERMAN ANTITRUST ACT

Combinations and Conspiracies—Monopolies—Consent Decree—Practices Enjoined—Restrictive Agreements Between Buyer and Suppliers.—A holding company which controlled various local transportation systems was enjoined by a consent decree from (1) procuring any operating equipment on the condition that the supplier purchase stock of, or any financial interest in, the holding company, any local transportation system controlled by the company, or any other local transportation system; (2) entering into any contract with any supplier of operating equipment which restricts or limits the holding company or any local transportation system controlled by the company as to (a) areas in which such transportation companies may operate, (b) changes of operating equipment to any type, (c) types of transportation services furnished, (d) purchases of new operating equipment, except that any contract for the supply of tires and tubes may require that new buses be purchased without tires and tubes, (e) disposal of any interest in any local transportation system controlled by the holding company or acquisition of any interest in any other local transportation system; (3) entering into any contract with any supplier of operating equipment for financing the operations of the holding company, any local transportation system controlled by the company, or any other local transportation system, upon or accompanied by any agreement for the purchase or sale of operating equipment, except contracts with respect to terms of payment of price; or (4) entering into any contract with any supplier of operating equipment which is conditioned upon the procurement of other operating equipment from any other supplier.

See Combinations and Conspiracies, Vol. 1, ¶ 2005.595, 2005.703, 2005.833, 2005.848; Monopolies, Vol. 1, ¶ 2610.760; Department of Justice Enforcement and Procedure, Vol. 2, ¶ 8421.

Department of Justice Enforcement and Procedure—Consent Decrees—Specific Relief—Supply Contracts.—A holding company which controlled various local transportation systems consented to the entry of a decree which ordered and directed that (1) one and only one new contract for the supply of petroleum products and one and only one new contract for the supply of tires and tubes to the holding company or to local transportation systems controlled by the company shall be awarded in accordance with the requirements and procedures set forth in the decree; (2) contracts for the supply of petroleum products shall be for a period of no more than one year; and (3) contracts for the supply of tires and tubes shall be for a period of no more than three years. Another provision of the decree sets forth the procedure with respect to bids for supply contracts.

See Department of Justice Enforcement and Procedure, Vol. 2, ¶ 8301.50.

Department of Justice Enforcement and Procedure—Consent Decrees—Specific Relief—Bids for Supplies.—A consent decree entered against a holding company which controlled various local transportation systems, in setting forth the requirements for future contracts for the supply of operating equipment, provided that (1) a request for bids by suppliers of operating equipment shall be published in a specified trade journal within ninety days from the date of the entry of the decree, (2) the request for bids, the drawing up and issuance of specifications, the method and time of submission of bids, and the opening of bids shall not give to any supplier or prospective supplier any competitive advantage or preference over any other supplier, (3) subject to the right of the holding company, any local transportation system controlled by the company, or specified other companies to reject all bids, the contract shall be awarded to the lowest responsible bidder, and (4) all bids shall be opened at the time and place stated in the request for bids, and the names of the bidders and the prices bid shall be entered in a record which shall be available for inspection by the Department of Justice.

See Department of Justice Enforcement and Procedure, Vol. 2, ¶ 8301.45.

Department of Justice Enforcement and Procedure—Consent Decrees—Contingent Provision—Termination of Contracts.—A holding company which controlled various local transportation systems was ordered by a consent decree to cancel, upon the entry of a final judgment against a defendant petroleum company, specified contracts between certain of the holding company's local transportation com-

panies and the petroleum company. The holding company also was ordered to take, upon the entry of a final judgment against a defendant tire and tube company, all action within its power to have terminated certain agreements between the tire and tube company and certain of the holding company's local transportation companies.

See Department of Justice Enforcement and Procedure, Vol. 2, ¶ 8341.20.

For the plaintiff: Stanley N. Barnes, Assistant Attorney General, and W. D. Kilgore, Jr., Earl A. Jinkinson, and Ralph M. McCareins.

For the defendants: John T. Chadwell and C. Frank Reavis for National City Lines, Inc. and Pacific City Lines, Inc.

For prior opinions of the U. S. District Court, Northern District of Illinois, Eastern Division, see 1954 Trade Cases ¶ 67,654 and 1950–1951 Trade Cases ¶ 62,875.

Final Judgment

JULIUS J. HOFFMAN, District Judge [*In full text*]: Plaintiff, United States of America, having filed its complaint herein on April 10, 1947, and all the defendants having severally appeared and filed answers to the complaint denying the substantive allegations thereof, and the defendants National City Lines, Inc., and Pacific City Lines, Inc., by their attorneys, having severally consented to the entry of this Final Judgment without admission by said defendants with respect to any issue of fact or law.

Now, therefore, no testimony or evidence having been taken herein, and the Court having entered its order herein on February 26, 1954, and upon consent of the plaintiff, United States of America, and defendants National City Lines, Inc., and Pacific City Lines, Inc., it is hereby

Ordered, adjudged and decreed, as follows:

I

[*Sherman Act*]

This Court has jurisdiction of the subject matter herein and of the parties signatory hereto. The complaint states a cause of action against the defendants signatory hereto under Sections 1 and 2 of the Act of Congress of July 2, 1890, entitled "An Act to protect trade and commerce against unlawful restraints and monopolies," commonly known as the Sherman Act, and acts amendatory thereof and supplemental thereto.

II

[*Definitions*]

As used in this Final Judgment:

(A) "National" means National City Lines, Inc., a corporation organized and existing under the laws of the State of Delaware, with its principal place of business in Chicago, Illinois;

(B) "Pacific" means Pacific City Lines, Inc., a corporation organized under the laws of the State of Delaware and dissolved on December 31, 1947, at which time all of its assets were conveyed to and all of its liabilities were assumed by, National;

(C) "Firestone" means The Firestone Tire and Rubber Company, a corporation organized and existing under the laws of the State of Ohio, with its principal place of business in Akron, Ohio;

(D) "Standard" means Standard Oil Company of California, a corporation organized and existing under the laws of the State of Delaware, with its principal place of business in San Francisco, California;

(E) "Person" means any individual, partnership, firm, corporation, association, trustee, or any other business or legal entity;

(F) "National Operating Company" means any operating company now controlled by National and which it continues to control and any operating company more than 50% of whose stock entitled to vote upon the election of directors is hereafter acquired by National;

(G) "Operating company" means any person engaged in the business of providing public transit service;

(H) "Operating equipment" means tires, tubes, motor buses, and petroleum products, or any of them used by operating companies.

III

[*Applicability of Provisions*]

The provisions of this Final Judgment applicable to any defendant signatory hereto shall apply to such defendant, its officers, directors, agents, servants, employees, subsidiaries, successors and assigns and to each of those persons in active concert or participation with it who shall have received actual notice of this Final Judgment by personal service or otherwise.

IV

[*Contingent Cancellation of Contracts*]

(A) Defendant National is ordered and directed to cancel, upon entry of a Final Judgment against Standard, each of the following contracts:

(1) Agreement between Standard and Pacific, dated May 1, 1943, as amended May 1, 1946;

(2) Agreement between Standard and Salt Lake City Lines, dated July 12, 1944, as amended May 1, 1946.

(B) National is ordered and directed to take, upon the entry of a Final Judgment against Firestone herein, all action within its power to have terminated the agreements between Firestone and Los Angeles Transit Lines and St. Louis Public Service Company for the supply of tires and tubes.

(C) National is ordered and directed to take, upon the entry of a Final Judgment against Standard herein, all action within its power to have terminated the agreement between Standard and Los Angeles Transit Lines for the supply of petroleum products.

(D) Nothing in Sections IV, VI and VII of this Final Judgment shall be construed to limit the right of Firestone to obtain performance of the obligation to purchase tires and tubes on the basis of unused mileage, or other similar provisions of the last agreements in effect prior to the entry of this judgment.

V

[*Operating Equipment Supply Contracts*]

Defendant National is enjoined and restrained from doing, or permitting any National operating company to do, any of the following:

(A) Procuring any operating equipment on the condition, agreement or understanding that the supplier thereof purchase capital stock of, or any financial interest in, National, any National operating company or any other operating company;

(B) Entering into any contract, agreement or understanding with any supplier of operating equipment which restricts or limits, in any manner whatsoever, National or any National operating company as to:

(1) Areas or localities in which such companies may operate;

(2) Conversions or changes of operating equipment to any type whatsoever;

(3) Types of transportation services furnished;

(4) Purchases of new operating equipment of any type whatsoever, except that any contract for the supply, service, purchase or rental of tires and tubes may require new buses be purchased without tires and tubes;

(5) Disposal of any interest in any National operating company or acquisition of any interest in any other operating company;

(C) Entering into any contract, agreement or understanding with any supplier of operating equipment for financing the operations of National, any National operating company or any other operating company, upon or accompanied by any contract, agreement or understanding for the purchase or sale of operating equipment, except contracts, agreements or understandings with respect to terms of payment or price;

(D) Entering into any contract, agreement or understanding with any supplier of operating equipment which is conditioned upon the procurement of other operating equipment from any other supplier.

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VI

[*New Supply Contracts*]

(A) It is ordered and directed that one and only one new agreement for the supply of petroleum products and one and only one new agreement for the supply and services of tires and tubes to defendant National or to National operating companies (which operating companies are those set forth in paragraphs (B) and (C) below) shall be awarded in accordance with the requirements and procedures set forth in Sections VI and VII of this Final Judgment but as to Los Angeles Transit Lines or St. Louis Public Service Company said agreements shall be subject to the necessary action by said companies. New agreements for the supply of petroleum products to replace those presently outstanding with Standard, or for the supply and service of tires and tubes to replace those presently outstanding with Firestone, shall not be required until entry of a Final Judgment against Standard and Firestone terminating and cancelling said agreements.

(B) The agreements for the supply of petroleum products shall be for a period of no more than one year. A separate agreement may be made for the supply for said year by the companies set forth in each of the following groups of National operating companies (provided, however, that at Nationals option the companies may be divided into a larger number of groups for such purpose):

"Group I"

Company	Location of Company
Jackson City Lines, Inc	Jackson, Mich.
Kalamazoo City Lines, Inc	Kalamazoo, Mich.
Saginaw City Lines, Inc	Saginaw, Mich.

"Group II"

Company	Location of Company
Aurora City Lines, Inc	Aurora, Ill.
Bloomington-Normal City Lines, Inc	Bloomington, Ill.
Burlington City Lines, Inc	Burlington, Ill.
Champaign-Urbana City Lines, Inc	Champaign, Ill.
Cedar Rapids City Lines, Inc	Cedar Rapids, Iowa
Danville City Lines, Inc	Danville, Ill.
Decatur City Lines, Inc	Decatur, Ill.
East St. Louis City Lines, Inc	East St. Louis, Ill.
Elgin City Lines, Inc	Elgin, Ill.
Joliet City Lines, Inc	Joliet, Ill.
Lincoln City Lines, Inc	Lincoln, Nebr.
Quincy City Lines, Inc	Quincy, Ill.
Terre Haute City Lines, Inc	Terre Haute, Ind.

"Group III"

Company	Location of Company
El Paso City Lines, Inc	El Paso, Texas
Tulsa City Lines, Inc	Tulsa, Okla.

"Group IV"

Company	Location of Company
Glendale City Lines, Inc	Glendale, Cal.
Long Beach City Lines, Inc	Long Beach, Cal.
Pasadena City Lines, Inc	Pasadena, Cal.
Sacramento City Lines, Inc	Sacramento, Cal.
San Jose City Lines, Inc	San Jose, Cal.
Stockton City Lines, Inc	Stockton, Cal.

"Group V"

Company	Location of Company
Salt Lake City Lines	Salt Lake City, Utah
Spokane City Lines, Inc	Spokane, Wash.

A separate agreement shall be made by Los Angeles Transit Lines and a separate one by St. Louis Public Service Company.

(C) The agreements for the supply and service of tires and tubes shall be for a period of no more than three years. A separate agreement may be made for the tires and tubes to be used for said period by the companies set forth in each of the following groups of National operating companies (provided, however, that at National's option the companies may be divided into a larger number of groups for such purpose) :

"Group I"

Company	Location of Company
Jackson City Lines, Inc	Jackson, Mich.
Kalamazoo City Lines, Inc	Kalamazoo, Mich.
Pontiac City Lines	Pontiac, Mich.
Saginaw City iLnes, Inc	Saginaw, Mich.

"Group II"

Company	Location of Company
Aurora City Lines, Inc	Aurora, Ill.
Bloomington-Normal City Lines, Inc	Bloomington, Ill.
Burlington City Lines, Inc	Burlington, Ill.
Canton City Lines, Inc	Canton, Ohio
Champaign-Urbana City Lines, Inc	Champaign, Ill.
Cedar Rapids City Lines, Inc	Cedar Rapids, Iowa
Danville City Lines, Inc	Danville, Ill.
Davenport City Lines, Inc	Davenport, Iowa
Decatur City Lines, Inc	Decatur, Ill.
East St. Louis City Lines, Inc	East St. Louis, Ill.
Elgin City Lines, Inc	Elgin, Ill.
Joliet City Lines, Inc	Joliet, Ill.
Lincoln City Lines, Inc	Lincoln, Neb.
Portsmouth City Lines	Portsmouth, Ohio
Quincy City Lines, Inc	Quincy, Ill.
Rock Island-Moline City Lines	Rock Island, Ill.
Terre Haute City Lines, Inc	Terre Haute, Ind.

"Group III"

Company	Location of Company
Beaumont City Limits	Beaumont, Texas
El Paso City Lines, Inc	El Paso, Texas
Mobile City Lines	Mobile, Ala.
Montgomery City Lines	Montgomery, Ala.
Tampa City Lines	Tampa, Fla.
Tulsa City Lines, Inc	Tulsa, Okla.

"Group IV"

Company	Location of Company
Glendale City Lines, Inc	Glendale, Cal.
Long Beach City Lines, Inc	Long Beach, Cal.
Pasadena City Lines, Inc	Pasadena, Cal.
Sacramento City Lines	Sacramento, Cal.
Salt Lake City Lines	Salt Lake City, Utah
San Jose City Lines, Inc	San Jose, Cal.
Spokane City Lines, Inc	Spokane, Wash.
Stockton City Lines, Inc	Stockton, Cal.

A separate agreement shall be made by Los Angeles Transit Lines and a separate one by St. Louis Public Service Company.

VII

[*Bids*]

(A) A request for bids by suppliers shall be published once in Bus Transportation and Mass Transportation within 90 days from the date of entry of this Final Judgment except that as to those companies being supplied under contracts with Standard or Firestone, said request shall be so published within 90 days after the effective date of a Final Judgment against Standard and Firestone.

(B) The request for bids, the drawing up and issuance of specifications, the method and time submission of bids, and the opening of bids shall not give to any supplier or prospective supplier any competitive advantage or preference over any other supplier.

(C) Subject to the right of National, any National operating company, Los Angeles Transit Lines or St. Louis Public Service Company to reject all bids, the agreement shall be awarded to and made with the lowest responsible bidder. By "lowest responsible bidder" is meant (1) a company which is engaged in the business of supplying the operating equipment to be furnished under the agreement, or in performing the work or services to be covered by the agreement, and which has the financial ability, equipment, available supply of service approved operating equipment, and the reliability necessary to furnish said operating equipment, and (2) the company which will supply all of the particular operating equipment at an aggregate price which (after considering any credits or offsets to or by the operating companies) is the lowest dollar amount.

(D) All bids shall be opened at the time and place stated in the request for bids; and the names of the bidders and the prices bid shall be entered in a record which shall be available for inspection by duly authorized representatives of the Department of Justice.

VIII

[*Inspection and Compliance*]

For the purpose of securing compliance with this Final Judgment and for no other purpose, duly authorized representatives of the Department of Justice shall, upon written request of the Attorney General, or the Assistant Attorney General in charge of the Antitrust Division, and on reasonable notice to any defendant made to its principal office, be permitted (1) access during the office hours of said defendant to all books, ledgers, accounts, correspondence, memoranda and other records and documents in the possession or under the control of said defendant relating to any matters contained in this Judgment, and (2) subject to the reasonable convenience of said defendant, and without restraint or interference from it, to interview officers or employees of said defendant, who may have counsel present, regarding any such matters, and upon such request the defendant shall submit such reports in writing to the Department of Justice with respect to any matters contained in this Final Judgment as may from time to time be necessary to the enforcement of this Final Judgment. No information obtained by the means provided in this section shall be divulged by any representative of the Department of Justice to any person other than a duly authorized representative of such Department, except in the course of legal proceedings to which the United States is a party for the purpose of securing compliance with this Final Judgment or as otherwise required by law.

IX

[*Jurisdiction Retained*]

Jurisdiction is retained for the purpose of enabling any of the parties to this Final Judgment to apply to this Court at any time for such further orders and directions as may be necessary or appropriate for the construction or carrying out of this Judgment or for the modification or termination of any of the provisions thereof, and for the purpose of the enforcement or compliance therewith and the punishment of violations thereof.

Senator O'MAHONEY. The citations are given there, are they not?

Mr. DIXON. I do not believe either of these are published decisions, Senator.

Senator O'MAHONEY. No.

Mr. DIXON. So except in the services that publish this type of reporting——

Senator O'MAHONEY. We can identify them and include what is necessary.

Mr. MCHUGH. Mr. Dixon, do you think that the conviction in the criminal case and the judgment in the civil case, with which you were intimately associated, were successful in really restoring competition for the National City Lines' business?

Mr. Dixon. Well, I think anyone can answer that question better if you could come back 5 years from now with figures as to what has happened in the intervening period.

I think the likelihood is, and just again venturing an opinion, that if this committee or if the Department of Justice takes a look at this situation 5 years from now, you will probably find that National City Lines companies, if they are still operating them, will be using General Motors equipment.

Senator O'Mahoney. Well, it is a matter of fact, and I am sure it has been your experience, that a giant corporation, whatever it be, which becomes involved in a lawsuit, either with a small business or with the Government in antitrust procedure, because of its financial strength can almost always wear the little business out, and by consistent appeals and motions, dilatory motions, of one kind or another, and appeals all the way up to the Supreme Court, can consume so much time that the effectiveness of the prohibition of the antitrust law is greatly reduced.

If my memory serves me correctly, the big packers, before they finally yielded to the decision of the Supreme Court that they were in a combination and in violation of the antitrust law, preserved the status quo for at least a decade, and in this connection it is important to remember that since the corporation is an artificial person, its personnel changes, and those who were the executives when a decree was handed down are on pension or retired when a particular case is coming to its conclusion or a new one arising, and they can apply new means and methods of thought to prolong the economic position which they have occupied to strangulate small business and to conspire to monopolize trade and commerce; isn't that right?

Mr. Dixon. I certainly agree, Senator, with what you have said, that that in practice is what happens in substantially most of these cases.

In other words, the Government, in enforcing the antitrust laws, does everything, as they now stand, does everything possible to make use of the procedures that are available to remove the obstruction on commerce that is so apparent in so many of these cases and situations.

The difficulty always is, as you have just suggested—take this case or these cases, it is approximately 8 years or more from the time the indictment in the civil case was filed before there is an ultimate determination of it.

The conspiracy charge had been in effect for at least 10 years prior to the time the indictment and civil cases were filed.

The result is that for a period of 18 years in this case the market involved here has been foreclosed from substantially all competition, and in the meantime, the companies have been making the profits on the products that they have sold in this market, without any fear that they were going to lose that business from competitive suppliers.

Now, as a practical matter, the court decree may require certain things, but if you have been doing business with someone for 18 years the chances are that you are going to be a little reluctant to change to someone else unless you are forced to do so.

Senator O'Mahoney. Well, this passage of time also illustrates, may I say to our general counsel and to the assistant counsel, why neither the Brookings Institution nor the Michigan University professors nor the vice president and general counsel, Mr. Hogan, of

General Motors have come up to volunteer a contribution to the study of the effect of big business upon the social and economic structure of the United States.

They may think that time will result in this matter being completely forgotten; that when this committee has adjourned and made its report, there will be other things. But I still hope that it will not be necessary for me to suggest to the committee that a subpena be issued in the case of these three groups which have a good deal of knowledge about General Motors to contribute. I hope they will voluntarily contribute their knowledge, or if they have no knowledge, because the study meant nothing and was not an iron curtain hiding secret testimony, that they will come before us and tell us about it.

It is almost 4:30. Have you any more questions?

Mr. McHugh. We are all finished, Senator.

Senator O'Mahoney. Well, the committee will stand in recess until 10 o'clock tomorrow morning.

(Whereupon, at 4:20 p. m., the hearing was adjourned, to reconvene at 10 a. m., Wednesday, November 16, 1955.)

Exhibit 19.—Prepared Statement of GM Corp.

A General Motors Statement on S. 1167, The "Industrial Reorganization Act"

I. INTRODUCTION

The proposed "Industrial Reorganization Act," if enacted into law, would do great and possibly irreparable harm to our economy. Based on an extremely narrow and completely erroneous view of competitive reality, it proposes to restructure major parts of the manufacturing sector with clearly adverse implications for society as a whole.

Under this Bill, this restructuring is to be entrusted to one or a few appointed government officials in whose hands would be vested unprecedented power. The likely consequences of this newly created power would be to diminish rather than foster competition and to increase rather than lessen government regulation.

S. 1167 is a design which, intentionally or not, would strait-jacket our economic system. By challenging success, it would destroy the incentives for efficiency and competition. Indeed, the Bill's very passage would tend to discourage business firms from making investments required to meet many of our economic and social challenges.

This Bill is not an "amnesty statute" for American business, as it has been described.[1] It is a punitive measure and its enactment would destroy the mainspring of the drive for economic and social progress.

The extraordinary provisions of the Bill are embodied in the three tests of Title I which are presumed to indicate monopoly power and in the Title II requirement that industrial reorganization plans be developed for certain industries, whether or not monopoly power exists.

Title I presumes the existence of "monopoly power" if: (a) any four or fewer corporations account for at least 50 percent of the sales in any "line of commerce," in any section of the country, in any year out of the three most recent years; or (b) there has been no substantial price competition among two or more corporations in any "line of commerce," in any section of the country, for three consecutive years out of the most recent five years; or (c) a firm's average rate of return on net worth after taxes exceeds 15 percent for five consecutive years out of the most recent seven years preceding the filing of the complaint.

In our view, Title I is based on erroneous theoretical premises. It seeks to establish the absence or presence of competition in arbitrarily defined "markets," on the basis of the number of competitors and their market shares. It singles out price as the only indication of competition and ignores competitive rivalry through quality, innovation, product improvement, cost control and distribution effort. It equates an arbitrarily chosen level of corporate earnings, regardless of how achieved, with monopoly power.

These presumptions are based on theories and assertions concerning the nature of competition and on data and research techniques which many economic and legal scholars now recognize as invalid and outmoded. It is disturbing to see these theories at the core of a legislative proposal at the very time they are being subjected to searching reappraisal. Moreover, the presumption of monopoly power on the basis of the Title I provisions is contradicted by empirical evidence which shows that the automotive industry is characterized by vigorous and intense competition in the public interest.

The Bill not only contains arbitrary criteria for determining whether *firms* possess unlawful "monopoly power"; it also directs that a "plan of reorganization" be developed for each of seven *industries*, "whether or not any corporation is determined to be in violation of Title I."[2] This latter provision is of deep concern because it prejudges firms in these industries and, in effect, allows them no defense. It is claimed that these firms are in large measure responsible for such economic ills as inflation and unemployment,[3] and that their reorganization would contribute to the amelioration of these problems. These assertions are inconsistent with the facts. In addition, the monopoly power tests represent a clear threat to the successful future of many U.S. companies in addition to those in the seven industries.

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[1] *Congressional Record*, July 24, 1972, S 11496

[2] S. 1167, 93d Congress, 1st Session, p. 8.

[3] *Congressional Record*, July 24, 1972, S 11495.

This statement discusses the nature of competition, the irrelevance of the Bill's three criteria of monopoly power, and the likely consequences of the proposed divestiture remedy, and the illusory nature of the Bill's "efficiency defense." It also stresses the need for pro-competitive public policies.

II. THE NATURE OF COMPETITION

S. 1167 clearly condemns competition among the few—so-called "oligopoly" which it links with monopoly as being socially undesirable. The basis for this condemnation appears to be the abstract concept of "pure" competition. This concept provides a distorted vision of the real world, a vision which pervades the entire Bill.

Two general definitions of competition must be distinguished. On the one hand, there are simplified theoretical "competitive models" of the firm and industry used to introduce students to the intricacies of economics. Alternatively, there is the real world competition in which sellers are in *rivalry* for consumers' patronage—a dynamic world which is infinitely more complex than that of the classroom model. Both are useful but for entirely different purposes. One is a theoretical construct and the other a fact. They should not be confused.

The conventional textbook concept of competition is predicated on a series of assumptions about markets, which, if met, will compel economic efficiency (i.e., goods will be produced at minimum unit cost and priced at cost). These assumptions usually call for: (a) a large number of producers selling (b) identical products to a large number of buyers: (c) both buyers and sellers having a thorough knowledge of market transactions, although (d) no individual buyer or seller can affect the price at which these transactions occur; (e) firms, resources and goods entering and leaving the market freely, without delay or cost, and (f) no artificial restraints (e.g., government price supports or ceilings).

In this model, every seller is passive and impersonal and will earn enough money to stay in business only if he acts in the same way as do all other sellers. Although few economists believe that such a market has ever existed or could ever exist, this concept of competition[4]—given its restrictive assumptions—is convenient as an introductory tool of economic analysis. This use of a restricted model of competition is certainly proper.

The use of this simplified model as a blueprint for industrial reorganization, however, is improper. But this is exactly what S. 1167 proposes when it makes market shares, price-only competition and profit rates the criteria for determining the existence of monopoly power.

At least three major deficiencies exist in the use of the classroom model as a basis for such public policy.[5] First, technological progress and changing consumer preferences are ignored because the model assumes a static economy. Second, the achievement of a high level of economic efficiency in most industries precludes the large number of sellers assumed by the theory of "pure" competition. It is, third, also unreasonable to assume that separate firms will always produce identical products and that consumers are only interested in price and not in quality, product features and service.

To serve as a sound guide for antitrust policy, the competitive concept must focus on consumer satisfaction, efficiency and technological progress. These goals are achieved through the dynamic adjustment of individual firms to changing consumer preferences, technological innovations and other market forces. They are achieved by competition that is based on *rivalry* among sellers. In the real world, rivalry fosters a wide variety of activities by firms to attract patronage—rivalry to the benefit of the consumer.[6]

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[4] "In the literature of economics, this market situation—where each seller is faced with a horizontal demand curve for his output—has been given another special name; pure competition.' This name, unfortunately, is misleading, since this market situation is neither more nor less competitive than many others." Armen A. Alchian and William R. Allen, *University Economics*, Wadsworth, 1967, p. 106.

[5] See John S. McGee, *In Defense of Industrial Concentration*, Praeger Publishers, 1971. pp. 13–23.

[6] "For my own part, I accept the concept of competition which I think is held quite generally by those outside the specialized economic fraternity. It is that competition is rivalry between the members of one economic group to secure or retain the patronage of the members of another economic group. For example, it is the rivalry of a number of retailers to secure the patronage of customers; it is the rivalry of manufacturers to secure the patronage of retailers; indeed, it may be rivalry of buyers to secure the patronage of sellers, although in our system the active rivalry is usually between the sellers for the favor of the buyers rather than the reverse." Clare E. Griffin, *A Study of The Antitrust Laws*, Hearings before Senate Subcommittee on Antirust and Monopoly, Part 1, 84th Cong., 1st Sess., 1955, p. 384.

Economists also have developed theoretical models relating to oligopoly—market situations in which there are less than the large number of suppliers posited by the models of "pure competition." Some of these models, because of their unrealistic assumptions regarding business behavior, yield non-competitive results. However, these results follow from the assumptions made—they are not at all the necessary consequences of real world oligopoly. Again, academic models may serve a purpose in the classroom but they are hardly adequate as a basis for industrial reorganization. Here only careful analysis based on the facts will do. Such an analysis of the motor vehicle industry demonstrates that competition among the few—so-called "oligopoly"—is characterized by competitive rivalry which produces customer satisfaction, progress and efficiency.

III. THE PROPOSED "MONOPOLY POWER" TESTS ARE INVALID AND UNSOUND PUBLIC POLICY TOOLS

S. 1167 embodies a radically new public policy. It is not, as has been asserted, merely a restatement of "the philosophy which has been the bedrock of the antitrust laws." [7] It is a drastic departure from existing case law which defines monopoly power as the power to restrict total market supply, to increase prices and to prevent entry.[8] Title I establishes three arbitrary tests of "monopoly power"—market concentration, price behavior, and firm profitability. These tests are both irrelevant to an assessment of competition and seriously misleading.[9] They are a dramatic break with, if not repudiation of, established law.

Whereas traditional antitrust enforcement has been directed at selected types of monopolistic behavior considered anti-social (e.g., conspiracy, "predatory" pricing, etc.), S. 1167 is centered on industry structure. This emphasis on structural tests is neither sound in theory, nor is it in the public interest.

The sweeping application of the proposed Bill is equally disturbing. It would make any business vulnerable to divestiture if it were declared to fit any one of the three Title I tests. Indeed, on the basis of just one of the tests—the concentration ratio—at least one-third of the nation's manufacuring industries, and many other industries as well, would have been vulnrable to reorganization during the 1960's.[10]

In the following three sections, each of the tests are discussed, in turn, with respect to its lack of validity as an indicator of monopoly power and its inability to serve as a workable and constructive public policy tool.

A. THE CONCENTRATION TEST

The basic flaw in the presumption about concentration is the attempt to link the intensity of competition with some arbitrary count of number of competitors or share of sales. Measures of concentration obviously depend on the definition of the industry or market. Concerning these definitions, Professor Edward H. Chamberlin, a pioneer in the examination of the theory of competition involving small numbers and dissimilar products, observed.

"'Industry' or 'commodity' boundaries are a snare and a delusion—in the highest degree arbitrarily drawn, and, wherever drawn, establishing at once wholly false implications both as to competition of substitutes within their limits, which supposedly stops at their borders, and as to the possibility of ruling on the presence or absence of oligopolistic forces by the simple device of counting the number of producers included." [11]

A specialist in the field of industrial organization, Professor M. A. Adelman, described the market and its boundaries in these terms:

"The market in economic analysis is not a place or complex of people or objects, but a relationship among buyers and sellers. As a solar system is held

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[7] *Congressional Record,* July 24, 1972, S 11496.

[8] *United States* v. *Paramount Pictures, Inc.,* 334 U.S. 131 (1948); *United States* v. *Griffith,* 334 U.S. 100 (1948); *American Tobacco Co.* v. *United States,* 328 U.S. 781 (1946). Cf. *United States* v. *Grinnell,* 384 U.S. 563, 571 (1966); *United States* v. *E. I. du Pont de Nemours & Co.* (Cellophane), 351 U.S. 377, 391 (1956).

[9] ". . . this Bill substitutes simplistic tests for relevant evidence to define monopoly power. Each of the tests that would require a firm to prove that it does not possess monopoly power is unsound in theory and would be disastrous in application." J. Fred Weston, *S. 1167—Industrial Reorganization Act,* Statement submitted to the Senate Antitrust and Monopoly Subcommittee, March 29, 1973, p. 35.

[10] Based on data from U.S. Federal Trade Commission, *Annual Report—1972,* U.S. Government Printing Office, Washington, D.C., p. 44.

[11] Edward H. Chamberlin, "Product Heterogenity and Public Policy," *American Economic Review,* May, 1950, pp. 86–87.

together by the force of the gravitational attraction toward the sun, and has its boundaries where the force of that attraction becomes negligible, so a market is held together by the substitution of one product or process or service for another. The boundaries of the market exist at the points where the nearest substitute is so costly that it cannot properly be considered a substitute at all." [12]

Regrettably, in antitrust proceedings and in the array of "concentration ratios," as customarily calculated, markets have usually been defined without reference to all of the alternatives—in fact, without reference to any of them. All too often, artificially narrow and commercially unrealistic market definitions have been adopted.

The concentration test of S. 1167 applies "in any line of commerce in any section of the country." This is the language of Section 7 of the Clayton Act and implies a desire to focus on narrowly defined markets. Even under the Sherman Act, which is a more general statute, courts frequently have adopted narrow market definitions totally at variance with economic reality. In the *Grinnell Case* [13] for example, the Supreme Court held that the "appropriate market" consisted only of protection systems which sent a signal to a central station off the premises and which were accredited for special rates by insurance companies. Alternative forms of protection such as cheaper non-accredited services; systems that sent a signal to a station located on the plant site or in a fire station; and systems that sounded an alarm on the scene were excluded. The "market," in fact, was specifically tailored to the scope of the services offered by the defendant and limited to the geographic areas where the defendant operated. If the language of S. 1167 is interpreted the way it has been in the Grinnell and similar past cases, any enterprise in the country could run afoul of this test.[14]

Definitional questions about markets or a "line of commerce in any section of the country" have been debated for years. Such debates will continue as long as competition outside the assumed boundaries is ignored. It is cold comfort for a businessman to be told that the sale he lost was really not lost to a competitor but to a seller in a different market. However, even if markets could be correctly defined, the extent to competition could not be determind by counting the number of buyers or sellers in a market. Such statistics lack significance because they do not reflect the qualitative aspects of the industry or market. Jesse J. Friedman has stated:

"Bare statistics necessarily omit many qualitative factors which are essential to a complete understanding of the competitive structure of the entire industrial economy or of an individual industry. By the same token, the data themselves do not reveal the causes of the concentration shown, nor the relative importance of new entries, integration, internal growth, mergers, or business decline or mortality in accounting for the degree or trend of concentration." [15]

As far as the motor vehicle industry is concerned, the fact that for more than fifty years a major share of total U.S. sales has been accounted for by four companies has not resulted in any reduction of the vigor of competitive behavior. Competition among motor vehicle producers is manifest in all forms of rivalry for the consumers' patronage and for superior efficiency—rivalry in cost control, innovation and market development. If customer patronage results from such rivalry, then high sales levels are not a sign of monopolization but rather of success in the competitive struggle.[16] Obtaining sales is not equivalent to controlling the market, and current sales do not guarantee future sales.

Businessmen work in a dynamic setting in which customer preferences change, technological breakthroughs create new opportunities, potential entrants are

[12] M. A. Adelman, "Economic Concentration Measures: Uses and Abuses," *Conference Board Studies in Business Economics*, No. 57, 1957, pp. 15–16.

[13] *United States* v. *Grinnell Corp.*, 384 U.S. 563 (1966).

[14] Compare *Rea* v. *Ford Motor Co., CCH 1973–1 Trade Cases*, para. 74,332 (W.D. Pa. Dec. 28, 1972), which finds that a relevant market consists of Ford automobiles and *Calnetics Corp.* v. *Volkswagen of America, Inc.*, 353 F. Supp. 1219 (C.D. Cal., 1973), which finds that a relevant market consists of air conditioners for Volkswagens. With such market definitions it is not difficult to find a 100 percent share in a single company, not to mention 50 percent in four.

[15] *Concentration in American Industry*, Report of the Senate Subcommittee on Antitrust and Monopoly, 85th Cong., 1st Sess., 1957, p. 4.

[16] Under the pressure of competitive rivalry, and in the apparent absence of effective barriers to entry, it would seem that the concentration of an industry's output in a few firms could only derive from their superiority in producing and marketing products or in the superiority of a structure of industry in which there are only a few firms." Harold Demsetz, "Industry Structure, Market Rivalry, and Public Policy," *The Journal of Law and Economics*, April, 1973, p. 1.

quick to challenge existing firms if their performance falters and, most importantly, a setting in which the customer's favor must be earned anew with each sale. These business world realities point up Professor Edward S. Mason's observation:

"In particular one should be cautious in attributing monopolistic significance to size of firm or percentage of sales in a market subject to active product or process innovation. This is presumably the basis for the common-sense view that the automobile industry is a highly competitive industry despite the fact that, at least before the war, 90 percent of the sales of popularly priced cars were made by three firms, two of which persistently earned high rates of profits. I suggest that the common-sense view is probably right." [17]

Clearly, concentration is not an indicator of the possession of monopoly power. Furthermore, there is no consensus as to the correct method for measuring concentration. It is doubtful that it could be done correctly or, if done correctly, that it would have any validity beyond a very short period of time. At this juncture, therefore, the use of concentration ratios is a very crude tool for public policy because "*measured* concentration . . . is not necessarily equivalent to *actual concentration*." [18]

The Census definitions of industries and products were not evolved with the study of competition in mind and they do not necessarily reflect relevant markets in which competition actually takes place. They ignore the reality that used durable goods compete with new durable goods, that competitive pressures are international in scope and that cross competition—competition across industry or product lines—is an important fact of life in the modern world.

Furthermore, concentration measures, such as those published by the Bureau of the Census, have a spurious precision. Under the Census Standard Industrial Classification (SIC) System, all manufacturing is divided into 21 broad industry groups, called two-digit industries. These groupings become progressively narrower as they are more closely defined. There are approximately 150 three-digit groups, 422 four-digit industries, 1,200 five-digit product classes and 10,000 individual seven-digit products. Although this would seem to indicate that the SIC System has great precision, the Census volumes themselves contain statements as to the inadequacies of the bases for the statistics.[19]

Due to the dynamic and complex nature of our economy, a concentration ratio based on Census definitions is not an appropriate measure either of the extent or of the vigor of competition. The Census Bureau definition of motor vehicles (SIC Code 3711), for example, does not take cognizance of the interaction of used and new vehicles and ignores the international character of motor vehicle markets. Furthermore, the Bureau's definition of "passenger cars" (SIC Code 37111) does not reflect the competitive interaction of passenger cars with "trucks" (SIC Code 37112) such as pickups, vans and utility vehicles.

To begin with, the Census definition of motor vehicles ignores the existence

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[17] Edward S. Mason, *Economic Concentration and the Monopoly Problem,* Harvard University Press, 1957, pp. 179–180.

[18] Betty Bock, "Concentration Patterns in Manufacturing," *Conference Board Studies in Business Economics,* No. 65, 1959, p. 18.

[19] "For the purpose of measuring concentration, the fact that the classification system is not based exclusively on the usage of the product is somewhat of a limitation, since in the economic concept of the market it is immaterial whether products which are substitutable for each other are produced by the same processes or made with the same materials. In some cases, the industry and product definitions are too broad; that is, there are included in the same category products which do not serve the same function and are thus not substitutable for each other. In other cases they are too narrow; that is, a single category fails to include products which are substitutable; for example, metal, glass and paper containers are classified in separate industries.

"Another limitation is the fact that the SIC industries are regularly being redefined. The need for redefinition arises particularly from the introduction of new products, the declining importance of older products, the introduction of new technologies, the growth of small fields into important industries, and similar dynamic developments. While necessary to keep the classification abreast of the changing nature of the economy an inevitable cost of redefinition is the loss of comparability for many categories over time.

"The problem associated with industries which have local or regional rather than national markets is also worth mentioning, and the necessity for using domestic production (or its approximate equivalent in shipments), rather than domestic consumption, as a measure of the size of the market." U.S. Department of Commerce, Bureau of the Census, "Value-of-Shipment Concentration Ratios," *Annual Survey of Manufacturers—1970* M70(AS)-9, U.S. Government Printing Office, Washington, D.C., 1972, p. 1. See also *Concentration Ratios in Manufacturing Industry—1963,* Report prepared by the Bureau of the Census for the U.S. Senate Subcommittee on Antitrust and Monopoly, 89th Cong., 2nd Sess., 1966, pp. V–VIII, XV–XVII.

of competition from used vehicles. Professor George J. Stigler commented more than thirty years ago that ". . . the concentration ratio for motor vehicles is almost 90, but this ratio takes no cognizance of the large used-car market." [20] The durability and repairability of motor vehicles broadens the scope of competition in the industry. Thus, customers generally have the option of retaining their current vehicle if the offerings of new vehicle manufacturers are not sufficiently attractive to them—or they can purchase a used car.[21] During the decade ending in 1969, over 60 percent of all cars purchased by U.S. families were used cars.[22] Thus, each new vehicle producer is not only competing with all other new vehicle producers but with literally thousands of used vehicle dealers.

Increasingly, automotive manufacturers are competing in a single worldwide market. In the U.S., for example, domestic new vehicle producers compete with over 20 foreign producers.[23] Regardless of their home bases, all automotive producers are engaged in an aggressive and highly competitive search for new sales opportunities. Clearly, U.S. manufacturers face strong competitive pressures which are ignored by concentration ratios based on U.S. sales of domestically produced vehicles.

Beyond these evident limitations, concentration ratios based on Census product groups do not take account of the continuity of the total vehicle market—for example, the competitive interaction between passenger cars and light trucks, such as vans, pickups, motor homes and utility vehicles that serve, among other things, as personal transportation vehicles.

The increasing use of light-duty trucks for personal transportation was noted by the U.S. Department of Commerce more than four years ago when it reported:

"Truck sales will benefit greatly from the noncommercial demand for these vehicles. Light trucks, those nominally rated as one-half ton or three-quarter ton capacity, will continue to enjoy an unprecedented sales boom as more of these units are purchased for recreational vehicles and second 'cars.' The increased use of light trucks as personal vehicles is now a strong influence in the design and marketing of these units." [24]

More recently, the U.S. Department of Commerce reported that an "estimated 15 to 17 percent of all households have a light-duty truck occupying the second spot in their two-car garages." [25] Although these vehicles compete with passenger cars, and are merchandised as passenger cars, the Census Bureau excludes them from the definition of passenger cars.

The competitive elements discussed above—used vehicles, the worldwide market, light trucks—are examples of the extraordinary deficiencies of concentration ratios when applied to the motor vehicle business. They in no way measure the vast array of alternatives available to the buyer. Chart 1 indicates that new domestic passenger cars accounted for less than one-third of the personal automotive transportation purchased in the United States in 1972.

Beyond these factors relating to the competition for sales of private passenger vehicles, there are other considerations worth noting. Chief among them are the competition of public transportation services—taxis, buses, commuter and intercity rail systems and airlines. These various modes are alternatives to private vehicles for specific point-to-point trips. In addition, there is the competition of non-automotive products and services for the consumers' dollar. Again, the "market" in which motor vehicle manufacturers compete is determined by the alternatives available to the customer.

In summary, apart from the point that concentration ratios do not measure the true dimensions of competition, the concentration-monopoly power link of S.

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[20] George J. Stigler, "The Extent and Bases of Monopoly," *American Economic Review*, Supplement, June, 1942, p. 8.

[21] Approximately 17 percent of the people who purchased cars between November, 1970 and November, 1971 had shopped for both new and used cars. The buyers who actively considered both new and used vehicles represented a broad spectrum of income groups. Horst Sylvester, *New and Used Cars as Consumer Alternatives*, University of Michigan, 1972. Unpublished Doctoral Dissertation.

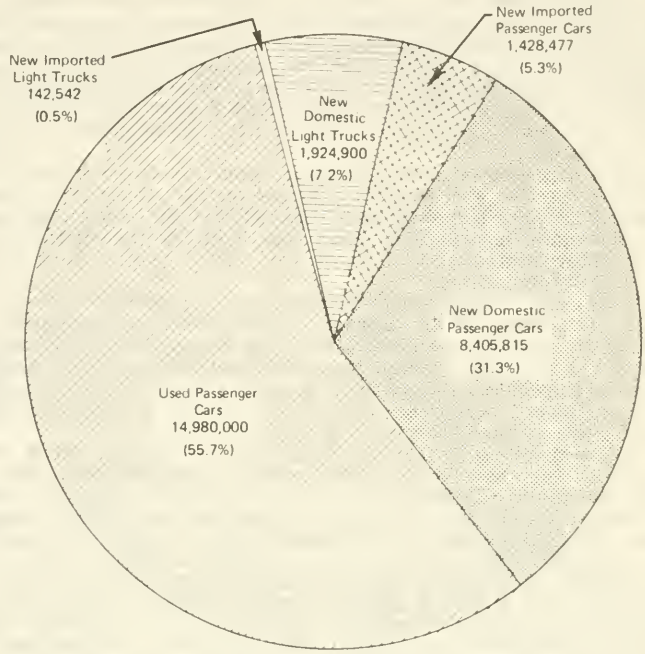
[22] Survey Research Center, University of Michigan, *1970 Survey of Consumer Finances*, 1971, p. 53.

[23] Toyota, Nissan, Fiat, VW, Renault, British Leyland, Citroen, Peugeot, Toyo Kogyo, Daimler-Benz, Honda, Volvo, B.M.W., Porsche, Alfa Romeo, Saab, Rolls-Royce, Jensen, Lotus, Suzuki, and Fuji Heavy Industries.

[24] U.S. Department of Commerce, *U.S. Industrial Outlook, 1969*, December, 1968, p. 265.

[25] U.S. Department of Commerce, *U.S. Industrial Outlook, 1973*, January, 1973, p. 345.

PASSENGER CARS AND LIGHT TRUCKS PURCHASED
IN THE UNITED STATES - 1972



NOTE Used cars include private and dealer sales. Data for used trucks not available.

New Imported Passenger Cars include 186,431 units from facilities owned by U.S. motor vehicle manufacturers. New Imported Light Truck sales include 42,500 units from facilities partially owned by U.S. motor vehicle manufacturers.

Source R. L. Polk, U.S Department of Commerce, MVMA.

CHART 1

1167 is at best a theory unsupported by evidence. Indeed, such structural tests of competition are viewed as an anachronism by many economists. Professor Harold Demsetz, for example, concludes that: "*We have no theory that allows us to deduce from the observable degree of concentration in a particular market whether or not price and output are competitive.*" [20]

B. The Price Competition Test

S. 1167 presumes that a firm possesses monopoly power "if there has been no substantial price competition among two or more corporations in any line of commerce in any section of the country for a period of three consecutive years out of the most recent five years preceding the filing of the complaint." While no one can gainsay the importance of price competition, the Bill's singling out of "price" by implication ignores the inseparable tie between price and other forms of competition—new product development, service, distribution and other terms of the sale. S. 1167 views both price and competition in black-and-white, not stereoscoptically and in their natural color.

[20] Harold Demsetz, "Why Regulate Utilities?" *The Journal of Law and Economics*, April, 1968, pp. 59-60 (emphasis in the original).

Conceptually, price is the amount of money exchanged between buyer and seller for a specified quantity of goods and services of a specified grade or quality and under agreed upon terms and conditions of sale. The concept of price is meaningless without relating it to a specific product. Thus, the buyer and seller may agree on a price for a Chevrolet Impala with an 8-cylinder engine, automatic transmission, radio, air conditioner, power assists, color and trim—and sold in a particular way for delivery at a particular time and place, under a specific warranty and with a package of expected services. The price also reflects the buyer's previous experience with this make as well as the resale value and reputation of the vehicle. An effective price change occurs each time any of these specifications change, even if the amount of money exchanged remains constant.

Obviously, in a competitive market, the more customized a product, the more important its precise specifications and the quality of its supporting services. Conversely, the more standardized a product and the terms and conditions of its sale, the more important the price aspect of the equation. However, even wheat is differentiated and its price per bushel reflects such attributes as grade and time of delivery.

It is unrealistic to establish S. 1167's price competition notion as a measure of the competitiveness of an industry and to ignore the qualitative aspects of transactions.[27] Price competition is only one facet of competition; firms also compete in product, cost control, marketing and service. By focusing on price, as a test of competition, the consumer's welfare is placed in jeopardy.[28]

The distinguished economist, Joseph Schumpeter, provided the proper perspective for price competition when he wrote:

"Economists are at long last emerging from the stage in which price competition was all they saw. As soon as quality competition and sales effect are admitted into the sacred precincts of theory, the price variable is ousted from its dominant position. However, it is still competition within a rigid pattern of invariant conditions, methods of production and forms of industrial organization in particular, that practically monopolizes attention. But in capitalist reality as distinguished from its textbook picture, it is not that kind of competition which counts but the competition from the new commodity, the new technology, the new source of supply, the new type of organization (the largest-scale unit of control for instance)—competition which commands a decisive cost or quality advantage and which strikes not at the margins of the profits and the outputs of the existing firms but at their foundations and their very lives. This kind of competition is at much more effective than the other as a bombardment is in comparison with forcing a door, and so much more important that it becomes a matter of comparative indifference whether competition in the ordinary sense functions more or less promptly; the powerful lever that in the long run expands output and brings down prices is in any case made of other stuff."[29]

A case in point is provided by GM's own experience with its development of diesel locomotives.[30] The advancement of locomotive power from steam to diesel was such an improvement (in both operating economy and service effectiveness)

[27] "By way of general summary, it seems difficult to understand how the economist can pretend to explain (or to prescribe for) the economic system and leave products out of the picture. Why not leave prices out? And why is one more important than the other? It is perhaps unnecessary to argue the point, since *nonprice* competition seems already to have achieved some substantial recognition in the literature. But many are still afraid of it, in particular the traditionalists who do not like to rock the boat. From their point of view, I think they are right. One thing seems certain—nonprice competition will not stay quietly in a separate compartment, leaving the rest of economic theory to go its way unaffected and undisturbed by its recognition. For it pervades, and pervades vitally, the whole competitive process." Edward H. Chamberlin, *Towards A More General Theory of Value*, Oxford University Press, 1957, pp. 136–137.

[28] "But what is essential to a study of price is not necesarily appropriate for the theory of economic welfare. If other things beside price are relevant in the determination of welfare, price theory is an incomplete foundation for welfare theory. Nor can it be assumed as a matter of course that the conditions which isolate the price variable are the conditions of fullest competition." Lawrence Abbott, *Quality and Competition*, Columbia University Press, 1955, p. 114.

[29] Joseph A. Schumpeter, *Capitalism, Socialism, and Democracy*, Harper and Brothers Publishers, 1950, pp. 84–85.

[30] For a discussion of this development, see C. R. Osborn, *A Study of the Antitrust Laws*, Hearings before Senate Subcommittee on Antitrust and Monopoly, Part 8, 84th Cong. 1st Sess., 1955, pp. 3948–3998, and General Motors Corporation, *The Locomotive Industry and General Motors*, May, 1973.

that steam locomotives of existing designs ceased to be competitive as transportation equipment and their value declined to their usefulness as scrap or as museum pieces.

Competition which is meaningful and which advances the interests of consumers occurs when sellers strive for sales by offering consumers more value for their dollars. If price were the only criterion used in the purchase of motor vehicles, for example, there would be no demand in volume for vehicles other than for stripped-down versions of the lowest priced makes, and these would not be improved from one decade to another. Chart 2, for example, shows that the great bulk of demand for new passenger cars in 1972 was for vehicles priced above $2,500. Only 8.4 percent of all cars purchased were priced at a lesser figure despite the availability of over 70 imported and domestic models in the lower price ranges.

CHART 2

HOUSEHOLD PURCHASES OF NEW DOMESTIC AND IMPORTED CARS BY REPORTED GROSS PRICE: 1972

Reported price	Annual total (thousands)	Percent
Under $2,000	127	1.5
$2,000 to $2,499	585	6.9
$2,500 to $2,999	1,187	14.0
$3,000 to $3,499	1,197	14.1
$3,500 to $3,999	1,209	14.2
$4,000 to $4,999	2,196	25.9
$5,000 and over	1,562	18.4
Not reported	423	5.0
Total	8,486	100.0

Note: Data exclude business and government purchases.
Source: Based on data from a U.S. Bureau of the Census survey of consumer buying expectations.

Another problem with S. 1167's pricing test of "monopoly power," involves the question of what constitutes price competition. While the Bill itself does not offer a definition, the section-by-section analysis inserted into the *Congressional Record* states "the Bill looks to parallel or administered pricing as an indicator of excessive market power." It adds: "The phrase 'no substantial price competition' is designed to focus upon those situations where prices do not respond to fluctuations in supply and demand." [31]

This definition, however, does not offer any real guide to the meaning of price competition. "Parallel pricing" is fully compatible with vigorous competition since similar products must carry similar prices in the marketplace.

As for "administered pricing," there has been considerable discussion concerning what, if anything, the term represents. Apparently, the use of this term springs from the fact that the "price-taker" of the competitive model does not exist save in a very small segment of the U.S. economy. Rather than being able to sell their output at some preexisting market clearing price, almost all producers must, on the basis of imperfect knowledge, assign tentative prices to their products which they can only hope will result in competitive success. How often and by how much these prices are changed depends on many factors including the speed at which market feedback is obtained, the normal variations in sales levels for any given time period, and the producers' various assessments of changes in the underlying market forces. This type of pricing behavior is found throughout the American economy and indeed in almost all other economies. As Gardiner C. Means, the originator of the term, said:

"Most of the prices you come in contact with every day are administered prices—the prices in the Senate Restaurant, at your barbershop, and in your local stores. The prices of steel and automobiles at wholesale. In fact, most industrial prices are administered prices and so are a large portion of retail prices." [32]

[31] *Congressional Record*, July 24, 1972, S 11502.
[32] *Administered Prices*, Hearings before the Senate Antitrust and Monopoly Subcommittee, Part I, 85th Cong., 1st Sess., 1957, p. 75.

In view of the fact that such pricing exists throughout the economy, it can have no operational significance.[33] "Administered prices" are consistent with price competitiveness. It is untenable to contend that they are caused by or indicate the presence of "market power."

It is clear that the proper perspective for an evaluation of "administered prices," if the term means anything at all, is as follows:

"The term administered price provides a useful description of the price making process in most segments of the economy. It does not involve a judgment that either the process of the price charged is wrong. The term does not indicate whether prices are fair or unfair, whether price behavior is good or bad, or whether prices are too high or too low. Unfortunately, some writers have used the term to describe a form of price behavior—usually one which they do not approve.

"It is useful to understand what administered prices are not. They are not monopoly prices. They are not prices set only by big business. They are not identical with inflexible prices." [34]

Indeed, depending on one's point of view, either the phenomenon does not exist, or it is ubiquitous. There is no support either empirically or in economic theory for the view that such prices are an indicator of "monopoly power" or that they would disappear if, pursuant to the divestiture proposals of S. 1167, there were more firms in an industry. In short, the notion of "administered prices," offers no guidance as a policy standard.

There are also empirical reasons why the price test of S. 1167 cannot be used to measure price competition. The major empirical problem is that actual transaction prices are not readily observable on a fully comparable basis.

In the automotive industry, for example, the legally required Manufacturer's Suggested Retail Price (MSRP) or "sticker price," represents the manufacturer's best judgment as to the competitive viability of the product. It is not, however, a transaction price in the sense that it reflects accurately the complex factors which enter into each transaction. The MSRP provides a basis for negotiations between the dealer and the customer. Most new car sales transactions involve the trade-in of a used vehicle and an installment purchase contract. From sale to sale, there are differences in the relative weight of these components as well as in the total transaction price.

The MSRP normally does not change during the model year. However, since each new vehicle retail transaction is a result of individual bargaining between the dealer and his customer, the retail transaction price can and does vary substantially from the "sticker price" throughout the model year.

The marketing and merchandising programs offered by manufacturers also affect transaction prices because they reduce dealers' costs and can, therefore, reduce the actual price paid by the customer. These marketing and merchandising programs take many forms. Special sales campaigns, for example, provide the dealer with a bonus on every new vehicle he sells above an established sales level. In addition, special product promotions involving reduced prices for specified optional equipment are an important competitive requirement of new vehicle retailing. These programs are adapted throughout the model year to changing conditions in demand and the competitive efforts of other producers.

Chart 3 summarizes these programs for the 1969 model year, a year during which the industry operated without the artificial constraints of price controls and did not experience a nationwide strike.

Ford introduced several special product promotions beginning in November and December with savings up to $80 per unit. GM initiated similar programs in December and January which offered savings of $30 to $50 per vehicle. In January, Chrysler and AMC offered dealers savings of $24 to $92 and $47 to $157, respectively, on vehicles equipped with specified equipment. The domestic manufacturers continued to offer these programs on various car lines throughout the model year.

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[33] Professor Martin Bailey of The Brookings Institutions has described this thesis as "a theory in search of a phenomenon." Quoted in Gilbert Burck, "The Myths and Realities of Corporate Pricing," *Fortune*, April, 1972, p. 89; see also George J. Stigler, "Administered Prices and Oligopolistic Inflation," *Journal of Business*, January, 1962, pp. 1–13.

[34] Jules Backman, *Administered Prices*, Hearings before the Senate Antitrust and Monopoly Subcommittee, Part 3, 85th Cong., 1st Session, 1957, p. 1123.

CHART 3

SPECIAL SALES CAMPAIGNS AND OPTION PACKAGE PROGRAMS 1969 MODEL YEAR

Make	Effective dates	Type of program	Models	Per unit savings
Ford	November 1–(1)	Option package	Mustang, Fairlane	$17–$50
Do	December 1–(2)	do	Galaxie 500	38–80
Mercury	December 1–(1)	do	Marauder, Montego, Comet	29–50
Ford	December 1–January 31	do	Falcon	40
Pontiac	December 21–February 28	do	Tempest, Catalina, Bonneville.	50
Buick	January 1–March 31	do	Skylark	30–45
Dodge	January 1–April 30	Sales campaign	Dart, Coronet, Charger, Polara, Monaco, light trucks.	10–60
Plymouth	do	do	Valiant, Belvedere, Barracuda, Fury.	10–75
Chrysler	do	do	All models	15–50
Plymouth	January 1–(1)	Option package	Valiant, Barracuda, Belvedere, Fury.	24–92
Dodge	do	do	Dart, Coronet, Polara	35–81
American Motors	January 1–March 31	do	Javelin, Rebel, Ambassador	47–157
Mercury	January 13–March 31	do	Cougar	34
Dodge	February 1–April 30	do	Dart	142–155
Mercury	February 10–April 30	do	Monterey	36–59
Chevrolet	March 1–May 30	do	Nova	52
Ford	March 1–April 30	Sales campaign	Thunderbird	150
Mercury	do	do	Mercury, Montego, Cougar	100
Ford	March 1–May 30	Option package	Pickup trucks	65–207
Plymouth	March 1–(1)	do	Belvedere, Fury	31–89
Chrysler	do	do	Newport	44–94
Pontiac	March 1–April 30	Sales campaign	Firebird	25–75
Mercury	March 21–April 30	do	Cougar, Montego	75
Do	March 31–May 31	Option package	Cougar	119
Dodge	April 1–(1)	do	Coronet	41–66
Mercury	April 21–May 31	Sales campaign	Marquis, Montego, Cougar	50–125
Ford	May 1–September 19	do	Thunderbird	100–250
Chrysler	May 1–September 23	do	All models	20–200
Plymouth	do	do	Barracuda, Belvedere, Fury	10–140
Dodge	do	do	Dart, Coronet, Charger, Polara, Monaco, light trucks.	10–140
Plymouth	June 4–July 31	do	Fury	(3)
Dodge	do	do	Charger, Polara, Monaco	(3)
Chrysler	do	do	All models	(3)
American Motors	June 11–August 10	do	Javelin, Rebel, AMX, Ambassador.	25–125
Mercury	July 1–September 19	do	All models except Marauder	50–180
Chrysler	July 1–August 31	do	Imperial	500
Do	July 1–September 30	do	Simca	50–100
Chevrolet	August 1–September 17	do	Biscayne, Bel Air, Impala, Caprice.	50–150
Pontiac	do	do	Catalina, Executive, Bonneville, Grand Prix.	50–150
Oldsmobile	do	do	Delta, 88, 98, Toronado	50–150
Buick	do	do	LeSabre, Wildcat, Electra, Riviera.	50–150
American Motors	August 11–September 25	do	Ambassador, AMX, Javelin, Rambler, Rebel.	100–300

[1] Termination date unknown.
[2] End of model run.
[3] Programs allowed extended floor planning with interest savings of an estimated $15–$30 per unit.

Source: Wards Automotive Reports and other trade sources.

In the first half of the 1974 model year, the gasoline shortage sharply reduced consumer demand for automobiles. This has been reflected in price concessions at the manufacturer's level which exceed in amount and in scope any that have been seen in recent years. They will unquestionable continue as long as demand is depressed.

A study, sponsored by General Motors, of the retail effects of several of the 1969 programs found that a large part of the reduction to the dealer was passed on to customers. It concluded:

"From in-depth interviews held with a significant proportion of new-car dealers in the Pittsburgh area of makes recently experiencing cash incentive programs, it was found not only that manufacturers reduce prices during the model year but also that dealers respond by converting these discounts into

cash savings for their customers. This is all the more significant since, in the process of selling the affected models, dealers were often not certain of the actual amount of discount for which they would qualify under the rules of the specific program. The results of this survey indicate a degree of price flexibility not generally recognized in the literature on new-automobile pricing." [35]

Accurate measurement of prices requires, in addition to ascertainment of transaction prices, adjustment for changes in product content. Without such adjustments, the determination of any price changes is extremely difficult. Even with adjustments, price changes at best are only approximations. This interrelationship of price and product is recognized by the Bureau of Labor Statistics.[36] The Cost of Living Council has also recognized the inseparability of product and price. Concerning additions to the standard equipment of automobiles, it said: "Such quality adjustments have not been considered price increases under stabilization program rules since the beginning of Phase II." [37]

Even if the price of a product could be unambiguously determined, there would remain the problem of determining whether or not *price competition* existed. Whether a price rises, falls or remains constant or whether it is different from or identical to any other price tells little about the presence or absence of price or any other type of competitive behavior. Price competition *per se* cannot be distilled from the total competitive brew nor can it be observed as an isolated variable in the incredibly complex marketplace.

Despite all these conceptual difficulties of determining effective prices, the fact remains that individual purchasers through shopping, comparing and testing of products, arrive, at least in their own minds, at conclusions regarding the relative pricing and valuation of different products. It is these conclusions that exert unremitting pressure on manufacturers to offer their products at competitive prices.

In short, the price competition test of S. 1167 lacks significance for determining the presence or absence of monopoly power, and presents formidable measurement problems relating to the determination of actual transaction prices and to the inseparability of price from other product characteristics. Finally, even if price were precisely determinable, the presence or absence of price competition—one of the monopoly tests set forth in the Bill—would not be answered.

C. The profit test

Contrary to the presumption set forth in S. 1167, a rate of return does not become monopolistic when it reaches 15 percent after taxes or any other arbitrary level for a five year or any other period. Many corporations, large and small—not to mention individuals and partnerships—are earning more than a 15 percent accounting return.[38] Professor J. Fred Weston has emphasized that a return of 15 percent or more in five consecutive years is "consistent with both efficiency and competitive behavior." [39]

The level and sustainability of profits in any corporation, in any industry, depends on many variables—efficiency, product demand, the quality of management, location, level of economic activity, innovation, risk, and the ability to adjust and adapt to changing markets. As will be discussed later, differences in accounting procedures and effects of inflation also importantly influence the level of profits reported by business firms.

The lack of relevance of profit level to monopoly power was described by Dr. D. T. Armentano as follows:

"Profit studies that attempt to 'measure' monopoly * * * conceptually assume away demand shifts and cost-reducing innovations and risks as short-run phenomena whose 'windfall' gains or losses somehow disappear in the static and peaceful, equilibrium long run. Again, nonsense. There is nothing peculiarly

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[35] G. William Trivoli, "The Effects of Price Concessions on New Automobiles to Dealers During the Model Year 1969," *Journal of Business*, October, 1971, p. 404.

[36] "In many instances, changes in quoted prices are accompanied by changes in the quality of consumer goods and services. Also, new products are introduced frequently which bear little resemblance to products previously on the market; hence, direct price comparisons cannot be made. The Bureau of Labor Statistics makes every effort to adjust quoted prices for changes in quality . . ." U.S. Department of Labor, Bureau of Labor Statistics, *The Consumer Price Index*, 1971, p. 5.

[37] Cost of Living Council, Press Release, December 10, 1973, p. 4.

[38] For a Dun & Bradstreet survey of 1972 earnings in 71 business classifications, see *Dun's*, November, 1973, pp. 118, 122–123, 126.

[39] J. Fred Weston, *S. 1167—Industrial Reorganization Act*, *op. cit.*, p. 33.

short run about risk, changes in consumer demand, or innovation; since the real business world is never in equilibrium, these dynamic market forces exist as much in the long run as in the short run. Long-run 'profits' might be just as attributable to long-run innovation as to anything else. Thus, postulating a frictionless, profitless equilibrium in some undefined long run, where measurements of the divergence of price from marginal cost or average cost can be used to indicate monopoly or inefficiency, is only an exercise in mathematics." [40]

There is, of course, the possibility that a firm, if it is a monopoly, may earn a "monopoly profit." However, the existence of profits, no matter how large, or their persistence, no matter how long, tells nothing about "monopoly power."

Furthermore, there is a distinction to be drawn between profits of a firm and profits of an industry. As Professor Yale Brozen has noted: "Economic theorists seldom point to accounting profits in individual companies as a possible indicator of existence of monopoly. Their discussions . . . have been in terms of industry rates of return.[41] He concluded: "Calculated rates of return earned by a single company, adjusted to match economic concepts, are no guide to whether it has a monopoly.[42]

In any given industry, earnings differ among competing firms because of variations in the quality of management and other resources. Some firms show "high" returns while others in the same industry show lower returns or losses. Although not necessary for a finding of competitiveness, a dispersion in earnings among firms is typical of competitive industries.[43] The automotive industry exemplifies this characteristic.

Chart 4 shows the dispersion in the accounting rates of return among four U.S. automotive manufacturers for the period 1955-1973.

CHART 4

RETURN ON NET WORTH—(AFTER TAXES) 1955-73

[In percent]

	GM	Ford	Chrysler	AMC
1973	19.1	14.2	9.4	25.0
1972	18.5	14.6	8.9	12.3
1971	17.9	11.8	3.7	4.8
1970	[1] 6.2	9.4	Loss	Loss
1969	16.7	10.5	4.6	2.4
1968	17.8	12.7	14.4	6.2
1967	17.6	[1] 1.8	10.9	Loss
1966	20.6	13.0	11.2	Loss
1965	25.8	15.7	14.9	1.9
1964	22.8	12.6	18.9	9.4
1963	22.4	13.1	17.5	13.8
1962	21.9	14.1	8.3	13.7
1961	14.8	13.1	1.2	10.5
1960	16.5	14.9	4.6	21.6
1959	16.3	17.3	Loss	31.6
1958	12.6	5.0	Loss	19.0
1957	17.2	12.8	16.4	Loss
1956	18.5	11.7	3.1	Loss
1955	28.0	22.8	15.4	Loss

[1] Major nationwide strikes.

Notes: (1) Information calculated using net worth as of fiscal year-end. GM, Ford, and Chrysler fiscal years end December 31; AMC's ends September 30.

(2) Chrysler data for 1961 through 1969 restated to reflect 1970 change in inventory accounting from LIFO to FIFO. Data to restate prior to 1961 not available.

(3) Ford data for 1955 through 1960 restated to reflect 1961 change in principles of consolidation which included foreign branches in consolidated financial statements.

Source: Fortune directories of the 500 largest corporations; 1973 based on corporate news releases.

[40] D. T. Armentano, *The Myths of Antitrust*, Arlington House, 1972, p. 39.

[41] Yale Brozen, "Significance of Profit Data for Antitrust Policy," *The Antitrust Bulletin, Spring*, 1969, p. 122.

[42] *Ibid.*, p. 123.

[43] "Free enterprise will always be marked by disparities—in the size of firms, in profits, and in products. These are not differences to fear. These disparities are the basis of competition . . ." Eugene M. Singer, *Antitrust in Search of An Identity: Images and Classical Models Under Crossfire*, Twelfth Conference on Antitrust Issues in Today's Economy, The Conference Board, March 1, 1973, p. 9.

During this nineteen year period, General Motors has generally been more efficient in adjusting to cyclical swings in volume than its competitors. There have been years, however, when other firms have met the test of the market more successfully. For example, American Motors' rate of return exceeded all other producers in the recession year of 1958 as well as in 1959, 1960 and 1973. There is little doubt that American Motors achieved this by having the right product, skillfully marketed, at the right time. The substantial increases in Chrysler's earnings rate between 1961 and 1964 and between 1970 and 1972 have been attributed to improved products and merchandising and consequent higher volume. Ford's low rate of return in 1967 reflects the effect on earnings of a strike, as did General Motors' in 1970.

From the very beginning of the automotive industry, one thing has been clear: the risk of failure has been at least as great as the chance of success. The high incidence of failure of automotive producers demonstrates that risk is an ever present fact of life in the industry. It is one, though by no means the only, explanatory variable in the profit picture of this and many other industries.

The Bill's condemnation of profits "in excess of 15 percent over a period of five consecutive years out of the most recent seven years" raises an interesting question. Is an average rate of return on net worth of 15 percent or more to be regarded favorably only as long as it does not endure over a time span of more than four years? If so, this contains the strange presumption that better performance should be encouraged and rewarded—but only for a relatively short time span. Rather, sound public policy should encourage superior performance for as long a period as a firm in free competition can achieve such performance.

There are numerous references in economic literature to the fact that neither the level or the persistence of profits is useful as an indicator of monopoly power.[44] A government-sponsored committee, for example, in discussing factors bearing on identification of workable competition, did not regard profit as one of ten relevant "factors." [45] The Committee recognized that: ". . . it is altogether normal in a competitive economy that a given industry or group of firms in an industry, each acting independently, can earn extremely high (or low) profits at any given time, and over considerable periods of time." [46]

It is paradoxical that in an economy dependent on the free workings of the incentive system, profits should be proscribed if they do not conform to the arbitrary and irrelevant specifications set by S. 1167. Establishing such limits is tantamount to penalizing success and efficiency. This Bill would destroy incentives to efficiency, capital investment and technological advance—objectives which our economic system should foster.

In addition to their validity as a guide to the existence of monopoly power, accounting profit measures cannot serve as public policy tools. The problem of measuring profits has been described as follows:

"The data necessary to determine rate of return on investment for comparisons of profitability in the economic sense are not generally available. While data on return on net worth as measured for accounting purposes are publicly available, the accounting measure bears no necessary relation to the economic concept of return on investment and can provide no reliable evidence as to competition or monopoly.

"This is not to gainsay the relationship that can exist between a monopolistic market structure and monopoly profits. The problem is that to understand that relationship through use of profit data will require major advances in the techniques of profitability measurement and comparison.[47]

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[44] Corwin D. Edwards, *Maintaining Competition: Requisites of a Governmental Policy*, McGraw-Hill, 1949, p. 125; Mandell M. Bober, *Intermediate Price and Income Theory*, Norton, 1955, pp. 206–208, 242–43; Kenneth E. Boulding, *Principles of Economic Policy*, *Prentice-Hall*, 1958, pp. 294–96; Clare E. Griffin, *Enterprise in a Free Society*, Richard D. Irwin, 1949, pp. 134–37; G. E. Hale and Rosemary D. Hale, *Market Power: Size and Shape Under the Sherman Act*, Little, Brown and Company, 1958, pp. 78–79, 188–90; G. Warren Nutter, "Monopoly, Bigness and Progress," *Journal of Political Economy*, December, 1956, pp. 522–23.

[45] U.S. Department of Justice, *Report of the Attorney General's National Committee to Study the Antitrust Laws*, Government Printing Office, Washington, D.C., 1955, pp. 324–36.

[46] *Ibid.*, pp. 323–24

[47] *The Conference Board Record*, December, 1972, p. 49. (Introduction to "Relative Profitability and Monopoly Power" by Jesse J. Friedman and Murray N. Friedman.)

The accounting rate of profit cannot be regarded as an indicator of economic profit because of the use by accountants of the historical cost method of valuing plant and equipment, the frequent practice of charging to expense certain items from which an economic viewpoint might be capitalized, and the problem of quantifying risk.

Accounting profits usually reflect accounting procedures that value assets and charge depreciation on an historical cost rather than a replacement cost basis. In an inflationary period, therefore, accounting profits are higher than economic profits because interest charges and depreciation allowances, based on historical costs, are understated in the economic sense. George Terborgh of the Machinery and Allied Products Institute has estimated that of the $700 billion in corporate accounting profits during the quarter-century since World War II about $130 billion represent an understatement of economic costs due to the use of historic costs in depreciation and inventory accounting.[48]

Without adjustments for changes in the price level, different firms may show different profit rates because they happened to build their plants or buy machinery in different years. Obviously, these differences have become more pronounced due to the substantial inflation in recent years.

The implication of the recent increase in the price level was emphasized by Professor Paul W. McCracken as follows:

"According to a study by the Machinery and Allied Products Institute, which has led the way in rigorous work on capital goods economics, the understatement of true economic costs by conventional accounting procedures in 1973 was about $25 billion. After-tax profits last year, therefore, were actually 30% below those in the mid-1960s. And when profits, with more realistic estimates of costs, are expressed in 1965 prices throughout, the real purchasing power of after-tax profits in 1973 is found to be roughly half that in 1965." [49]

Accounting rates of profits may also be inadequate for economic analysis because of the capitalizing-versus-expensing decision. For example, some firms tend to be more research oriented than others and where research is charged to expense, net assets and net worth for these firms tend to be understated. Other firms may understate their net worth by treating product development and corporate advertising as expense items. Of this problem, Professors Solomon and Laya have said:

"Divisions, companies, or industries which tend to expense or write off a large fraction of investment will show a much higher book-yield than an equally profitable counterpart which capitalizes a higher fraction of outlays. It is not surprising that the cosmetic and pharmaceutical industries which invest heavily in noncapitalized assets such as research and development and long-range advertising tend to show higher than average book-yields, nor is it surprising that the producing divisions of the petroleum industry, which expense a high fraction of investment outlays, tend to have higher book-yields than refining or marketing divisions." [50]

It is also necessary when evaluating or comparing rates of return on net worth to take into account the various levels of risk that may be present. It is obvious that high risk investments are associated with a higher potential payoff than are "safe bets." A major risk is that of not meeting consumer demand—not providing the right goods at the right time and in the right price range. This is the perennial risk a firm in the automotive business faces in its relationships with its customers.

Attempts have been made to quantify this type of risk. Fisher and Hall, for example, computed risk-adjusted rates of return for 88 firms in 11 industry groups for the period 1950–1964.[51] Although the automotive industry ranks third out of eleven in terms of average return over the period, it also has the highest risk by the Fisher and Hall measurement. On a risk-adjusted basis, the industry's rate of return (7.54 percent) is in eighth place—fourth from the

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[48] George Terborgh, *Essays on Inflation*, Machinery and Allied Products Institute, 1971, pp. 53–55; see also George Leland Bach, *The New Inflation*, Brown University Press, 1973, pp. 75–79.

[49] Paul W. McCracken, *Wall Street Journal*, February 21, 1974.

[50] Ezra Solomon and Jaime C. Laya, "Measurement of Company Profitability: Some Systematic Errors in the Accounting Rate of Return," in *Financial Research and Management Decisions*, A. A. Robichek, ed., John Wiley & Sons, 1967, pp. 178–179.

[51] I. N. Fisher and G. R. Hall, "Risk and Corporate Rates of Return," *Quarterly Journal of Economics*, February, 1969, pp. 79–92.

bottom—in the eleven industry groups studied. In short, risk-adjusted results can vary significantly from a simple calculation of return on net worth.

In any event, many students of the problem have concluded that "in no sense" can accounting data on profits "form a sound or solid basis for comparing the economic profitability of companies or industries where the accounting method of valuation of assets, particularly plant and equipment, or the accounting treatment of intangibles such as research and development, significantly affects the profit or investment figures." [52]

Other measurement problems arise in the use of accounting profits as public policy tools due to the non-comparability of the reported profit data of different firms. These problems reflect the many varying rules and standards under accepted accounting methods for the timing of cost accruals and estimating the useful lives of assets. In many cases, the selection of a particular method for writing off certain expenses or asset values may be arbitrary or may be based on the peculiar characteristics of an individual firm.

The profit test of "monopoly power," no less than the concentration and price competition tests, is conceptually erroneous. The measurement problems involved in all three tests present enormous obstacles to any, let alone an equitable, administration of this bill. "Short cut" criteria based on concentration ratios or some arbitrary standard of price competition or of "fair" profits would result both in injustices and in negating the strong incentives to efficiency inherent in competitive enterprise.

IV. ECONOMIC CONSEQUENCES OF S. 1167

The economic impact of the passage of S. 1167 would be enormous. It proposes to tamper with at least one-third of the nation's manufacturing industries and many other non-manufacturing industries. On the basis of the concentration test alone, the Bill would reach a great variety of industries operating nationwide right to the pins, needles and fasteners industry. The Bill also would apply to companies operating on a regional or fairly local basis since it employs the "in any line of commerce in any section of the country" language of Section 7 of the Clayton Act.[53] Although the Bill singles out seven major industry categories for initial study with a view to reorganization, if passed, it would directly affect all businesses not just those in the seven named industries.

For perspective, Chart 5 shows the economic impact of these seven categories of industries. In 1972, they accounted for 7 percent of U.S. industrial employment, 10 percent of all wages and salaries paid, 21 percent of all business spending for plant and equipment and 37 percent of total industrial production.

CHART 5

7 CATEGORIES OF INDUSTRIES—THEIR ROLE IN U.S. ECONOMY, 1972

	7 industry categories	U.S. total	Percent of total
Employment—(millions)	5.8	79.2	7
Wages and salaries paid—(billions of dollars)	62.0	627.0	10
Plant and equipment expenditures—(billions of dollars)	18.0	88.0	21
Industrial production—(billions of dollars)	127.0	348.0	37

Note: The 7 categories of industries are: chemicals and drugs; electrical machinery and equipment; electronic computing and communication equipment; energy; iron and steel; motor vehicles; nonferrous metals.

Sources: Employment, wages, and salaries data are from the July 1973, issue of the Survey of Current Business, U.S. Department of Commerce. Plant and equipment data are from the U.S. Commerce Department's Survey of Capital Spending and published by their Bureau of Economic Analysis. Industrial production data are from the Federal Reserve Board's Division of Research and Statistics.

[52] Jesse J. Friedman and Murray N. Friedman, "Relative Profitability and Monopoly Power," *Conference Board Record, December*, 1972, p. 52.

[53] Professor Milton Handler of Columbia University has provided "some illumination and amusement" on this point by composing "an imaginary opinion" of the Supreme Court: that at some time in the future would call for divestiture of Joe's Delicatessen, Inc., the second largest food establishment at the intersection of K and 21st Streets, N.W., Washington, D.C., which has "acquired all the assets of Victor's Meat Market Co., the third largest food store at this intersection . . ." Milton "Recent Antitrust Developments—1964." *Michigan Law Review*, November, 1964, pp. 70–71. While this article is humorously written, the point that even small retailers run afoul of the theories underlying this proposed legislation is far from humorous.

Chart 6, on the following page, shows that during the decade ended in 1972, the gross product (or value added) originating in these seven "industries" increased from $67 billion to $121 billion or by 80 percent. After adjusting for inflation, real output was up 65 percent, equal to a growth rate of 5 percent a year. The growth in output provided jobs for 700,000 new employees. Furthermore, these "industries" as a group were able to hold down their prices relative to the whole economy. The average price increase for the seven was only 9 percent compared with an increase of 38 percent for the entire Gross National Product. This is one indication of relative efficiency.

CHART 6

7 CATEGORIES OF INDUSTRIES—10-YEAR RECORD, 1962–72

	1962	1972	Change
Gross product originating (billions of current dollars)	67	121	[1]+80
Gross product originating (billions of const. 1962 dollars)	67	111	[1]+65
Employment	5, 100, 000	5, 800, 000	+700, 000
Implicit price index, 7 industries (1962=100)	100	109	[1]+9
GNP implicit price index (1962=100)	100	138	[1]+38

[1] In percent.

Source: Employment data are from July 1963 and July 1973 issues of Survey of Current Business. Gross product data are from the Commerce Department's Bureau of Economic Analysis, Industrial Economics Division.

Although we believe this to be a creditable record, a record sharply at variance with the allegations of inflationary behavior, inefficiency, unemployment and monopolistically reduced output contained in the preamble to the Bill.

The Industrial Reorganization Act, if it becomes law, would have adverse effects on incentives, resource allocation and product quality. It also would subject business firms to unnecessary hazards, including an unjustified increase in the already heavy burden of uncertainty and a severer handicap in competing successfully in worldwide markets. Its enforcement would entail large expenditures both by the Federal government and the business community. There is every reason to believe that these costs, which must ultimately be borne by the American consumer, would be substantial—much greater than the illusory benefits claimed for the Bill.

A. Incentives

The statement accompanying the initial introduction of the Bill properly noted that "price controls do little to encourage efficiency or productivity improvements." [54] S. 1167, however, would be very much like price controls in this respect. It would undermine, not strengthen, management incentives for improved efficiency. Indeed, it would destroy the incentive to engage in all-out vigorous competition.

Under this Bill, rational behavior by many firms would require the avoidance of competitive success. Its provisions would, therefore, discourage superior performance and encourage soft ineffectual competition and cartel-like behavior. The result would be a higher than necessary costs and prices to the detriment of the entire economy. This type of behavior which, among other things, leads to inefficiency and competitive inertia is the very type of behavior castigated in the preamble to S. 1167.[55]

It appears inconsistent, therefore, to advocate legislation which would produce the exact opposite of its stated intent, namely, "to promote competition throughout the economy to the maximum extent feasible." [56]

The inadvisability of setting limits to competitive success—as S. 1167 does—has been described as follows:

"The fundamental weakness with this approach is that there is no conceivable way of limiting size without also limiting growth. In my judgment, the

[54] *Congressional Record*, July 24, 1972, S 11495.

[55] Equally disturbing is the provision in Title II of the Bill allowing the Reorganization Commission to make public disclosure of the detailed information submitted. Incentives to compete will unquestionably be dampened if new marketing strategies, product programs and manufacturing processes can be made public knowledge at the discretion of the Commission without recourse or redress.

[56] S. 1167, p. 2.

most important factor in many lines leading to product improvement, cost and price reduction, and other benefits to the public has been the constant and persuasive drive, at least on the part of some concerns, to gain a larger part of consumer patronage. This imposes upon the others the necessity of doing their level best to maintain their own position in the market. * * * If now—and this, I think, is an important point—you place a hard-and-fast limit upon size, then any concern which would be affected by that limit will be strongly encouraged to adopt noncompetitive policies. * * * In short, by putting a definite limit on size, you would be placing a requirement upon these concerns that they must, in fact, act like monopolists in order to avoid the charge of being monopolists." [57]

"A legal limit on size would tend to defeat the purpose of the antitrust laws aimed to preserve and encourage competition. A limit on size would weaken competition by preventing the largest concerns from striving (as they do now) to expand their sales and would force them to do the very thing that we do not wish them to do—namely, to attempt to make more money by raising their prices and limiting the volume of their sales. It would be ironic to weaken competition in order to check the growth of bigness!" [58]

"Adherence to structural tests alone would impose on American business firms handicaps and inflexibilities resulting in serious costs to our national economic efficiency and growth, diminished consumer welfare, and dangerous implications for our international economic position.[59]

B. Resource allocation

In a free society, the vast majority of economic decision are made by private individuals and groups. The rate at which national output grows and the components of that growth are determined primarily by private attitudes and actions. Opportunities for economic returns on investment are signals for resources including managerial skills and capital to move into or out of an industry.

The imposition of arbitrary limits, both on profits and sales would cause resources to avoid certain industries and to move into others or to move overseas. One consequence of this is certain—S. 1167 would create distortions in the applications of capital and entrepreneurial resources. It would artificially deflect them away from the pattern that is generated by a consumer-determined free market economy.

Some distortions would arise from a firm's need to avoid running afoul of the monopoly power presumptions. As Dr. Eugene M. Singer has observed:

"Consider the effects on our economy if a company saw its fifth consecutive year of *profits over 15 percent after taxes* coming up. If the company were a research-oriented company, it would attempt to spend two years of research and development expenditures in the current year. If the company were in advertised consumer products, it would plan two years of media advertising into the current year for a shorter intensive campaign. Such a provision in a bill would only cause considerable shifting of investment and current expenditures with no discernible benefit to either the public or the economy generally." [60]

A longer range distortion would arise from forcing firms to turn away from those areas in which they have been most successful in serving consumers and to undertake business activities in which they are less efficient. With respect to profits, firms in danger of violating S. 1167's test could be expected to react in much the same way as firms faced with an excess profits tax—i.e., waste resources in inefficient activities not required to satisfy consumer desires.

C. Product quality

The evaluation of a particular piece of economic legislation should take into consideration its direct effects on the consumer. It is in its effects on consumers that S. 1167 would be most harmful for it would discourage competitive rivalry by manufacturers to serve them with better products made more efficiently.

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[57] Clare E. Griffin, "A Study of the Antitrust Laws," *op. cit.*, p. 390.
[58] Sumner Slichter, *New York Times*, Magazine Section, March 20, 1955, pp. 30, 32.
[59] J. Fred Weston, "Changing Environments and New Concepts of Firms and Markets," In: *New Technologies, Competition and Antitrust*, Ninth Conference on Antitrust Issues in Today's Economy, National Industrial Conference Board, March 5, 1970, New York City, p. 14.
[60] Eugene M. Singer, *op. cit.*, p. 8.

As Professor Paul W. McCracken warned in his testimony before this Subcommittee:

"Large firms would have an incentive to shy away from new product development and in other ways to reduce their competitive efforts in order to keep the market share of the largest four firms from exceeding 50 percent. Firms would also refrain from innovating or making major marketing improvements if they were likely to increase profits sufficiently to make the firms subject to reorganization." [61]

The automotive industry, for example, has been characterized by product competition producing a steady stream of product innovations—some dramatic, some less so—but all contributing in the aggregate to producing vehicles of greater value in terms of safety, durability and reliability. Competitive rivalry has also spurred innovations in improved methods of production and in the use of better materials.

Among the product improvements in one popular car—the 1974 Chevrolet Impala—since 1960 are: body insulation for improved quietness, upper level ventilation, a 43 percent increase in rear window glass visibility, anti-theft lock system, energy absorbing steering column and steering wheel, extended oil change interval, permanently sealed fuel pump, alumnized exhaust valves, more reliable water pumps with ceramic seals, variable ratio power steering, bias-belted tires, and power disc brakes.

Again, product competition in no way minimizes the importance of price competition. In fact, product and price competition are inseparable and their interplay enhances customer satisfaction. By failing to recognize this and by focusing on price competition, S. 1167 would discourage competitive efforts to attract customers with constantly improved products and services.

D. Risk and uncertainty

Another major adverse effect would be an additional large dose of long-lasting uncertainty over and beyond the sizeable risks and hazards that are the normal lot of business firms. If enacted, the shadow of doubt cast by the new law will affect the market valuation of the securities of many companies. The savings of many investors, small and large, are likely to be jeopardized.

Faced with uncertainty regarding the possibility, timing and nature of the reorganization of their companies, and mindful of their responsibility to stockholders, managements will be motivated to refrain from investing in additional capacity, expanding research and development and introducing new products. The reason for such restraint is obvious—under S. 1167 growth in market share would become a dangerous business objective.

Holding companies have been dissolved and largely-autonomous corporate divisions have been sold in the past with varying degrees of success. There is no precedent, however, for the type and scale of restructuring contemplated in this proposal. What is particularly damaging is that this Bill's passage would, in effect, be a public announcement that America's major industries are to be reorganized over a period of at least 15 years. The consequent doubt and uncertainty regarding the choice of the next target and the timing and nature of government action is bound to dampen entrepreneurial vigor and willingness to assume risks in those industries that are vulnerable.

The rate of investment, growth in capacity and employment are likely to suffer also in those supplier industries that may not be directly affected by the Bill but whose fortunes rise and fall with those of their major customers.

Furthermore, uncertainty would persist even where an industry has been restructured. The Damocles Sword of further action would continue to hang over industry since the Bill provides that the Federal Trade Commission will assume the functions and powers of the Reorganization Commission when the Act expires.

E. Burden of administration and litigation

The Bill would impose a heavy burden on the Commission and the Court established to hear its recommendations, as well as on those firms confronted with the need to defend themselves. Such proceedings are bound to be pro-

[61] Paul W. McCracken and Thomas G. Moore, *S. 1167—Industrial Reorganization Act*, Transcript of Hearings before Senate Antitrust and Monopoly Subcommittee, March 29, 1973, p. 216.

tracted if the relevant issues are to be explored and the trial is to amount to anything more than a drumhead court-martial. They will require in-depth studies if an informed judgment is to be made as to whether the present organization of the principal companies in an industry could be changed without a "loss of substantial economies." The broad tests of illegality set forth in S. 1167 do not simplify the process of reaching such an informed judgment because the studies would necessarily involve an attempt to measure, among other things, the probable consequences of reorganization.

These tasks would entail staggering costs on the part of both the government and the affected companies in terms of employe man-hours, managerial energies, legal and consulting fees. These costs would ultimately be borne primarily by consumers who would pay a high price for the questionable benefits of a Bill that penalizes the very firms that have established a record of superior economic performance.

F. Foreign competition

The rationalization of overseas producers to achieve the benefits of economies of scale and improved managerial systems contributed to their increased competitiveness. Chart 7 illustrates that the establishment of what now constitutes the British Leyland Motor Corporation involved a number of mergers. In 1961, Jaguar acquired Daimler and Guy Motors. Standard Triumph International, in a weak position, was taken over by Leyland, which subsequently acquired ACV, their chief competitor in heavy commercial vehicle manufacture. BMC acquired Jaguar in 1966, and changed its name to British Motor Holdings (BMH). Not long afterwards, Leyland acquired Rover, which had previously acquired Alvis. The final merger between BMH and Leyland was actively encouraged by the British government which acted at times as an intermediary and provided financing on favorable terms to assist the merger.

Concerning the merger movement overseas, Professor J. Fred Weston commented:

"While for doctrinal reasons the growth of U.S. firms has been discouraged or even impeded, since 1966 the largest foreign firms have been growing at roughly twice the rate of the largest U.S. firms. While the largest foreign firms were about half the size of the largest U.S. firms five years ago, in 1972 the foreign firms are two-thirds or more of the size of the largest U.S. firms. If the comparative rates of growth of the largest foreign firms as compared with the largest U.S. firms continue, in four years the top 100 foreign firms will be larger in total assets than the largest 100 U.S. firms. We have already experienced some disequilibrating effects of the higher growth rates of large foreign firms in the international markets. Further handicaps to the efficiency of American firms as called for by the Deconcentration Bill would further aggravate our international economic problems." [62]

American industry would be severely handicapped in its efforts to compete successfully in the world economy if it were upended by extreme structuralist doctrines not applied in the rest of the world. Firms in other countries regard the competency of American management of large scale enterprise as an asset which they seek to capture by emulation. In the United States, however, firms which attract the preferences of an exceptionally high number of customers and do it at exceptionally low cost would be subject to censure under the provisions of S. 1167.

V. S. 1167 AND EFFICIENCY

S. 1167, if enacted, would have a serious adverse effect on the efficiency of our economy. It clearly advocates the reorganization of major industries but, despite apparent protective clauses, it fails to recognize the full dimension and complex sources of economic efficiency.

Sec. 101 provides that a firm possessing "monopoly power," as defined in the Bill, shall not be subject to divestiture if it can show that this would entail "loss of substantial economies." Sec. 203 directs that the Industrial Reorganization Commission, in determining the maximum number of competitors and minimum vertical integration in the seven target industries, must avoid "the loss of substantial economies." Thus, the Bill creates the illusion that little loss of economic efficiency will result from any dismemberment under its provisions.

[62] J. Fred Weston, *S. 1167—Industrial Reorganization Act*, Statement submitted to the Senate Antitrust and Monopoly Subcommittee, March 29, 1973, p. 3.

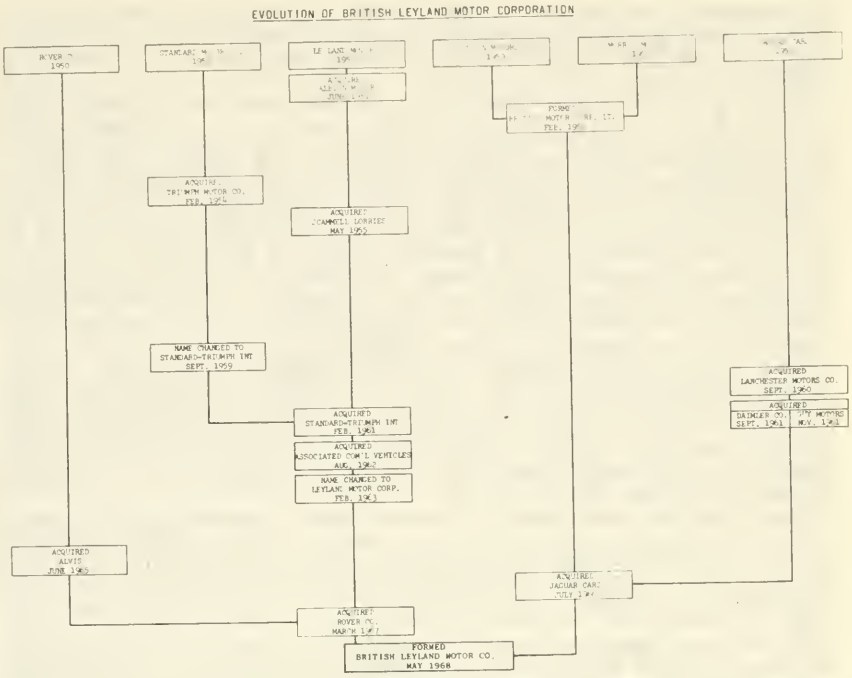

CHART 7

These safeguards against lost efficiency are illusory. The best empirical evidence of the efficiency of a firm—sales success and profits—are specifically condemned as evidence of "monopoly power." Yet, the very firms which have already demonstrated superior efficiencies are the ones required to defend their existence. They face an impossible task, however, because the preemption of these indicators of efficiency as evidence of monopoly power precludes any defense against divestiture.

In addition, the requirement that potential loss of economies be shown to be "substantial," suggests that it will be necessary for a firm to demonstrate that its operations would be "seriously impaired" upon divestiture.[63] Significant losses of efficiency, however, might well occur before such a point was reached,

[63] Senator Hart pointed out in his Section-by-Section analysis of the Bill that the language "loss of substantial economies" is similar to that used in the Public Utility Holding Act of 1935. Under that Act, the Supreme Court upheld a SEC finding that such loss must cause serious impairment to be considered substantial. *Securities and Exchange Commission* v. *New England Electric System*, 384 U.S. 176, 86 S.Ct. 1397, 16 L.Ed.2d 456, (1966).

particularly if the other efficient firms in the industry are also reorganized. At the very least, it appears that the Commission would have considerable discretion as to the degree of inefficiency it would countenance in reorganizing an industry.

While S. 1167 does not explain the term "economies," the Section-by-Section analysis of the Bill refers to "economies of scale" and "how much vertical integration is necessary." [64] Industrial efficiency encompasses much more. In fact, the overall efficiency of a firm is multi-faceted. It includes efficiences flowing from superior management, from teamwork, and from competent research, product design, material usage and production methods. Policy planning and production control, for example, are important determinants of a firm's efficiency. However, the quality of planning and control is dependent not only on the collective competence of its entire management organization, but also on the manner in which individual functions are assigned, on the interrelationships which are established to give collateral support to these functions, and on the coordination and integration of the various parts into the whole.

In the motor vehicle industry, technical economies are substantial.[65] For example, higher volume production frequently justifies expenditures on capital equipment which more than pay for themselves as the volume potential increases. Illustrative of this are the high-speed presses which, with a single set of dies, produce inner door panels for all General Motors regular-size cars. These presses are most efficient when operating at a production rate approaching two million identical panels per year.

General Motors growth has been accompanied by and continues to generate such efficiencies. Whatever might be the size for efficient auto production by any particular firm—and this would have to be large relative to the size of firms in most other industries—it does not provide any useful measure of an upper limit for production by other firms in the competitive environment that exists.

In a modern industrial society, the number and diversity of risks faced by any firm is great. To meet them successfully requires not only a competent management organization, but also a superior combination of product policy, adequate financial resources, and intuitive foresight. Professor John S. McGee has described these risks as follows:

"Production is only one of the business functions; economies and talent have powerful roles in the other ones as well. In the first place, someone must judge the market, with respect to the duration and magnitude of demands for different designs and models and the approximate quantities that can be sold at various prices. And this often means forecasting three or more years ahead. Second, someone must decide, in detail, the physical characteristics of each and all of the necessary parts and how they will fit together. Third, someone must decide precisely how to tool to produce each of the parts. Fourth, someone must allocate and schedule production so as to minimize costs. And, finally, someone must sell enough of the cars at such prices as will make the whole venture worthwhile. Mistakes at *any* stage jeopardize the whole. One can design well—by technical standards—but fail to provide what consumers really want. One can design well for the market, but design parts or tools poorly for production. One can simply make a mistake about the size or duration of a market, and under- or over-tool. And so on. In short, technical economies mean a lot, but not everything. They probably do not explain all of the differences in the costs or success of automobile firms." [66]

In the real world, the sources of efficiency are not only multifaceted, but also interrelated and interdependent. Many of them are qualitative in nature and defy precise measurement. Furthermore, both the absolute and the relative effect of each factor is constantly changing over time with changes in technology, transportation and communications, management techniques, and product characteristics. To try to measure the importance of any one of them to the overall effectiveness of a firm would be futile; to prove it in court impossible.

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[64] *Congressional Record*, July 24, 1972, S 11502

[65] Under present technology, my opinion is that no automobile firm has yet grown nearly large enough to exhaust the various technical economies in press-plant operations." John S. McGee, "Economies of Size in Auto Body Manufacture," *Journal of Law and Economics*, October, 1973, p. 263.

[66] John S. McGee, *op. cit.*, pp. 263–264.

Moreover, even if it were possible to measure the specific contribution of the various sources of efficiency to a firm's relative success, such a determination is irrelevant to the question of how the firm's efficiency would suffer if it were dismembered. The relevant facts in answering this question relate to the nature of the firm's organization and the extent to which it represents a single unified enterprise.

General Motors, for example, is a single unitary enterprise, a tightly woven network of operations interconnected both vertically and horizontally, and entirely dependent for its successful operation on the planning and coordinating functions of its corporate management and staff. GM divisions benefit from the exchange of ideas, innovations and production know-how, both directly with other divisions and through the offices of the central staffs which provide specialized services—labor relations, finance, research, engineering and design —to all divisions. Frequently, new improved methods are adopted by some divisions when superior performance by other divisions is revealed through comparisons made by corporate analysts.

The unitary nature of General Motors contributes to efficiency by providing considerable flexibility. When emergency situations arise which threaten production at a particular location, for example, it is often possible to alleviate the problems through the prompt utilization of capacity at another location. Such situations may involve local strikes, fires, machine breakdowns, transportation delays or unforeseen growth in consumer demand. On the other hand, there are many key facilities within GM peforming work which is proprietary in nature or cannot be contracted to an outside firm upon which all the divisions are dependent.

The integrated nature of GM's operations is further illustrated by the degree to which basic body and chassis components are shared by the various car lines. The high volume compact, intermediate and regular-size bodies (represented, respectively, by the Chevrolet Nova, Chevelle and Impala) are each shared by four different car lines, even though they offer different vehicles.[67] The North American models (other than Vega, Corvette and luxury cars) share three basic frame designs, two basic automatic transmissions, three rear axles, two propeller shafts, two rear suspensions and one basic front suspension design. The economies obtained through such sharing go beyond the obvious manufacturing savings, and include design, testing, tooling and service parts distribution.

Although it is not possible to quantify the technical and other efficiencies arising from General Motors' operations, it is obvious from the unitary nature of GM that dismemberment would entail a great loss of efficiency. The various divisions of General Motors are responsible only for the operations of their respective plants. Neither the plants nor the divisions are the equivalent of separate companies. They do not perform the full range of management functions required for independent business existence. As a result, dismemberment would increase their costs and reduce their ability to compete effectively. This loss would be borne, not only by GM's stockholders, employes and suppliers, but inevitably by customers.

If this Bill were to be enacted and its provisions carried out, similar losses could be expected in other companies and other industries. The cumulative loss would be a heavy one in terms of productivity, costs and prices and the ability to successfully compete against imports and in world markets. In return for the exposure of our economy to the grave risk of lost efficiency, S. 1167 offers only the wishful thought that somehow consumers will gain if industry can be restructured to resemble a theoretical classroom model.

VI. PUBLIC POLICY AND COMPETITIVE RIVALRY

The preamble to the proposed "Industrial Reorganization Act," refers to the need "to promote competition throughout the economy to the maximum extent feasible." General Motors is in complete accord with this goal because we believe in competitive rivalry.

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[67] As an indication of economy obtained through this sharing, it has been calculated that if each of the four car lines were to design its own compact in a manner so as to differentiate *doors* only, additional investment totaling $60 million would be required in terms of special tools and dies and capital equipment for a new press line.

S. 1167 is proposed as "an alternative to Government regulation and control."[68] It is doubtful, however, that this Bill, if enacted, would either promote competitive behavior or minimize government regulation. On the contrary, the new Commission and the Special Court would be vested with enormous and unprecedented power over U.S. industry. The exercise of this power would involve additional intrusions into the decision-making processes of the market economy.

Concerning governmental power, Lee Loevinger, a former Assistant Attorney General in Charge of the U.S. Justice Department's Antitrust Division, has observed:

"Usually neglected in discussion of this subject is the fact that the concentration of power has about the same social consequences, whether it is held in private or public institutions, and that economic and social power has undoubtedly become increasingly concentrated in government in recent years.

"The tendency to seek power is natural. Government officials are not disembodied spirits inhabiting some ethereal realm where they seek only some holy grail called 'the public interest.' Government officials are flesh and blood people who are motivated by the same impulses as are normal to all humans. * * *

"The power motive is to government what the profit motive is to business."[69]

On the other hand, contrary to the allegations voiced at the Hearings on S. 1167, "big" business does not possess the economic, social and political power attributed to it. The size of business firms arises not from power but from service—service to customers and to markets. A business firm has a broad constituency which votes everyday in the marketplace and determines the firm's continuing success—or its decline or at times failure. The sovereignty of the consumer, which has been dismissed so cavalierly by some, is a daily reality to businessmen.

In addition to this continual necessity to provide customers with what they want, business firms must meet numerous governmental requirements. The motor vehicle industry is subject to regulation from the inception of a product to its sale, and from sales promotion right through warranty and the fulfillment of those warranties. In meeting safety regulations alone, General Motors' cars must meet 48 different governmental standards and regulations, involving 799 separate test points and to comply with the 1974 emissions certification General Motors subjected 160 prototype cars to 794 separate emission tests.

While corporations exist at the will of the state and their activities are governed by laws and regulations, government is not the sole protector of the consumers' interests. Competition, and the forces of supply and demand remain the best protection for consumers.

Nevertheless, S. 1167 would arm the Industrial Reorganization Commission with a broad mandate to reorganize the nation's industrial structure. This mandate rather than strengthening competition would lead to the very consequences of regulation—non-competitive behavior—which the proponents of S. 1167 rightfully deplore. It also would accelerate its damaging trend of government action to override free market processes through increased regulation.

These anticompetitive tendencies would be magnified if the "reorganization" contemplated by the Bill were ever carried out. It is entirely unrealistic to suppose that the Commission would be able to fragment business enterprises and then leave them to struggle on their own. The only way the survival of these artificially-created entities could be assured would be to surround the industry with a web of regulations giving access to suppliers, to markets, to personnel, to technical knowledge and other essentials for business success. The *Ford-Autolite* divestiture decree, with its anticompetitive restrictions, is a classic example.[70]

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[68] *Congressional Record*, July 24, 1972, S 11495.

[69] Lee Loevinger, An Address before International Radio and Television Society, New York, January 4, 1973, pp. 24–25.

[70] In this case the decree directed Ford to buy 50 percent of its spark plug requirements from the divested concern for a period of five years and enjoined Ford for a period of ten years from making spark plugs itself. *Ford Motor Co. v. U.S.*, 405 U.S. 562 (1972). This actual restriction on competition is decreed to be justified by theoretical benefits which might arise at some time in the future from the addition of a competitor. See also *Calnetics Corp. v. Volkswagen of America*, 353 F. Supp. 1219 (C.D. Cal. 1973), in which the defendant was ordered not only to divest itself of a domestic manufacturer of auto air conditioners, but also was enjoined from making them itself in the United States for a period of ten years and even enjoined for seven years from importing vehicles from abroad with air conditioners already installed.

Implementation of this Bill would represent a giant stride in the direction of a fully-controlled economy—the very thing its sponsors say they abhor. The Bill would prevent competitive rivalry from proceeding to its logical conclusion; namely, that some companies will succeed better than others—at least for a time. In place of vigorous rivalry, this proposal would substitute the indifferent performance of regulated industry.

As Professor Paul McCracken put it during his testimony before this Subcommittee: "Rather than having American industry guided by the 'invisible hand,' industry would be subject to the withering hand of Government. We see the hazards of such an approach when we consider the effect of Government regulation. . ." [71] The achievement of freer competition, therefore, would best be accomplished by deregulation of government-sponsored monopolies. As Professor Donald F. Turner said: "* * * if it is to deal with the monopoly problem in our economy, Congress would do well to pay at least equal attention to unnecessary monopoly and restriction on competition imposed by widespread, unwarranted governmental regulation of various sectors of the economy.

"While I obviously do not agree with those who think that that is the only monopoly problem, I certainly agree [that] it is a most serious aspect of the problem, and am inclined to agree that *probably more could be done for competition generally in our economy by deregulation than by deconcentration in the unregulated sector.*" [72] (Italics added)

In view of the great increase in government regulation and its sorry record, and the fact that the U.S. economy, despite a number of current difficult problems, is basically strong and has great potential for further growth, the advocacy of S. 1167 is incomprehensible.

VII. CONCLUSION

The Industrial Reorganization Act is based on a fallacious concept of competition and it would not accomplish its stated purposes if enacted. It also represents an unwise and extreme delegation of authority to yet another appointive regulatory agency.

It would hobble the competitive enterprise system; it would be harmful to the best interests of consumers, and it would retard economic efficiency at a time when such efficiency is needed to deal with a host of economic and social challenges.

Exhibit 20.—GM Corp. Study Entitled "Competition and the Motor Vehicle Industry"

Competition and The Motor Vehicle Industry

INTRODUCTION AND SUMMARY

This study appraises the competitive dynamics of the motor vehicle industry with particular reference to General Motors Corporation. It is a good time to make such an appraisal. As a nation, we are entering the final quarter of a century that has seen great changes in the way we live and great advances in our standard of living. The motor vehicle industry, which is just about as old as the century, has contributed significantly to these developments.

The study consists of seven chapters which describe and analyze the competitive disciplines in the motor vehicle industry. Chapter I provides a brief account of the factors which determined the changing competitive fortunes of automotive producers through the nearly post-World War II years. Chapter II describes the vigorous rivalry among the manufacturers—domestic and foreign—to meet the demand for motor vehicle transportation during the past three decades. It includes a discussion of the smaller car challenge as well as the competitive interaction between new and used vehicles and between motor vehicles and other modes of transportation.

The multidimensional aspects of competition—competition in products and manufacturing processes, in prices, and in marketing and servicing—are ex-

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[71] Paul W. McCracken, *op. cit.*, p. 216.

[72] Donald F. Turner, *S. 1167—Industrial Reorganization Act*, Transcript of Hearings before the Senate Antitrust and Monopoly Subcommittee, March 30, 1973, p. 308.

amined in Chapters III to V respectively. These forms of competition are inseparable and their interplay is indispensable to the satisfaction of consumer demand. Chapter VI deals with "concentration," the requirement of size, and conditions of entry in the industry. Chapter VII discusses the sources of General Motors' efficiency.

Competitive rivalry to attract customer patronage and to achieve efficiency and progress is the hallmark of the motor vehicle industry. This rivalry has produced steady improvement in product quality, an expanding range of vehicles to serve the diverse needs of customers, highly competitive price trends and major advances in manufacturing technology, processes and marketing methods.

Customer preferences are the single most important influence shaping the industry and its products. Every manufacturer faces the overriding necessity of building vehicles which fit the varied needs of many different users and to do so efficiently. In view of new product lead times often exceeding three years, the manufacturer has to anticipate customer needs and assume the risks of large investments. General Motors' success stems from its early and continuing recognition of these competitive imperatives. Since the early 1920's, General Motors' policy has been to provide customers with improved cars "for every purse and purpose."

No motor vehicle manufacturer has control of any part of the market. There are striking variations in customer acceptance of each manufacturer's products—variations by product groups, car lines and geographic area. While repeat sales are highly prized, the evidence is overwhelming that customer preference must be earned anew with each sale. Customers do not have to buy from any manufacturer. Sales can only be obtained by offering buyers products which yield values which the customer considers to be superior to any alternative.

Currently, motor vehicle manufacturers—domestic and foreign—offer more than 425 passenger car models and body styles in the United States. The availability of alternative engines, drivelines and comfort and convenience equipment provides customers with an almost continuous gradation of product choice. Over the years, U.S. consumers have received the cars they demanded, although many were produced which failed this test. The American buyer has had a wider choice of new cars, both small and large, at fully competitive prices than new car buyers anywhere else in the world.

Motor vehicle producers also face competition from the large stock of used vehicles in the U.S. The great reservoir of unused mileage and the repairability of motor vehicles give customers the option of continuing to use existing vehicles rather than purchasing new ones. The interaction between new and used vehicles is an integral part of competition in the industry.

If there is one phrase that can describe the motor vehicle market, that phrase would be "dynamic change." Since motor vehicles are durable and represent a major family purchase decision, cyclical swings in employment and in consumer confidence create amplified swings in new car demand. Moreover, the relative purchase rates of particular car lines or body styles vary as consumer life styles change.

This is well illustrated by the increasing use of light-duty trucks for personal transportation, particularly for recreational purposes. With an estimated one out of every seven households having a light-duty truck occupying the second spot in their two-car garages, light trucks have become a new contender for consumer favor.

Competition in the industry is multidimensional. It encompasses all aspects of the product, the processes used in their manufacture, how they are sold and serviced and at what price. Product competition has produced a steady stream of innovation, much of which has met the rigorous test of the market by providing greater value, safety and reliability. Manufacturers also compete to develop new processes, tools, skills and materials that result in more efficient manufacturing operations and permit more effective responses to consumer demand.

Out of a long and painstaking process of trial and error, a variety of marketing programs have evolved. These are highly competitive efforts to keep the marketing process sensitive to specific trends in customer preferences. Efficiency in marketing, no less than in manufacturing, must be an integral

part of business success. Marketing programs include, for example, efforts to do a better job in informing customers about the vehicle and its features through enective advertising, making the product easily available through a well-located dealer network and through selling incentives and promotions.

The franchised dealer system is the cornerstone of motor vehicle marketing. Its strength lies in the skill and commitment of thousands of independent local businessmen. The widespread use of this system by both domestic and foreign manufacturers in preference to other readily available marketing and distribution channels is proof of its efficiency in serving the needs of the motor vehicle buying public.

Pricing is an important aspect of competitive rivalry in the industry. The Manufacturer's Suggested Retail Price (MSRP) is at most a preliminary assessment of the competitive challenge which each product faces. It is tested daily by the reaction of customers in the marketplace. The price the customer pays—the transaction price—reflects the customer's valuation of the product which may be above or below the MSRP. Manufacturers must accommodate to these valuations and customarily do this through special sales campaigns and product promotions. These provide a sensitive and flexible means of adjusting prices to changing conditions in demand and the competitive efforts of other producers.

Price and product competition are two sides of the same coin. The significant expansion since 1959 in the variety of smaller and lower priced cars is another way of saying that customer interest in this area of the price-product spectrum has expanded. On balance, reflecting improvements in manufacturing efficiency, competitive pressures and shifts in the mix of new cars purchased, the increase in the average price paid for a new vehicle has been relatively small in spite of strong inflationary pressures during most of the past decade.

Large scale manufacturing has been a characteristic of efficient passenger car manufacture in the U.S. ever since the mass production of the assembly line replaced the handmade product of the mechanic's garage. The complexity and size of motor vehicles requires a large investment in plant, equipment, machinery and specialized tools as well as large professional staffs which cut across the entire range of scientific, engineering and management skills. This generalization applies to producers in the United States and increasingly to those in other industrialized areas of the world. To a greater or lesser degree, all are realizing economies of scale in individual plant operations, economies achieved through the carefully designed commonality of certain parts and tooling, logistic and other benefits resulting from multi-plant operations, and, importantly, economies from management systems that provide overall coordination, direction and motivation.

Illustrative of efficiency on the plant level are the economies of scale in metal body stamping. With proper maintenance, the dies commonly used in the manufacture of automotive body panels can be used to stamp very large numbers of pieces. GM, for example, has obtained as many as seven million pieces from body part die sets and currently is using die sets which have already turned out over four million major pieces. Clearly, the higher the output requirements, the greater the utilization of the die sets and the lower the cost per piece.

The multi-plant operations of General Motors result in additional savings through logistics, access to regional markets, additional scale economies, utilization of specialized assembly lines, and expanded opportunities for commonality in certain parts and tooling. There are, for example, 10,800 dies and fabricating tools, costing an estimated $500 million, employed jointly in the manufacture of Chevrolet car bodies and the bodies of other GM car divisions. The economies of such commonality would be lost if each operating division were forced to reconstitute itself as a self-contained business.

General Motors, in pursuit of improved efficiency, is a closely knit system of highly specialized manufacturing, assembling and marketing activities coordinated under the overall guidance of a unified policy and managerial control. As important as technology is, it is management—the development of capable people, their organization into an effective team and the creation of products that customers want—that ultimately equates technology with efficiency. The various divisions under this overall direction are responsible only

for the operations of their respective plants. Neither the plants nor the divisions are the equivalent of separate companies. They do not perform the full range of management functions required for independent business existence.

General Motors' growth since the early 1920's has been preponderantly growth from within. Its size has been determined by the product itself, the requirements of efficient manufacture, distribution and service, as well as market demand. Within this context, its present size has been determined by willingness to assume the risks of growth and by the ability to realize the added efficiencies of growth. Its present size is a result of its ability to satisfy consumer demand more effectively than its competitors.

The design, manufacturing and marketing of motor vehicles has always been a high risk, turbulent business. Industrial history is replete with evidence that a firm will prosper and grow only so long as it serves customers efficiently, and that it will decline, regardless of its past achievements, whenever it fails to meet customer demands.

The success of the industry in providing mobility for the millions, not just for a select few, was not the result of government sponsorship, protection or subsidy. It was achieved by private capital competing freely in the marketplace—the mechanism for consumer approval or rejection of products and services.

I. THE HISTORICAL SETTING

The history of the motor vehicle industry from its early years is directly relevant to the central theme of this study—the vigorous competitive rivalry to attract customer patronage and to achieve progress and efficiency. Examination of the record of early entries into the business and of the high incidence of failure demonstrates that from the outset the automotive industry was, as it is today, intensely competitive.

The first successful gasoline-engine automobile in the United States was "born" 81 years ago. Scores of companies with a variety of vehicles entered the infant industry each year in the early 1900's. Of the nearly 1,000 companies that tired to build and sell motor vehicles prior to 1927, less than 200 continued in business long enough to offer a commercially suitable vehicle.[1]

There were many reasons for failure. Some early makers were good engineers but poor business managers. Some guessed wrong on what the public would like. Engineering improvements came too fast for many firms to keep pace. From the very beginning of the industry, one thing was clear: the risk of failure was at least as great as the reward for success.

The financial lure of the new industry was described as follows:

"The Ford Motor Company was a business success from the start. Sales for the three-and-one-half-month period between June 16 and September 30, 1903, totaled $132,482, and resulted in a net profit of $36,958. On October 1, 1903, a dividend of 2 per cent was paid; a month later, 10 per cent; in January, 1904, 20 per cent; and six months later, 68 per cent. In a little more than fifteen months from the date of incorporation, the Ford Motor Company had paid dividends totaling 100 per cent of the issued capital stock." [2] In later years, Ford attained equally impressive results. In 1909, for example, it earned profits of $3,225,876 on a net worth of $2,028,553—a return of 154 percent.[3]

Late in 1908, in this formative period of great risk and great reward, General Motors was organized. Most of the companies which comprised General Motors "were small and untried enterprises, badly in need of equipment and of inventories; and many of them were in debt." [4] The new company faced tough competition and an uncertain future. Success was not predestined. There was no guarantee of a place in the market nor assurance of any profit.

General Motors' sales for the first full fiscal year totaled 25,000 cars and trucks, 19 percent of total U.S. sales. Its sales grew over the next few years at a lower rate than that of the industry. By 1916, sales of 146,000 GM motor vehicles represented only 9 percent of the U.S. total. In contrast, Ford's sales that year had reach 598,000 units, or 37 percent of the industry total.

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[1] Lawrence H. Seltzer, *A Financial History of the American Automobile Industry* (Houghton Mifflin Company, New York, 1928), p. 64

[2] *Ibid.*, p. 91.

[3] *Ibid.*, p. 128.

[4] *Ibid.*, p. 161.

The weakness of General Motors and the leadership of Ford became very apparent during the economic crisis of 1920–21 when industry sales fell from 2.2 million vehicles in 1920 to 1.6 million in 1921.[5] Ford remained the industry leader with about 60 percent of the motor vehicles produced in 1921.[6] Ford's name was a household word wherever roads reached. Its factories were efficient and its distribution network well organized. Ford's announcement of a $5-a-day wage had made its employes the envy of all workers and its consistently high profits had made it the envy of most businessmen.

General Motors' position was markedly different. The companies which evolved into GM's five car divisions were weak and their operations were uncoordinated. While some units had cash in excess of their needs, others were borrowing. Some were paying higher prices than others for the same materials. There was no proving ground, no inventory or production control, no product planning, and only the most rudimentary research, sales forecasting and financial analysis.

These deficiencies and the onset of the economic crisis resulted in such serious financial difficulty for General Motors that it was necessary to borrow $83 million from banks in October, 1920 in order to avert complete collapse. It reported a loss for 1921 of $38.7 million—an amount almost equal to its total profit for its first six years of operation, 1909 through 1914.

Apart from Buick and Cadillac, the companies included in General Motors had either already failed (e.g., Cartercar, Elmore, Ewing, Marquette, Welch); were about to fail (e.g., Scripps-Booth, Sheridan); had shut down during the 1920–21 depression (e.g., Oakland[7] and Oldsmobile); or had poor prospects. Chevrolet lost $8.7 million in 1921 and a firm of consulting industrial engineers recommended that it be dropped.[8] In total, GM production in 1921 was less than 12 percent of U.S. industry output. Chart 1 shows the distribution of new vehicle production in 1921.

The crisis marked the turning point in General Motors' history. New men were asked to assume leadership of the Corporation. A new concept of management was forged and a new concept of product emerged. Coordinated policy control replaced the undirected efforts of prior years.

The new management concept has been acknowledged as a milestone in business administration and its principal architect, Alfred P. Sloan, Jr., as a pioneer of modern management. Fundamentally, it involves (1) coordination of the enterprise under top management and of policy under top-level committees, and (2) delegation of operating responsibility. Within this framework, management staffs conduct analysis, advise policy committees and coordinate administration.[9]

The clear recognition that policy must be the responsibility of top management and that it must be based on the best available data and sound evaluation has been a major factor in the growth of General Motors.[10] By delegating responsibility, this management concept encourages individual accomplishment. This kind of decentralization emphasizes the importance of skills and experienced people. It seeks to maximize the initiative, imagination and creativity of the individual in a large organization.

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[5] U.S. Federal Trade Commission. *Report on Motor Vehicle Industry,* House Document No. 468, 76th Cong., 1st Sess., (1939), p. 22.

[6] L. D. Crusoe, former executive vice president, Ford Motor Co., has testified that Ford "produced almost 62 percent of all of the cars built in America" in 1921. Hearings, "A Study of the Antitrust Laws," Senate Judiciary Subcommittee on Antitrust and Monopoly, 84th Cong., 1st Sess., (1955), pt. 2, p. 646. Industry unit production and sales data for this early period are not fully reliable. Thus, estimates of Ford's share of sales vary from 55 to 62 percent.

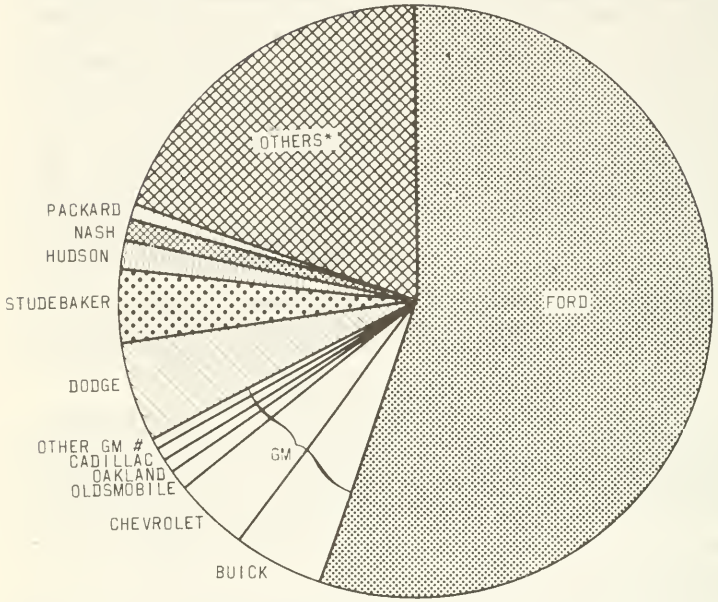
[7] The Oakland Motor Car Company is now the Pontiac Motor Division.

[8] Norman Beasley and George W. Stark, *Made in Detroit* (G. P. Putnam's Sons, New York, 1957), p. 279. Alfred P. Sloan, Jr. said that the Chevrolet of this period was "of very poor quality" and that the Ford, Hudson and Dodge cars were "far superior." Deposition of Alfred P. Sloan, Jr. in *U.S. v. du Pont, GM, et al.,* April 28, 1952.

[9] See Alfred P. Sloan, Jr., *My Years with General Motors* (Doubleday and Company, Inc., Garden City, N. Y., 1964).

[10] "Vital decision-making, in policy matters as well as in business, must remain at the top. That is partly—though not completely—what the top is for. But rational decision-making depends on having a full range of rational options from which to choose. Successful management organizes the enterprise so that this process can best take place. It is a mechanism whereby free men can most efficiently exercise their reason, initiative, creativity and personal responsibility." J. J. Servan-Schreiber, *The American Challenge* (Athenaeum House, Inc., New York, 1968), pp. 79–80.

DISTRIBUTION OF U.S. MOTOR VEHICLE PRODUCTION - 1921



* Others Include: Maxwell, Reo, Graham, Auburn, Pierce-Arrow, Hupp, Chandler, Chalmers, Lincoln And Willys-Knight

\# Includes Scripps-Booth, Sheridan And GM Truck

Source: F.T.C. Report on Motor Vehicle Industry, 1939, p.27; Published Company Data, And L.H. Seltzer - A Financial History of The American Automobile Industry

CHART 1

This widely acknowledged emphasis on systematic management, discussed in Chapter VII, has been and continues to be a key element in General Motors' success.[11] In contrast, business historians have cited Ford's disregard of sound management principles as one of the basic reasons for the decline of the company in the quater century after 1920.[12]

The management concept was central to General Motors' ability to compete successfully against Ford in the 1920's. Similarly, the resurgence of Ford in the 1950's has been largely credited to its reorganization under General Motors' management principles and the leadership of executives (some formerly with General Motors) skilled in objective management.[13] The importance of organi-

[11] "By 1925 then, the structure, initially designed by Sloan before the crisis of 1920 and put into effect early in 1921, had been worked out so as to assure effective administration of the many and varied industrial resources that Durant had collected. • • • The new organizational structure served General Motors well. From 1924 to 1927, the Corporation's share of the motor vehicle market rose from 18.8 per cent to 43.3 . . . From then on, General Motors has maintained the leading position in the industry. The clearly and rationally defined structure became increasingly valuable as the demand for automobiles leveled off and competition intensified." Alfred D. Chandler, Jr., *Strategy and Structure* (M.I.T. Press, Cambridge, 1962), p. 158.

[12] Allan Nevins and Frank Ernest Hill, *Ford: Decline and Rebirth, 1933–1962* (Charles Scribner's Sons, New York, 1962), p. 230; Crusoe, *op. cit.*, pp. 647–648.

[13] Allan Nevins and Frank Ernest Hill, *op. cit.*, pp. 315–345, 387.

zation and management to success in large competitive firms is equally true today and is receiving increased recognition.[14]

General Motors was the first company in the industry to establish a design staff, a proving ground, a research laboratory, and a consumer research activity. This staff work led to the recognition of the varied nature of the demand for motor vehicles. The General Motors' approach, therefore, was "a car for every purse and purpose" and its continual improvement, rather than the Ford idea of basic transportation of "any color . . . so long as it is black." The GM concept recognized that all customers were not alike and led to a product policy which sought to respond to all segments of customer demand. The policy was based on the recognition that most customers wanted more than just basic transportation; they also wanted comfort, good appearance, performance that was better than just adequate, and above all, periodic improvement.

General Motors' contributions to automotive engineering and competitive innovation also were important factors in its success. Prior to World War II, they included the first all-steel one piece roof, two-cycle diesel truck engines, independent front-wheel suspension and the automatic transmission. Stimulated by competitive rivalry, many companies engaged in this constant effort at product improvement and innovation.[15]

The effect of these new management and product concepts is evident in the changed sales positions of the competing companies in the years up to World War II.

As shown in Chart 2, General Motors' improved performance was reflected in an increase in sales from 12 percent of the U.S. total in 1921 to 44 percent in 1941. The new Chrysler Corporation founded by Walter P. Chrysler, a former General Motors executive, went from 3 percent of sales in 1925 to 23 percent in 1933 and exceeded Ford in 1940 and 1941. Ford with about 60 percent of sales in 1921 dropped to 20 percent by 1941.

From this background of the prewar years, several facts that bear upon competition in the automotive industry deserve emphasis. First, large size and intense continuing competitiveness have characterized the most successful firms for more than half a century. Ford's great profitability attracted new competition. Yet, its high market share in the early 1920's did not enable the company to control the market nor prevent other companies from competing successfully. A high market share and great profitability cannot insulate any motor vehicle manufacturer against loss of position to competitors who offer better product values.

Second, the companies which made up General Motors, most of which were discontinued as failures, constituted a firm which by 1920 was in deep financial trouble, with a weak product line and poor sales prospects. The fact is that General Motors' growth since this depressed position in the early 1920's has been preponderantly growth from within.

Third, General Motors began to develop only as the new system of internal administrative management took shape after 1920. This concern with organization and managerial skill in large-scale enterprise was a major factor in the improvement in the company's competitive success. Another major factor was the new product concept along with constant improvement and innovation to meet changing public tastes.

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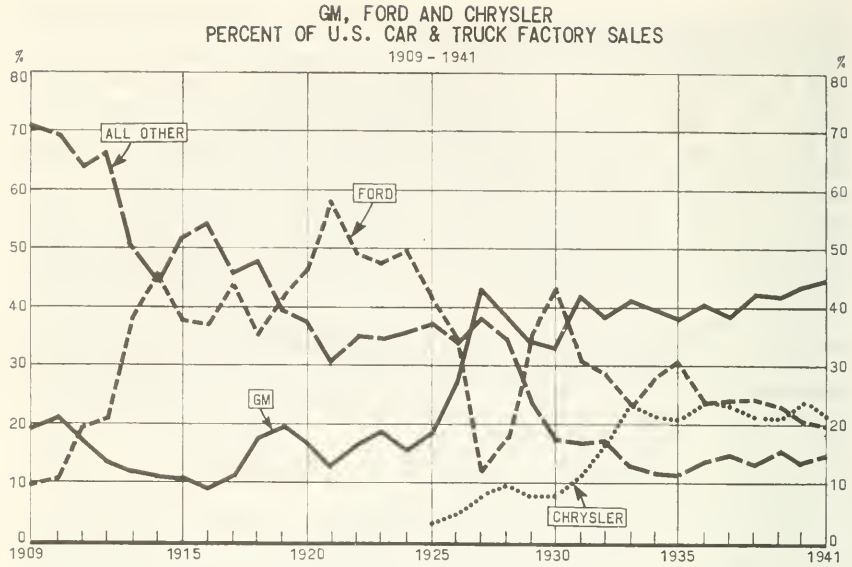
[14] "One of the greatest 'quality' superiorities in the United States has been the ingenuity and energy of its 'entrepreneurs'—its business innovators, managers, and risk takers. The spirit of inquiry and innovation, and the organizing and operating energy of the American entrepreneur deserve much credit for our spectacular economic progress." George Leland Bach, *Economics—An Introduction to Analysis and Policy* (Prentice Hall, Englewood Cliffs, N. J., 1971), p. 238.

As Professor Arthur Schlesinger, Jr., in his foreword to the Servan-Schreiber book summarizes its thesis, the success of American industry is not attributed to greater capital or scientific and technological superiority but rather to: ". . . the 'art of organization'—in the mobilization of intelligence and talent to conquer not only invention but development, production and marketing . . . American industry spills out across the world primarily because of the energy released by the American system—by the opportunity for individual initiative, by the innovative knack of teams, by the flexibility of business structure and by the decentralization of business decision." J. J. Servan-Schreiber, *op. cit.*, p. ix.

[15] See, for example, the listing of milestones in Automobile Manufacturers Association, Inc., *Automobiles of America* (Wayne State University Press, Detroit, 1970).



NOTE: Ford Data Based on Production 1909-1925

SOURCE: 1909-1925 Published Company Data
1926-1941 AMA

CHART 2

The varying fortunes of the motor vehicle companies during the prewar years reflect the differing management capabilities and responses to customer demands. General Motors, in the last analysis, owes its success to superior management and to greater public acceptance of its products in the free marketplace.

With the entrance of the United States into World War II, civilian motor vehicle production was sharply curtailed. While virtually all passenger car production was suspended, new trucks for non-military use were rationed on the basis of national priorities. For the duration of the war, the industry became part of the "arsenal of democracy."

In 1945, when civilian motor vehicle production resumed, the prewar manufacturers—along with at least one significant newcomer, Kaiser-Frazer—took up the competitive challenge.[16] The strength of the postwar economy plus the backlog of demand created by the more than three year lapse in civilian production generated a strong demand for motor vehicles in the early postwar years. This period in the motor vehicle industry was similar in many respects to the early years of the industry when the primary problem was to produce a vehicle—*any* vehicle. Raw materials and parts shortages combined with labor difficulties prevented manufacturers from producing to their full capacity.

Chrysler, Ford, General Motors, Hudson, Nash and Packard resumed production of their prewar passenger car models with minimal modifications. In 1946, Studebaker, which produced prewar car models for a few months in 1945, introduced the first new postwar model and the Crosley Corporation began production of a small lightweight car which it had designed before the war. Civilian truck production expanded as plants, closed during the war, were reopened and facilities which had been devoted to military vehicles were reconverted. Willys-Overland, which built Jeeps during the war, modified

[16] "All the firms producing cars in 1946 were in the position of having to enter or re-enter the industry after the end of the war." Charles E. Edwards, *Dynamics of the United States Automobile Industry* (University of South Carolina Press, Columbia, S.C., 1965), p. 4.

their design and continued production for the civilian market. They also reestablished passenger car production.

As in the early years of the industry, a number of new companies sought to produce motor vehicles. Kaiser-Frazer achieved some success for a while but was unable to meet the more exacting customer requirements which developed as the war backlog was filled. Most of the new companies never manufactured more than a few prototypes.[17] Even Ford Motor Company was shaken by "financial chaos" prior to its reorganization between 1945 and 1948.[18]

In the early 1950's, the renewed importance to customers of product improvements and the post-Korean War recession demonstrated that success in the motor vehicle industry required more than the ability to turn out a car or truck that ran. Since then, the success of motor vehicle manufacturers has hinged increasingly on their ability to provide the type of product desired by their customers at a competitive price.

II. MEETING THE DEMAND FOR MOTOR VEHICLE TRANSPORTATION

Competition in the motor vehicle industry is an unending process of rivalry among competitors to attract the patronage of motor vehicle purchasers. It could not be otherwise, for new vehicle buyers are well informed and choose carefully from among competing makes, many of which they may have driven and tested throughout their adult lives. Comparisons among motor vehicles are facilitated by the fact that they are highly conspicuous on the streets and highways and are probably talked about more than any other high-value product. The consequence is that the industry's offerings are subject to continuing scrutiny by a public that is both sophisticated and experienced with respect to motor vehicles.

This chapter describes the demand for motor vehicles and the vigorous rivalry—stiff competition—faced by any and every manufacturer, domestic and foreign, to serve the public's diverse requirements for motor vehicle transportation. In addition, the important competitive pressures resulting from used vehicles and alternative transportation modes are discussed.

A. The demand for motor vehicles

The level and composition of the demand for motor vehicles reflects a variety of needs in our economy, including personal transportation and the movement of goods. Motor vehicles are purchased by individuals, by rental and leasing firms, by companies for use in their own operations, and by governmental units.

Since the early 1900's, the number and variety of new motor vehicles purchased each year has grown significantly. New vehicle sales reached 1 million by 1916 and 5 million by 1929. Annual sales during the great depression fell to a low of 1.3 million in 1932. In the post-World War II period, demand expanded to a record 14.4 million in 1973. In recent years, about 70 percent of annual purchases represent replacement of cars and trucks which have been scrapped.

The number and types of passenger cars and other vehicles purchased for personal transportation are influenced by the level of personal income, the size and age distribution of the population, family characteristics and life style. For example, the unprecedented increase in the number of young people who attained driving age during the mid-sixties—a period of sustained prosperity—accounted for the surge in the popularity of sporty and other specialty cars. Various social factors also have an impact on vehicle demand. The continuing movement to the suburbs and the increasing number of working wives stimulated the demand for second and even third cars. Increased leisure and a desire to spend more of it away from cities and their environs contributed to the spurt in demand for recreation vehicles during the past several years.

The types of new cars that appeal to various kinds of customers obviously will differ considerably. The manufacturer who wishes to accommodate all purses and purposes, therefore, must provide the public with a wide variety

[17] "In 1948, AMA says, 20 new companies were organized to build cars. Not a single one got into volume production." *Business Week*, February 6, 1954, p. 55.

[18] Nevins and Hill, *op. cit.*, p. 328.

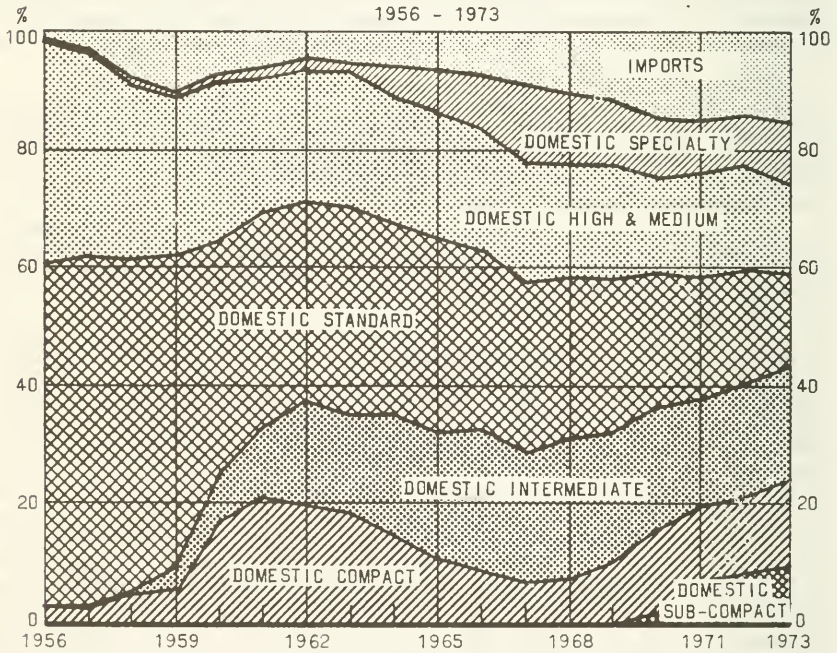
of vehicles. These range from basic transportation to limousines, from two-seat sports cars to full-sized family cars and vans. Numerous items of optional equipment permit tailoring an essentially stock product to the individual requirements of a highly varied demand.

The demand for motor vehicles also is determined by product improvements which add to their efficiency, comfort and convenience. Recently, concern over fuel shortages and increases in the price of gasoline have affected motor vehicle demand by enhancing the popularity of smaller cars. Government regulation of prices, tax changes and the imposition of design and performance criteria for automotive products also affect the level and composition of demand.

Since the mid-1950's, there have been significant changes in the types of motor vehicles purchased. The fluctuating nature of customer demand for passenger cars is demonstrated by changes in the relative importance of seven product groups,[19] as shown in Chart 3.

Since 1956, there has been a decline in the relative importance of the standard and the medium and high categories reflecting, in part, the introduction of intermediate cars in 1959. Compacts, which were increasingly popular until 1961, when they accounted for 20.8 percent of registrations, declined to 6.7 percent of registrations by 1967. Since then they have regained consumer favor and represented 14.7 percent in 1973.

PERCENT OF INDUSTRY NEW PASSENGER CAR REGISTRATIONS ACCOUNTED FOR BY PRICE PRODUCT GROUPS



Source: Based on R.L. Polk Registrations And Ward's Classifications

CHART 3

[19] Composition of the six *domestic* product groups in 1973: *Standard*—Ambassador, Chevrolet, Ford, Fury; *Intermediate*—Century, Chevelle, Charger, Coronet, Cutlass, Le-Mans, Matador, Montego, Satellite, Torino; *Compact*—Comet, Dart, Hornet, Maverick, Nova, Omega, Apollo, Valiant, Ventura; *Sub-compact*—Pinto, Gremlin, Vega; *Specialty*—Barracuda, Camaro, Challenger, Corvette, Cougar, Eldorado, Firebird, Grand Prix, Javelin, Mark IV, Monte Carlo, Mustang, Riviera, Thunderbird, Toronado; *Medium and High*—Dodge, Pontiac, Oldsmobile, Buick, Mercury, Chrysler, Cadillac, Lincoln, Imperial.

Imported cars accounted for 10.2 percent of registrations in 1959 but declined in popularity in the following three years. Since 1962, however, the demand for these vehicles has recovered and they accounted for approximately 15 percent in 1973. Specialty cars rose to a high of 12.8 percent in 1967 but tapered off to 10.3 percent in 1973. Domestic sub-compacts, first introduced in 1970,[20] grew to represent 9.4 percent of the total in 1973.

In addition to the trends shown in Chart 3, another significant development in recent years has been the growing demand for light-duty trucks for personal transportation. They rival cars in either the standard-size or intermediate-size product groups in popularity. For example, in 1973, Chevrolet's half-ton Fleetside pickup was the largest selling model of any General Motors' vehicle.[21]

These trends were determined by the customer—the single most important influence in the industry. In determining their needs, customers today have more information than ever about new vehicles. Unlike the early days of the industry, when motor vehicles were a novelty and many buyers were making their first purchase, in the 1970's more than two-thirds of new vehicle sales represented replacement of existing cars and trucks. Today's buyers shop with an extensive background about what they need and want. They know about the products by personal driving experience—experience with rental cars and test drives at dealerships as well as with their own cars, by the experiences of their relatives and friends, and by the reputation of both the manufacturers and the dealers. Since the purchase of a new vehicle is in most cases a major investment, they have every incentive to make an informed purchase by actively shopping among competing products. For example, a GM Customer Research survey found that seven out of ten purchasers of 1973 compact and sub-compact cars said they considered buying a different make than the one they actually purchased. In addition to information obtained from salesmen in the dealerships, the customer's interest in making an informed selection is served by a variety of automotive magazines and other periodicals as well as by manufacturer and dealer advertising.[22]

Each time a customer purchases a new car he has the opportunity to evaluate alternative makes in relation to his specific needs and preferences. While some buyers select the same make as the one they already own, many others, for a variety of reasons, choose to purchase a different make. As a consumer's economic and family circumstances change, the type of vehicle desired often changes. The availability of new products better suited to an individual's preferences also causes changes from one make to another.

Chart 4 illustrates the repurchase rates for the five GM car divisions.

In the 1973 model year, 54 percent of those new car buyers who replaced a Chevrolet purchased another Chevrolet, about 15 percent shifted to other GM cars and more than 30 percent switched to the products of other manufacturers. The Pontiac Division had a repurchase rate of 40 percent, with 30 percent buying other GM cars and 30 percent buying non-GM vehicles. Cadillac's repurchase rate of 65 percent was the highest for General Motors' divisions.

While repeat sales are highly prized by each manufacturer, the evidence is overwhelming that customer preference must be earned anew with each sale.

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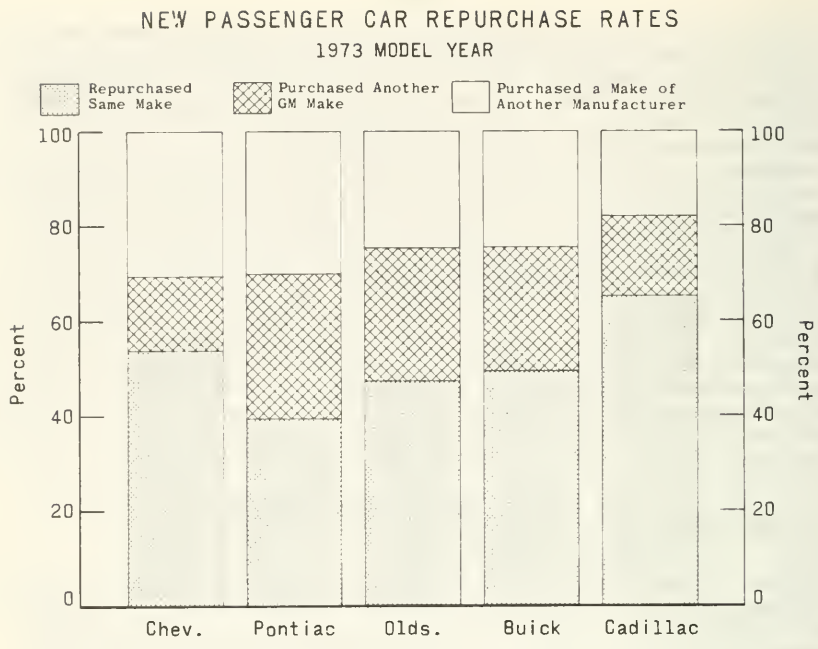
[20] While some domestic smaller cars—the Henry J, Crosley, Aero Willys and Rambler—were offered to the public in the early post-World War II period, there was little demand for them. Except for the Rambler, they were all discontinued by 1955.

[21] For a discussion of the competitive interaction between light-duty trucks and passenger cars see p. 44 to 48.

[22] The customer can approach the purchase of a new car with almost complete information on all aspects of the transaction. "Automobile row," the geographic clustering of competing dealerships, offers customers the opportunity to compare competing products within a short period of time. The value of his used car, assuming he is trading, is readily available from the same used car guide books that the dealer would consult. These are available in almost all public libraries and banks and provide both estimated wholesale value as well as retail value. The customer always has, of course, the option of selling his used car privately through a well established market of classified ads in daily newspapers. The prospective customer can even obtain a good estimate of the dealer cost of the car by purchasing annual paperbacks displayed in supermarkets, drug stores, etc. Periodicals with automotive consumer information, in addition to daily newspapers, include: Car and Driver, Road and Track, Popular Mechanics, Motor Trend, Road Test, Consumers Bulletin, Consumer Reports, Automotive News, Automotive Industries, Motor Magazine, Sports Car Digest, World Car Guide and Car International.



Source: GM Customer Research

CHART 4

During the 1973 model year, for example, an estimated total of 30 percent of sales—more than 3 million cars—represented shifts in buyer patronage among manufacturers. In addition, and estimated 500,000 new car buyers did not previously own any car and 1.2 million purchased a second or third car. All producers are aware that a substantial percentage of customers are undecided and may switch makes in their next purchase.

There is active competitive rivalry among the automotive firms to win customers from other manufacturers, to attract buyers who are purchasing a new car for the first time or are becoming multiple car owners, and to retain the patronage of previous customers. Thus, the annual sales volume of each manufacturer is only a composite of innumerable individual choices—nothing can be taken for granted.

The overriding necessity to give the customer what he wants in his new vehicle is evident in the range of products offered, in the introduction of new and redesigned models and in the variety of optional equipment made available. To succeed, a manufacturer must offer products with substantial utility and appeal relative to those of competitors, and offer them at fully competitive prices.

Customer reaction to the competitive offerings is decisive and crucial. Manufacturers, in varying degrees, succeed in anticipating and adapting to changing customer preferences. No producer can ignore them. None can control them.

B. Competitive rivalry among passenger car suppliers

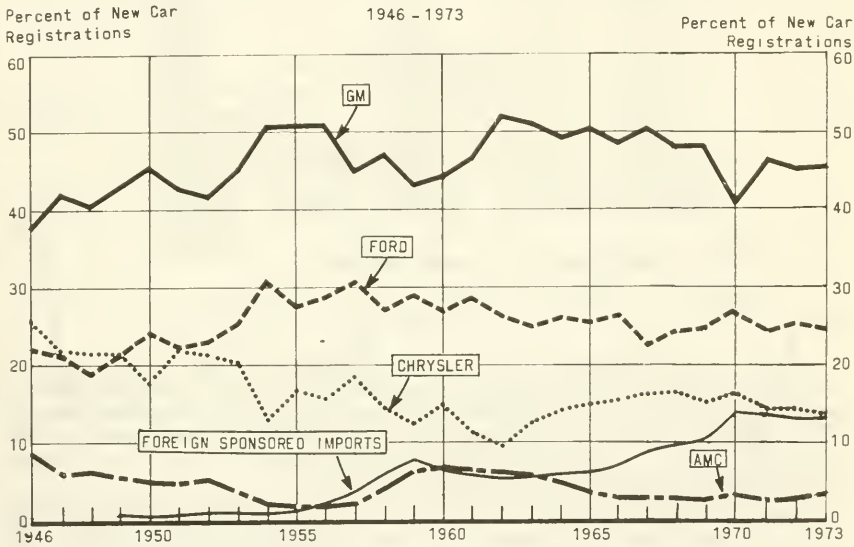
Vigorous rivalry for customer patronage is the driving force in the growth and adaptive development of the motor vehicle industry. This rivalry is omnipresent. It exists in the competition among domestic manufacturers, the competition from foreign manufacturers, and in the competitive interaction of new and used vehicles. In addition to presenting a profile of sales performance, this section discusses the smaller car challenge and the influence of used cars.

1. A Profile of sales performance

Currently, there are four major domestic new passenger car manufacturers—General Motors, Ford, Chrsyler and American Motors. In 1973, they supplied 86.8 percent of all new passenger cars purchased in the United States, and over 20 overseas competitors[23] selling in the United States supplied 13.2 percent. These domestic and foreign manufacturers offer more than 425 models and body styles. Alternative engines, drivelines, and comfort and convenience equipment provide an almost continuous gradation of product choice.

Variations in the competitive performance of these manufacturers since 1946 reflect the intense rivalry of producers for the customer's favor. As shown in Chart 5, General Motors sold 38 percent of total new passenger cars (including imports) in 1946 (when steel allocations were in effect), increased its sales to 51 percent in 1954, declined to 43 percent in 1959, rose to 52 percent in 1962, and sold 45 percent in 1973. Ford sales, under 19 percent in 1948, were up to almost 31 percent in 1954 and down to 24.5 percent in 1973. The share of American Motors and its predecessor companies has averaged about 4 percent throughout the period 1946 to 1973, ranging from a high of 9 percent immediately following World War II, to a low of 2 percent in the mid-1950's. In 1973, AMC accounted for about 3.5 percent of the new cars sold in the United States. Chrysler, which exceeded Ford in the 1946–49 period, had almost 26 percent in 1946, fell to under 10 percent in 1962, rose to over 16 percent in 1967 and was 13.7 percent in 1973. U.S. sales by foreign manufacturers represented less than 1 percent before 1956. By 1959, they accounted for 7.3 percent and in 1973 represented the aforementioned 13.2 percent of the total.

COMPETITIVE POSITION OF U.S. PASSENGER CAR MANUFACTURERS



Note: Nash-Kelvinator Corp. and Hudson Motor Car Company Combined To Form AMC in 1954.

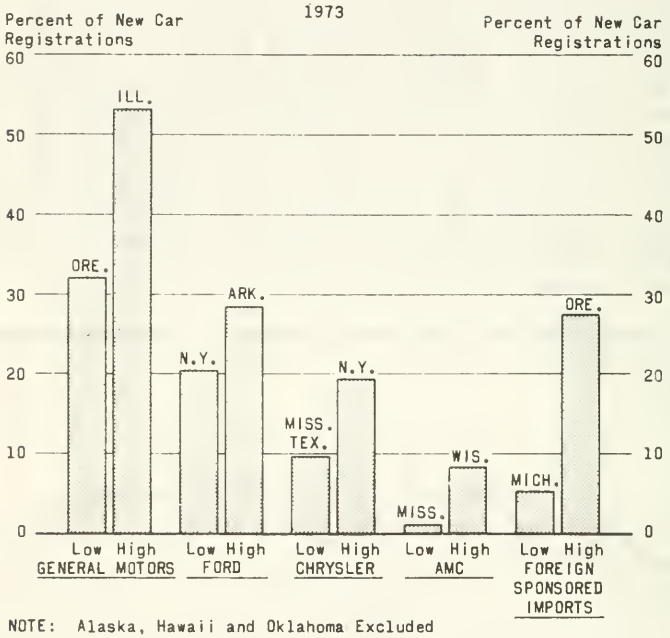
Source: R.L. Polk

CHART 5

[23] The companies and the number of U.S. new passenger car registrations reported by R. L. Polk in 1973 were: Volkswagen (V.W. and Audi), 515,882; Toyota, 276,720; Nissan (Datsun), 229,115; Toyo Kogyo (Mazda), 104,328; British Leyland (M.G., Triumph, Jaguar, Austin and Rover), 66,328; Volvo, 61,042; Fiat (Fiat and Ferrari), 59,079; Daimler-Benz (Mercedes Benz), 42,102; Honda, 36,700; Fuji Heavy Industries (Subaru), 30,949; Porsche, 23,867; Saab, 16,842; B.M.W., 13,927; Renault, 6,799; Peugeot, 3,977; Alfa Romeo, 2,523; Jensen, 1,370; Citroen, 1,000; Lotus, 963; Rolls-Royce, 581; Other, 276.

That no manufacturer has any control over customer choice is evident in the wide regional differences in demand for the products of individual manufacturers. Chart 6 shows, by state, the range and variation in the competitive performance of the domestic passenger car manufacturers as well as of foreign sponsored imports. General Motors' competitive performance, for example, varied in 1973 by 21 percentage points between Illinois and Oregon.

COMPETITIVE POSITIONS OF
PASSENGER CAR MANUFACTURERS BY STATES



NOTE: Alaska, Hawaii and Oklahoma Excluded

Source: R. L. Polk

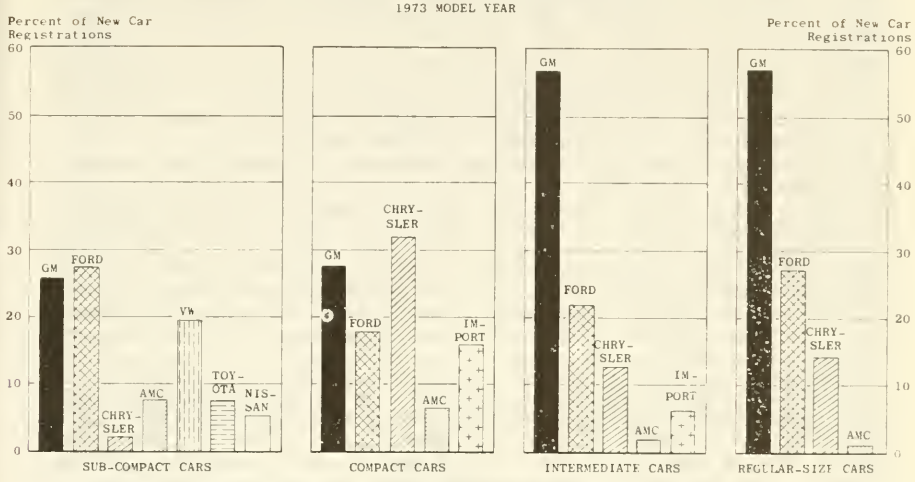
CHART 6

Striking variations also appear in the acceptance of each manufacturer's products within related product categories. In 1973, foreign sponsored imports accounted for more than 35 percent of subcompact cars. As shown in Chart 7, Ford, General Motors and Volkswagen were the leading manufacturers in this group. Chrysler sold the highest number of compact cars and General Motors led in sales of intermediate and regular-size cars.

Continuing fluctuations in the success of individual car lines also indicate the intense competition which exists. A product which is highly successful one year may well "miss the market" the next, or an unsuccessful product one year may, with design improvements, be very successful the following year. Chart 8 shows the variations in the sales of three car lines.

The Chevrolet Nova, which was first introduced as the Chevy II in the fall of 1961, accounted for 362,000 sales, 4.9 percent of total U.S. passenger car sales, in the 1963 model year. Two years later, Nova sales had fallen to 125,000 units, less than 1.5 percent of the total. The car was redesigned for the 1968 model year and within two years its sales doubled. The Nova has continued to be successful and, except for the strike-effected 1971 model year, attained more than 3 percent of sales in the early 1970's. Sales of the Ford Mustang, which was introduced in the middle of the 1964 model year, reached a high of 543,000 units representing 5.9 percent of total car sales in model year

COMPETITION WITHIN SELECTED PRODUCT GROUPS
PERCENT OF INDUSTRY REGISTRATIONS BY COMPANY
1973 MODEL YEAR

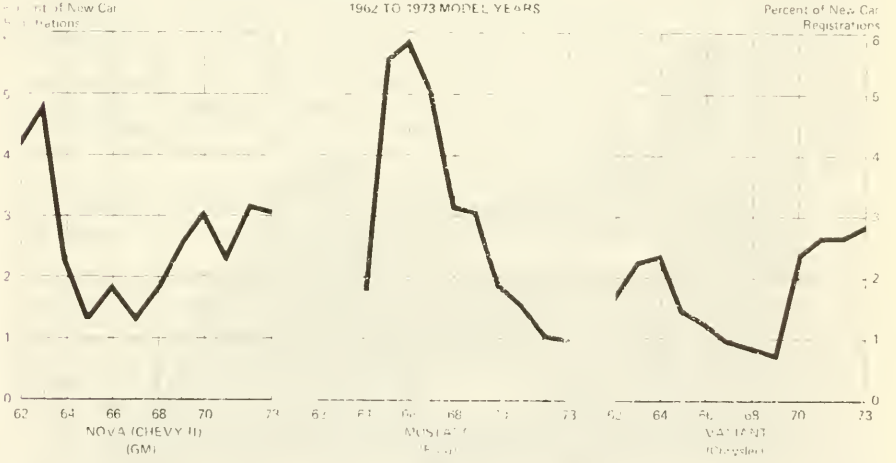


NOTE: Imports are foreign sponsored
Regular-size cars exclude Cadillac, Buick Electra & Riviera, Oldsmobile 98 & Toronado, Lincoln, Thunderbird, Chrysler Imperial & New Yorker

SOURCE: R. L. Polk

CHART 7

PERCENT OF NEW PASSENGER CAR SALES
SELECTED CAR LINES
1962 TO 1973 MODEL YEARS



Source: R. L. Polk

1966. Thereafter, it experienced a continual decline in customer acceptance despite design changes.[24] In one year, sales had declined by about 35 percent, from 440,000 units in 1967 to 282,000 units in 1968.[25] In the 1973 model year, Mustang's sales of 119,000 units represented only 1.0 percent of the total. Another example of a car whose fortune changed rapidly is the Plymouth Valiant. After initial success, Valiant sales declined to 80,000 units or less than one percent of the total in 1969. With the introduction of the Duster series in the 1970 model line, Valiant sales rose to 220,000 units or 2.4 percent of total U.S. passenger car sales and by 1973 they represented 2.9 percent.

The Edsel is a particularly spectacular example of the fact that the automotive market is governed by the customer exercising his free choice. It was introduced late in 1957, after Ford reportedly spent $250 million on design, development and tooling, but annual sales never reached the 300,000 units projected. It was discontinued in November, 1959, when even the redesigned 1960 models failed to achieve customer acceptance. Failures occur not only with newly introduced products but with established nameplates as well. Examples are the DeSoto, which after a long history at Chrysler was discontinued in 1960, and GM's Corvair, first introduced in the fall of 1959 and discontinued in 1969.

Variations in competitive success, as depicted in Charts 6 to 8, reflect the fact that motor vehicles are bought and sold on the basis of customer choice in a setting of intense competitive rivalry. The contrasts between: (1) General Motors' success in Illinois and its lesser performance in Oregon; (2) General Motors' varying degrees of success in different product groups, and (3) the fluctuations in popularity of particular car lines are examples which demonstrate that the producers have no control of any part of the market. What they get they earn by serving customers.

2. The Smaller car challenge

Customer demand for smaller cars emerged during the late 1950's and intensified in the late 1960's. The vitality of competition in the automotive industry is evident in the reaction of manufacturers to this change in preference.

Smaller cars in the U.S., of course, are not a phenomenon unique to the years since the late 1950's. One of the first truly small cars, in the sense that it was considerably smaller than the standard-size cars of its day, was the Austin Bantam which appeared on the market in 1930. Despite the fact that the Austin was introduced during the Depression when low-cost transportation might have appeared desirable, its annual sales never exceeded 5,000. Consumers who could not afford higher-priced new cars preferred used ones to this low-priced vehicle. Another unsuccessful attempt to sell a smaller car was made with the introduction of the Crosley in 1939.

After World War II, a number of smaller cars appeared on the market. In 1946, Crosley brought out a slightly larger version of its prewar smaller car. The Henry J, Nash Rambler, Willys Aero and Hudson Jet were introduced in the early 1950's.

These cars, though competently engineered, designed and manufactured, did not sell well because demand was centered on larger cars which offered better performance and riding qualities than the smaller models. By 1955, production of all of the domestic smaller cars had been discontinued except for the Rambler which was by then being produced by American Motors Corporation.

GM's experience in the manufacture and distribution of smaller cars started when it took on the manufacture of Vauxhall cars in England and Opel cars in Germany during the 1920's. Throughout the next two decades, General Motors continued designing, building and testing small, experimental cars for possible introduction both abroad and in the United States. Between 1930 and 1960, these programs included the construction of many experimental models of varying sizes and styles. Each model was extensively studied in terms of sales potential and probable cost of production. In the early 1950's, General Motors even went so far as to start tooling up for U.S. production of a small car

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[24] A Ford Motor executive, in discussing these changes, commented: ". . . in [1971] we put in the 429 [cubic inch] engine. It was designed as a muscle car. It was bigger, heavier and harder to drive. There wasn't any market. The timing was perfectly wrong." *New York Times*, September 16, 1973.

[25] While sales in the 1968 model year are affected by a nationwide strike, sales of the Mustang in the following year did not recover.

but abandoned the project because of the discouraging market experiences of other manufacturers. Market and cost studies at that time indicated that a small car would not be competitive with used cars. However, car demand patterns shifted during the later 1950's—partly reflecting the 1958 recession and partly the rapid expansion in multicar ownership. Initially, this still limited market potential was met by overseas manufacturers.

As shown in Chart 9, overseas imports accounted for just 1.7 of new car sales in 1956. By 1959, the total had grown to 10.2 percent. Most of these vehicles were smaller-size passenger cars and nearly all of them came from Western Europe.[26]

General Motors, Ford and Chrysler responded to this challenge initially by expanding imports of smaller cars from their facilities in Great Britain and West Germany. American Motors increased production of its domestically built Rambler and Studebaker introduced the Lark, a shortened version of its standard-size car. Late in 1959, after intensive preparations that began more than two years earlier, General Motors introduced a U.S. built smaller car, the Corvair. Other U.S. built smaller cars were also introduced at that time—the Ford Falcon, Dodge Dart and Plymouth Valiant. In the following year, General Motors introduced three other smaller U.S. cars, the Pontiac Tempest, Oldsmobile F–85 and Buick Special; Ford offered the Mercury Comet and Chrysler introduced the Dodge Lancer. In the fall of 1961, General Motors added another

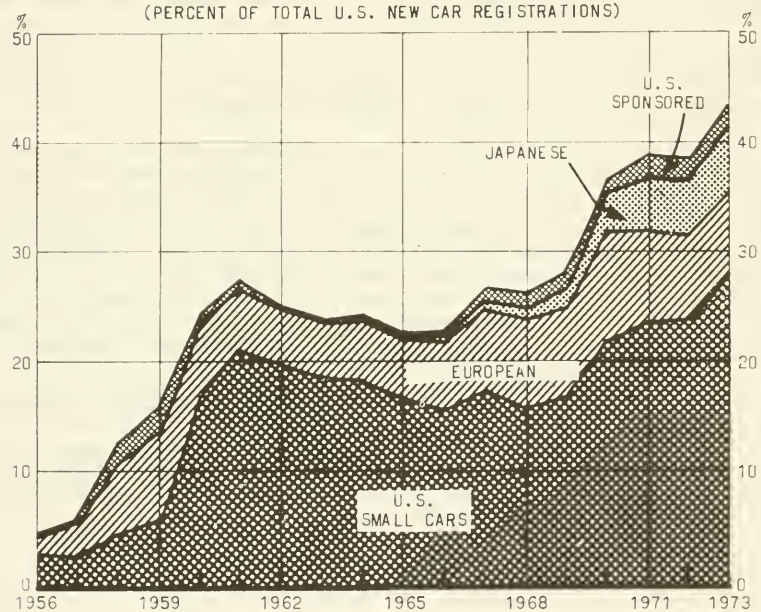

CHART 9

[26] Between 1956 and 1959, registrations of Renault (France) increased from 2,400 to 91,000; Volvo (Sweden) 1,600 to 18,000; Triumph (Great Britain), from 2,300 to 23,000; VW (West Germany), from 50,000 to 120,000; Fiat (Italy), from 55 to 38,000.

entry, the Chevy II (later the Nova), and Ford brought out the Fairlane and Meteor.

There was an immediate favorable consumer response to these new products. It was evident that they were highly competitive with the foreign imports even though slightly larger in size and higher in price. Domestic compacts achieved 20.8 percent of sales in 1961. The American consumer at that time clearly preferred the quality and performance of domestic compacts to sub-compact foreign products. In addition, the poor service and parts support provided by many of the foreign manufacturers disenchanted American owners. As a result, the overseas imports, including those sponsored by domestic manufacturers, declined from a peak of 10.2 percent in 1959 to less than 5 percent in 1962.

The U.S. manufacturers had successfully responded to the customers' demand for smaller cars. However, while other import sales dropped, one foreign manufacturer—Volkswagen—continued to expand its sales. In 1962, VW registered 193,000 units, about 60 percent more than in 1959. This performance was due to the fact that VW—besides offering an acceptable product—gave more careful attention than other foreign manufacturers to such competitive factors as quality of dealer organization, service facilities, parts distribution and advertising.

Customer interest in sub-compact cars increased in the late 1960's—a trend which accelerated with the emergence of Japanese manufacturers, particularly Toyota and Nissan (Datsun) as important suppliers to U.S. consumers. Imported vehicles in 1965 accounted for 6 percent of U.S. new car registrations and Japanese makes represented approximately one out of thirty of these imports. By 1971, 15 percent of all U.S. new car registrations were imports with the Japanese manufacturers accounting for nearly one out of every three. They had learned the VW lesson well and had established sound dealer systems which provided service and parts for their products. They were not only successful with their sedans and station wagons but also with their sports cars and light-duty trucks, product types in which Volkswagen had never been notably successful in this country.

In the latter half of the 1960's, as in the 1956–1962 period, U.S. manufacturers competed for this resurging small car business with imports from their overseas facilities as well as with their domestic compacts such as GM's Nova, Ford's Maverick, Chrysler's Valiant and AMC's Rambler American (now called Hornet). In the meantime, however, as the demand for economy cars continued to grow, General Motors started work on the development of a sub-compact car. On the basis of its continuing market studies, General Motors concluded that its new entry would be able to compete effectively only if it offered the customer a substantial advance in vehicles design and manufacture. This major program was brought to fruition with the introduction of the Vega in September, 1970.

Shortly after the Vega was introduced, Richard C. Gerstenberg, then General Motors Vice Chairman, described the planning of this new car in an address to the National Academy of Engineering as follows:

"To produce this car, we built a completely new plant in Lordstown, Ohio. It is one of the most highly automated automobile assembly operations in the world. This especially applies to welding equipment on the assembly lines. More than 85% of assembly-line welding on the Vega is done automatically. New processes are used in rustproofing and soundproofing. The body paint is applied automatically.

"Equally important are the contributions made by simplified product design, innovations in use of materials, and reductions of weight. A new aluminum alloy and a new fabricating process were used to produce the engine block.

"Beyond the car itself, our engineers made a major contribution to a different design for railroad cars to reduce shipping costs and minimize damage to the car in transit. The automobiles are packed hanging on the inside of a pallet which becomes the side of the rail car. The capacity of each new rail car is increased to 30 Vegas—compared to 18 in conventional rail cars.

"Technological innovation was the foundation of our approach to the new Vega. This was essential if we were to achieve our goal of producing a car with American standards of quality, designed to meet the discriminating needs of American motorists, and at a price which made it strongly competitive in value with imported cars. And we wanted our new car to be built with American parts and material and by American workers."

American Motors and Ford also offered customers new domestically produced sub-compact cars—the Gremlin and the Pinto, respectively.[27] These three domestic entries, while similar to the imports in terms of size and basic vehicle characteristics, offered increased value tailored to the needs of U.S. consumers. Foreign manufacturers and their U.S. subsidiaries had too much at stake in the U.S. not to counter these new products. For example, in 1970, U.S. sales accounted for approximately 20 percent of West German and 8 percent of Japanese automotive output. The major importers in recent years, therefore, have broadened their merchandising strategy by stressing product as well as price, by upgrading their top-of-the-line models, and by introducing "thrift" or mini-type car lines. This strategy worked particularly well for such Japanese manufacturers as Toyota, Nissan (Datsun) and Honda. Sales of higher priced imports such as the Datsun 240Z, Audi (Volkswagen), Volvo and Mercedes-Benz increased. The Mazda, manufactured by Toyo Kogyo, featured a rotary engine for which some consumers were willing to pay a substantial premium.

Since 1955, in addition to a decrease in U.S. import tariff rates on passenger cars from 8.5 percent to 3.0 percent, changes in a number of social and economic factors led to a growing demand for types of cars which had previously not sold well in the U.S. The movement from the cities to suburban locations tended to increase the number of households which were multiple vehicle owners. Imported vehicles, offering economy-priced transportation, were often purchased as second or third cars. Another factor was the rising cost of car operation. In addition, as a consequence of the "baby boom" following World War II, younger buyers represented a higher proportion of the industry's customers. These buyers were interested in smaller cars ranging from models with a low initial price and low operating costs to specialty and sports cars in the medium and high price ranges.

Vehicle sales by foreign manufacturers in the United States also benefited from four major cost advantages—the incremental nature of export sales, lower labor costs, international currency distortions and tax rebates. In addition, the domestic manufacturers have continuously supported tariff reductions with the result that imported cars have been available in the United States at prices which fully reflected these cost advantages.

Foreign manufacturers have been able to consider their sales in the United States as incremental to their domestic sales. The low unit costs derived from a large domestic sales volume were carried over to their export sales. The 120,000 VW's sold in the United States in 1959, for example, represented only 20 percent of total VW production in that year. It was profitable for the high-volume producers in Western Europe and Japan to supply small cars to U.S. customers even when the U.S. demand was low because their sales at home gave them the volume base necessary for efficient production. By comparison, the decisions of U.S. manufacturers to launch domestic small economy cars in the late 1950's and again in the late 1960's had to be based almost entirely on the volume obtainable in the United States and Canada because of limited export opportunities.

Foreign manufacturers had another important advantage in lower labor costs. Chart 10 shows the hourly labor costs in the motor vehicle industry for the major producing countries.

CHART 10

TOTAL HOURLY COST INCLUDING SUPPLEMENTARY BENEFITS AT GENERAL MOTORS' OPERATIONS

[In U.S. dollars]

	1960	1970	1974
United States	3.21	5.59	8.18
West Germany	1.05	2.61	6.72
United Kingdom	1.22	1.69	2.89
France	1.13	1.90	3.28
Japan[1]	.41	1.15	2.33

[1] Average for Japanese automotive industry.

Source: GM internal data.

[27] Chrysler relied on the Colt and Cricket, imported from affiliated companies in Japan and the U.K., respectively.

In 1960, during the first wave of imports, hourly labor costs in West Germany, which accounted for 44 percent of U.S. vehicle imports, were 67 percent lower than in the U.S. In 1970, West German labor costs were still less than half the U.S. level. Costs in Japan, which had become an important competitor by 1970, were only about 21 percent of the U.S. level.

Since 1970, although labor costs in Japan and West Germany have grown at a faster rate than in the United States, an absolute difference remains. In January, 1974, U.S. hourly labor costs were $5.85 and $1.46 higher than in Japan and West Germany, respectively.

The advantage of these overseas wage rates was for several years reinforced by the undervaluation of foreign currencies relative to the U.S. dollar. From the late 1950's until December, 1971, foreign manufacturers were able to take advantage of international exchange rates which placed an artificially high value on the U.S. dollar. The resulting undervaluation of many foreign currencies, in effect, constituted a subsidy to overseas motor vehicle producers.

As a result of recent international monetary developments, this subsidy has been eliminated. As a consequence of the devaluation of the U.S. dollar to more realistic levels and the subsequent floating of key currencies, the products of foreign manufacturers, including motor vehicles, are now offered for sale in the United States at prices which reflect more realistic exchange rates.

European producers have further benefited by the rebate of value-added taxes on exported vehicles. Currently, West German automotive producers, for example, receive a rebate equal to 11 percent of the value of their exports—which more than compensates for the 3 percent import duty levied by the United States on cars, and which offsets, in part, the tariff on imported light-duty trucks.

Moreover, the entry of some foreign manufacturers was facilitated by their use of existing U.S. dealer outlets. Although Volkswagen almost from the start established its own franchised dealer system, some foreign cars initially were distributed through dualing with the franchised dealers of U.S. manufacturers. As of February 1, 1960, for example, 737 General Motors' franchised dealers also sold imported cars of other manufacturers. Such dualing has continued and at the end of 1973, 659 GM dealers also held franchises from Japanese manufacturers, 144 from British, 106 from Italian, 89 from West German, 82 from Swedish and 56 from French manufacturers.

Although foreign manufacturers were able in the post-World War II period to export cars to the United States in response to the growing demand for smaller cars, a number of factors precluded domestic manufacturers from selling U.S. build cars abroad. U.S. manufacturers have competed in world markets for more than 60 years. Initially, overseas demand was served by exporting finished vehicles. However, increasing shipping costs, rising tariffs on fully-assembled vehicles and various other trade barriers soon made the establishement of overseas assembly plants a competitive necessity.

As early as the mid-1920's, the inadequacy of the export-overseas assembly approach of U.S. manufacturers became apparent. Consumer preference in the United States was for larger, more comfortable and more powerful automobiles than those required by European conditions relating to roads, taxes, insurance costs and fuel prices. In addition, the growth of European motor vehicle demand permitted the adoption of U.S. mass production methods. The increased competitiveness of European manufacturers limited the export opportunities of U.S. manufacturers. Consequently, General Motors, for example, acquired manufacturing facilities in England in 1925 and in Germany in 1929 to produce the types of cars demanded in Europe.

Two major developments in the quarter century after the end of the second World War reinforced the need for overseas production rather than U.S. exports. One was the creation of large trade groups such as the European Economic Community and the European Free Trade Association. The removal of tariffs within each of these two trade groups resulted in greatly expanded market opportunities, and the maintenance of external tariffs provided protection for producers located within the groups. The second development grew out of the desire of many nations to achieve a rapid increase in their rate of industrialization. To achieve this, quotas and "local content" requirements designed to curtail imports and encourage investment in domestic motor vehicle and parts production were adopted by many countries. For example, the 1974 "local content" requirement for passenger cars in Brazil is 100 percent and in Australia from 85 to 95 percent.

Differences in customer product requirements and preferences, trade barriers —both tariff and non-tariff—reflecting deep-rooted national policies, and logistics have over the years increasingly foreclosed export opportunities for U.S. motor vehicle manufacturers. GM's overseas investments have been dictated by sales opportunities which firms in other countries would have been quick to act upon if General Motors and other U.S. producers had not established facilities overseas. The recent currency realignments and the rapidly growing income levels in Europe, Japan and other developed areas may, in the years ahead, provide an improved competitive basis for U.S. automotive exports. However, there is still the possibility that national policies designed to favor local manufacturers may continue to offset these improvements in the U.S. position.

By way of summary, it is important to stress the fact that manufacturers in the United States were keenly aware of the competitive advantage which overseas manufacturers had in the production and distribution of small cars. Despite this combination of advantages, U.S. producers in the late 1950's and early 1960's successfully met this challenge with compact cars—somewhat larger than the imports. The introduction of domestic sub-compacts represented a major cost challenge. In meeting this challenge as early as they did and as well as they did, they exhibited a willingness to innovate with new manufacturing technology and to undertake large investments with great risks.

At no time during the past decade and a half has the American buyer lacked an adequate selection of small cars. As the demand for these cars grew, the number and variety of models available increased. In January, 1974, there were 81 domestically produced compact, sub-compact and sporty passenger car models. In addition, domestic manufacturers offered 12 models of small cars produced abroad and foreign manufacturers offered 72 small car models in the United States.

The international oil shortage intensified the small car challenge. It showed again the swiftness of change and the impact of world events upon the motor vehicle industry. On September 30, 1973—less than a month before the emargo—dealer stocks of GM smaller cars, such as the Vega and Nova, totaled almost 110,000 which represented a 62 days supply. In contrast, there was a 47 days supply of intermediate cars, a 52 days supply of regular-size cars, and a 42 days supply of luxury cars. Throughout the first nine months of 1973, General Motors' production was, in fact, closely in line with consumer demand. Not only was the supply of small cars adequate to meet demand but there is every indication that they were being effectively advertised and promoted.

The oil embargo created great confusion and uncertainty in the minds of consumers. Passenger car demand declined sharply as buyers awaited some indications from the government concerning availability of gasoline and the likelihood of rationing. There also was a dramatic shift in consumer demand towards smaller cars which had no precedent in the history of the industry. This shift could not be matched by corresponding instantaneous changes in production schedules.

General Motors' response to this challenge was described by GM Executive Vice President Elliott M. Estes at the 1974 Chicago Auto Show as follows:

"* * * we are accelerating our program to increase substantially our capacity to build small cars, and our plans to add new small cars, even as we continue to work on programs to increase the fuel efficiency of all of our cars.

"To put some measure on this effort to increase our smaller car capabilities, I can tell you that since the inception of the program for our Chevrolet Vega, which we introduced 3½ years ago, and including our commitments to get our small 1975 models on the road, General Motors will have spent more than $2.0 billion to meet this growing demand.

"General Motors will have developed the capability by the 1975 model year to build more than 2 million small cars. This represents about a 70 percent increase over our 1973 production.

"We introduced our subcompact car, the Chevrolet Vega, in September of 1970, after converting a number of facilities including the Lordstown, Ohio, assembly plant. As demand increased, we converted our Ste. Therese plant in Quebec from full-size cars to Vegas, and then we increased its capacity further.

"Now, we will convert our South Gate plant in California from current production of the full-size Chevrolet, Buick and Pontiac to build Vegas on the West Coast for the first time. We plan to complete production of 1974 models

at South Gate by April 5, and close the plant for the conversion. It will resume production with 1975 Vega models on two shifts.

"We also have been increasing our capacity to build compact Novas, Omegas, Venturas and Apollos. By the beginning of the 1975 model year, we will have converted facilities from the larger to these smaller cars or expanded capacity at Tarrytown in New York, Leeds in Missouri, and Willow Run in Michigan.

"At Norwood, Ohio, and Van Nuys, California, we will also have increased our capacity to build the sporty Chevrolet Camaros and Pontiac Firebirds.

"During the same period, we have enlarged our line of intermediate-size cars and increased our capacity to serve this growing market. For example, we recently converted our Doraville, Georgia, plant from full-size to the smaller intermediate cars.

"These conversions and expansions in assembly plants are only the more visible parts of our effort. Not so apparent, but no less important, are the programs going on in our engine, transmission, and component plants that are necessary for this large-scale readjustment in the mix of our production. As I say, taken together, this program represents an investment of $2 billion by General Motors to match our products to the changing American tastes."

Over the years, U.S. consumers have received the cars they demanded—a greater choice of cars, both small and large, than has been available anywhere else in the world. Only with the oil embargo in the fall of 1973 was the balance of supply and demand disrupted and this balance is being rapidly reestablished. The lesson of this unforseen disruption makes clear, however, the primacy of consumer choice. No one has to buy General Motors' products and sales can only be achieved by offering products which buyers believe yield superior values at the price.

3. Competition between new and used vehicles

Motor vehicle manufacturers in the United States are faced with competition from another source—the large number of vehicles in service. In 1973, there were approximately 90 million cars on the road. Their average age was about six years—about half their average service life. This constitutes a great reservoir of unused mileage which, because of the repairability of motor vehicles, could be expanded even further. Indeed, as the necessities of World War II proved, careful maintenance and usage can assure a continuing high level of transportation service over substantially longer periods.

The significance of competition between used and new durable goods has been described as follows:

"Generally, if goods are durable, such as passenger cars, machinery, and various household appliances, the position of the consumer is strengthened and competitive pressures among producers are increased. When a product is durable, a buyer can postpone its replacement, and, as a result, is not compelled immediately to accept the terms of a particular supplier. In addition, durable goods are usually repairable, and thus purchase of a replacement can be postponed even longer. Further, the consumer may resort to secondhand markets, and this further strengthens his bargaining position and thereby affects the market for a particular new durable good." [28]

More than thirty years ago, Professor George J. Stigler noted the need for "cognizance of the large used-car market" as a competitive factor in the automotive industry.[29]

The retail prices of used vehicles are reflected in the wholesale auctions where new and used vehicle dealers and other professionals buy and sell a great number of vehicles. These auction markets are sensitive barometers of the total demand for automotive transportation and individual customer preferences. Retail and wholesale used vehicle price trends are reported in several trade publications on a weekly and monthly basis.[30]

The availability of used vehicles increases the range of product choice for the customer and influences the entire structure of prices. There is a substantial area of price overlap between new and used vehicles. Chart 11, for example,

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[28] William T. Hogan and Frank Koelble, "Determination of the Market for Antitrust Purposes: Difficulties and Problems," *University of Detroit Law Journal*, April, 1962, pp. 537–538.

[29] George J. Stigler, "The Extent and Bases of Monopoly," *American Economic Review*, Supplement, June, 1942, p. 8.

[30] See, for example, *NADA Used Car Guide*, published monthly by a National Automobile Dealers Association or *Automotive Market Reports*, published on a semi-weekly basis.

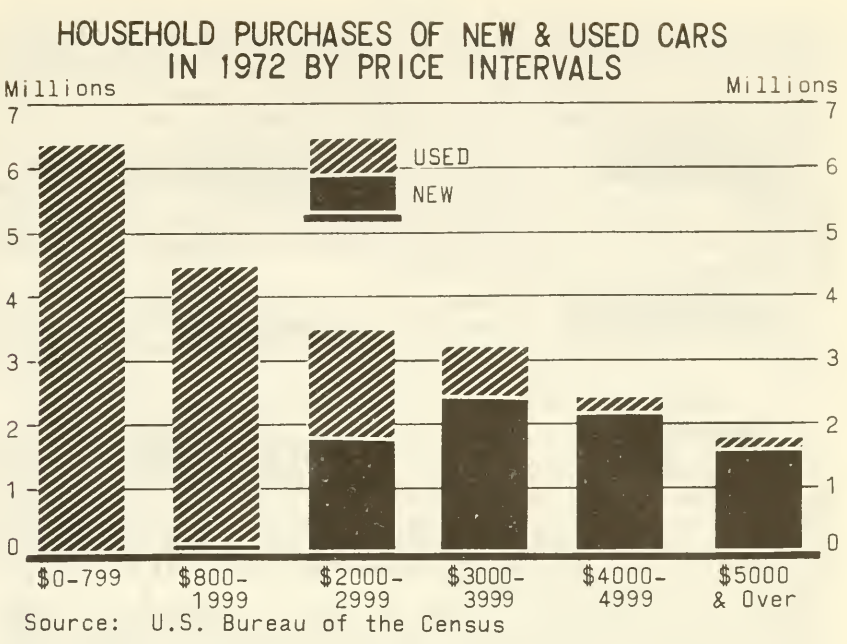

CHART 11

indicates by price intervals the number of new and used cars purchased in 1972. Even among cars selling for $5,000 and over, nearly 10 percent had a previous owner.

In 1972, customers spending $2,450 for a car, for example, could choose among a great variety of new and used cars.[31] Looking only at three General Motors' models, they could have purchased a new compact Chevrolet Nova with standard equipment, a 6-cylinder engine and an AM radio. Also available at the same price was a one-year old intermediate-size Buick Skylark hardtop sport coupe with a 6-cylinder engine, power steering and automatic transmission. Alternatively, a two-year old standard-size, 4-door Pontiac Catalina with a V-8 engine, power steering, automatic transmission, air conditioning, power seats and power windows could have been selected at that price.

In terms of equipment, performance and comfort, used vehicles often compete with new vehicles selling at substantially higher prices. The competitive influence of used vehicles, in terms of product qualities, specifications and optional equipment, has an important bearing on new vehicle engineering and design as well as on prices.

While all consumers may not consider used vehicles acceptable alternatives to new vehicles, nevertheless, the competitive interaction between new and used vehicles is continuing and pervasive. A survey conducted by the Division of Research, Graduate School of Business Administration, University of Michigan, found that approximately 17 percent of the people who had recently purchased cars had actively shopped for both new and used cars.[32] Such buyers represented a broad spectrum of income groups. In addition, during the decade ending in 1969, over 60 percent of all cars purchased by U.S. families were used cars.[33]

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[31] *NADA Official Used Car Guide* (Central Edition), April, 1972.

[32] Horst Sylvester, *New and Used Cars as Consumer Alternatives*, University of Michigan, 1972, Unpublished Doctoral Dissertation.

[33] Survey Research Center, University of Michigan, *1970 Survey of Consumer Finances*, 1971, p. 53.

In fact, whether offered for sale or not, used vehicles have a substantial impact on new vehicle sales.[34] Since over 80 percent of all American families own at least one car, or light truck, and the vast majority of these vehicles still have many years of useful life, most households can decide to "get another year out of the old buggy," if the available products and prices are not sufficiently attractive or the economic outlook is poor or uncertain.

In short, each new car producer is not only competing with all other new car producers but with literally thousands of used vehicle dealers for the patronage of customers who, in the end, may decide to stay with what they have. This competitive interaction has significantly accelerated the pace and direction of new product development and shaped the marketing efforts of all manufacturers in the automotive industry.

C. The competition of other products

Passenger cars compete not only with other cars but with light trucks and other modes of transport. This competition from other vehicles—less obvious but very real—is discussed in this section.

1. Light trucks used for personal transportation

Light-duty trucks have become an attractive purchase alternative to conventional passenger cars. These trucks, which represented less than 10 percent of total motor vehicle registrations for the period 1952 through 1962, accounted for 18.1 percent in 1973. This light truck trend is particularly important because these vehicles increasingly are being used for personal transportation in addition to and even instead of their commercial uses. In 1963, 24.5 percent of all trucks were used primarily for personal transportation. By 1972, the proportion had grown to 41.2 percent.[35]

Much of this important development is due to the expanding use of light-duty trucks for recreational purposes. For example, sales of motor homes—self-contained units mounted on a light truck chassis or converted vans—were 84 percent higher in 1972 than in 1971.[36]

The increasing use of light-duty trucks for personal transportation was noted by the U.S. Department of Commerce more than five years ago when it reported.

"Truck sales will benefit greatly from the non-commercial demand for these vehicles. Light trucks, those nominally rated as one-half ton or three-quarter ton capacity, will continue to enjoy an unprecedented sales boom as more of these units are purchased for recreational vehicles and second 'cars.' The increased use of light trucks as personal vehicles is now a strong influence in the design and marketing of these units." [37]

More recently the U.S. Department of Commerce reported that an "estimated 15 to 17 percent of all households have a light-duty truck occupying the second spot in their two-car garages.[38] Thus, it is clear that light trucks compete directly with passenger cars.

Chart 12 shows that in 1974, for example, a customer for a personal transportation vehicle had a number of options offering different passenger and cargo capacities. An Impala coupe prospect could have considered an El Camino or a Cheyenne pickup. A station wagon prospect could have found the added trailer-towing capability of a Suburban or perhaps the much greater capacity of a Sportvan preferable to the Impala station wagon.

Light trucks are merchandised as passenger cars. The International Harvester ad, shown on Chart 13, for example, points out the personal transportation —weekday and weekend—uses of the Scout II. Many light trucks are sold with optional convenience and comfort equipment similar to those available on passenger cars. For example, 36 percent of General Motors' 1973 pickup trucks were equipped with air conditioning and 48 percent with special interior and exterior trim.

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[34] Economic studies of automobile demand in the United States take account of used cars, or alternatively, the stock of cars in use in various ways. See, for example, C. F. Roos and Victor von Szeliski, in: *The Dynamics of Automobile Demand* (General Motors Corporation, New York, 1939), pp. 21–95; and Gregory C. Chow, *Demand for Automobiles in the United States: A Study in Consumer Durables* (North-Holland Publishing Company, Amsterdam, 1957).

[35] U.S. Department of Commerce, *1972 Census of Transportation, U.S. Summary*, 1973, p. XIII.

[36] Motor Vehicle Manufacturers Association, *1973 Motor Truck Facts*, p. 16.

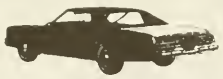
[37] U.S. Department of Commerce, *U.S. Industrial Outlook, 1969*, December, 1968, p. 265.

[38] U.S. Department of Commerce, *U.S. Industrial Outlook, 1973*, January, 1973, p. 345.

SELECTED 1974 CHEVROLET PASSENGER CAR AND LIGHT TRUCK CHOICES

Manufacturers Suggested Retail Prices of Vehicles Equipped With V-8 Engine, Automatic Transmission, Power Disc Brakes and Power Steering.

IMPALA COUPE
$3,897



6 Passenger - 18.1 cu.ft. Cargo Capacity - 121.5" Wheelbase

IMPALA WAGON
$4,406

9 Passenger - 106.4 cu.ft. Cargo Capacity - 125" Wheelbase

EL CAMINO
$3,521

3 Passenger - 38.0 cu.ft. Cargo Capacity - 116" Wheelbase

SUBURBAN
$4,807

9 Passenger - 143.5 cu.ft. Cargo Capacity - 129.5" Wheelbase

CHEVENNE PICKUP
$3,869

3 Passenger - 74.3 cu.ft. Cargo Capacity - 131.5" Wheelbase

SPORTVAN
$4,662

12 Passenger - 296.0 cu.ft. Cargo Capacity - 125" Wheelbase

CHART 12

General Motors introduced a Chevrolet pickup model, the Cameo Carrier, in 1955 to serve the demand for vehicles that combine the capabilities of a truck and the comfort and design of a car. This vehicle later became the popular Fleetside trucks. The real breakthrough, however, was the introduction of truck independent front suspension by General Motors in the fall of 1959. That gave trucks the potential of a ride comparable to that of a passenger car. As a result of such innovations by General Motors and other manufacturers, the interaction between light trucks and passenger cars is an important competitive aspect of the motor vehicle industry.

United States new truck registrations in 1973 reached a record of 3 million units. Light trucks, which accounted for 86 percent of this total, were supplied principally by the four domestic car manufacturers, the major heavy-duty truck manufacturer—International Harvester—and four foreign firms—Nissan (Datson), Toyota, Toyo Kogyo (Mazda) and Volkswagen.

There are differences in the competitive success of these manufacturers in various types of products. In 1973, General Motors, AMC and International Harvester were the leading producers of truck-type station wagons and general utility vehicles. Chrysler and Ford were more successful in the sale of conventional vans than their competitors and General Motors and Ford led in sales of conventional pickups. In mini-pickups, all of which are imported, Nissan (Datsun) accounted for 38 percent of total sales.

In summary, the customers' interest in light trucks for personal transportation is another facet of the dynamic nature of demand in the motor vehicle industry.

2. Competition of other transportation services

Purchasers of transportation services are in a very strong bargaining position. This position derives from the wide range of choices available to them. They can buy a new motor vehicle, domestic or imported, or a used vehicle. In addition, they need not buy a car or truck at all. Generally, they can continue to use their existing vehicles and they have other transportation alternatives as well.

The transportation market existed before the motor vehicle. Private cars and trucks had to find their place within it. In the early days of the industry, when automotive engineering was in its infancy, vehicles were undependable, inconvenient and costly to purchase and operate. Private motor vehicle use was,

The two family car.

The great American dream used to be two cars in every garage. But INTERNATIONAL changed all that with the new SCOUT II.

The new Scout II lets you be two families in one (weekday and weekend).

All week long the Scout II works just like the rest of your weekday family—going to the station, supermarket, cleaners and school. And that's where the fold down rear seat for extra carrying space comes in mighty handy. Of course, so does the smooth ride and optional creature comforts like automatic transmission, air conditioning, power steering and power brakes.

But come the weekend, the Scout II is as ready to play as the rest of your weekend family.

The Scout II loves to go fishing, skiing, hunting, camping or just exploring.

And with four-wheel drive you'll discover a lot of fun begins where the road ends.

So when you stop and think about it, you really don't need two cars do you?

In fact, you don't need a car.

You need a Scout II.

The one for both of your families.

Get 'em up Scout!

Scout II

International Harvester Company Chicago, Illinois 60611

SELECTED FOR USE AT THE U.S. OLYMPIC TRIALS

USA

Source: Esquire, August, 1972.

CHART 13

at best, a marginal competitive threat to other forms of transportation. As motor vehicles became more dependable, manufacturers offered a widening range of products and prices to reach larger parts of the market.

The demand for various types of automotive transportation is a part of the total demand for transportation services. The transportation mode a customer selects depends on a number of factors including distance, time constraints, personal preferences and relative costs. Travelers often can choose to use private motor vehicles, or rental cars, taxis, buses, motorcycles, commuter or intercity rail systems, or planes. A 1973 study found that 75 percent of all

workers traveled to work by passenger car, 8 percent by truck, and 8 percent used some form of public transportation.[39]

In 1972, 87 percent of all intercity passenger miles were traveled in passenger cars, 10 percent in airplanes, 2 percent in buses, and 1 percent by railroad. This represents a shift during the past 15 years away from motor vehicles and railroads to airplanes. In 1960, passenger cars accounted for 90 percent of intercity passenger miles. The attraction by the mid-1960's of jet aircraft with their greater speed was sufficient to cause a decline in the use of automobiles for intercity passenger travel. Over this time period, airline gains were achieved at the expense of all other modes of travel.

Each transportation mode for passenger travel offers a variety of services at different prices. Each competes for the patronage of the customer for many of the transportation services he needs. As a result, the various modes are alternatives for specific point-to-point trips. However, unlike public transportation which supplies scheduled trips between specified points, the motor vehicle manufacturer supplies a product which can be used over a long period to go anywhere at anytime at the individual's discretion. The motor vehicle's competitive attractiveness is determined by the services it provides over time in relation to operating cost and net acquisition cost, i.e., initial price less resale value.

The exact calculus by which the customer evaluates the choices available to him is, of course, a highly individual and variable matter. There is little doubt, however, that considerations of time, cost and convenience are of high priority. The expanding use of motor vehicles itself is evidence that they are competitive with the services afforded by the alternatives.

The broader range of new goods and services now available to consumers is still another dimension of competition. With widespread motor vehicle ownership an established fact in the United States, consumers may well prefer a completely different product or service to the replacement of their existing vehicle or the acquisition of an additional one. Backyard swimming pools, boats and summer cottages are illustrative of an increasingly wide range of choices within the financial reach of many potential new motor vehicle buyers. In addition, frequent or extended vacations and other types of services vie for the consumer's dollar. The new motor vehicle must compete against all of these. In the vast majority of cases the choice is not between such alternatives and owning a motor vehicle; the choice is between the purchase of these alternatives and the purchase of a vehicle to add to or replace the one already owned.

This fuller dimension of product and price competition is a well-understood reality of competitive marketing which encourages automotive manufacturers to attain high standards of quality and value and rapid product improvement. Consumer choice has given direction to and shaped the substance of the rising standard of living in the United States.

III. COMPETITION IN PRODUCTS AND PROCESSES

Competition in the motor vehicle industry encompasses all aspects of the products, how they are manufactured, sold and serviced, and at what price. Product and process competition—the subject of this Chapter—is the rivalry of manufacturers to serve the customer with better products made more efficiently. It results in products which can more effectively meet existing consumer demand and in products to meet new needs as they develop. It in no way minimizes the importance of price competition—the subject of Chapter IV—or of competition in the marketing and servicing of vehicles discussed in Chapter V. In fact, all of these forms of competition are inseparable and their interplay enhances the value to the customer.

Innovation and change have been the hallmarks of the motor vehicle industry since its inception. To be successful, manufacturers must be in the forefront of engineering and manufacturing development. This necessity spurs competitive innovation to provide new and improved vehicles to meet the demand for efficient, reliable and safe motorized transportation. To improve its competitive position, each manufacturer must develop new engineering concepts and designs. To reduce production costs, each must constantly upgrade manufac-

[39] *Nationwide Personal Transportation Study: Home to Work Trips and Travel*, U.S. Department of Transportation, August, 1973, p. 14.

turing tools and equipment and production methods. This requires the successful coordination of applied and basic research.

In a business as competitive as the auto industry, it is imperative that products and services be produced within the context of a severe cost constraint determined by the prices customers are willing to pay for them. Consequently, the pace of innovation, particularly major automotive engineering changes, is a function of cost constraints as well as of technical feasibility. A good idea is no good to the consumer until it is marketable at a competitive price. Frederick G. Donner, former Chairman and Chief Executive Officer of General Motors, expressed this essential point as follows:

"We must balance trends in preference against the many compromises that are necessary to make a final product that is both reliable and good looking, that performs well and that sells at a competitive price in the necessary volume. We must design, not just the cars we would like to build, but more importantly the cars that our customers want to buy." [40]

The pace of innovation also reflects the fact that it frequently takes years to develop a new automotive product. In many cases, bringing an idea to commercial reality requires a chain of breakthroughs to solve major problems—breakthroughs in materials, in fuels and lubricants, in manufacturing processes and techniques and in product performance. For example, GM's introduction in 1934 of the "Turret Top," a solid roof made of one piece of sheet steel, required new processes in the steel industry by which steel could be rolled in the necessary width. It also required the solution of hundreds of serious engineering problems, particularly those involving insulation and noise absorption. The single most significant advancement of the Vega engine—the aluminum block—required technical breakthroughs in die casting and in silicon alloying. In other cases, new products require the design and construction of modern facilities to achieve high volume production. The pace of innovation also must be consistent with the assurance of product reliability and safety, and the updating of work skills from production workers to garage mechanics.

While the timing and rate of innovation in the industry depends on technological and cost constraints and the acquisition of the necessary skills, the rivalry that pervades the industry compels manufacturers to overcome these constraints as quickly as they can. In addition to constant efforts to reduce the lead-time needed to develop a new product for sale, and to reduce costs and to upgrade skills, they have greatly expanded their R&D activities.[41]

Research, development and innovation in the motor vehicle industry goes beyond the development of new products and the improvement of product components. The struggle to keep costs in check and to offer competitively attractive product values, under conditions of steadily advancing labor costs and rising costs to meet social goals, has made the achievement of improvements in manufacturing and assembly technology necessary for survival.

Competitive innovation in this area involves product designs that simplify production, save material or reduce the number of parts; improvements of existing materials; the search for new materials that are lighter, less expensive and easier to fabricate; improved manufacturing processes that save time, eliminate costly equipment, reduce or recycle scrap and facilitate handling; new instrumentation to speed testing and improve quality control—all means toward the ultimate objective of providing the customer more automotive value for his sales dollar.

The vehicles on the road today are tangible evidence of breakthroughs in all of these areas. In addition, they reflect the accumulation of many smaller and unheralded advances in the approximately 15,000 parts which go into the typical passenger car. Small changes in design and materials add up to major advances over a period of years. The contributions of supplying industries, such as specialized steel alloys, improved glass and better finishes also have added importantly to this ongoing improvement.

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[40] Alfred P. Sloan, Jr., *op. cit.*, p. 440.

[41] These efforts, in addition to producing more automotive improvements, also have generated a "fallout" of non-automotive innovations which have benefited the entire community. As a result of its work in the field of radioactive isotopes, for example, General Motors developed a technique for making medical X-rays with lightweight portable equipment. Other contributions GM has made to the medical field include the Mechanical Heart, the Centra-Filmer for purifying the Salk and other vaccines, the Photoelectric Oxyhemograph and the Electric Stethograph. In the field of space exploration, General Motors has contributed importantly to the development and production of inertial guidance systems and a lunar vehicle.

Available on most of GM's 1974 car models, for example, is a "GM specification' steel-belted radial ply tire for a better, quieter ride. Less visible improvements available on various models include: more effective rust-preventive coating on frames and suspension arms, a new flame arrestor battery cap, aluminized carburetor ducts to prevent rusting, an integrated engine distributor point assembly and capacitor to eliminated radio interference, and wear sensors which signal the need for a brake pad replacement. Improved serviceability is a feature of instrument panels on some models and of the rear universal joint on others.

Such changes are neither simple nor easy to make. They are, however, a competitive, and in some cases a legal imperative. No company striving to sell vehicles in volume can avoid the overriding imperative of continuing product improvement.

A. Product innovation

The continuing product innovation so characteristic of the automotive industry reflects developments by virtual y all of its members. As customer needs and preferences have changed, the industry has developed new types of passenger cars. In 1910, GM introduced the first closed car, a Cadillac. Chrysler introduced a streamlined design in 1934 and in 1935 Chevrolet brought out the first all-steel-bodied station wagon and Studebaker produced the first six passenger sedan. In the post-war period, Chrysler introduced the two-door "hardtop" and Hudson the step-down body design. GM brought out the four-door "hardtop" style, the fiberglass Corvette, the rear-engine Corvair and the front-wheel drive Toronado and Eldorado. Other product innovations on this broad scale include Ford's Thunderbird and Mustang. Current work on rotary-engine passenger cars is a further illustrations of this type of competitive effort.

From an engineering standpoint, the most important developments include the improvements of such vehicle components as engines, transmission, suspensions, and brake systems. GM pioneered fundamental combustion chamber studies and the development of high compression engines. The modern short-stroke V–8 was first introduced on 1949 model Cadillacs and Oldsmobiles. Other critical innovations by GM in the development of engines include dynamic crankshaft ba anc ing, hydraulic valve lifters and the automatic choke.

General Motors has always been in the forefront in transmission development. The synchromesh transmission was introduced on the Cadillac in 1928. Today virtua ly all manual transmissions employe the synchromesh principle. After years of research and experiments by Cadillac, the first completely automatic transmission—Hydra-matic—was released for production in 1939 on the 1940 O dsmoble. The next big step in automatic transmission development was the introduction by the Buick Division in 1948 of the Dynaflow transmission, incorporating a torque converter which gave the motoring public greater driving smoothness and more flexible performance. Studebaker and Chrysler a'so contributed importantly to transmission development with helical gears and fluid couplings, respectively.

In the late 1920's, General Motors began experimenting with various forms of independent front-wheel suspension. The "Knee-Action" design introduced on its 1934 models was recognized as the greatest advance in absorbing road shocks in many years and was quickly adopted by the entire industry. Since then, engineers have made further refinements to take better advantage of the possibilities inherent in the original design—for example, the substitution of ball joints for kingpins, first introduced by Ford on the Lincoln in 1952.

The development of four-wheel hydraulic brakes by Lockheed in 1917 contributed greatly to the safer and more effective use of motor vehicles. Following World War II, brake development progressed greatly with the introduction of self-adjusting brakes, bonded linings, air-cooled drums, and disc brakes. Among the leading innovators were Studebaker and Chrysler, in addition to General Motors.

Such developments of the major systems of automobiles have contributed to their overall performance and safety. Beyond these, and from many points of view more important to safety, have been the major advances in basic structural design and materials made since the 1920's. The many specific safety features that have been incorporated in cars over the years—tilt beam headlights, directional signals, seat belts, padded interiors, etc.—important as they are, would be of much 'ess value if the structural integrity of the car itself did not provide inherent durability, reliability and safety.

From the earliest days of the industry, the safety of the vehicle concerned most drivers and has been a primary objective of industry engineering and

design efforts. Historically, most auto manufacturers have concentrated on the fundamental safety attributes of the vehicle—attributes which, for the most part, are now taken for granted. These include such qualities as improved vehicle weight balance, lower center of gravity, strength of the body and chassis, brake and steering response, and visibility. Indeed, safety considerations have been involved in practically every part and assembly of parts in the vehicle. There is no question that most of the progress in safety occurred prior to the enactment of Federal safety legislation in 1966.

In recent years, automotive companies often have incorporated new safety features in their vehicles in advance of government-mandated standards. General Motors, for example, introduced the energy-absorbing steering column on its 1967 models. In 1968, greater protection against passenger compartment penetration in side collisions was provided by high-strength steel beams welded in the doors of some GM cars. General Motors also introduced the anti-theft steering column lock which, at least indirectly, contributed to safety because of the high incidence of accidents involving stolen vehicles.

General Motors' research also has contributed to safer highways. Three decades ago at the 1939–40 World's Fair in New York City, General Motors' pioneering exhibit pointed the way toward modern high-speed freeway construction. While it is difficult to assign degrees of importance to the individual factors contributing to highway safety, there is little question that modern freeway design has made a large contribution.

As a result of these efforts over the years, progress has been made in reducing the automobile fatality rate. The average highway death rate for the period 1928–32 was 15.6 per 100 million vehicle miles; in 1972, it was down to 4.5 and preliminary data from the National Safety Council indicates a decline to 4.2 for 1973—the lowest rate on record. Highway travel in the United States also is demonstrably safer than in any other major industrialized country. For example, the latest fatality rates for West Germany, France, and Japan are more than twice those of the United States.

In order to reduce air pollution, a number of innovations in automotive emission control have been phased in over a period of years.[42] These have reduced the level of emissions significantly. In current models, compared with the uncontrolled cars of the early 1960's, exhaust hydrocarbons have been reduced by 80 percent, carbon monoxide by almost 70 percent and oxides of nitrogen (NO_x) by about 40 percent.

Competitive innovation is manifested in the different approaches the manufacturers have taken regarding the 1975 interim standards set by the Environmental Protection Agency. After examining more than 800 different catalysts, General Motors has developed a catalytic converter system for 1975. The converter is a muffler-like device attached to the exhaust system which chemically renders pollutants harmless or inert. General Motors believes that this system on its cars will be competitive in terms of initial cost, maintenance, and especially in fuel economy and engine performance. Other manufacturers focused on other ways of meeting these standards.

Current automative research and engineering programs continue the search for further improvements in motor vehicle power plants. General Motors, for example, is continuing to look closely at all possible alternatives to the conventional gasoline engine, including the stratified charge, rotary, gas turbine, diesel, electric, and steam engine. It has built and tested vehicles with these experimental engines. Some of these power plants hold promise while others so far do not. Some have development problems that are apparent only when the power plant is installed and tested in an actual operating vehicle. Others involve trade-offs between emissions and other engine requirements that, at the present state of the art, preclude their wide application.

Automotive engineers, in addition to exploring various alternative automotive power plants, are stepping up their search for better fuel economy. The im-

[42] Emission control developments on GM cars have included: Positive Crankcase Ventilation first installed by GM on all new 1961 cars in California and in all 1963 cars nationwide; the Air Injection Reactor (AIR) and the Controlled Combustion System (CCS) to control exhaust emissions (AIR was introduced on new GM 1966 models in California and either the AIR or the CCS were on 1968 models nationwide); Transmission Controlled Spark to reduce emissions of both hydrocarbons and oxides of nitrogen was a major feature of the CCS on most 1970–72 and many 1973 GM cars; the Evaporative Control System was adopted in 1970 for California and nationwide for all 1971 models; Exhaust Gas Recirculation was adopted for control of NOx in California for 1972 cars and was extended to nationwide use in 1973. Anticipating the use of catalysts in 1975, which do not tolerate lead, GM reduced engine compression ratios in 1970 for 1971 models to accommodate the use of unleaded gas.

proved economy resulting from GM's introduction of the high-compression engine more than two decades ago has since been erased by the trade-off of gas mileage for power devices, air conditioning, heavier bumpers and safety equipment and improved emission controls. To improve gasoline mileage and contribute to the conservation of energy, General Motors has priority programs in a wide range of areas including transmission and driveline modification, optimization of air conditioners, adoption of new tire construction materials, as well as vehicle weight reductions.

Finally, not to be overlooked are efforts to reduce vehicle maintenance requirements. General Motors, for example, formerly recommended that a car receive an oil change and lubrication every 1,000 miles or every month. Today the mileage between oil changes has increased to 6,000 miles or four months, because of improvements in engine design and in lubricants. Some points on the car require lubrication only once every 12,000 miles or 12 months, and some are now lubricated for life. Regrinding valves, replacing piston rings, and reboring engines, once regular maintenance procedures, are rarely necessary today. General Motors also has pioneered the development of a maintenance-free battery. This battery is available on several models and its use on more cars and trucks is anticipated in the future.

B. Process and material innovation

In addition to competitive innovation in products, the motor vehicle manufacturers are competing to develop new processes, tools, skills, and materials that result in more efficient manufacturing operations. Technology applied through competitive enterprise is the basic source of increasing productivity.

Over the years, General Motors has developed or adapted highly sophisticated equipment for both its own manufacturing plants and those of firms supplying the automotive industry. These included electrical discharge and electro-chemical machines, parts balancing machines, end-of-line emissions testing equipment, carburetor testing systems with adaptive controls, aluminum die-casting techniques and equipment, magnetic forming machines, electron beam welding equipment, engine cold testing techniques, continuous pour foundry equipment, and industrial robot controls. In many instances, GM has obtained patents on the equipment or processes it developed and issued free licenses to others to build or otherwise make use of the equipment. Over 100 such licenses for the Acurad die-casting technique, for example, have been granted to other firms.

GM has also been a prolific source of innovation in materials used in automotive applications. GM's Research Staff has developed nearly all the bearing materials used in GM's vehicles today. Through research in metallurgy have come a variety of new alloys and die-casting advances and controlled temperature metal-forming techniques. Similar advances have been made in high-strength fibers, polymers, ceramics, and nodular iron. These are either already in use or have potential for the future.

There is vigorous competition to make cars lighter through new processes and materials. Auto designers and materials suppliers are seeking to replace some of the 1½ tons of low-carbon steel in a car with lighter materials. High-strength low-alloy steels (HSLA) are being used in side impact beams and they are almost a certainty for use in frames and suspensions in the future. Plastics are widely used in front ends and radiator grilles. Some models use plastics for such parts as the rear end panel, quarter panel extensions and rear window louvers. Urethane elastomers are basic to several new bumper designs. Aluminum, which has been used for trim and some grilles, now is used in other applications such as the load floor of the Vega hatchback and wagon.

Shifting to HSLA steel, plastics and aluminum to achieve both reductions in weight and cost requires the solution of many technical problems within the context of an energy shortage.[43] Thinner gauge HSLA steel is more susceptible to corrosion and, therefore, requires better coatings. Aluminum sheet is less ductile than steel, and so bends must have a larger radius. Neither aluminum nor plastic can be welded to steel, so some panels will have to be assembled by adhesive bonding. Plastics also require special

[43] The energy shortage could severely affect the availability and cost of the petrochemicals needed to produce plastics and the electric power needed to produce aluminum. However, while most plastics are now petroleum based, they can be produced from other hydrocarbons—even from agricultural waste products such as corn stalks or wheat stubble.

processing and handling to prevent sagging, wavy finishes, and poor color matches.

Nevertheless, competitive innovation in this area is intense. There are incentives—improved mileage and cost savings—for such innovation. A reduction in weight in one part of the automobile can lead to another reduction, and maybe several more. This weight reduction compounding can turn a seemingly insignificant savings into an important one. An initial saving of 100 lbs., for example, may permit further reductions in the weight of frames, engines, wheels, tires and suspensions.

Motor vehicle manufacturers are seeking innovative applications of computers in nearly every facet of the business. Initially used in accounting areas such as payroll, billing and inventory control, computers are now employed in product design, manufacturing, production scheduling, and marketing.

In GM, computer programs are used to translate the designer's clay model into the production engineer's die. Computer graphics are used in product and tool engineering. Mathematical modeling and simulation are being used for the planning and evaluation of new manufacturing installations and the improvement of existing ones. In assembly plants, the computer is being used for controlling the mix of models and options to equalize labor content and handle the flow of materials more efficiently. In manufacturing, it is widely used for quality control, including exhaust emission, carburetor flow, motor and pump, suspension design and fastener tests.

In marketing, the computer is used in a variety of ways. Dealer communications terminals are being used for ordering vehicles and parts, for warranty reports and for 10-day sales reporting. The movement of freight cars and the special rail cars used for the shipment of finished motor vehicles are closely monitored by computers. GM's objective is to sell the customer the car he wants, complete with all the options he wants, deliver it as soon as possible and service it with minimum inconvenience. The computer is indispensable to achieving this objective.

The computer is even being used increasingly as a part of the product itself. The Oldsmobile Toronado offers an antiskid braking system which includes a small on-board computer to monitor braking action and prevent brake lockups. The "Max Trac" drive control, a Buick option, uses a computer to assure maximum traction and prevent rear wheel spin. Electronic circuits in ignition systems replace the conventional distributor rotor and ignition breaker points on many models. In the future, GM expects a centralized on-board computer will handle these functions, plus many new ones such as fuel injection, velocity sensors, obstacle detectors and diagnostic devices. These improvements and others still under development are indicative not only of the competitive necessity to innovate but also of the fact that creative innovation is not the exclusive domain of any producer large or small.

Competitive rivalry encourages the automotive producers to employ the most recent methods in their operations, adopt better production techniques and methods, develop better materials and seek new applications for them.

C. Annual model change

The story of innovation and product competition would not be complete without reference to the annual model change. In addition to shifts in consumer demand and expectations, product or process changes by auto manufacturers are triggered by the innovations of other producers, government safety and emissions regulations, and shifts in the relative cost of productive factors.

Adaptations to such developments can and often must be accomplished on a running basis. However, new product introductions, engineering innovations, appearance changes and process improvements are most efficiently accomplished at the start of each model year. The model change has been timed to coincide with the seasonal decline in demand in late September and early October. It stimulates buyer interest and thus helps to stabilize production and employment through the winter months. Such stabilization reduces cost of production thereby increasing values for the consumer.

The annual model change does not mean a complete redesign of all of a firm's car lines or even of any of them every year. For example, it has been General Motors' practice in the past to provide its higher price car lines with completely new or substantially new body designs every fourth or fifth year. During intervening years, the appearance of a given car line might be en-

hanced by major or minor body sheet metal changes. The cycle for General Motors' smaller cars has been longer. The Chevy II (now called the Nova) was introduced in the 1962 model year, received a completely new body for the 1968 model year, and is scheduled for major sheet metal changes on 1975 models. During the intervening years, while there were no major design changes on the Nova and other GM compact cars, substantial improvements were made in some components.

Annual model changes also provide consumers with the results of the continuing research, development and testing on improved engine, chassis and suspension systems. These improvements are usually made available initially on a particular limited volume car series. Once their value to the customer has been demonstrated (and production capacity has been sufficiently expanded), such engineering developments are added to other car lines in succeeding model years.

The success of GM's efforts to build high quality products of the type desired by customers also can be measured by the continuing acceptance of these products in the marketplace both when initially purchased and later when resold. Many of General Motors' vehicles have retained a higher proportion of their value over time than competing products. Between the 1962 and 1972 model years, the Chevrolet Impala, for example, enjoyed a greater resale value than comparably equipped cars of other manufacturers in all but one year. The differential was as high as $279 and averaged more than $100. The traditionally high resale values for General Motors' products is an indication of its ability to provide customers with high quality motor vehicles.

IV. COMPETITION IN PRICES

Product and process competition in no way diminishes the importance of price competition, although they add to the complexity and sensitivity of competitive adjustments. They are inseparably tied to price competition. This Chapter discusses the Manufacturer's Suggested Retail Price, the price the customer pays, pricing considerations in product development and price trends in the industry.

A. The manufacturer's suggested retail price

A Manufacturer's Suggested Retail Price (MSRP) is shown on a window sticker attached to each new passenger car, as required by law, and applies only to the specific vehicle as equipped. It is a base from which the dealer and customer negotiate the transaction price, which reflects local demand and supply conditions for both the particular new car and the used car being traded.

The determination of the MSRP represents a complex balancing of many interrelated factors. These include the competitive advantages the manufacturer believes his new product offers in relation to his and other prior models, an estimate of the customer appeal of new competitive products, the most recent prices of competing products, and appraisals of the market potential. In assessing these factors, the manufacturer draws on an up-to-date body of data on consumer demand trends.

In his approach to new product pricing, each manufacturer is constrained within narrow limits by the competitive realities of the market on the one hand and the facts of cost change on the other. A new vehicle offering specified qualities and features can be sold only if the product and its price—its value—are comparable with that of other similar vehicles. Consequently, comparable makes, models and body styles are offered for sale at similar prices.

Year-to-year changes in new vehicle prices must take into account the competitive challenge which each product line, model and body style is expected to meet. Each year's development of the MSRP requires a highly particularized product and price analysis which leaves no opportunity for inflexible pricing procedures.

The MSRP is the manufacturer's estimate of a price that reflects all of the above factors, but this estimate still has to be tested by the reaction of customers in the marketplace. General Motors' approach to pricing, therefore, places major emphasis on the relative strength of demand for various vehicles. As a result, price adjustments vary from model to model as determined by market forces. In September, 1970, for example, while the announced prices for GM's 1971 models represented an average increase of 4 percent over com-

parably equipped 1970 models, the increases ranged from 1.8 percent on the 4-door Buick Centurion hardtop to 7.9 percent on the low volume Cadillac Fleetwood 75 sedan.

The strength of demand for various types of cars, the competitive position of any particular model and overall cost considerations influence the price of specific models. These factors operated even under the direct price controls of the New Economic Policy. Chart 14, for example, shows the effect of such factors on the base vehicle prices for Chevrolet's compact Nova and regular-size Impala for two recent model years.

CHART 14

PERCENT CHANGE IN BASE VEHICLE PRICES AT MODEL INTRODUCTION—SELECTED MODELS 1971 AND 1974

	1970–71	1973–74
Compact Nova (2-door sedan)	+2.2	+6.3
Regular-size Impala (2-door hardtop)	+4.0	+.7

Note: Price adjustments for optional equipment made standard not included.

When the 1971 models were introduced, domestic small cars faced particularly strong competition from foreign-made cars. At that time, as discussed in Chapter II, imported cars had a competitive price advantage arising from lower labor costs overseas and a very substantial over-valuation of the dollar —particularly in relation to the German mark and Japanese yen. The prices at which General Motors could sell its smaller cars reflected these competitive realities which limited price increases on the compact Nova to 2.2 percent in spite of substantially larger cost increases. In contrast, the prices of the 1971 Impala and similar domestic cars were less directly affected by this subsidized competition from abroad.

By the fall of 1973, prices of imported cars had increased dramatically as a result of the exchange rate realignments and rising costs of production overseas. With the removal of the artificially low (in effect subsidized) prices for the imports, and in view of a very strong demand for small cars, introductory prices for the 1974 Nova could be increased at a rate more nearly in line with experienced cost increases. Impala prices, however, in spite of cost changes, were increased relatively little because of demand trends for regular-size cars.

B. The price the customer pays

The Manufacturer's Suggested Retail Price brings into focus all of the competitive and cost factors affecting each new model. With the large number of individual models and body styles produced and the availability of a great variety of optional equipment for each vehicle, the MSRP has become an important adjunct of new vehicle retailing. The "price sticker" by identifying the specific make and model and all items of optional equipment assists the customer in his evaluation of the product choices available at various prices.

The MSRP provides a basis for negotiations between the dealer and the customer. The final transaction price involves detailed negotiations because the customer buys an individualized product and the majority of new car transactions involve a "trade-in." [4] The difference between the MSRP and transaction price depends on many considerations, including the demand for the particular model, the ability of the manufacturer and dealer to satisfy the demand promptly, and what, if any, profit the dealer can expect on the resale of the used vehicle traded in.

Marketing and merchandising programs offered by manufacturers serve as a motivation to dealers and salesmen and thus influence the transaction price. These programs, offered at various times during a model year, are geared to changing conditions in demand and the competitive efforts of other producers. They represent selling tools which the manufacturer uses to adapt his marketing efforts selectively to the dictates of the market.

[4] The price of the used vehicle traded in depends on a number of factors—the make, model and optional equipment and its mileage and general condition, as well as the current economic climate.

Special sales campaigns offer dealers payments based on the number of qualified cars delivered to customers during the campaign period and special product promotions offer optional equipment at a reduced cost. These programs are an important competitive requirement for dealers and, in addition, by reducing variations in production contribute to manufacturing efficiency. Chart 15 summarizes such programs during the 1969 model year, a year during which the industry operated without the artificial constraints of price controls and did not experience a major nationwide strike.

Ford introduced several special product promotions beginning in November and December with savings of up to $80 per unit. GM initiated similar programs in December and January which offered savings of $30 to $50 per vehicle. In January, Chrysler and AMC offered dealers savings of $24 to $92 and $47 to $157, respectively, on vehicles with specified equipment. The domestic manufacturers continued to offer such programs on various car lines throughout the model year.

CHART 15

SPECIAL SALES CAMPAIGNS AND OPTION PACKAGE PROGRAMS 1969 MODEL YEAR

Make	Effective dates	Type of program	Models	Per unit savings
Ford	November 1–(1)	Option package	Mustang, Fairlane	$17–$57
Do	December 1–(2)	do	Galaxie 500	38–80
Mercury	December 1–(1)	do	Marauder, Montego, Comet	29–50
Ford	December 1–January 31	do	Falcon	40
Pontiac	December 21–February 28	do	Tempest, Catalina, Bonneville.	50
Buick	January 1–March 31	do	Skylark	30–45
Dodge	January 1–April 30	Sales campaign	Dart, Coronet, Charger, Polara, Monaco, light trucks.	10–60
Plymouth	do	do	Valiant, Belvedere, Barracuda, Fury.	10–75
Chrysler	do	do	All models	15–50
Plymouth	January 1–(1)	Option package	Valiant, Barracuda, Belvedere, Fury.	24–92
Dodge	do	do	Dart, Coronet, Polara	35–81
American Motors	January 1–March 31	do	Javelin, Rebel, Ambassador	47–157
Mercury	January 13–March 31	do	Cougar	34
Dodge	February 1–April 30	do	Dart	142–155
Mercury	February 10–April 30	do	Monterey	36–59
Chevrolet	March 1–May 30	do	Nova	52
Ford	March 1–April 30	Sales campaign	Thunderbird	150
Mercury	do	do	Mercury, Montego, Cougar	100
Ford	March 1–May 30	Option package	Pickup trucks	65–207
Plymouth	March 1–(1)	do	Belvedere, Fury	31–89
Chrysler	do	do	Newport	44–94
Pontiac	March 1–April 30	Sales campaign	Firebird	25–75
Mercury	March 21–April 30	do	Cougar Montego	75
Do	March 31–May 31	Option package	Cougar	119
Dodge	April 1–(1)	do	Coronet	41–66
Mercury	April 21–May 31	Sales campaign	Marquis, Montego, Cougar	50–125
Ford	May 1–September 19	do	Thunderbird	100–250
Chrysler	May 1–September 23	do	All models	20–200
Plymouth	do	do	Barracuda, Belvedere, Fury	10–140
Dodge	do	do	Dart, Coronet, Charger, Polara, Monaco, light trucks.	10–140
Plymouth	June 4–July 31	do	Fury	(3)
Dodge	do	do	Charger, Polara, Monaco	(3)
Chrysler	do	do	All models	(3)
American Motors	June 11–August 10	do	Javelin, Rebel, AMX Ambassador.	25–125
Mercury	July 1–September 19	do	All models except Marauder	50–180
Chrysler	July 1–August 31	do	Imperial	500
Do	July 1–September 30	do	Simca	50–100
Chevrolet	August 1–September 17	do	Biscayne, Bel Air, Impala, Caprice.	50–150
Pontiac	do	do	Catalina, Executive, Bonneville, Grand Prix.	50–150
Oldsmobile	do	do	Delta 88, 98, Toronado	50–150
Buick	do	do	LeSabre, Wildcat, Electra, Riviera.	50–150
American Motors	August 11–September 25	do	Ambassador, AMX, Javelin, Rambler, Rebel.	100–300

[1] Termination date unknown.
[2] End of model run.
[3] Programs allowed extended floor planning with interest savings of an estimated $15–$30 per unit.

Source: Wards Automotive Reports and other trade sources.

In the first half of the 1974 model year, the gasoline shortage sharply reduced consumer demand for new and used cars, particularly larger models. In response, General Motors offered cash allowances to dealers on new intermediate and regular-size cars, beginning for Pontiacs on December 21, 1973; for Buicks on January 1, 1974, and for Chevrolets and Oldsmobiles on February 1, 1974. In view of a continuing low level of sales, General Motors on March 1, 1974, extended these programs. The allowances involved were substantial, amounting to as much as $350 for certain models—the highest GM allowance in recent years. These programs, since they represent, in effect, a price reduction to the dealer, reduce the price paid by the customer and can be a sales stimulant.

A study, sponsored by General Motors, of the effect of several of the 1969 programs found that a large part of the reduction to the dealer was passed on to customers. The study, based on a survey of dealers in the greater Pittsburgh area, concluded:

"From in-depth interviews held with a significant proportion of new-car dealers in the Pittsburgh area of makes recently experiencing cash incentive programs, it was found not only that manufacturers reduce prices during the model year but also that dealers respond by converting these discounts into cash savings for their customers. This is all the more significant since, in the process of selling the affected models, dealers were often not certain of the actual amount of discount for which they would qualify under the rules of the specific program. The results of this survey indicate a degree of price flexibility not generally recognized in the literature on new-automobile pricing." [45]

Competitive pressures affect each dealer's approach to marketing opportunities. Each strives to retain as large a part of the difference between the wholesale price and the MSRP as local competitive conditions, combined with a desire for sales, permit. Other factors, such as the dealer's reputation for service as well as the reputation of the product and the manufacturer, importantly affect the dealer's ability to build a successful business. The merchandising efforts of other dealers, new vehicle stocks and used car price trends are also important.

These factors, which are critical to the individual dealer trying to sell a vehicle, are just as important to the manufacturer. Ultimately, therefore, these various aspects of the dealer-buyer transaction determine prices, marketing programs, and sales volumes at the manufacturing level. Each producer analyzes these factors as carefully as possible so that product, price, and marketing adjustments can be made quickly to meet the demands of customers.

C. Pricing considerations in product development

The shifts in customer preferences, discussed in terms of product characteristics in Chapter II, have significant price implications. As shown in Chart 16, since 1959, there has been an increasingly wide selection of small and intermediate-size domestic passenger cars available at prices below that of the high-volume Chevrolet Impala V-8.

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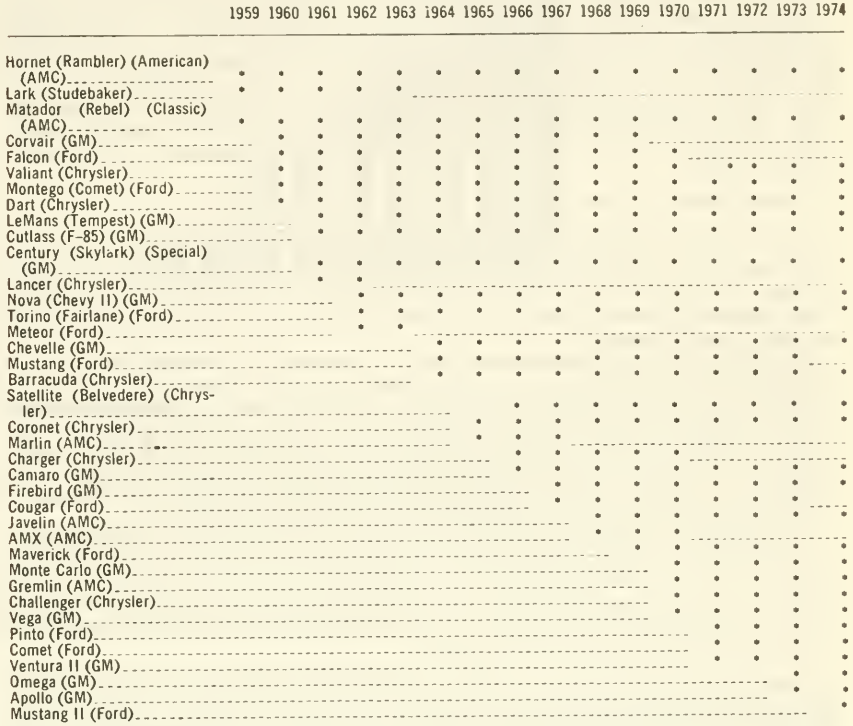
[45] G. William Trivoli, "The Effects of Price Concessions on New Automobiles to Dealers During the Model Year 1969," *The Journal of Business*, October, 1971, p. 404.

CHART 16

DOMESTICALLY PRODUCED SMALL AND INTERMEDIATE MAKES OFFERED AT PRICES BELOW THE CHEVROLET IMPALA V-8

[By model year]



Source: Ward's.

There has been a ninefold increase in the number of these lower price models—from 3 in 1959 to 28 in 1974. These models represented less than 10 percent of new car registrations in 1959. By 1973, they represented almost 50 percent. Thus, over this period, there has been a significant expansion, both absolutely and relatively, in the variety of new domestic lower price makes. This expansion reflects the long-term efforts of each manufacturer to anticipate trends in customer preferences and strengthen areas of weakness in his product line.

In developing a new product, the manufacturer must work from market trends which establish the basic vehicle specifications and price ranges required in order to be competitive. The key test is whether a product of the type specified can be produced at a cost which will enable the manufacturer to sell at a profit. Most manufacturers have had the experience of building prototypes which could not meet this test and were not put on the market.

In addition, because of the long lead time required to bring an automobile to market (as much as four years), it is imperative to try to anticipate trends in customer preference. Otherwise, by the time a car is marketed, its design may be outdated or it may have other features that no longer have a high degree of customer favor. Many models have been introduced which showed promise of meeting the test but subsequently failed. Some classic examples are the 1929 "pregnant" Buick, the 1934 Air Flow Chrysler, and the 1958 Edsel, to name only a few.

The manufacturer must estimate, as best he can, the costs involved in a new product to determine whether it can be developed and marketed at a price that would make competitive success probable. However, the competitive performance of the new model may be greater or less than anticipated. It may affect the sales volume of other models in the manufacturer's line to a greater or lesser degree than estimated. The most that can be said is that the manufacturer hopes the new product will make a contribution to profits.

The manufacturer cannot rely on a mechanistic calculation of price changes based on cost changes. Cost estimates merely suggest which products *might* be marketed on a profitable basis. While costs do exert pressure on manufacturers, particularly during the new model development process, they are only one element in the complex of factors to be considered. The other elements include the competitive efforts of other manufacturers, volume expectations and, most importantly, the customer who must be satisfied by the product values offered.

D. Price trends and price levels

Competitive rivalry among motor vehicle manufacturers to reduce costs and to develop products which can be sold at the lower end of the new car price range has resulted in substantial benefit to consumers. The net effect of these efforts is that increase in the average price paid for a new vehicle has been relatively small in spite of the strong inflationary pressures which have existed for many years.

The effect of the manufacturers' price competition can be seen in Chart 17. Between 1959 and January, 1974, the Consumer Price Index as a whole rose by 60 percent while the passenger car component, adjusted for product changes, increased by 6.6 percent. The wholesale price index for new cars, over this period, increased by 13.7 percent. New car price performance has been notably better than that of other major categories of consumer expenditures. The small increase in new car prices since 1959 contrasts sharply with price changes in medical care services, home ownership and apparel, for example.

In relation to family income, the cost of a new car declined significantly between 1959 and 1973 even though the quality of cars was improved and many cars were ordered with more options such as power assists and air conditioning. As Chart 18 indicates, the average cost of a new car was equal to over 50 percent of the median annual family income in 1959 but declined to less than 35 percent of income by 1973.

In view of the rising cost pressures throughout the economy during this 15 year period, the new car price trend is remarkable. Had price trends in the economy generally paralleled those in the motor vehicle industry, there would not be the widespread concern about inflation so evident today.

V. COMPETITION IN MARKETING

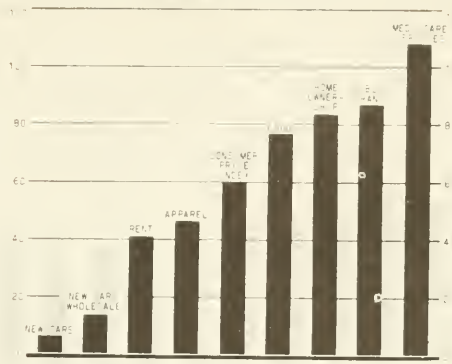
The long and costly process from a new product concept to actual production culminates in the display of the new vehicle in dealer showrooms. The competitive market and cost factors, discussed in the previous Chapter, determine the price range within which the vehicle must be offered for sale. The next critical step is to demonstrate the product's value to potential customers.

Marketing includes all of the diverse aspects of distribution, merchandising and product promotion as well as the tasks of selling and servicing the vehicles. Customers must be told about the vehicle and its features. It must be available to inspect and to drive in adequate numbers at the right places. As with all highly engineered products, there must be assured sources of replacement parts and service facilities. Finally, it must be sold in a highly personal transaction to a buyer who has a great many alternatives, and at a price subject to the continuing test of the market. These varied elements, taken in combination, constitute the marketing challenge.

A. The distribution system

Motor vehicles are sold in the U.S. through franchised dealers, distributors and manufacturer-owned retail outlets. The most common method of distribution is through a network of franchised dealers—locally owned and operated independent businesses. These dealers can all represent more than one manufacturer and many of them do. Franchised dealers compete with others selling the same products and with dealers selling other makes of motor vehicles.

PERCENT CHANGE IN PRICES OF NEW CARS
AND SELECTED CONSUMER GOODS AND SERVICES



Note: The Bureau of Labor Statistics adjusts for quality changes in compiling its price indexes. The new car price index is adjusted for structural and engineering changes which affect safety, reliability, performance, durability, economy, carrying capacity, maneuverability, and/or comfort and convenience. In addition, adjustments are made for warranty changes (and certain other changes in the terms and conditions of sale). No adjustments are made for style or appearance changes or for changes considered by BLS to be "minor" in extent. Quality change adjustments are made for both improvements and deteriorations in the product. The new car price index also reflects the reduction of the 10 percent excise tax on new cars to 7 percent in June of 1965 and its complete removal in 1971. The net effect of excise tax removal between 1959 and January, 1974, is equivalent to a price decrease of approximately 8 percent.

Source: Bureau of Labor Statistics, U.S. Department of Labor.

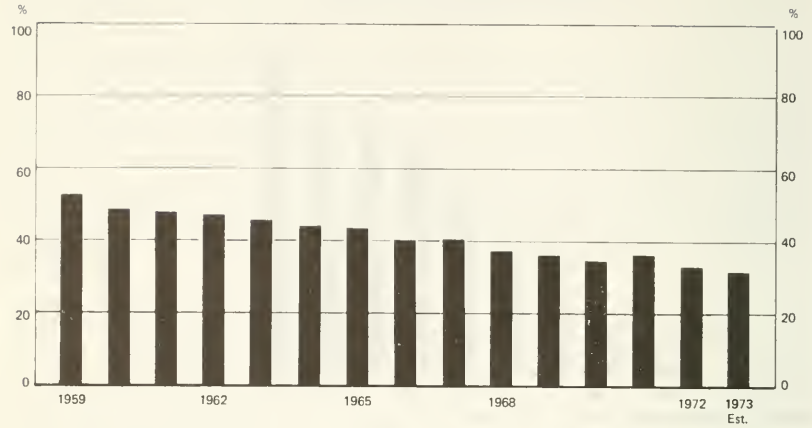
CHART 17

Although the franchise agreement between the dealer and manufacturer specifies the location of the premises at which the dealer may sell and service vehicles, dealers are free to sell to anyone at any price. There are no exclusive dealer territories.

In addition to performing the retail selling function, franchised dealers provide service and parts facilities. Reliable service is an essential factor in selling cars and trucks. New vehicles must be inspected and prepared for delivery by the retail dealer. Customers normally expect to return to the dealer who sold them the vehicle for neeessary adjustments and for required maintenance and repair service. Warranty obligations, responsibilities under the safety and emissions regulations and the increasing scope of product liability make it necessary to have an adequate number of facilities properly equipped and located to perform needed service. From the customer's point of view, service facilities must be conveniently located. Furthermore, motorists driving longer distances benefit from the existence of a national network of such facilities. Motor vehicle manufacturers have found that the franchised dealer system is the most dependable way of handling all of these service requirements.

Due to the importance to customers of service and parts availability, automotive companies must work constantly to improve the quality of their dealers' service facilities and to conduct major programs to train personnel for service work. For example, General Motors established a national network of 30 dealer service training centers in the 1950's. Here the dealers' employes are instructed in the latest methods of servicing vehicles and components. Since 1953, General Motors has supplied free instruction and classroom equipment for some 2.9 million enrollees. In addition, GM operates a fleet of 187 mobile training units which extend training and instruction right into the

PERCENT OF FAMILY INCOME TO PURCHASE NEW PASSENGER CARS
1959 – 1973



Note: This Chart reflects changes in product mix, in the quality of cars, and in the optional equipment ordered.

Source: U.S. Department of Commerce, Bureau of the Census; National Automobile Dealers Association Data

CHART 18

dealerships. Efforts are also made to assure that dealers will have the new tools, equipment, facilities and replacement parts inventories to properly service current and past models. To assure the prompt availability of replacement parts, GM maintains a national network of 37 parts warehouses with 19 million square feet of floor space.

A distinguishing feature of motor vehicle retailing is that the dealer-customer relationship is often long-term. It is based on continuing service to the customer. Illustrative of the continual competitive effort by General Motors to upgrade dealer service is Chevrolet's program which establishes 22 performance standards for its dealers. Each participating dealership is evaluated on these points, which include facilities, shop equipment, manpower and parts. General Motors assists the dealers in making the necessary improvements to meet these standards. The goal of the program is complete customer service satisfaction. While much progress has been made toward this goal, GM continues to consider the quality of dealer service one of the most sensitive and critical areas of the automotive business.

Franchised dealers are an important source of market information needed for the forecasting of sales and for estimating production requirements. Through their sales reports and the flow of orders, as well as by informal appraisals of current and anticipated market conditions, automotive dealers provide the manufacturers with information which permits them to make rational decisions in planning production. These production decisions determine total volume as well as the mix of production by make, body style, color, trim and optional equipment. In addition, dealers provide information essential in developing optimum vehicle distribution patterns by geographical area.

The reconciliation of the objective of promptly satisfying fluctuating customer demand with the objective of stabilizing production poses critical planning problems. If production and inventory dislocations are to be avoided, and if the right products are to be shipped to the right places at the appropriate times and in appropriate numbers, it is essential that continuous, complete and accurate retail sales and stock information be obtained. Without this information, the manufacturer cannot establish or modify his future production schedules to anticipate incoming dealer orders with any precision. The ability to do so smoothly and promptly is of utmost importance for competitive

reasons. Customers will not wait indefinitely for their cars. It is also important because increased costs—both financial and social—result inevitably from abrupt adjustments of production schedules. To make the system work smoothly and efficiently, therefore, the dealer participation obtained under the present automotive franchise system is essential.

The dealer system also facilitates entry into the automotive business by enabling any manufacturer with a remarkable product to offer its franchise to hundreds of established outlets of other manufacturers with experienced personnel. As already noted, many foreign automotive manufacturers market their vehicles through dealer organizations which were established over the years by domestic manufacturers. As of December 31, 1973, 2,196 or 16.7 percent of the 13,147 U.S. General Motors franchised automotive dealers handled non-General Motors vehicles.[46] A wide range of foreign and domestic manufacturers is represented by these General Motors dealers. The number of General Motors dealers handling Japanese vehicles, apart from the Chevrolet branded but Japanese made light-duty truck LUV, for example, increased from 108 in February, 1970, to 659 in December, 1973.

Obviously, no automotive manufacturer is compelled to market its vehicles through the franchise system. If a manufacturer wanted to distribute vehicles through department stores, discount houses, or gas stations, the way is open for him to do so.[47] In some cases, manufacturers have found it necessary to retail vehicles directly, in addition to selling them through dealer networks. The widespread use of the franchise system indicates that it has been the best means of serving the needs of the majority of the motor vehicle buying public. This is apparent to European and Japanese automotive manufacturers who increasingly are selling through franchised dealers in their home countries. They also have chosen to distribute almost all of their products in the U.S. through franchised dealer systems.

B. Merchandising programs

With U.S. new vehicle purchases in 1973 averaging nearly 47,000 per selling day, there can be no relaxation of competitive merchandising efforts by any manufacturer. These efforts include sales incentive programs to stimulate activity at the retail level and advertising designed to interest potential buyers. Merchandising programs to improve competitive performance may be initiated by a manufacturer and his dealers, or they may be a response to such efforts by another producer. In either case, they are an integral part of the ongoing competitive effort.

In addition to the special sales campaigns and option package programs discussed in Chapter IV, the manufacturers also seek to increase their sales volumes through cash incentive programs for salesmen and trip awards to both dealers and salesmen. All of these programs are designed to encourage the dealer and his sales force to work harder in developing an offer attractive to the customer. They permit frequent and quick competitive adjustments to market conditions.

Product advertising is another marketing tool used to compete with other manufacturers for increased sales and to introduce new products. Essentially, it is a communications device used in connection with other merchandising efforts, such as personal selling, sales promotion and product publicity. It provides information to consumers thereby contributing to their ability to make well-informed choices. In the automotive industry, product advertising basically serves two functions: to inform consumers about the availability and quality of cars and trucks and to increase the potential customer's interest in purchasing the advertised products and related services.

Charts 19 and 20 reproduce advertisements for the 1974 Chevrolet Impala and the 1973 Oldsmobile Omega. In addition to noting the car's higher resale value, the Impala ad informed its readers that the car has a new corrosion-resistant frame coating, power front disc brakes with new sensors that alert the driver when the disc pads need replacement, and an acrylic lacquer finish which resists fading or dulling. The Oldsmobile Omega ad informed its readers that the Omega was a new compact priced under $2,700.

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[46] Data on dualing at more than one location are not available.

[47] Kaiser-Frazer's attempt to market a modified version of the Henry J through Sears in the early 1950's, however, was very unsuccessful.

Introducing the 1974 Impala.

The road to staying America's most popular car is a rough one.

For 13 straight years, Impala has been America's favorite car—the great American value. And for a number of good reasons. Some of which have to do with rooster tails, baking and freezing.

Rooster tails.

We make rooster tails by barreling through our own man-made floods. Water, as you know, can play havoc with the undercarriage and brakes. And salt water is worse.

So for 1974, all Impalas have a new corrosion-resistant frame coating. And all come with power front disc brakes that resist the effects of water.

The disc brakes also have brand-new wear sensors. They sing out and warn you if the disc pads need replacement.

Impalas are driven in the middle of Arizona in the heat of summer, when metal gets so hot you can barely touch it. That's why Impala's acrylic-lacquer finish is formulated to resist fading or dulling.

A car doesn't like extreme cold any better than it does intense heat.

So we also drive Impalas in the frigid climates.

We show no mercy.

We drive Impalas on virtually every kind of driving surface, including some we hope you never encounter, like "Belgian blocks."

We drive them at high speeds. We stop them in grueling panic stops.

And when you see and drive our new Impala we think you'll appreciate the fruits of its labors.

Just look at it. Exceedingly handsome styling. With a massive new grille, a new roof line that features a wide expanse of glass, plus the comforts that leave you with little else to do but enjoy the ride. Which, of course, is what owning a big car is all about.

Here's another point to ponder:

For years, Impala has not only been the nation's top seller, bar none, but it has traditionally brought a high resale value.

All cars are designed to be terrific when new. The real trick is to design them so they'll go right on being terrific.

1974 Impala. The great American value. When you buy it. And when you sell it.

Chevrolet

1974 Impala Custom Coupe

Chevrolet. Building a better way to see the U.S.A.

GM

2506

CHART 19

Meet the new Omega. The under $2700 Oldsmobile.

No kidding. This 2-door Coupe is priced under $2700. The manufacturer's suggested retail price, including the whitewall tires shown, is $2,612.70. Of course, destination charge, other available equipment, state or local taxes are additional, but it's a lot of Olds for the money.

It's a whole new kind of Olds. Omega is a compact. But with Olds big-car thinking built in. It looks more like a bigger Olds than a little compact outside, and on the inside, too.

Built like a 1-1/2-ton brick. Omega is nearly 500 pounds more car than some smaller compacts. Its wheelbase is longer—111 inches. And you feel the difference on the road. It's strong. Solid. Roomy. Quiet.

The good stuff is standard. Omega gives you things you may pay extra for in other compacts. Deluxe interior, "wet-look" vinyl trim. Carpeting. Vinyl-grip steering wheel. Chrome trim around the windows and wheel openings. And a 250-cu.-in. engine. Sure you can get a smaller, lighter compact for less money—but it wouldn't be an Olds. And there's a difference. Oldsmobile. Always a step ahead.

'73 Oldsmobile Omega.

CHART 20

GM

It is not possible, of course, to supply all of the information buyers might find of interest in any one newspaper, magazine, radio or television advertisement. In a one-minute T.V. commercial about new models, for example, the message may be limited to arousing interest, achieving product awareness or describing one particular feature in an effort to familiarize the public with the product. Advertising, therefore, tries to interest the customer to take the time to visit a dealership to actually see the new models and obtain additional information about their price, quality and features. Thus, automotive customers make their decisions based on a wide variety of information—information from advertising, product brochures and salesmen in the dealerships, product reports in independent consumer publications and in other periodicals.

and, most importantly, from their own experiences with motor vehicles and the opinions of their friends and neighbors.

Advertising by itself cannot sell the customer a motor vehicle. It is certainly incapable of maintaining consumer acceptance of an unsatisfactory product or a product which is not fully competitive in value. In the automotive industry, products which miss the market cannot be saved by heavy advertising outlays. For example, the Ford Motor Company allocated $50 million for initial advertising and promotion of the Edsel but it was discontinued for lack of sales.[48] Such heavily-advertised failures in other fields as Procter & Gamble's Rinso, DuPont's Corfam, and the "midi" look in women's clothing a few years ago, challenge the view that companies can succeed with any product provided it is advertised enough.

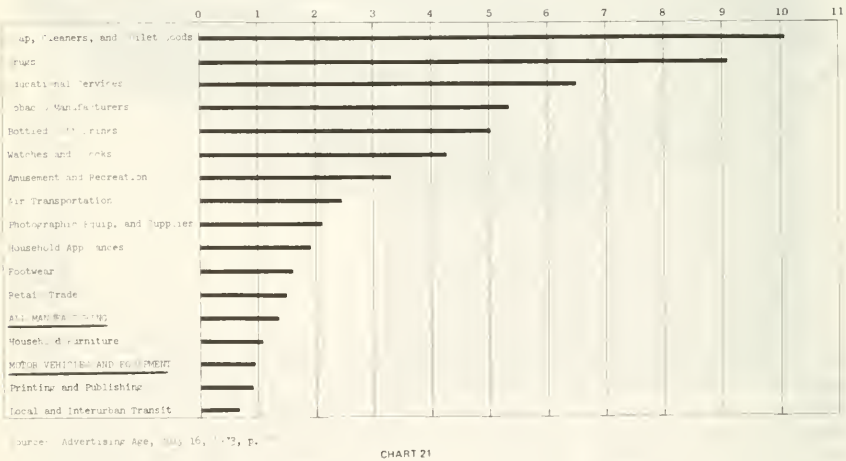
To provide perspective concerning the advertising outlays of motor vehicle manufacturers, Chart 21 shows the percentage of sales revenues invested in advertising by selected consumer goods and services industries in 1969–1970, the latest year for which data are available from the Internal Revenue Service.

This comparison demonstrates that advertising outlays, as a percent of sales, are lower for motor vehicles and equipment than for the average of all manufacturing—less than one cent on the sales dollar. It is also lower than the average for retail trade and for such durable goods industries as household appliances and household furniture and much lower than the five to ten cents on the sales dollar spent for some products.

Advertising is only one of several marketing alternatives available in selling products and services in a highly competitive industry. Regarding these alternatives, Otto Kleppner has said:

"A reason so many manufacturers of consumer products use advertising is that they have found that *advertising is the way to tell many people about a product in the fastest time at the lowest cost per message.*"[49] (emphasis in original)

Thus, a decrease in advertising budgets would not necessarily allow manufacturers to lower prices. It would, in fact, tend to increase total selling expenses, since some other, less efficient method of reaching prospective customers would be required.



Source: Advertising Age, May 16, 1972, p.

CHART 21

[48] John Brooks, *The Fate of the Edsel and Other Business Adventures* (Harper and Row, New York, 1963), p. 41.

[49] Otto Kleppner, *Advertising Procedure* (Prentice-Hall, Inc., Englewood Cliffs, N.J., 1973), p. 33.

Advertising is frequently a vital means by which new entrants gain consumer acceptance for their products and services. Advertising has facilitated the entry of many foreign firms into the United States. It has been an important factor in the success of Volkswagen, Toyota, Nissan (Datsun) and Toyo-Kogyo (Mazda), among others. Advertising helped make the "Beetle" a household word.

In addition to media advertising, the manufacturers conduct programs to improve communication with customers by providing product brouchures and other literature, by equipping dealer showrooms with audio-visual systems and by participating in auto shows. They also offer training for managers in every department of the dealership. Such programs reflect the competitive actions and reactions of manunfacturers in their striving to build customer satisfaction and increase sales.

Programs designed to improve the motorist's understanding of the basic principles of a car's operation and maintenance are offered by dealers and manufacturers. Through such programs, new cars and light-duty trucks are provided to high schoo's for use in driver education courses. Automotive components are donated to secondary schools and community colleges offering courses in automotive repair, and dealers, assisted by manufacturers, conduct maintenance and auto safety courses and clinics for motorists in their communities.

These types of marketing programs, which evolved out of a long process of trial and error, reflect the highly competitive efforts by all manufacturers to serve motorists. They result in greater value for the customer and increased sales for the dealer and the manufacturer.

VI. CONCENTRATION SIZE AND ENTRY

The structure of any industry is to a large degree the product of competitive forces within that industry. Professor Harold Demsetz has observed that:

"Under the pressure of competitive rivalry, and in the apparent absence of effective barriers to entry, it would seem that the concentration of an industry's output in a few firms could only derive from their superiority in producing and marketing products or in the superiority of a structure of industry in which there are only a few firms." [50]

This Chapter discusses three aspects of the motor vehicle industry—concentration, size of firms and entry.

A. Concentration and competition

As discussed in Chapter II, the passenger car market defined in terms of available competitive alternatives encompasses new domestic and foreign cars, used cars, and light trucks. Conventional concentration ratios, such as those used by the U.S. Census Bureau, do not reflect fully these competitive interactions.

Chart 22, which does include imports and light trucks but not used vehicles, shows that the four largest sellers accounted for 79.8 percent of total U.S. new vehicle sales as early as 1922 and for 92.6 percent in 1935. In 1973, four companies accounted for 86.1 percent. While consumer demand for new vehicles has favored the products of a few companies, this has been a favor that they have had to earn. The pattern of "concentration" was established early in the industry's history but it has shown no systematic increase.

Interestingly, a similar pattern exists in all other major industrial countries. In 1972, four firms accounted for 81 percent of total sales in Japan, 80 percent in France, 79 percent in Great Britain, 78 percent in Italy and 69 percent in West Germany. The nature of the automotive business seems to call for large size which will result in fairly high levels of "concentration," as usually computed.

In view of the intense worldwide rivalry among motor vehicle producers, neither the quantity nor the quality of competition can be measured by a mechanical counting of the number of producers or tabulating of their shares of the "market," however defined. Rather, competition must be measured by

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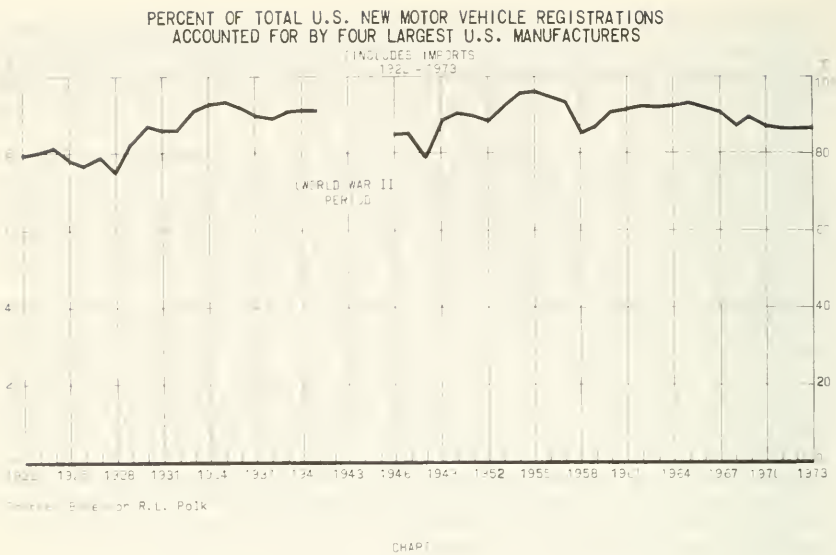
[50] Harold Demsetz, "Industry Structure, Market Rivalry, and Public Policy," *The Journal of Law and Economics*, April, 1973, p. 1.



CHART

the intensity of rivalry among the producers and by the industry's performance. Professor J. Fred Weston has stated:

"With respect to concentration as an indicator of industry structure, the trends suggest that concentration measures as computed have less and less significance for predicting competition or performance. The link between the structure of an industry and its probable competitive behavior or performance has never been well established. The likelihood of proof of relationships is further reduced by the changed nature of firms and the broadened dimensions of competition." [51]

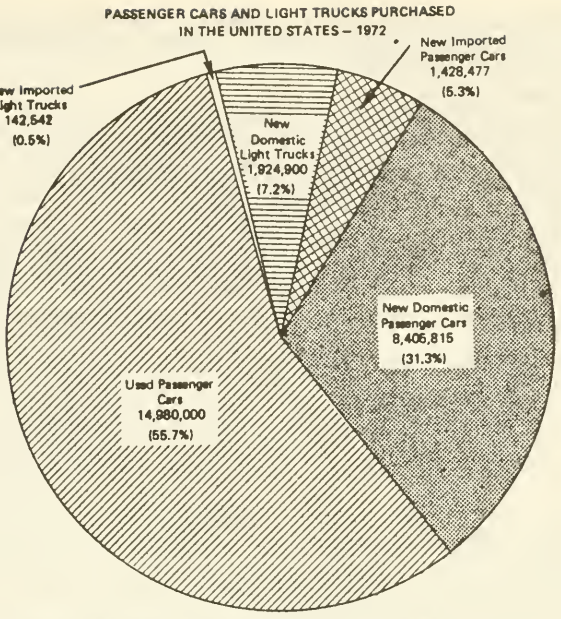
The determination of any specific degree of concentration is almost wholly dependent upon industry or market definition, which has proved to be a somewhat elusive, if not illusory, art.[52] The Census Bureau definitions of "industries" and "products" were not evolved with the study of competition in mind and they do not necessarily reflect markets in which competition actually takes p'ace. To illustrate, the Census definition of motor vehicles (SIC Code 3711) does not take cognizance of the interaction of used and new vehicles and ignores the international character of motor vehicle markets. Furthermore, the Bureau's definition of "passenger cars" (SIC Code 37111) does not reflect the competitive interaction of passenger cars with "trucks" (SIC Code 37112) such as pickups, utillty vehicles, etc.

Chart 23 indicates that when the competitive elements discussed in Chapter II—imported vehicles, used vehicles, light trucks—are included in the market definition, new domestic passenger cars in 1972 accounted for only about one-third of the total.

In any case, the present small number of domestic competitors does not indicate that the largest, General Motors, can in any way control market

[51] J. Fred Weston, "Changing Environments and New Concepts of Firms and Markets," In: *New Technologics, Competition and Antitrust*, Ninth Conference on Antitrust Issues in Today's Economy, National Industrial Conference Board, March 5, 1970, New York City, p. 14.

[52] "'Industry' or 'commodity' boundaries are a snare and a delusion—in the highest degree arbitrarily drawn, and, wherever drawn, establishing at once wholly false implications both as to competition of substitutes within their limits, which supposedly stops at their borders, and as to the possibility of ruling on the presence or absence of oligopolistic forces by the simple device of counting the number of producers included." E. H. Chamberlin, "Product Heterogeneity and Public Policy," *American Economic Review*, May, 1950, pp. 86–87.



NOTE: Used cars include private and dealer sales. Data for used trucks not available.

New Imported Passenger Cars include 188,431 units from facilities owned by U.S. motor vehicle manufacturers. New Imported Light Truck sales include 42,500 units from facilities partially owned by U.S. motor vehicle manufacturers.

Source: R. L. Polk, U.S. Department of Commerce, MVMA.

CHART 23

supply, arbitrarily increase prices, or prohibit new firms from entering—the prime requisites for the existence of monopoly power. Any attempt by General Motors to restrict output and artificially increase prices would merely result in the loss of sales to other domestic and foreign producers. Variations in the competitive performance of General Motors discussed in Chapter II—variations in its share of total new vehicle sales, the wide geographic differences in customer acceptance of its products, variations in the acceptance of its various types of products and the changing success of individual lines—indicate the competitive pressures to which GM is subject. These fluctuations demonstrate that General Motors and, indeed, all other automotive manufacturers have no assured market position beyond what they earn.

Profit opportunities in a dynamic market provide a continuing incentive to each motor vehicle producer to expand volume rather than to restrict output. The current conversion and expansion programs of domestic manufacturers to meet the unprecedented demand for smaller cars are cases in point. Competitive rivalry—the effort of all manufacturers to participate more fully in changing market opportunities—leads firms to assume the risks inherent in such investments and to expand, nor curtail, output. Any manufacturer failing to respond adequately to these market opportunities will lose sales and profits.

The evidence that U.S. automotive producers are vigorous rivals is overwhelming. "Concentrated" or not, the industry is competitive, and responsive to the customer. General Motors' competitors have frequently attested to the

intense competition in the automotive industry.[53] Government officials whose duties involved knowledge of the automotive industry have similarly recognized this fact, [54] as have economists.[55]

B. The requirement for large size

Corporate firms of large size are a characteristic of efficient passenger car manufacture in the United States. Not only General Motors but each of the other U.S. producers is a large company by any standard.[56] This characteristic has been evident ever since the mass production of the assembly line replaced the handmade product of the mechanic's garage.

There are good economic reasons for such large size. Motor vehicles, because of their complexity and size, cannot be produced in the volume essential to low cost without a large investment in plant, equipment, machinery and specialized tools. Their manufacture also requires large professional staffs which cut across the entire range of scientific, engineering and management skills.[57]

The large U.S. market provides an opportunity to obtain the required volume. This, however, necessitates a nationwide distribution system since access to conveniently located dealers reduces the customer's expenditure of time, effort and money in both the purchasing and servicing of motor vehicles.

The efficiencies associated with high volume production, and their relation to the size of automotive firms have been apparent for many years. As early as twenty years ago, for example, a Technical Assistance Mission of the

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[53] "It is our firm view that the automobile industry is one of the most highly competitive in the United States, and that the forces of competition are freely at work." Letter by Roy D. Chapin, Chairman, American Motors Corporation, to Senators Wayne Morse and Gaylord Nelson, dated June 28, 1968.

"General Motors is big, but no one would say that its size has made the automobile industry non-competitive." George H. Love, former Chairman, Chrysler Corporation, in an address at the University of Pennsylvania, November 18, 1964.

"There is no such thing as an entrenched and unassailable position in the automobile business. There never has been and I do not believe there ever will be." L. L. Colbert, former President, Chrysler Corporation, Hearings, "A Study of the Antitrust Laws," Senate Judiciary Subcommittee on Antitrust and Monopoly, 84th Cong., 1st Sess., (1955), pt. 1, p. 339.

"The Chairman: And you do not think it is dangerous to the economy to have General Motors, Ford, and Chrysler doing 96 percent of the business?

"Mr. Kaiser: No, sir, I do not. I do not think so because of the extreme competition among the three of them." Edgar F. Kaiser, former President, Kaiser Motors Corporation, Hearings, "A Study of the Antitrust Laws," Senate Judiciary Subcommittee on Antitrust and Monopoly, 84th Cong., 1st Sess., (1955), pt. 2, p. 543.

[54] "I believe that there is intense competition in the automobile industry, Senator Hansen." Lowell K. Bridwell, Administrator, Federal Highway Administration, U.S. Department of Transportation, Hearings, "Prices of Motor Vehicle Safety Equipment," Senate Government Operations Subcommittee on Executive Reorganization, 90th Cong., 2nd Sess., (1968), p. 59.

"I have always looked at the automotive industry as a competitive industry; . . . As being a competitive industry; yes." Heinz A. Abersfeller, Commissioner, Federal Supply Service, General Services Administration, Hearings, "Prices of Motor Vehicle Safety Equipment, Senate Government Operations Subcommittee on Executive Reorganization, 90th Cong., 2nd Sess., (1968), p. 122.

[55] "The American automobile industry is highly concentrated (the four largest companies do more than 80 percent of the business), but the competition between the four is fierce. They encounter strong competition from abroad, and also from used cars, which are always a part of the total automobile supply. The whole industry competes with railroads, buses, and airplanes as alternative modes of travel." Emerson P. Schmidt. *Union Power and the Public Interest* (Nash Publishing, Los Angeles, 1973), p. 163.

"In particular one should be cautious in attributing monopolistic significance to size of firm or percentage of sales in a market subject to active product or process innovation. This is presumably the basis for the common-sense view that the automobile industry is a highly competitive industry despite the fact that, at least before the war, 90 percent of the sales of popularly priced cars were made by three firms, two of which persistently earned high rates of profits. I suggest that the common-sense view is probably right." Edward S. Mason, *Economic Concentration and the Monopoly Problem* (Harvard University Press, Cambridge, 1957), pp. 179–180.

[56] American Motors, the fourth largest domestic manufacturer, ranked 101 among the 500 largest U.S. industrial corporations with 1972 sales of over $1.4 billion. ("The Fortune Directory of the 500 Largest U.S. Industrial Corporations," *Fortune*, May 15, 1973, p. 226.) Its facilities for the manufacure of automobiles, trucks and buses include production capabilities for bodies, forgings, engines, axles, differentials, tubing, plastic parts, electrical components, and trim, etc. Chrysler ranked fifth with 1972 sales of nearly $10 billion. In addition to automobiles and trucks, it manufactures air conditioners, heating and cooling equipment, powdered metal and chemical products, outboard marine and industrial engines, boats and defense products. Ford ranked third with 1972 sales of over $20 billion. In addition to automobiles and trucks, it manufactures tractors and farm implements, electronics and communications systems, and defense products.

[57] Efficiencies associated with GM's motor vehicle production are discussed in Chapter VII.

Organization for European Economic Co-operation summarized its detailed study of the United States motor vehicle industry as follows:

"The main trend in the United States automobile industry has been the progressive reduction of manufacturing costs along with the widening of the home market and the rationalisation of production processes." [58]

By the early 1960's, it was clear that the task confronting European producers would be similar in many significant respects to that faced decades earlier by U.S. manufacturers. With the unfilled demand overseas left by years of depression and war largely satisfied, the new challenge was to meet, under more intense competitive conditions, the increasingly sophisticated demands of customers. At the same time, the reduction of motor vehicle tariffs the European Common Market and the European Free Trade Association created market potentials and competitive pressures similar to those in the United States.

The impact of these factors on European producers has been described as follows:

"In devising a strategy for this complex and shifting market, the European auto executive is pulled by a bewildering variety of forces. He needs to operate efficiently, at or near full capacity, but cannot afford to keep his customer waiting for delivery. He needs long, steady production runs for a few models, but is finding that he must offer new models and more variations. He needs to make Europe his market, but has to be sensitive to the fickle preferences in national markets. These complications signal the arrival of a new competitive age that only very large companies are going to survive." [59]

These pressures have resulted in a number of significant mergers, joint ventures and cooperative agreements in Europe. The rationalization of the U.K.'s motor vehicle industry began in 1951 when Leyland Motors acquired Albion Motors. The following year British Motor Corporation (BMC) was formed by a merger of Austin Motors and Morris Motors. In 1968, after many acquisitions of independent firms, BMC and Leyland merged to form British Leyland Motor Co. In West Germany, Volkswagen acquired control of Auto Union in 1964 and NSU in 1969 and inaugurated joint ventures during this period with Citreon, Daimler-Benz and Porsche. Fiat has acquired the Italian firms Autobianchi, Lancia and Ferrari and the French firm UNIC. The leading French firm, government-owned Renault, has various joint ventures with Peugeot and other major producers. Volvo has acquired one-third ownership of DAF, the Dutch automaker and entered into partnership with DAF, Germany's Flockner-Humboldt-Dentz and France's Saviem to develop light truck components.

The size required for efficient production and distribution in the motor vehicle industry changes over time with changes in such external considerations as technology, transportation and communications, management techniques and product characteristics. It also varies by firm. What is too small a size for one firm may be right for another. The proper size for any firm also depends upon such internal factors as the nature of the production processes utilized, the degree and type of integration, the type of product specialization, the management systems utilized, and the quality of management itself.

Whatever might be the appropriate size for efficient auto production by any particular firm—and this would have to be large relative to the size of firms in most other industries—it can provide no guide to the future size of that firm. This is so because in the presence of intense competitive rivalry, if the demand for a firm's products exceeds the volume required for efficient production, the firm will expand to the size necessary to fill the demand efficiently. The size and growth of General Motors, for example, have been determined by the product itself, and by the requirements of efficient manufacture, distribution and service, as well as market demand. GM's present size was not artifically contrived. It has been determined by the willingness to assume the risks of growth, the ability to realize the added efficiencies of growth, and most importantly by the simple fact that satisfying consumer demand required such growth and size.

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[58] Organization for European Economic Co-operation, *Some Aspects of the Motor Vehicle Industry in the U.S.A.*, Technical Assistance Mission No. 92, October, 1953, p. 18.

[59] Gregory H. Wierzynski, "The Battle for the European Auto Market," *Fortune*, September 15, 1968, p. 121.

C. Entry and competition

Since success in the automotive industry requires a major investment and entails great risks, entry has been less frequent than into many other industries. This has been due to the very intensity of competition itself. The experience of overseas producers, such as Volkswagen, Toyota, Nissan, Volvo, Fiat and Mercedes-Benz, however, demonstrates how successful a new competitor can be in the United States.

Entry into the business is open to all who are willing to assume the risks; there are no artificial barriers. Patents, for example, have not played a major role in the industry since the basic Selden patent was successfully challenged in 1911. Patents have been licensed royalty free or at reasonable royalties; in most instances have not been enforced, and only in rare instances have become the subject matter of litigation. There also are no barriers to entry due to control of resources by any manufacturer. General Motors, for example, sells components such as engines, transmissions, bearings, and electrical equipment. These and other necessary components have been articles of commerce sold by a host of suppliers to all customers for years.

The existing system of distribution does not constitute a barrier to entry. Firms of all sizes can and do obtain satisfactory dealer representation. Volkswagen, for example, has set up a separate franchised dealer organization, while AMC, Toyota, Honda, Fiat and Saab have, in part at least, utilized franchised dealers jointly with other manufacturers.[60] In January, 1974, more than 30 percent of American Motors' dealers were also franchised to sell the products of other domestic producers.[61] Among the 13,147 General Motors' franchised dealers, at least 2,196 dealers sold and serviced cars and trucks of other manufacturers, including overseas producers, as of December 31, 1973.

Substantial potential U.S. entrants into the industry are ready to take advantage of any market opportunity. Many companies, particularly those producing construction equipment, tractors and farm equipment, motorcycles,[62] and automotive parts, have engineering and research capabilities, manufacturing and assembly know-how and facilities, the nucleus of a retail distribution system and relationships with suppliers which are easily adaptable to the automotive business. These firms all have the potential to enter the motor vehicle industry whenever existing producers are either unable to respond to market trends or stay in the forefront of product development and innovation.

The continuing challenge of innovation is a constant source of competitive pressure.[63] The Copper Development Association, the Otis Elevator Company and Sebring-Vanguard, Inc., already have developed new electric vehicles for use in metropolitan areas.[64] Large electrical equipment manufacturing firms have been mentioned as possible entrants utilizing electric power in the vehicles they would build. General Electric and Westinghouse, for example, have expended substantial research efforts on prototype electric vehicles.

Foreign manufacturers currently selling in the U.S. may broaden the scope of their operations in this country by assembling motor vehicles here. Volvo, the Swedish auto manufacturer, announced on September 13, 1973, that it will build a $100 million assembly plant in Chesapeake, Virginia, which is scheduled to open in late 1976.

Pehr G. Gyllenhammar, Volvo's President, said the assembly plant was "planned before the upheaval in world currencies started," and that the decision was not a response to readjustments in the exchange values of the U.S. dollar and the Swedish krona.[65] Volvo has reported that its plans were

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[60] An indication of the ease with which an automobile manufacturer with an appealing product may increase the number of its dealers is provided by Volkswagen and Toyota. Volkswagen increased the number of its U.S. dealers from 687 in 1963 to 1,203 in 1973; Toyota's from 129 to 932 and Nissan's increased from 250 to 937 in the same period. *Automotive News Almanac*, 1964 and 1973 editions.

[61] *Automotive News, February* 4, 1974, p. 148.

[62] Two foreign car manufacturers, Honda and BMW, were originally motorcycle manufacturers.

[63] That such innovational developments are real possibilities is demonstrated by General Motors' own experience in the development of the diesel locomotive. General Motors, in the face of almost universal initial skepticism, developed and sold the diesel locomotive when the three principal companies in the industry were completely wedded to steam propulsion. Through its entry into a technologically stagnant industry, General Motors brought a new and important measure of competition into the locomotive industry.

[64] *Detroit Free Press*, November 14, 1973; *Automotive News, February* 4, 1974, p. 10; *Automotive News*, March 18, 1974, pp. 13–14.

[65] *Wall Street Journal*, September 14, 1973.

based on extensive feasibility studies, including the relative costs of continuing to serve U.S. customers with vehicles imported from Sweden versus assembly of vehicles using imported and domestic parts and components.

The establishment of firms as new motor vehicle assemblers and manufacturers in the United States is facilitated by the availability of financing in the United States. Volvo, for instance, reportedly expects to obtain about 75 percent of the required $100 million from U.S. banks. The efforts of local and state governments to attract new firms into their communities also facilitate entry.

Other foreign automobile manufacturers are considering assembly operations in the United States. A Volkswagen study group has been assessing the feasibility of building a plant, at a cost of between $1.2 billion and $1.6 billion, capable of producing about 2,000 cars a day.[66] Nissan Motor Company, which manufactures Datsun cars, reportedly has inspected a possible site and plant in Seattle, Washington.[67] C. R. Brown, Vice President of Mazda Motors of America, said consideration is being given to assembling complete Mazda rotary engine vehicles in the U.S. He added that U.S. assembly of vehicles now imported into this country is "a step which I believe most major import manufacturers will adopt in time."[68]

In summary, although the number of U.S. automotive producers is small and although one company, General Motors, presently has a larger share of sales than the others, there is no basis for concern about the vitality of competition. Domestic and overseas competitors selling in the United States have the capability of increasing their sales at the expense of General Motors whenever they develop superior products or do a better job of marketing those products. Although the successful entry of new firms depends on creating an efficient organization, producing an acceptable product at a competitive price, and being willing to risk the capital required to meet changing market demand, these are no more than the requirements which existing firms have had to meet in order to compete effectively.

VII. SOURCES OF GENERAL MOTORS' EFFICIENCY

Business success achieved through sales leadership in open competition with others is an obvious indicator of economic efficiency. Judged by this test General Motors has done well. GM also has earned high grades as an innovator and as a builder of quality products.

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Analysis of GM's efficiency suggests no simply explanation because efficiency has many sources. These include economics of scale in individual plant operations, the economies achieved through the carefully designed commonality of certain parts and tooling, the logistic and other benefits resulting from a multiplant operation, and, most importantly, the management system that exercises overall coordination. The component elements of efficiency defy quantification, but the experiences of General Motors provide some insights into this important matter.

General Motors, in pursuit of improved efficiency, is a closely knit system of highly specialized manufacturing assembling and marketing activities operating under the overall supervision of a single central management. The various divisions under this overall direction are responsible only for the operations of their respective plants. They do not perform the full range of management functions required for independent business existence. The following description of General Motors indicates its unitary nature and the interdependence of its organizational structure.

A. Organization and management

One of the major sources of General Motors' efficiency, and one that has been utilized by many corporations throughout the world, is the organizational structure evolved by GM. Alfred P. Sloan, Jr., in his book, *My Years with General Motors*,[69] has provided an excellent insider's description of this structure. *Strategy and Structure*, a historical study by Alfred D. Chandler, Jr., discusses

[66] *Wall Street Journal*, September 13, 1973.
[67] *Wall Street Journal*, July 13, 1973.
[68] *Journal of Commerce*, September 18, 1973.
[69] Alfred P. Sloan, Jr., *op. cit.*

the contributions of this organizational innovation to GM's success.[70] Recent studies by Professor Oliver E. Williamson provide additional support for the contributions of this form of organization. Williamson says, for example, that "the resulting structure displays both rationality and synergy: the whole is greater (more effective, more efficient) than the sum of the parts." [71]

GM's system is a blend of coordinated policy-making and decentralized administration. GM has realized that coordination, properly established, makes possible directional control and specialization with resulting economies. Decentralization, properly established, develops initiative and responsibility. It makes possible a proper distribution of decisions at all levels of management and results in the flexibility and cooperative effort which is so necessary to a large-scale enterprise. In the structure and function of a decentralized organization such as General Motors, no part can properly be understood and appraised separately from the whole.

Each of GM's operating divisions is established under a general manager. Those divisions having a common relationship are placed under group executives for coordinating purposes. This is the line organization.

Various central office staffs perform functional activities that can be accomplished more effectively by a corporate unit in the interest of the whole. Their duties also include the coordination of similar functional activities of the operating divisions in order to promote their effectiveness. Over the years, the duties of the central office staff have changed and expanded within the framework of the general concept. Chart 24 shows these staff activities and their relationship to the line organization.

Necessarily, there must be continuing cooperation and exchange of ideas between the staff and the line organizations. In the final analysis, it is this cooperative effort which makes for maximum efficiency. The balance between decentralized operations, on the one hand, and coordinated control on the other, varies according to the temperaments and talents of individual executives and the way in which they work.

General Motors' management concept fosters a continuous flow of ideas and information upward and downward through the organization. This results in mutual education and understanding at all levels from foreman to chief executive officer. It provides interpretation and understanding of policy and procedure and leads to maximum initiative at every managerial level by those closest to the facts. Finally, it makes possible an accurate appraisal of the contribution of individual executives, as well as of every divisional organization and staff operation. It is in this sense that General Motors' executives often speak of the importance of people and stress the fact that it is people that make the difference between one organization and another.

General Motors has had the good fortune of having developed an able and seasoned management. Its management policies and personnel represent an unbroken chain over several decades. As a result, General Motors has senior and middle managers—many of whom came up through the ranks—imbued with a strong team spirit born of long associations and common hard work in achieving and maintaining industry leadership.

To complement skills achieved through experience within the Corporation and through internal training programs, GM has recruited outstanding persons with academic and business experience. Some of those hired for their expert qualifications have turned to general management positions. Many others use their special skills in technical pursuits on staffs such as research, personnel development, engineering, design, law and finance.

The various professional staffs of General Motors serve as a forum for the exchange of ideas and innovations and as catalysts for new projects. Within General Motors, all of these staffs interact in a variety of ways—through seminars, conferences and "state of the art" workshops, as well as day-to-day working relationships.

The competitive nature of the motor vehicle business, the confidentiality of research efforts and the continuous need to tie into specific future programs

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[70] Alfred D. Chandler, Jr., *op. cit.*

[71] Oliver E. Williamson, "Managerial Discretion, Organization Form, and the Multi-division Hypothesis," In: *The Corporate Economy: Growth, Competition and Innovative Potential*, Robin Marris and Adrian Woods, eds. (Harvard University Press, Cambridge, 1971), p. 354.

ORGANIZATION CHART

GENERAL MOTORS CORPORATION

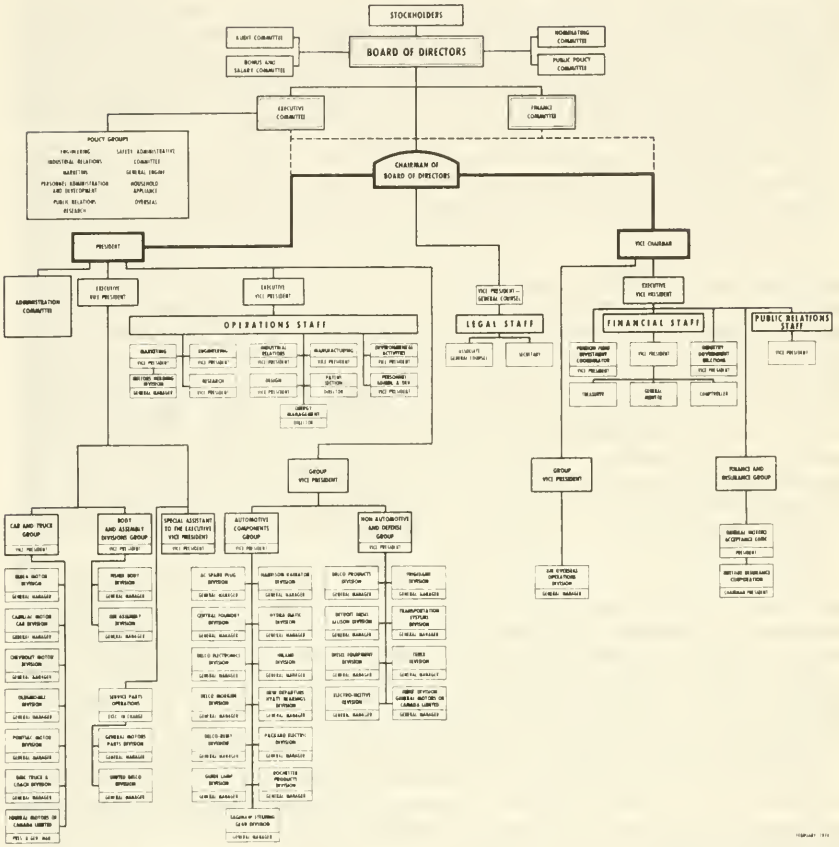

CHART 24

require that the bulk of General Motors' staff activities be carried on internally rather than purchased outside. Staff activities contribute to all GM divisions and products thereby avoiding wasteful duplicate staffing. In this way substantial efficiencies result.

The contributions of organizational structure—its effect on communication, coordination and responsiveness to both changing technical opportunities and consumer preferences—have historically been a topic of study by management professionals and social scientists. The importance of organization to the performance of firms is receiving increasing attention by economists, particularly those concerned with industrial organization.[72] The conclusion of these

[72] Armen A. Alchian and Harold Demsetz, "Production, Information Costs, and Economic Organization," *American Economic Review*, December, 1972, pp. 777–795.

studies is very clear. Efficiency involves more than well-designed products, more than machinery and tools and more than materials. It is, beyond all of these, determined by the organization of men and women in such a way as to enlist their best effort in the realization of defined corporate goals.

B. Unitary operations

There are 28 U.S. and Canadian GM vehicle assembly plants located throughout North America. Typically, these plants produce two or three different car lines, but specialize in a single basic body size. These assembly plants are supplied by 90 GM manufacturing plants which are located primarily in Michigan, Ohio, Indiana, and New York. The car divisions themselves operate many of these manufacturing plants, supplementing the GM fabricating divisions and outside suppliers that provide parts, components and sub-assemblies used by the total General Motors' assembly system.

To illustrate the logistics of the system, the General Motors Assembly Division (GMAD) plant at Willow Run, Michigan, assembles three lines of compact cars—the Chevrolet Nova, the Pontiac Ventura and the Oldsmobile Omega. To carry out these assembly operations, Willow Run depends on many other GM divisions as well as outside suppliers. For example, it receives engines from Chevrolet, Pontiac and Oldsmobile Divisions and different types of transmissions from Buick Motor Division and from Chevrolet transmission plants at Cleveland, Toledo and Muncie. Axles are obtained from a Chevrolet plant in Buffalo and propshafts, fenders and hoods from Chevrolet Pressed Metal in Cleveland. Springs are obtained from Chevrolet, Livonia, and wheels from Chevrolet, Warren. Sheet metal and hardware come from Fisher Body plants. Starting motors and soft trim are furnished by GM of Canada. Instrument panels, gauges, air cleaners, switches, oil filters and tank units are secured from AC Spark Plug Division in Flint. Altogether, 190 types of major parts and components arrive at Willow Run either daily or weekly from other GM plants. Their punctual arrival and uninterrupted flow are essential to the efficient scheduling of the three lines of cars built at Willow Run, particularly since each is produced in a great variety of specifications as to body type, color, trim and items of optional equipment.

The various parts of General Motors which contribute to these results (at Willow Run and elsewhere) are not self-sufficient business entities. The development of the Oldsmobile Omega provides an example of how substantial economies are achieved by a mutually complementary set of activities within General Motors' system. Most of the research and basic engineering work relating to the Oldsmobile Omega was performed at the General Motors Technical Center and by Chevrolet Division, rather than by Oldsmobile Division. These substantial costs—incurred initially in connection with the Chevrolet Nova—were saved by Oldsmobile but would have been required of any independent firm trying to bring out a new compact car. In addition, much of the Oldsmobile contribution to the Omega did not require new basic engineering work. The car utilizes a previously existing Oldsmobile V-8 engine and transmission (the latter built by Buick) which are also utilized in the Oldsmobile Cutlass.

Similarly, the costs of the Chevrolet Nova itself also are reduced by the use of many components which are also used in different sized GM cars. These include the use of the same basic V-8 engine and transmission as in the Chevrolet Chevelle; the same rear suspension as in the Chevrolet Camaro, and the same basic front suspension as in the Chevelle, the Camaro, the Chevrolet Impala and most other GM models.

In fact, because of the benefits obtained from central staff activities, none of General Motors' car divisions performs the full product engineering function, let alone the research and development, that any independent firm would require. Examples of work that can be done by the staffs rather than duplicated by each division include the bulk of research and development, car design, and specific engineering to meet safety and emission requirements, as well as substantial work on tool design and construction, process engineering, and the design, construction, and layout of plants.

Similar, though perhaps less obvious, economies exist with respect to most of the other functions that must be performed by any business firm. These functions range from central office determination of financial, personnel and distribution policies to central office administration of employe benefit programs,

auditing, money management and even of some purchasing. General Motors' divisions do not have the personnel to perform such functions to the extent required of any independent firm. The common support of such functions has permitted substantial savings for General Motors.

C. Integration

Economies may also be achieved through integration—i.e., by extending the production process within the firm backwards to components, parts or even basic materials. In deciding whether to make or buy an item or service for incorporation into its end products, General Motors has always considered the effect of such a decision on its total efficiency. The policy, therefore, has been to make for its own use those items that cannot be procured more advantageously from outside suppliers, when factors such as quality, price, delivery performance, and alternative uses for its resources are considered.

Whether or not in-house production is more efficient is influenced by three main factors—the volume of output required; product specifications, that is, whether the component is unique in a production sense to the particular vehicle manufacturer or whether it is standardized, and the availability of skills and facilities within the company.[73]

Total demand for some automotive components is much greater than the volume required by General Motors. Many kinds of identical tires and truck wheels or transmissions, for example are utilized by different automotive firms in common. Products such as sheet steel, nonferrous metals, plastics and glass are used in a wide variety of other industries. If opportunities for volume or scale economies exist and they are not obtained at the volume used by GM, production by outside firms will often be more efficient. Even where volume economies are not involved, outside suppliers may have superior experience and skills developed over the years which make them more efficient.

Alternatively, where the GM volume requirement is relatively large, where the part is unique and important to the overall functioning of the vehicle, and where GM possesses the required skills and expertise, in-house manufacture or integration is apt to produce superior results. As a consequence of such considerations, high volume passenger car producers, both in the United States and abroad, are typically more highly integrated than are low volume heavy-duty truck manufacturers.[74]

Accordingly, General Motors obtains from outside vendors all basic materials and standard maintenance, repair and operating supplies, as well as items such as car and truck frames, tires, glass, textiles, most wheels, certain tools and dies, and manufacturing equipment. General Motors' outside purchases totaled almost $17.5 billion in 1973 or over 48 percent of total sales revenue. Although this proportion of outside purchases has remained relatively constant for many years, the advantages and disadvantages of vertical integration and the competition between outside suppliers and internal sources force a continuous re-evaluation of the make-or-buy decision.

D. Manufacturing Efficiencies

Efficiency increases in single-plant units are more limited than those possible in large integrated multi-plant concerns. Professor Neil H. Jacoby emphasizes this point: consumers' interests are best served by *enterprises* of the most efficient size in each industry, and not merely by optimum-scale *plants*. The major thrust of postwar changes in management practices—a subject frequently neglected by economists—has been to enlarge the potential economies of scale of enterprises. Increasingly, enterprises have become multi-plant, multi-product, multi-divisional, and multinational." [75]

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[73] "Experience indicates—and common sense dictates—that a number of functions can almost always be better performed centrally. Even very large divisionally organized companies, such as General Motors, do not fragment certain functions. They usually maintain central law departments and a central treasury department." W. Cameron Caswell, "Taking Stock of Divisionalization," *Journal of Business*, July, 1956, p. 166.

[74] This has been explained with respect to British truck manufacture as follows: "Obviously integration can give many advantages in terms of quality and control and securing supplies, and given sufficiently high levels of production, unit costs can be significantly reduced. However, as the specialists produce at annual production levels of below 5,000 a year the use of expensive equipment to produce engines, gearboxes, axles and so on would mean relatively high unit costs . . . " D. G. Rhys, "Heavy Commercial Vehicles: The Survival of the Small Firm," *The Journal of Industrial Economics*, July, 1972, p. 233.

[75] Neil H. Jacoby, *Corporate Power and Social Responsibility* (MacMillan Publishing Co., Inc., New York, 1973), p. 137.

General Motors' experience proves that there are significant economies beyond those available at the plant level. As a multi-plant firm, it realizes efficiencies from the synchronized flow of materials, mass distribution, research, activities, and, where transportation costs and servicing are important, from proximity to sources of supply and markets.

Multi-plant, multi-product efficiencies may be generated by optimum use of common parts and tooling. Illustrative of efficiency at the plant level are economies of scale in metal body stamping.

1. Commonality in parts and tooling

Success in business enterprise hinges importantly on management's ability to understand the needs and wants of its customers and to meet them with appropriate products. Automotive demand in the United States is both large and highly diversified. It reflects the countless uses to which motor vehicles are put and the varied financial resources, tastes and circumstances of the buyers, both private and commercial.

Automotive manufacturers face the challenge of meetitng these diverse wants without unnecessarily complicating the basic product lineup. In an unrealistically simple and risk-free world, manufacturers could each specialize in a different line of automotive products. In practice, passenger car manufacturers must try to cope with fluctuations in demand that tend to favor different types of vehicles at different times. Coordinated management, the use of common tools and the nature of modern technology permit the highly varied tastes of consumers to be most efficiently served by producing a family of related but different products. However, beyond some point multiplicity and variety of product raises costs more than benefits. Sound business judgment is required to determine the critical point at which the values consumers place on a broad and varied product line are overbalanced by increases in costs.

General Motors currently attempts to meet the wide spectrum of passenger car demand by offering 25 different lines of cars involving 10 basic body types. Chart 25 shows the various types of cars offered by each of the five car divisions.

CHART 25

GM PASSENGER CAR LINES

Body types	Divisions				
	Chevrolet	Pontiac	Oldsmobile	Buick	Cadillac
Subcompact	Vega				
Compact	Nova	Ventura	Omega	Apollo	
Sporty	Camaro	Firebird			
Intermediate	Chevelle	LeMans	Cutlass	Century	
Personal	Monte Carlo	Grand Prix			
Standard	Chevrolet	Pontiac	Delta	LeSabre	
Luxury			Ninety-eight	Electra	Cadillac.
Personal luxury			Toronado	Riviera	Eldorado.
Limousine					Cadillac.
Sports	Corvette				

Since, in most instances, several GM divisions market cars that share the same inner body structure or "body shell," the cars can be manufactured from common tools and dies. In some instances, selected outer body sheet metal stampings are shared by various makes. For example, the four compact GM cars are distinguished from one another by the different designs of front and rear ends, and by differences in interiors, engines and drivelines. The exterior sheet metal of the doors, roofs, fenders, hoods and deck lids are identical as is the inner body framework of these cars. A decision to use completely different doors on each of these four car lines would involve an estimated additional expenditure of over $60 million.[76] The large savings involved in standardized body parts is one way in which GM reduces the cost of a wide variety of products.

[76] This expenditure includes the dies, presses, sub-assembly lines, building facilities and rearrangement expense which would be required to produce the three additional door designs.

Sales experience and customer surveys show that many buyers of more expensive automobiles place a relatively high value on esthetic qualities and product individuality. Accordingly, while significant economies of sharing—including those of shared body structure—are preserved, the external appearance and other characteristics of higher price cars are individualized. Standard-size Chevrolets, Pontiacs, Oldsmobiles and Buicks share the same floor plan, as do the intermediate models. Common roof panels are used for various intermediate coupes, and another roof is common to all intermediate sedans. The pattern of common roof panel usage also applies to standard-size coupes and to sedans. Common windshields, window lift mechanisms, hardware and numerous other body components also are shared by divisional variations of the body types.

Additional savings in the use of body tools and dies are obtained by designing different body types to share common body common body components. GM's personal-size Chevrolet Monte Carlo and Pontiac Grand Prix, for example, share many inner body components with intermediate cars such as the Chevelle and Pontiac LeMans. The luxury models—Oldsmobile 98, Buick Electra and Cadillac—share some inner body components with standard-size cars, such as the Chevrolet Impala. The same is true to a lesser extent of the personal uxury cars—the Oldsmobile Toronado, Buick Riviera and Cadillac Eldorado.

There are 10,800 dies and fabricating tools, costing an estimated $500 million, employed jointly in the manufacture of Chevrolet car bodies and the bodies of other GM car division. Thus, the economic benefits of shared tools are substantial. Such advantages would be lost if each line had a unique body and all were designed and produced independently. There would be significant losses of efficiency (in a simple, obvious manufacturing sense) if Chevrolet, or any other car division, were wrenched out of GM's structure.

Economies also arise in the manufacture of various other components. The coordinated interrelationships which are designed into GM's basic powertrain and chassis systems represent efforts to reconcile the economies of standardization with consumers' preferences for variety. These efforts involve matching engines, transmissions, axle ratios, frames and suspension components to each other and to the weight of each type of car for best attainable performance in terms of driveability, handling, and ride. Given these constraints, General Motors in 1974 offers on its compact, intermediate, sporty and standard-size cars only three basic frame designs, including two perimeter-type frames and one stub-type; two basic automatic transmission designs in five basic variations to accommodate different torque requirements for different engines, and three basic size axles in sufficient variations to accommodate different gear ratios and different size axle tubes for varying tread requirements and brake sizes. On these body types, GM also offers two basic propeller shaft designs in variations to accommodate different wheelbases and transmission output shafts; one basic front suspension design with variations to accommodate different control arm length and gauge and bushing diameters, as well as front end geometry modifications; and two basic rear suspension designs, one for the intermediate and larger cars and one for the compact and sporty cars. With respect to engines, General Motors obtains the wide variation in performance demanded by consumers from just a few different engine blocks. This is accomplished through various modifications in cylinder size, stroke, and carburetion.

The preceding discussion shows how General Motors' organization promotes efficiency through a coordinated division of labor among the divisions, increased production runs, and improved specialized skills. In respect to product planning, General Motors' car line offerings optimize the number of common body, powertrain and chassis components, consistent with the requirement of meeting a highly diverse customer demand. The net effect of such a management approach is reflected both in reduced costs and in greater product value for the customer.

2. Production runs and efficiency in metal body stamping

In mass production, growth in volume improves operating efficiency by justifying the use of different and more advanced manufacturing techniques (e.g., progression from a batch to a continuous flow process), as well as by lowering unit costs by simply spreading the fixed costs of production equipment over

a larger valume. The magnitude of these cost savings due to volume in the auto industry can be enormous, despite the great expense of the more advanced tools and equipment.[77]

GM's metal stamping operations provide an excellent example of the effect of volume changes on unit cost. A single die set (consisting of a male die and a female die) used in the manufacture of car bodies may cost as much as $500,000. A family of such dies used in the stamping of all of the inner and outer body sheet metal for one individual car model (e.g., a Chevrolet coupe) may run upwards of $60 million. Certain common outer sheet metal panels, such as hoods, doors, fenders, deck lids, underbodies and roofs are shared among related cars, both within the same division and also selectively across divisional lines. This commonality reduces the die costs of each model,[78] and provides an important incentive towards good management and coordination of interrelated designs.

With proper maintenance the dies commonly used in the stamping of body panels can be used for very large numbers of pieces. General Motors has obtained as many as seven million major pieces from body part die sets and currently is using die sets which have already turned out over four million major pieces. Die costs per unit of output, therefore, depend importantly on the total number of pieces that will eventually be used. The total volume of production depends on a variety of circumstances including the annual sales volume of a given car model and the time period between major design changes,[79] the commonality of sheet metal components among various body styles and car lines, requirements for replacement part inventories and opportunities for reworking dies to produce new body panel shapes. In short, the ability of an automotive stamping operation to take advantage of the longevity of such expensive special tools is clearly very important in determining unit die costs of major body panels.

Die costs per unit of output are also affected by the continuity with which the manufacturer uses specific die sets. Press lines are highly productive—e.g., up to 500 major body panels per hour on lines with automatic hand'ing equipment. At these rates, some two million pieces per year, theoretically, can be produced by a single line. For this reason, press shops periodically change dies when inventories of one body panel have been filled and others have been depleted.[80] Therefore, specific die sets may be active use only part of the time. Clearly the higher the output requirements, the greater the utilization of the die sets and the lower the piece cost.

The examples of manufacturing efficiencies presented in this chapter point up some of the most important aspects of GM's success. Volume operations in combination with thoughtful planning present opportunities for the application of advanced technologies and the attainment of increased economies. These are exemplified by a recently modernized plant in Saginaw, Michigan. This unique facility produces GM's entire requirements of front disc brake assemblies, approximately 36,000 units daily.

Equally important, it is the people in the organization that determine the degree of successful operations. Professor John S. McGee has described this well:

"Production is only one of the business functions; economies and talent have powerful roles in the other ones as well. In the first place, someone must

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[77] For a comprehensive discussion of this subject see John S. McGee, "Economics of Size in Auto Body Manufacture," *The Journal of Law and Economics*, October, 1973, pp. 239–273.

[78] Die costs for body panels for a family of related cars may further be affected by the use of "inserts." These inserts modify the shape of the "parent" die to make a variety of different panels off the same basic tool. Inserts, therefore, permit an increase of lines and models within the line without proportionately increasing the number and costs of necessary dies. Die inserts may also be used to make limited changes from one year's model to the next.

[79] The opportunity of extending production runs by limiting variety of body styles and car lines and by freezing designs for very extended periods has been tried by Ford and VW. Both strategies ultimately had to be abandoned because customers seek some variety of choice and periodic improvement in appearance, comfort, performance and handling.

[80] Changing a major body die typically takes seven to thirteen months.

judge the market, with respect to the duration and magnitude of demands for different designs and models and the approximate quantities that can be sold at various prices. And this often means forecasting three or more years ahead. Second, someone must decide, in detail, the physical characteristics of each and all of the necessary parts and how they will fit together. Third, someone must decide precisely how to tool to produce each of the parts. Fourth, someone must allocate and schedule production so as to minimize costs. And, finally, someone must sell enough of the cars at such prices as will make the whole venture worthwhile. Mistakes at *any* stage jeopardize the whole. One can design well — by technical standards — but fail to provide what consumers really want. One can design well for the market, but design parts or tools poorly for production. One can simply make a mistake about the size or duration of a market, and under- or over-tool. And so on. In short, technical economies mean a lot, but not everything. They probably do not explain all of the differences in the costs or success of automobile firms." [51]

In the real world, the sources of efficiency are not only multi-faceted, but also interrelated and interdependent. Many of them are qualitative in nature and defy precise measurement. Furthermore, both their absolute and relative contributions are constantly changing over time with changes in technology, transportation and communications, management techniques, and product characteristics. Ultimately the test of an organization is its success in serving the needs of its customers.

The pursuit of profit provides management with a powerful incentive to serve customers more efficiently. No other incentive could be universally relied upon to produce the same results. It has proved its merit to American and world society for centuries. But, obviously, it must be proved again and again, here in America and wherever men and women are still able to risk their capital and labor freely.

General Motors' efficiency is an acknowledged fact. It will strive to remain an efficient producer and effective competitor by advancing both the state of the arts and its managerial skills to the benefit of its customers.

CONCLUSION

The design, manufacturing and marketing of motor vehicles has always been a high risk, turbulent kind of business. The brief history of the industry sketched in the opening pages of this study is a record of dynamic and constructive change. More importantly, it is a record of the vitality and adaptiveness of competitive enterprise. These qualities, in large measure, reflect the intensely competitive striving for profit through serving customers efficiently. No one experienced in the ways of the industry would question that the customer is in the driver's seat and that those who disappoint him court failure. The present constitution of the industry has been the direct result of this process of competitive selection.

The automotive industry has been enormously successful in providing mobility for Americans. This was achieved by private capital; it was not the result of government sponsorship, protection, or subsidy. The industry accomplished this both by continuous upgrading of basic vehicle designs as well as by creative innovation in manufacturing technology and marketing organization, thus keeping the real cost of purchase within the reach of most citizens.

General Motors is proud of the contribution it is making to motor vehicle transportation. It has achieved its position by displaying the stamina and determination to survive and grow, to learn from adversity for the benefit of the future. Its management system, dedicated personnel, sound policies and business experience are the assets it brings to meeting whatever new challenges the future may hold.

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[51] John S. McGee, op. cit., pp. 263–64.

Exhibit 21—Committee Staff Tables Re Auto Production for Year 1973

GM PASSENGER CAR LINES AND AUTOMOBILE PRODUCTION 1973

Body type	Chevrolet	Pontiac	Oldsmobile	Buick	Cadillac	Total
Subcompact	Vega–(380,248)					380, 248
Compact	Nova–(375,325)	Ventura–(87,776)	Omega–(55,551)	Apollo–(59,128)		577, 780
Sporty	Camaro–(117, 828)	Firebird–(57,365)				175, 193
Intermediate	Chevelle– (314,760)	LeMans–(201,935)	Cutlass–(422,477)[1]	Century–(311,879)		1, 251. 051
Personal	Monte Carlo–(246,533)	Grand Prix–(165,853)				412, 386
Standard	Chevrolet–(886,825)	Pontiac–(339,111)	Delta [1]	LeSabre–(425,207)[2]		1, 631, 143
Luxury			Ninety-eight–(383,623)	Electra[2]	Cadillac–(252,687)[3]	636, 310
Personal Luxury			Toronado–(56,468)	Riviera–(29,992)	Eldorado–(54,930)	141, 930
Limousine					Cadillac[3]	
Sports	Corvette–(32,616)					32, 616

[1] Delta production included in Cutlass figure.
[2] Electra production included in LeSabre figure.
[3] Cadillac limousine production included in single Cadillac figure.

Sources: GM data provided to subcommittee, Competition in the Motor Vehicle Industry, p. 120; Automotive News.

PROPOSED BREAKUP OF GENERAL MOTORS CAR PRODUCTION

Body type	1973 GM production	Firm 1	Firm 2	Firm 3
Subcompact	[1] 380, 248	350, 000	350, 000	350, 000
Compact	[2] 577, 780	350, 000	350, 000	350, 000
Sporty	175, 193	87, 596	87, 596	
Intermediate	1, 251, 051	417, 017	417, 017	417, 017
Personal	412, 386		206, 190	206, 190
Standard	1, 631, 143	543, 714	543, 714	543, 714
Luxury	636, 310	212, 103	212, 103	212, 103
Personal luxury	141, 390	141, 390		
Sports	32, 616			32, 616
Total		2, 101, 820	2, 166, 620	2, 111, 540

[1] Assumes increased production of subcompacts to 1,000,000.
[2] Assumes increased production of compacts to 1,000,000.

CHRYSLER PRODUCTION 1973 MODEL YEAR

Body type	Plymouth division	Chrysler division	Dodge division	Total
Subcompact				
Compact	Valiant–316,837		Dart–176,069 Sportsman 51,153.	544, 059
Intermediate	Satellite–127,440		Coronet, Charger–212,816.	340, 256
Standard	Fury–280,330	Chrysler–234,229, Imperial–116,729.	Polara–153,057	684, 345
Specialty	Baracudda–22,213		Challenger–32,596	54, 809

Source: Automotive News.

FORD PRODUCTION 1973 MODEL YEAR

Body type	Ford division	Lincoln Mercury division	Total
Subcompact	Pinto–341,470		341, 470
Compact	Club Wagon–17,396, Maverick–201,393.	Comet–96,691	315, 480
Intermediate	Torino–331,798	Montego–156,805	488, 604
Standard	Ford–857,658	Lincoln–58,636, Mercury–150,-550.	1, 066, 871
Specialty	Mustang–134,867, Thunderbird–87,269.	Mark IV–69,37, Cougar–604,628	352, 201

Source: Automotive News.

Exhibit 22.—Excerpt from Automotive News, April 1973, Re 30 Top Vehicle Producers

HOME-COUNTRY PRODUCTION 1973-72—WORLD'S 30 LEADING VEHICLE PRODUCERS

Ranking	Country	Cars	Buses, trucks	Total 1973	Total 1972
1—General Motors	United States	5, 252, 736	1, 257, 651	6, 510, 387	5, 741, 820
2—Ford	do	2, 495, 853	946, 470	3, 442, 323	3, 196, 848
3—Toyota	Japan	1, 631, 940	676, 158	2, 308, 098	2, 087, 133
4—Nissan	do	1, 487, 360	551, 981	2, 039, 341	1, 864, 244
5—Chrysler	United States	1, 556, 377	377, 555	1, 933, 932	1, 692, 073
6—Fiat	Italy	1, 504, 147	131, 390	1, 635, 537	1, 587, 532
7—Volkswagen	West Germany	1, 364, 154	99, 335	1, 463, 489	1, 477, 343
8—Renault	France	1, 292, 991	158, 543	1, 451, 534	1, 360, 902
9—British Leyland	England	841, 634	158, 776	1, 000, 410	1, 055, 501
10—Opel	West Germany	868, 182	6, 173	874, 355	877, 963
11—Peugeot	France	684, 538	81, 440	765, 978	671, 139
12—Citroen	do	658, 829	92, 628	751, 457	736, 551
13—Toyo Kogyo	Japan	465, 734	273, 438	739, 172	640, 264
14—British Ford	England	474, 749	140, 527	615, 276	684, 000
15—Ford of Canada	Canada	445, 299	168, 153	4613, 52	626, 391
16—General Motors	do	443, 806	136, 593	580, 399	459, 561
17—Mitsubishi	Japan	280, 998	280, 834	561, 832	444, 332
18—Chrysler France	France	519, 822	26, 957	546, 779	492, 813
19—American Motors	United States	355, 855	132, 420	488, 275	387, 063
20—Ford Cologne	Germany	456, 022		456, 022	435, 966
21—Daimler Benz	do	331, 682	116, 554	448, 236	492, 360
22—Audi NSU	do	409, 793		409, 793	299, 482
23—VW	Brazil	333, 751	45, 619	379, 370	343, 533
24—SEAT	Spain	361, 100	2, 800	363, 900	338, 438
25—Honda	Japan	256, 962	98, 054	355, 016	330, 569
25—Chrysler UK	England	307, 549	28, 956	336, 505	389, 402
27—Daihatsu Kogyo	Japan	113, 764	193. 087	306, 851	271, 283
28—Chrysler	Canada	260, 722	22, 570	283, 292	292, 211
29—Volvo	Sweden	252, 036	20, 596	272, 632	252, 413
30—Vauxhall (GM)	England	151, 955	106, 766	258, 721	275, 010
Total		25, 860, 340	6, 332, 024	32, 192, 364	29, 804, 142

NOTE: British Ford—factory sales. Chrysler France—factory sales. Chrysler UK—factory sales.
Source: Automotive News, April.

Exhibit 23—Prepared Statement of Mr. Smith

PREPARED STATEMENT OF HAROLD L. SMITH, JR., VICE PRESIDENT, GM CORP.

My name is Harold L. Smith. I am a vice president of General Motors Corporation and general manager of its Electro-Motive Division, which manufactures locomotives. I am an engineer by background and was previously chief engineer of Electro-Motive. I am appearing here today in response to Senator Hart's letter of February 25 requesting testimony from General Motors on the manner in which it has promoted the use of locomotives. It is a privilege for me to appear and testify before the distinguished members of this Subcommittee.

General Motors success in the locomotive industry and the reasons for it are an old story but one that bears a very brief retelling. General Motors pioneered the development of the diesel road locomotive, which is generally recognized as the most important single contribution to railroad motive power in the last one hundred years. Indeed, the staff of this Subcommittee under Senator O'Mahoney, following its investigation of the locomotive industry almost twenty years ago, stated in its report (1956, p. 35) that:

"The diesel locomotive revolutionized the railroad industry. General Motors can point to its entry into this field as an example of the operation of a progressive company at its best—entry into a new field, with a new product satisfying an economic need, and offering progressive reduction in the pricing of its product."

General Motors entered the locomotive industry in 1935 with a new and revolutionary light-weight diesel engine. The engine had grown out of many years of basic research in combustion, going back to the 1920's under the direction of Mr. Charles F. Kettering at the General Motors Research Laboratories, then located in Detroit (now in Warren), Michigan.

The new engine weighed only about 20 pounds per horsepower, compared with 60 pounds or more per horsepower for most other diesel engines of that era, and was also about one-third their size. For the first time, a commercially practical internal combustion engine of sufficiently high horsepower and sufficiently small size and weight was available for possible use in road locomotives. If diesel power could be extended beyond switching operations into over-the-road passenger and freight operations, not only could the normal savings resulting from substituting diesel for steam locomotives be realized, but the way would be open to completely retire steam power from the railroads. This would yield enormous additional savings by completely eliminating the need for the expensive facilities necessary to support steam operations, such as roundhouses, water towers, coal chutes, ashpits, turntables, etc.

As it turned out, that is exactly what happened. The savings to the railroads from replacing steam with diesel power were indicated by a 1950 Interstate Commerce Commission study, which estimated that railroads saved $342,414,498 in 1948 from only *partial* dieselization of their operations. The same study concluded that *complete* dieselization would have saved well over $1 billion per year in terms of 1948 prices, costs and traffic volumes.[1] By way of comparison, the net income of the railroads was only some $750 million in 1948 and has never exceeded $1 billion in any year.

The contribution made by diesel locomotives is also illustrated by comparing the amount of work done by diesel locomotives relative to the steam locomotives which they replaced. In the 1920's, over 60,000 steam locomotives were required by U.S. railroads to haul somewhat over 400 billion ton-miles of freight. By 1956 almost all of these steam locomotives had been replaced by only 28,000 diesels, even though total freight traffic had increased by almost 50%. Thus, each diesel was doing the work of more than three of the steam locomotives which it replaced.

What the diesel locomotive has meant to the railroad was perhaps best summarized in 1955 by the then president of the Pennsylvania Railroad, when he stated in a speech:

"The greatest single contribution to the economic and efficient operation of our railroads during my 40 years of association with the industry has been the development of the Diesel locomotive. We all know the important part General Motors has played in that development. Today they have 23 million horsepower operating on our railroads in more than 16,000 Diesel units, some of which have made between 2½ and 3½ million miles and are still on the road performing quite satisfactorily. I would guess that this development alone is saving the railroads a minimum of 500 million dollars a year—with initial investments being paid off in 3 to 4 years."

In addition to the lightweight diesel engine, another revolutionary innovation in the locomotive industry by General Motors was the application of automotive mass production techniques to locomotive manufacture. Utilizing know-how developed in the automobile industry, General Motors developed new manufacturing methods and factory controls suitable for locomotives and, there being few tools then available in heavy industry which were suited to high precision manufacture, even designed and built its own tools.

Mass production was essential to the introduction of the diesel locomotive. A modern diesel is a complex product, consisting of over 250,000 individual parts and components and requiring over 1,000,000 separate shop operations to make. Unless manufactured by modern mass production methods such as those used in the automobile industry, utilizing tools, dies and fixtures, the diesel's first cost would be so high that its economic advantage would largely be lost.

General Motors has continued its research and innovations in locomotives right down to today. In addition to a staff of engineers and technicians at our division, who devote their total efforts to improving the performance and efficiency of our products, we are backed up by the full engineering and scientific resources of General Motors' central corporate engineering and research staffs in Michigan.

For example, in 1972, after development work with Delco Electronics Division of General Motors, we introduced on all of our mainline locomotives electrical control modules which dramatically increase the serviceability of control

[1] ICC Bureau of Transport Economics and Statistics, *Study of Railroad Motive Power*, File No. 66–A–11, Statement No. 5025, Washington, D. C., May 1950.

malfunctions and reduce locomotive down-time. In the event of a malfunction in any of a locomotive's electrical controls, the modules makes possible quick diagnosis and correction of the prob'em by simply removing the appropriate control module and plugging in a replacement. Formerly, a locomotive with control malfunctions could be out of service for one day to a week, while it was taken to the shop for diagnosis and repair.

In the last ten years alone, the great increase that Electro-Motive has been able to make in the productivity of diesel locomotives has permitted U.S. railroads to handle 31% more tonnage, with a locomotive fleet that has actually shrunk by 1500 units during the same period. The increased productivity of our locomotives is also illustrated by the combined improvement in the capacity and pricing of our equipment. Since 1948, due to general inflationary pressures the general level of prices for machinery and motive products as measured by the Bureau of Labor Statistics' Wholesale Price Index has increased more than 100%. Despite that increase in general prices, today we are making higher-horsepower locomotives available to the railroads at less cost per horsepower. (Price per unit of horsepower is the standard railroad measure of value.) For example, our current 3000 h.p. general purpose locomotive is available to the railroads at about a 15% *lower* cost per horsepower than our comparable 1500 h.p. unit in 1949. And as I have said, this has been accomplished against a backdrop of continuously rising prices for all goods and services.

In the early period of diesel locomotive development, our competitors had no faith in the diesel and ridicu'ed it. Their advertisements and speeches almost never failed to proclaim the superiority of steaem power—even as late as the 1940's and after World War II—long after the superiority of the diesel had been proven.[2] As time went on, our competitors finally did produce diesel locomotives, but they failed to match the quality and value of our product. It was this superiority of General Motors' product and service that attracted the patronage of railroad customers and the largest share of the business.

It has been suggested at these hearings that General Motors coerced the railroads into buying its locomotives by awarding or withholding freight shipments over their lines. I have been with Electro-Motive for over 25 years and I can state flatly that if there is one thing that has been a creed at Electro-Motive, it is that we sell our products solely on the basis of merit—price, quality and service. This is a long-standing General Motors business policy, and it was applied specifically with reference to railroad transactions in a general letter issued by Mr. Alfred P. Sloan, then head of General Motors, in February 1935, when General Motors entered the locomotive business. The record showing this policy and that it has been meticulously followed has been filed in the record of this hearing.[3] This policy as adopted long before "reciprocity" became a matter of legal significance; the reason for it was and is poor business to sell our products on the basis of trying to award traffic to a customer.

Under General Motors' decentralized system of management, an automotive division general manager is interested—because his compensation depends upon it—only in efficient, smooth and uninterrupted freight service to and from his manufacturing plants, and wouldn't even begin to think about routing traffic to benefit locomotive sales.

Furthermore, any traffic given to one locomotive customer would have to be taken away from another railroad customer. Since all railroads are either actual or potential customers for our locomotives, shifting traffic around every time one of them purchased some locomotives could only result in antagonizing all of our railroad customers. It seems obvious that "robbing Peter to pay Paul" would not be a viable locomotive sales policy for General Motors. The only practical policy to follow is to deal with the railroads strictly on the merits, with respect to both purchases and sales. And that is exactly what we do.

Anyone seeking to ascertain why General Motors has been so successful in se'ling locomotives would do well to heed a famous advertising slogan and

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[2] Examples of these advertisements and speeches are included in the booklet entitled "The Locomotive Industry and General Motors", at Appendix A thereof. I herewith submit the entire booklet to the Subcommittee for filing in the record of this hearing.

[3] See Appendix I hereto and see "The Locomotive Industry and General Motors".

"ask the man who owns one". The answer he would get is that General Motors locomotives are the most efficient and economical to operate. These savings in operating costs, spread over the life of the locomotive, in effect are equivalent to a *price* advantage of tremendous proportions.

On railroad after railroad, operating cost records showed that General Motors locomotives were superior, not only with respect to steam locomotives but as compared with diesels and other types as well. Railroad cost studies showed that the cost of operating their fleets of General Motors locomotives saved *millions of dollars per year* compared with their fleets of competitors' diesels.[4] Typical average savings of General Motors locomotives compared with other makes of diesels have been in the neighborhood of 10¢ per mile or more. Considering that a freight locomotive can be expected to operate two million miles or more during the course of its normal useful life, this represents a saving of $200,000 over its useful life—an amount approximating its initial cost.

In the face of the customers' obvious preference for a better product, it is no wonder that some of our competitors finally decided to get out of the locomotive business. Their locomotives simply did not warrant the customers' patronage, and the railroads did not buy them. This has been admitted by officers of those companies. For example, an official of one of the those companies has stated:

"* * * the judgment of those of us who had been in the company back in the diesel period was that General Motors had nothing to do with the Baldwin failure. It was our late start in the field and our inability to produce as good a competitive product."[5]

The former President and Chairman of the Board of another competitor has stated:

"[Alco] maintenance costs were excessive, in comparison with the Electro-Motive locomotives which had a margin and which were designed especially for road service. And they gave us terrific competition to the extent that we were practically eliminated from the field productwise."[6]

One might also ask the Alaskan Railroad and Amtrak, the National Railroad Passenger Corporation, what locomotives they purchased. The Alaskan is owned and operated by the United States Government and Amtrak is a quasi-governmental corporation which does not haul any freight. Therefore neither organization could be subject to any freight leverage. It is significant that 100% of the new diesel locomotives acquired by each of those companies have been General Motors units.

But I think probably the most convincing evidence for this Subcommittee that General Motors has attained its position in the locomotive business solely on merit is the fact that some years ago two suits were filed by the government against General Motors charging monopolization through the use of its freight traffic. After more than a decade of investigation, examination of records and talking to railroad and locomotive industry personnel, the government dismissed both suits prior to trial because of the lack of evidence. I understand that the court papers filed by the government in the Federal District Court in Chicago to dismiss the case stated:

"Plaintiff recently completed an extensive review and re-evaluation of the available evidence. Based upon this re-evaluation it is plaintiff's view that the available evidence is insufficient to establish the violations alleged."[7]

I would now like to turn to claims that have been made before this Subcommittee that General Motors promoted the use of diesel locomotives by the railroads in order to obtain greater automobile and truck sales. This claim is so ridiculous that it hardly warrants discussion. I have already indicated in very general terms the overwhelming superiority of the diesel compared

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[4] For example, figures compiled by the Chesapeake & Ohio Railroad for the years 1951 to 1959 showed that maintenance costs on their General Motors freight units averaged 25¢ less per unit mile than average maintenance costs of competitors' locomotives of comparable age and horsepower.

[5] Deposition of Mr. Edward Hopkinson, Jr., former Chairman of the Executive Committee of Baldwin-Lima-Hamilton, in *Evans* v. *Armour and Company, et al.*, Civil Action No. 38805, U.S.D.C., E.D. Pa. (1965), p. 188.

[6] Transcript of testimony of Mr. Perry Egbert, former President and Chairman of the Board of American Locomotive Company in *Lukens Steel Co.* v. *American Locomotive Co.*, Civil Action No. 3596, U.S.D.C., N.D. N.Y. (1951), p. 91.

[7] *United States* v. *General Motors* (locomotives), Civil Action No. 63 C 80, U.S.D.C., N.D. Ill., (E. Div.), Motion of Dismissal filed June 2, 1967.

with the steam locomotive. I would simply add here that if it had been General Motors purpose to encourage railway passengers to travel by automobile instead of by train, the last thing it would have done would be to promote the diesel; rather, any purpose to discourage railroad travel would have been better served by *not* introducing the diesel, so that railroad passengers would have had to continue to suffer in trains pulled by steam locomotives. Anyone old enough to recall railroad travel during the steam era will remember the ever-present cinders and soot from the coal being burned, the characteristic jerky starts and stops of the train and the frequent stops for coal and water service. Every few hundred miles long delays occurred while one locomotive was removed for service and another placed at the head of the train, and the trains seldom arrived on time.

General Motors development of a lightweight diesel engine made possible in the mid-1930's the era of the articulated streamlined trains, the famous Pioneer Zephyr and the other famous Zephyrs, all powered by the new General Motors diesel engines. The new streamliners attracted passengers back to the railroads in record numbers. (The Zephyr even starred in the motion picture "Silver Streak", in which it was billed as "the world's fastest train".) Photographs of several of these trains are attached to my statement, at Exhibit A.

Later in the 1930's General Motors introduced the first passenger locomotives, which could be used to pull standard railroad passenger cars. This ushered in the era of the prestige through trains such as the "City of Los Angeles" (Exhibit B). Passenger runs were the first road operations to be dieselized precisely because they did offer passengers through service, with faster, on-time performance.

In the years following World War II General Motors built the experimental "Aerotrain", which was a lightweight, low cost passenger train designed for economical, high-speed intercity passenger service (Exhibit C). It also built the widely exhibited "Train of Tomorrow", featuring the revolutionary new "Astra-Dome" passenger cars which were later reproduced and placed in services by many railroads and which were highly successful in attracting passengers to the railroads (Exhibit D).

A further strange claim made before this Subcommittee is that by promoting diesels General Motors prevented electrification of the railroads. If the railroads could justify electrification at all, it would have been when they were operating the very expensive and inefficient steam locomotives. Yet there was no appreciable electrification trend in this country prior to the diesel era, even though electric locomotive technology was well known. Thus, the record shows that electrification made almost no headway even against the steam locomotive. The first application of electric traction to mainline railway service in this country occurred in 1895, when the B & O Railroad electrified its line through its tunnels and terminals in Baltimore. By 1934, just prior to General Motors entry into the locomotive business, and after electrics had been available for *forty years*, there were only 748 electric locomotives in operation in the U.S., compared with 47,436 steam units.[8]

Obviously, factors other than General Motors promotion of the diesel must be responsible for the lack of electrification in this country. It stands to reason that if investment in electrification could not be justified even aginst the high costs of operating steam locomotives, the economics of electrification would look even less attractive which compared with the much lower operating costs of the diesel. In other words, dieselization was *chosen* by the railroads, simply because it was much more attractive economically than either steam or electric operation.

At this point it may be of interest to the Subcommittee if I review briefly the differences and similarities of diesel-electric and all-electric locomotives.

Both types are electric drive locomotives, using direct current traction motors to power the wheels, and requiring an electric generating set to supply the electrical energy. The difference is that the diesel locomotive carries its own engine-driven generator set along with it, while the all-electric uses a remotely located electric generator set, usually owned by a utility company, with the energy transmitted through wires to the locomotive.

Each type of power has its advantages. The electric locomotive can be built with a greater amount of power in a single unit, since its power is not limited

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[8] *Railroad Transportation, A Statistical Record, 1921–1961*, Bureau of Railway Economics, Association of American Railroads, Washington, D. C., December 1962.

by the capability of the diesel engine. On the other hand, the same amount of power can be made available in diesel locomotives by using multiple units. The diesel locomotive is more flexible, since it can go anywhere on the railroad system, while the electric locomotive must stay under the overhead wire or on a third rail. The electric locomotive is easier and less costly to maintain, because someone else, the utility company, has the job of maintaining the electrical generating set and includes these costs in his energy charges. Energy cost comparisons vary with supply and economic conditions, but most current studies indicate that energy costs continue to favor the diesel.

The overwhelming disadvantage of electrification in this country still is, as it always has been, the enormous capital investment required to install the electric power supply equipment. At current price levels, the capital cost for installing electrification would run between $80,000 and $100,000 per mile of double track. (This is the cost only to the railroad and does not include the cost of the central power generating plant.) Since it is not feasible to electrify unless a substantial length of line is covered—say 500 to 700 miles—it is apparent that a very sizable investment would be involved. This investment, plus the purchase of the electric locomotives themselves, would have to be made before any advantage from electric operation could be realized. The only reason electrification has not progressed in this country is because the railroads have not been persuaded that operating savings resulting from electrification would be sufficient to pay off the extra investment.

In 1950, an in-depth study of railroad motive power by the Interstate Commerce Commission stated as follows with respect to the high cost of electrification:

"Many studies of further main-line electrification have been made, but in all cases the cost of construction has been found to be very great and none of these projects have been undertaken." [9]

More recently, in 1971 the Secretary of Transportation appointed a blue-ribbon Government-Industry Task Force on Railroad Electrification. The purpose of the Task Force was to review the various factors influencing railroad electrification. The Task Force was a broadly based group of 27 members that could hardly be accused of bias against electric power: it was drawn from government, the railroads, electric power companies, copper cable suppliers and electric and diesel locomotive manufacturers. I personally was privileged to serve as a member of the Task Force.

The Task Force submitted its final report to the Secretary of Transportation in February of this year, after some two years of study. In that report, the Task Force reported its consensus views on railroad electrification, including the following:

"The substantial capital investment required to provide the catenary system, modifications to the signal and communication system necessitated by electrification, substations, transmission system extensions, and an electric locomotive fleet are obstacles to the adoption of electrification by American railroads. With the exception of commuter lines, the minimum length of viable electric rail operation is generally several hundred miles long and hence, it is generally not feasible for a railroad to electrify only a small segment of its system. As indicated in the [foregoing] discussion on *Why Railroads Have Not Expanded Electrification in the United States*, large scale electrification has been and is today beyond the financial capability of most of the nation's railroads, and even for those companies potentially able to finance electrification, it represents a critical capital investment decision." [10]

That is why there were only approximately 220 electric locomotives operating on U.S. railroads as of the end of 1972, compared with about 27,000 diesel locomotives.

Of course, it may be in the future that a changed relationship between the price of diesel fuel and the price of electric power will make electrification more attractive than it has been up to now. Or perhaps a breakthrough in electric locomotive technology will change the present equations between the two types of power. If so, I would expect the railroads to switch their pur-

[9] ICC Bureau of Transport Economics and Statistics, *Study of Railroad Motive Power*, File No. 66-A-11, Statement No. 5025, Washington, D. C., May 1950, p. 154.

[10] Report of the Government-Industry Task Force on Railroad Electrification, submitted to the Honorable Claude S. Brinegar, Secretary of Transportation, by letter dated February 20, 1974, from William E. Loftus, Chairman of the Task Force, p. 21.

chases from diesel locomotives to electric locomotives, when and if a net advantage of electrification is demonstrated, just as they purchased diesels in place of steam locomotives once the superiority of the diesel was established.

General Motors is working on various possible alternatives to the diesel for powering locomotives. We have experimented with a gas turbine engine: we have carried on extensive research with prime movers such as the Stirling and the free piston engines: we have submitted bids to railroads for all-electric locomotives on several occasions and are currently building two prototype electric locomotives. (Attached at Exhibit E is a photograph of our experimental free piston gasifier locomotive and a drawing of our prototype all-electric locomotive.) Whatever the future may bring for railway motive power, whether diesel, all-electric, gas turbine or other engines, General Motors is striving to be in a position to offer the best available product for the job at hand. This is necessarily so, because General Motors has no means by which to dictate what its customers will purchase; it can only sell them products which merit their business and which they wish to purchase.

The claim has also been made to this Subcommittee that General Motors forced the New Haven Railroad to "convert" from electric to diesel power, thereby causing a loss of passenger and freight business, higher operating costs, and bankruptcy. Based on this one supposed example, the further claim is made that poor earnings of all other U.S. railroads are likewise attributable to their having dieselized rather than electrified, due to coercion by General Motors.

Attached to my statement (Appendix II) is the affidavit of Mr. H. E. Hales, who was Chief Mechanical Officer of the New Haven in 1956. Because many of the pertinent facts regarding the New Haven relate to internal railroad matters which are outside my personal knowledge and, for that matter, outside General Motors' knowledge, we decided to ask an official of the railroad with personal knowledge of such facts to comment on the claims.

I believe Mr. Hales' statement goes a long way in refuting the claims made about the New Haven, and I will therefore add only a few comments.

First, there was never any "conversion of the New Haven system from electric to diesel power" as claimed. The mainline from New York City to New Haven, Conn. is still electrified today, as it has been since before World War I. Beyond New Haven, the railroad was never electrified, and therefore always utilized diesel (or steam) power.

Second, it is ridiculous to ask this Subcommittee to believe that General Motors coerced the New Haven to purchase General Motors diesels, when in fact the New Haven purchased *seven times as many* diesel locomotives from other locomotive manufacturers as from General Motors. Thus, at the end of 1956 the New Haven was operating a fleet of 408 diesel locomotives, of which only 50 were General Motors units. Thereafter, from 1957 through 1968, when the New Haven was merged into the Penn Central, the New Haven took delivery of 110 additional diesel units. Sixty of these were from General Motors.

That purchase record hardly bears out the claims that we forced the New Haven to buy our locomotives. And the claims do not make clear how it is that only the small percentage of New Haven diesels manufactured by *General Motors* brought about the railroad's downfall. Mr. Hales explains in his Affidavit why the New Haven chose our equipment. And he categorically denies that General Motors freight shipments were involved.

In regard to the claim that General Motors diesels caused the loss of passenger traffic to the New Haven, the 60 General Motors locomotives delivered to the New Haven between 1957 and 1960, designated FL–9's, were the **first General Motors** locomotives owned by the New Haven which were designed for passenger (as well as freight) service. Since the New Haven's passenger business had been deteriorating for many years prior to 1957, the FL–9's could not have been the responsible cause.

The FL–9's were not standard locomotives but were modified units incorporating a number of special design features specified by the New Haven. As explained in the Hales Affidavit, the New Haven had requested all the diesel locomotive manufacturers to submit designs for the special locomotives, but as it turned out, ours was the only design submitted that met their specifications.

Finally, I would like to comment briefly on references made to certain criticism by hearing officers of the Interstate Commerce Commission.

Most of the hearing officers' criticism was directed at the New Haven management, and I will not comment on that since it does not involve General Motors. But the hearing officers also criticized an engineering study submitted by General Motors to the New Haven in 1957 indicating the horsepower savings we estimated the New Haven could realize by purchasing 28 additional FL–9 units, which added to the 60 units previously ordered would give them a total of 88 FL–9's. Specifically, the hearing officers stated:

"To say that 88 FL–9 units, with an aggregate rail horsepower of 126,000 * * * will supplant locomotives in active service with a total rail horsepower of 288,260 (plus 16 switching engines) is manifestly absurd." [11]

I don't think that estimate was absurd at all. The estimate reflects about a 2 to 1 horsepower saving, which is well within the range we typically find in replacing, for example, outmoded diesel locomotives with modern diesel units. When we were replacing steam with diesel power, the savings in terms of horsepower frequently were even on the order of 3 to 1 or more. In the case of the New Haven, the inability of its electric locomotives to operate outside the electrified zone provided a potential for large savings through the use of the highly flexible FL–9's.[12]

The FL–9's could operate anywhere on the railroad, as diesels or as third rail electric locomotives, and could be used for either passenger or freight service. This meant, for example, that an FL–9 could haul a train all the way from New York City to Boston or Springfield, without an intermediate stop at New Haven—where the electrified zone ended—for a change of locomotives. In contrast, when an electric locomotive was used, it had to be removed at New Haven in favor of a diesel, and the electric would then stand idle at New Haven to await the return of the train from Boston or Springfield, when it would be hooked up to the train again for the return trip to New York City. (Hales noted that an electric might wait idle at New Haven for as much as six hours or more, depending on schedules.) Not infrequently there would be as many as *eight* New Haven electric locomotives—of either 3600 h.p. or 4000 h.p. each—standing idle for hours at New Haven waiting for return trips to New York City. Obviously it doesn't take much horsepower to replace 30,000 horsepower which isn't doing any work.

My point is that horsepower *ratings*—which the hearing officers were looking at—don't mean anything. What counts is the *utilization* of the horsepower—the amount of *work* being done.

The full ICC saw this point when they reviewed the hearing officers' opinion. They stated that "we are unable to find that [General Motors'] locomotive utilization plan was unsound", and went on to say in effect that the hearing officers' statement that 126,000 horsepower could not supplant 228,260 horsepower was true only *"assuming, of course, that 288,260 horsepower are required to meet the power requirements* of the railroad." [13] That is exactly what I've been talking about. The New Haven could get by with much less horsepower, provided it was *working* horsepower.

Thus, the Commission was consistent with its finding in a previous proceeding involving the purchase by the New Haven of these same FL–9 locomotives. There the Commission had stated: "our investigation of the performance records of the [FL–9's] and inspection of the locomotives themselves shows that this type of locomotive is very well suited for operation on the New Haven's system * * *" [14]

Time does not permit me to respond to each and every erroneous claim that has been made in these hearings regarding General Motors locomotive business.[15] But in concluding I would like to comment further on one claim.

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[11] *Passenger Fares, The New York, New Haven & Hartford Railroad Co.*, I.C.C. Docket No. 33332, as supplemented, Hearing Officers Recommendations dated November 21, 1960, p. 36.

[12] The Hales Affidavit also notes that the FL–9's would speed up both passenger and freight service in the electrified zone, where short falls of electric power often had caused electrified passenger and freight movements to be slowed, rescheduled or even stopped. The FL–9's, by operating as diesels within the electrified zone, could help relieve the power short fall.

[13] *Passenger Fares, New York, New Haven & Hartford Railroad Co.*, 314 I.C.C. 377, 387.

[14] *New York, New Haven & Hartford Railroad Co. Loan Guaranty*, 307 I.C.C. 105, 115.

[15] For example, a number of untrue allegations were made regarding General Motors acquisitions of the Winton Engine and Electro-Motive Companies. In fact, General Motors entry into the locomotive business in 1935 did not result from these 1930 acquisitions. For the true facts, see "The Locomotive Industry and General Motors" filed in the record of this hearing, at pp. 36–44.

It has been said that there is a conflict of interest in General Motors being in both the locomotive and the automobile business. Apparently the theory is that there is more money in selling automobiles and that if we simply offer inferior locomotives to the railroads, we can induce people to ride in automobiles rather than trains.

As an engineer, I don't really understand the logic of this, since if we don't make good locomotives what will happen is that our railroad customers will take their business to someone who does. Americans choose between planes, trains, buses and automobiles on the basis of their personal preference for a particular mode of travel—not on the basis of any manufacturer's wishes. But I think the record I have discussed clearly shows, better than any argument I can advance, that General Motors has never held back in its efforts to develop and manufacture the very best railroad motive power it could, and to give its railroad customers the products they want.

One can evaluate the strange theory that General Motors doesn't compete in locomotives so as to promote automobiles by taking a look at General Electric, which doesn't make any automobiles. They are a great company and a strong competitor wherever they do business, and today our two companies compete vigorously for diesel locomotive business. Yet we, who are supposed to be holding back in favor of automobiles, are doing a better job in terms of obtaining the railroads' patronage than General Electric, which could not be holding back. That does not look like General Motors has any conflict in selling locomotives along with automobiles.

If in the 1930's there had been a legal rule such as has been suggested here—that is, that an automobile manufacturer could not also make locomotive—General Motors' contributions to the railroads could not have occurred. Our expertise in engines, our techniques in mass production learned in the automobile business, could not have been applied to locomotives. Would it have been better for our country if the railroads had been forced by law to rely on the steam locomotive manufacturers? I think our record in the locomotive field supplies an obvious answer, and strongly suggests that public policy should encourage a company that has made the contributions General Motors has to stay in—not get out of—the locomotive business.

I have appreciated the opportunity to present my views. Thank you.

Appendix I

1. GENERAL MOTORS' LONG-STANDING POLICY AGAINST "RECIPROCITY"

General Motors has had a policy against using its purchases to induce suppliers to buy General Motors' products since at least the 1920's. This policy against "reciprocity" is based simply on the recognition that any other course is poor business.[1]

General Motors has always believed that purchasing agents could not be held responsible for doing their job properly—that is, buying quality supplies at the lowest price with good service and reliable delivery—if their decisions were to be governed by the alien and irrelevant factor of the volume of suppliers' purchases from General Motors. Moreover, General Motors could not expect to operate efficiently and obtain from suppliers their best in price, quality, reliability and service if the suppliers knew that their success in getting General Motors' business was governed not by these factors but by the volume of goods they bought from General Motors.

The question of reciprocity was taken up for consideration before the corporation's General Purchasing Committee at least as long ago as August 1927. This Committee was a Central Office advisory staff which existed during the 1920's and was responsible for establishing purchasing policies and entering into general contracts governing the purchases of more than one division. Its members were the principal divisional purchasing agents and it was headed first by Mr. Alfred P. Sloan, Jr., President of General Motors, and subsequently by the next ranking official, Vice-President Mr. John Pratt. The Purchasing

[1] "* * * for it is the most underling tradesmen only who make it a rule to employ chiefly their own customers. A great trader purchases his goods always where they are cheapest and best, without regard to any little interest of this kind." *The Wealth of Nations*, Adam Smith (Modern Liberty edition; 1937), p. 460.

Committee minutes reveal that a firm stand was taken against the practice of reciprocity:

"* * * it was agreed that the whole subject of reciprocity was so fraught with complications that it should be our established policy that all purchase transactions be consummated on their merits: that is, on prices consistent with quality of product and service demanded, facilities and reliability and responsibility of suppliers."

Shortly thereafter, in January 1928, Mr. Pratt in a letter to Mr. Sloan made an unequivocal statement of the philosophy governing General Motors in this matter. Mr. Pratt said in part:

"Nothing could be more detrimental to the moral of our Purchasing Agents, and to the general interests of our Corporation, than for any supplier to believe that anything can influence General Motors in choosing its sources of supply other than the three fundamentals of purchasing, namely—quality, service and price. I know you realize that as soon as any supplier feels that he can use collateral influence he is not as apt to give the utmost he can in quality, service and price to the one that deserves same, namely—the purchaser.

"I think that we are all pretty well agreed that we could not afford to use the principle of reciprocity in General Motors' purchases."

This policy against reciprocity has been continually restated and scrupulously followed. The current instructions on the subject read as follows:

"*Reciprocity*

"Many of our suppliers are also our customers. However, it is contrary to the policy of our Corporation to give any consideration or lend any weight to this circumstance in the course of dealings with customers in their capacity as suppliers. Each transaction must be evaluated on its own merits, and purchasing decisions must not be influenced in any way by the fact that a particular supplier may also be a customer.

"If the subject of reciprocity is interjected into negotiations by a supplier, such supplier should be advised in unequivocal terms of the Corporation's policy as stated above. If the subject is raised by letter, then the response should also be by letter."

2. THE SPECIFIC APPLICATION OF THE POLICY TO RAILROADS

In February of 1935, at the very time that General Motors was about to enter the locomotive manufacturing business, Mr. Sloan restated the general policy against reciprocity as it applied to the specific situation of transactions with railroads. This statement is found in General Policy Letter No. 549, entitled "The Relationship of the Corporation with the Railroads," and it was sent to all of the corporation's General Managers of Operations, Group Executives, General Staff Officers, Financial Officers, Operating Staff Officers and Heads of Staff Sections. Because of its particular importance to the locomotive business, it is inserted here in its entirety:

GENERAL MOTORS CORP., No. 549
February 15, 1935.

Subject: The relationship of the corporation with the railroads
To: General Managers of Operations
Copies for: Group executives, general officers, financial officers, operating staff officers, and heads of staff sections.

The Corporation is probably the largest shipper of freight in the country. With the extension of the Corporation's activities in lines other than motor cars and due to the growing use of the highways by the railroads to supplement the rails, the railroads have become potential users in important volume of many of our products. A new relationship is thus developed which brings with it certain responsibilities.

It is desirable to establish a definite policy with respect to these responsibilities, which policy is defined as follows:

First. Freight is to be routed in accordance with the most effective and efficient service that can be rendered.

Second. All relationships between any Operating Division or Subsidiary of General Motors, with respect to the sale of any of its products to any Transportation Company, shall be promoted on the basis of quality, service and value of the product involved.

The considerations in determining your relationship with Transportation Companies shall be service and merit, and you are asked to see that this policy is definitely understood by all persons within your organization who have to deal with the subject.

Very tru y yours.

ALFRED P. SLOAN, JR.,
President.

Mr. Sloan's letter was sent to all Traffic Managers and its text is still quoted, as the policy governing the routing of General Motors traffic, in the corporation's "*Standard Practice Manual for Guidance of Divisional Traffic Departments.*" copies of which are given to all General Motors personnel responsible for routing any General Motors traffic.

Because of the nature of General Motors' business, the policy expressed by Mr. Sloan is essential if the corporation is to be operated in an efficient manner. General Motors could not operate effectively if its freight traffic were routed on any basis other than merit, for efficient traffic movement is vital to the conduct of General Motors' widespread business activities.

The railroads serving General Motors' plants are an integral part of the corporation's production lines, and each day thousands upon thousands of freight movements to, from, and between General Motors' plants must be coordinated with each other, all subject to timing considerations affected by production scheduling, delivery requirements, raw material availability, and supplier delivery capability.

General Motors would be acting against its own best interests if it selected carriers on any basis other than the requirements of its production lines, for if it did so production would inevitably be disrupted by delays in arrivals of needed parts. A delay of even a few hours could shut down an entire plant, which in turn would disrupt operations at other plants. To increase inventories to allow for such delays would involve an immense additional investment in inventories, as well as in space in which to store them.

Moreover, the compensation of every divisional traffic representative is related directly to his contribution to his own division, not to the sales of any other division. Those traffic representatives therefore have not incentive to subordinate their divisions' interests in the efficient movement of traffic to Electro-Motive's interest in selling locomotives.

Consequently, the other divisions' demands for the best railroad service preclude Electro-Motive from controlling or influencing traffic other than its own even if it wanted to use General Motors traffic to influence locomotive sales. However, Electro-Motive's management from the beginning, starting with General Motors' entry into the business in 1935, has believed that the use of traffic was a poor sales tool and an objectionable business practice. Every head of the division and every sales manager of the division has recognized that the only sound foundation for the Electro-Motive's business was to compete on the basis of merit alone. They knew that resorting to traffic to influence sales was a "crutch" that would have weakened its efforts to develop and market the very best locomotives possible.

The railroad executives who made the buying decisions knew from long experience that the routing of General Motors traffic was not influenced by locomotive purchases, but dependen entirely upon the quality of the freight service they could provide. In the government antitrust suit against General Motors the deposition testimony of Messrs. Fred Gurley (late Chairman and President of the Santa Fe Railroad) and Walter Tuohy (late President of the Chesapeake & Ohio Railroad) is typical. Mr. Gurley said:

"Well, General Motors, of course, has a big organization. I think it has stronger policies on these matters [solicitation of traffic on the basis of purchases] than some people. I am quite clear that they pay no attention to your purchases in the routing of their traffic. That's always been my understanding." (Transcript, p. 281.)

Mr. Touhy said, discussing a conversation with William Lynch, Chevrolet Traffic Director:

"He said it was—he says, 'I am routing the traffic out of here, and it is on the basis of what you can give to me in the way of equipment, freight rates, service, et cetera, period, and that is all'." (Transcript, p. 61.)

Appendix II

STATE OF FLORIDA,
County of St. Johns, ss:

AFFIDAVIT OF H. E. HALES

H. E. HALES, being first duly sworn, deposes and says:

1. I am Vice President of Equipment and Purchases for the Florida East Coast Railway Company St. Augustine, Florida. During the period March, 1955, to August, 1957, I was Chief Mechanical Officer of the New Haven Railroad, with offices at New Haven, Connecticut. Prior to that, from 1942 to 2955, I had been with the Central of Georgia Railroad, mainly in the Mechanical Department.

2. I have seen the Committee Print of the Subcommittee on Antitrust and Monopoly, Committee of the Judiciary, United States Senate, entitled "American Ground Transport," and have read Pages 38–43 thereof, relating to locomotives and, in part, the New Haven Railroad.

3. I make this affidavit not out of any ties with or desire to defend either the New Haven Railroad or General Motors, but solely out of a sense of outrage at the many false claims made in the Committee Print and a desire to assist the Subcommittee in its inquiry by setting forth the true facts which are within my personal knowledge.

4. When I came to the New Haven in 1955, I found that although they operated a large fleet of diesel locomotives they owned no General Motors locomotives. When Hurricane Diane and resulting floods devastated New England and New Haven properties in the fall of 1955, washing out railway roadbed and bridges, and rendering large numbers of our locomotives inoperable, I recommended that the New Haven acquire new replacement locomotives from General Motors. I recommended General Motors equipment for two reasons: First and foremost, during my service on the Central of Georgia, which owned and operated all of the principal makes of diesel power and kept detailed comparative repair, operating and availability records for its locomotives, I found that General Motors' locomotives were vastly superior to the other makes. The other reason for my recommendation was a favorable delivery schedule for the General Motors locomotives. (We were in a hurry to replace our flood-damaged power and, in fact, had had to borrow some locomotives from the U. S. Government to continue operating.)

5. Accordingly, the New Haven took delivery of about fifty diesel locomotives from General Motors in 1956, consisting of yard switchers and freight locomotives. To my knowledge, these were the first General Motors locomotives ever owned by the New Haven. I was intimately involved in the negotiations with General Motors for these locomotives, and can state categorically that General Motors freight shipments were never discussed. As I have said, the only factors involved as far as I was concerned were the operating superiority of General Motors' locomotives and the favorable delivery schedule.

6. Sometime in 1955, the New Haven management began to think seriously of obtaining locomotives, assuming they could be designed, which could operate all the way through on the densely traveled mainline from New York City to New Haven, Conn. and on to Boston and return, and on the route New York City-New Haven-Springfield and return. Before explaining the reasons for this, it will be helpful if I briefly provide certain background.

7. The New Haven had an electrified zone extending from New York City to New Haven. There was no electrification above New Haven. Electric power in the electrified zone was provided from generating facilities owned by the railroad (Cos Cob, Conn.) or leased by it (Devon, Conn.), and power was also purchased outright from Consolidated Edison in the New York City area. Throughout most of the electrified zone, high voltage alternating current power was supplied through an overhead catenary system serving four main tracks. On a portion of the mainline running into New York City, low voltage direct current power was supplied by means of a third rail.

8. By the time I came to the New Haven, it had been experiencing increasing short falls of electric power. Outside sources of electric power, such as Consolidated Edison, simply did not have sufficient power available to sell us, as

our peak periods of demand matched theirs. Increasing the capacity of our Cos Cob facility would have involved the expenditure of millions of dollars, and would have required a long lead time because of the unavailability of the new turbine generators needed.

9. Returning now to the consideration being given by the New Haven's management to acquiring new locomotives for through service between New York and Boston and between New York and Springfield, we were interested in locomotives that could be operated as diesels except for the run into New York City, where D. C. electric operation was required. Such locomotives would provide several very important advantages.

10. First, such locomotives, operating principally as diesels, would reduce the use of electric power and thus help relieve the railroad's short fall of electric power. This would greatly improve both freight and passenger service, because frequently freight trains hauled by electric locomotives had to be rescheduled, slowed down or even stopped temporarily during peak passenger periods in order to assure sufficient power for passenger trains consisting of electric powered rail cars or trains pulled by electric locomotives, and even electric powered passenger train movements had to be slowed down from time to time to conserve electric power. (The principal passenger volume on the New Haven was the commuter movement into the New York City area, virtually all of which was handled by electric rail cars or trains.) The diesel feature would also reduce the New Haven's dependence on its Cos Cob facility, which had been built shortly after the turn of the century, and which the New Haven management feared might down at any time with disastrous results to the New Haven's operations.

11. The second principal advantage of such locomotives would be that they would greatly increase the New Haven's utilization of its locomotive fleet. The practice always had been on both the New York-Boston and New York-Springfield runs to remove the electric locomotive at New Haven and replace it with a diesel for the remaining run to Boston (Springfield). The electric locomotive would wait at the New Haven terminal for the diesel's return trip from Boston (Springfield), and when it arrived back in New Haven, the electric locomotive would again be hooked up to the trains for the return trip to New York City. Needless to say, it was extremely wasteful to have our high horsepower electric locomotives standing idle in New Haven, for as much as six hours or more depending on the schedule. Also, not having to stop in New Haven to change locomotives means we could speed up our schedules between New York and Boston (Springfield).

12. Accordingly, in 1955, the New Haven decided to invite all the diesel locomotive manufacturers—Alco, Fairbanks-Morse, Baldwin and General Motors—to submit bids on diesel locomotives which could also operate as electric locomotives from power supplied through a third rail. This decision was made solely by the New Haven management and was not influenced by General Motors or any other company. One of the design requirements we specified for the locomotives was a limited axle loading, necessitated because of the load limit of one of the viaducts on the route into Grand Central Station. As I recall, General Motors was the only manufacturer which was able to develop and submit a design meeting that requirement.

13. About the beginning of 1956, we ordered 60 of the newly-designed locomotives from General Motors. The units, designated FL–9's, could operate as diesels or as third rail electric locomotives, and had the additional flexibility of being suitable for either passenger or freight service.

14. Again, as in the New Haven's previous locomotive order from General Motors, I was intimately involved in the negotiations with General Motors for the acquisition of the FL–9's, and again I can state categorically that General Motors freight shipments were never discussed. Indeed, as I have said, General Motors bid was the only one that met the New Haven's specifications.

Dated at St. Augustine, Florida, this 3rd day of April 1974.

[SEAL] H. E. HALES.

LOYCE M. WELLS,
Notary Public, State of Florida at Large.

My Commission Expires July 14, 1974; bonded by Transamerica Insurance Co.

Exhibit 24.—GM Publication, May 1973, Entitled "The Locomotive Industry and General Motors"

THE LOCOMOTIVE INDUSTRY AND GENERAL MOTORS

INTRODUCTION

The claim is often made that a company with a large share of the business is a monopolist and that an industry with a small number of firms is noncompetitive. The locomotive business has been cited as an example of such an industry and General Motors has been singled out for criticism because for many years it has sold the bulk of the locomotives produced in the United States.

A fair reading of the historical facts should compel the conclusion that such criticism is unjustified. Accordingly, the story of the development of the locomotive business as it exists today and the pioneering role played by General Motors is set forth here. This story will demonstrate that the locomotive business is a classic case study of the proper working of the American competitive system.

The mere fact that the competitive struggle has resulted in the emergence of one company with most of the business does not mean that this company has monopolized.* Such success is merely the expected result under the free competitive system when the customer gives his patronage to the producer of a markedly superior product.

* In the early 1960's the Department of Justice brought both a civil and a criminal action against General Motors charging monopolization of the locomotive business in violation of the antitrust laws. Prosecution of the criminal case was dropped in 1964 upon the Government's statement that the "evidence is insufficient to prove the offense alleged in the indictment beyond a reasonable doubt." The civil Electro-Motive case was similarly dismissed voluntarily by the Government in 1967, upon the following statement:

> "Plaintiff recently completed an extensive review and re-evaluation of the available evidence. Based upon this re-evaluation it is plaintiff's view that the available evidence is insufficient to establish the violations alleged."

The story set forth here is divided into three principal parts. The first will describe how the industry, once dominated by a few manufacturers of steam locomotives, was transformed by the entry of General Motors with a new and superior product, the diesel locomotive. The second will show that vigorous competition has since led to the development of improved locomotives at lower prices. The third will disprove the charge that General Motors owes its success to the acquisition of companies in the business or to the exploitation of its position as a rail shipper in the sale of locomotives to railroads ("reciprocity").

I

General Motors' success in the locomotive business is solely the result of innovation and product superiority.

The record of General Motors' contributions in the locomotive business is, we believe, a classic story of our competitive system working at its best. Before General Motors entered, the locomotive business consisted principally of three companies (Alco, Baldwin & Lima) who were stubbornly wedded to steam. General Motors, in the face of almost universal initial skepticism, proceeded to develop and sell the diesel locomotive, whose superiority was so pronounced that it revolutionized the industry. In the face of healthy and continuing competition General Motors has maintained its front-running position with a record of innovation and continuing product improvement.

A. General Motors' Entry with a Revolutionary New Product.

Innovations by General Motors literally created the modern diesel locomotive industry. Since the early 1920's the General Motors Research Laboratories, under the di-

rection of Mr. Charles F. Kettering, had undertaken research studies to ascertain the potential of light-weight diesel engines as prime movers, without regard to specific application. The previously existing engines were both heavy and slow. The first prototype model of the new light-weight two-cycle diesel engine, which was to evolve into General Motors' first locomotive engine, was built in 1933 as a submarine engine. It weighed only around 20 pounds per horsepower, compared with 60 pounds or more per horsepower for the lightest diesel engines of that era, and was also about one-third their size. For the first time in America, a commercially practical internal combustion engine of sufficiently high horsepower and sufficiently small size and weight was available for possible use in road locomotives.

The first contact with the railway industry, however, occurred purely by happenstance. In 1933 General Motors displayed two of its new 201 diesel engines at the Chicago World's Fair, where they were used to provide power for the Chevrolet exhibit. Ralph Budd, then President of the Burlington Railroad, saw these engines and sought them for a new streamlined train the Burlington was building. Although General Motors was reluctant to supply what was still an experimental and untried engine for such important railroad service, at Mr. Budd's urging it ultimately agreed to build a modified version (the 201-A) of the new engine for the train that later became famous as the Pioneer Zephyr.

Although there were many difficulties with the 201-A engine, it was the spectacular and highly publicized experience of the Zephyr and subsequent streamliners which demonstrated that the new diesel engine could make a con-

tribution to railroad transportation and which led to General Motors' decision to enter the locomotive manufacturing field with the construction of a plant at LaGrange in 1935.

The entire period from the middle 1930's through World War II was a period in which the railroads carefully examined, studied, tested, and compared the performance of General Motors' new product in competition with steam locomotives. The question of diesel versus steam power was debated at almost every gathering of railroad personnel, and the controversy was abetted by the old-line locomotive builders, whose officials seemingly seized every available opportunity to make a speech or write an article "proving" that steam power was superior.

Indeed, the railroads first began purchasing General Motors locomotives only for use in unusual operating situations where steam could not do the job. For example, in early 1938 the Atlantic Coast Line, which competed with the Seaboard for the heavy winter railroad passenger traffic between Washington and the Florida resort area, announced a reduction of several hours in its operating schedule between Washington and Miami. Both railroads operated steam locomotives on that run, but because the Atlantic Coast Line had a shorter, straighter track and was placing the latest model Baldwin steam locomotives in that service, the Seaboard became concerned that it could not meet the reduction in the Atlantic Coast Line's schedule. Accordingly, when the Seaboard found that no steam locomotives were available which could do the job, almost as a last resort it ordered diesel locomotives from General Motors and placed them in service on its crack "Orange Blossom Special."

As it turned out, the competition between the Seaboard and the Atlantic Coast Line for the Miami passenger business attracted widespread attention in the railroad industry as a contest between diesel and steam power, pitting as it did the new General Motors diesel locomotive against the latest model steam locomotive. The diesel won hands down, for it not only enabled the Seaboard to meet the Atlantic Coast Line's faster schedule but in its first year of service the Seaboard attracted more passengers and realized more revenue than it ever had previously on the Miami run, mainly because of the new locomotive's on-time performance. As a postscript, the Atlantic Coast Line was as impressed by the performance of this new diesel locomotive as the Seaboard; shortly thereafter it stopped buying steam locomotives and began buying diesel locomotives.

Many other tests, studies and comparisons were made throughout this period. General Motors built demonstrator units which the railroads tested in actual service to see for themselves how General Motors locomotives performed relative to competing locomotives. General Motors made economic studies of the railroads' operations, to show that the economies which would be gained by operating General Motors locomotives more than justified their purchase. Frequently, these studies proved that General Motors locomotives would pay for themselves in a few years entirely out of the savings they produced.

Perhaps the most significant test of all occurred in 1939, when General Motors developed and built the first diesel freight locomotive ever produced. That locomotive, built as a demonstrator, became famous as the "No. 103" and is generally considered the most important locomotive ever

built in America after the original steam locomotive. The No. 103 was developed for the express purpose of determining whether the diesel locomotive could compete with steam in freight service, which is the most important type of railroad service and which by 1939 was virtually the last stronghold of steam operations. If a diesel locomotive could compete with steam in freight service, then the way would be open to total dieselization of the railroads, which would yield enormous additional savings by completely eliminating the need for the expensive facilities necessary to support steam operations, including roundhouses, water towers, coal chutes, ashpits, turntables, etc.

When General Motors made the No. 103 available to the railroads for testing, it did so on the express condition that the locomotive would be tested in the most demanding and rigorous service available, so that both the railroads and General Motors would learn what the overall capability of the diesel locomotive was in such service. (Despite the "proofs" advanced by the old-line locomotive builders that the diesel was unsuitable to freight operations, no one really knew because it had never been tested in such service.) Such tests would not merely show whether the diesel locomotive could perform satisfactorily in freight service, they would yield data which would make it possible to measure the economic contribution, if any, which the diesel locomotive could make in such service.

The No. 103 was tested by about 20 major railroads, covering over 80,000 miles under every variation in operating conditions that could be found in some 35 different states. The tests proved dramatically and conclusively that General Motors' new diesel freight locomotive repre-

sented a significant economic advance over the steam freight locomotives offered by other companies.*

From about 1940 on, sales of General Motors' new locomotives began climbing rapidly as the savings which they could achieve became more and more apparent. And, except for the interruption occasioned by World War II, the railroads began dieselizing in earnest.**

In short, General Motors achieved a substantial position in the business by developing a revolutionary new product and then demonstrating to the railroads that this product could produce substantial savings for them. The railroads began purchasing from General Motors in appreciable volume only after they determined that its product was superior to what other companies had to offer.

B. Other Locomotive Manufacturers Regarded the Diesel Locomotive as a "Passing Fancy."

The loss of business by General Motors' competitors once the merits of General Motors' new diesel locomotives

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* Mr. Fred Gurley, former Santa Fe Chairman of the Board, testified on the initial General Motors diesel freight locomotive, introduced in 1939 as follows: "* * * here we had the ultimate. Here was an engine that in my judgment outperformed anything we had in the country. I just made up my mind to two things right now: That the day of the steam engine was history; that I owed a debt of gratitude to the fellows that made that all possible, and that was your company, my good fellow, General Motors." (Deposition testimony in the civil Electro-Motive case, p. 144)

** During the early part of the war General Motors was taken out of locomotive production entirely, to permit its entire production of diesel engines to be utilized in connection with the Navy's LST program.

Subsequently General Motors was permitted to resume production of freight locomotives only. The Government had allocated diesel switcher production to Alco and Baldwin exclusively and had suspended production of diesel passenger locomotives.

At various times during the war Alco and Baldwin were authorized to build diesel road locomotives, but were unable to do so because they had no suitable design ready.

became known is not evidence that any anticompetitive influences were at work; it is evidence that the market was competitive, because the best product attracted most of the business. General Motors' competitors were penalized by their own failure to produce a competitive product, not by any control or market power of General Motors.*

When General Motors began developing and gaining experience with the diesel locomotive in the 1930's, Alco, Baldwin and Lima had all had a long history as producers of steam locomotives; both General Electric and Westinghouse had had considerable experience in building straight-electric locomotives; and all but Lima had experimented with diesels before General Motors' first diesel engine went into service on the Burlington Zephyr in 1934. The executives of those companies had been closely associated with the leaders of American railroads for many years; consequently, all of them were in an ideal position to analyze the railroads' motive power needs and to develop locomotives which would satisfy them. Moreover, all of those companies were large, well-established industrial concerns with ample facilities for designing and building any type of locomotive that the railroads desire. There being no important patents involved, they had ready access to all of the latest technical developments, and most of the components necessary for a diesel electric locomotive were readily available to any interested company.** Yet, none of these companies promoted the use of diesel locomotives;

* Mr. Kettering once testified, when questioned by Senator O'Mahoney regarding General Motors' large share of the diesel locomotive business, that General Motors' greatest competitive advantage was its competitors' belief "that we were crazy."

** As early as the middle 1920's both General Electric and Westinghouse were manufacturing and selling all of the components needed for the electric transmission system of a diesel electric locomotive, including traction motors, generators, and control apparatus.

indeed, most of them vigorously opposed it. A brief review of those companies' early diesel development activities and their subsequent attitude toward diesel power is sufficient to show why they lost their positions as the leaders in the American locomotive industry.

Alco had built diesel switching locomotives (in cooperation with General Electric and Ingersoll-Rand) as early as 1924 or 1925, and in the late 1920's built two experimental diesel road locomotives. In 1929, Alco acquired the McIntosh-Seymour Company which was then a leading builder of diesel engines. Alco used McIntosh-Seymour diesel engines to power its diesel switchers throughout the 1930's, to power a streamlined train in 1935 (the Rebel, on the GM&O), and also to power the few diesel passenger locomotives which Alco built before the war. But, according to Mr. Perry Egbert (former Alco President and Chairman of the Board), Alco did not even *begin* designing a new diesel engine specifically for a road locomotive until 1940, and Alco locomotives powered by that new engine were not available commercially until 1946.*

Baldwin, which had the largest locomotive plant in the world, had built two experimental diesel road locomotives in the late 1920's, and in 1931 it acquired a diesel engine

* *Lukens Steel Co.* v. *American Locomotive Co.,* Civil Action No. 3596 (U.S.D.C., N.D.N.Y.), transcript of Egbert testimony, pp. 79-98 (1951). According to Mr. Egbert, Alco's initial reaction to General Motors' plant to build diesel road locomotives was that General Motors "would not be successful in the development of road line locomotives" (p. 86). Mr. Egbert also testified that, when events proved that prediction wrong and Alco brought out a diesel passenger locomotive which was "rated up to the hilt," Alco (and the railroads) found that "our maintenance costs were excessive, in comparison with the Electro-Motive locomotives which had a margin and which were designed especially for road service. And they gave us terrific competition to the extent that we were practically eliminated from the field product-wise" (p. 91).

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manufacturer (De La Vergne). Baldwin built diesel switchers both before and during World War II, but did not market a diesel road locomotive until after the war. As late as November, 1945, Baldwin was still advertising steam locomotives, and it kept its steam locomotive building shops open until at least 1950. It dropped out of the locomotive business entirely around 1956. Its departure was no fault of General Motors; rather, according to its own officials:

> "* * * the judgment of those of us who had been in the company back in the diesel period was that *General Motors had nothing to do with the Baldwin failure. It was our late start in the field and our inability to produce as good a competitive product.*"*

Lima Locomotive Works (later Lima-Hamilton), which had built no diesel locomotives at all prior to 1949 (and then built only diesel switchers), never deserted steam power as long as it remained in business as a separate company. Even after the war, Lima continued to promote steam power, and as late as 1949 was still advertising that in its belief there would continue to be a demand for steam locomotives "for a long, long time." In the following year, 1950, Lima-Hamilton merged with Baldwin, and ceased to exist as a separate company.

The straight-electric type of locomotive first built by *General Electric* and *Westinghouse* at the turn of the century is similar to the diesel electric locomotive (except that it obtains its electric power from an outside source), and both of those companies have been closely connected with

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* Page 188 of deposition of Edward Hopkinson, Jr., former Chairman of Baldwin's Executive Committee (in *Evans* v. *Armour and Company, et al.*, 241 F. Supp. 705 (E.D. Pa. 1965)).

diesel locomotive developments in this country.* General Electric collaborated with Alco and Ingersoll-Rand in building diesel switchers in the middle 1920's, and several of General Motors' early diesel locomotives were built at General Electrics' Erie Works in 1934 and 1935. General Electric has built diesel electric locomotives for export since at least 1928, and for many years it has manufactured diesel locomotives in the low-horsepower ranges for a variety of domestic users, including some railroads. (Much later, in 1961, it came out with a new line of high-horsepower diesel electric road locomotives designed primarily for use on American railroads.)

In the late 1920's and early 1930's Westinghouse built several diesel electric locomotives, using diesel engines manufactured under license from the Beardmore Company of Scotland, and in 1935 Westinghouse furnished the diesel engines and electric transmission for a streamlined train operated by the New Haven. Shortly after that, however, Westinghouse discontinued its diesel locomotive activities, apparently in the belief that the diesel locomotive did not have a sufficiently attractive commercial future.

The diesel locomotive development efforts of all of those companies were limited by the view that the diesel locomotive was merely supplemental to the steam locomotive and was useful only in certain limited types of service, primarily switching. It is clear from their contemporary advertisements, as well as from speeches and papers by

* Both General Electric and Westinghouse for many years were important suppliers of the major electrical components needed for the electric transmission system in diesel locomotives, including traction motors, generators, and control apparatus. General Electric had always supplied such equipment for Alco locomotives, and formerly supplied Fairbanks, Morse (and at one time General Motors) as well. Westinghouse built such equipment for Baldwin (and also at one time for General Motors).

their executives, that those companies regarded the diesel road locomotive as a passing fancy which would never seriously challenge the dominance of steam, and that they considered General Motors' efforts to develop a diesel road locomotive to be sheer folly.* None of them saw the diesel locomotive as the locomotive of the future.

C. The Diesel Locomotive Aided Competitors by Creating New Demand.

The fact that the loss of market position suffered by the steam builders was due to normal rather than abnormal market forces is also proven by the fact that they, as well as Fairbanks, Morse,** found no barrier to producing diesel road locomotives once they decided to move in that direction after the war. In fact, General Motors facilitated such sales by others by creating the demand in the first place.

With the superiority of the diesel proved beyond any doubt by the end of the war or shortly thereafter, the railroads, following the dictates of economics, rushed to dieselize as fast as possible. Because General Motors had failed to gauge fully the extent of demand for its diesel locomotives, it lacked sufficient production capacity to fill that demand, and its share of sales declined as the railroads, again following the dictates of economics, purchased large quantities of diesel locomotives from its competitors. Even though the railroads regarded General Motors diesels as the best, any diesel was better than steam. During that

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* Copies of some of those advertisements and excerpts from some of those speeches are attached hereto as Appendix A.

** Fairbanks, Morse had manufactured marine diesel engines during the War. It never quite overcame the technical problems of conversion and fell aside when demand sharply declined in the 1950's.

period the railroads frequently purchased whichever make of diesel locomotive they could obtain first, in order to more quickly realize the economies of dieselization.

D. Reasons for the Superiority of the Diesel Locomotive.

The absolute superiority of diesel electric locomotives to steam locomotives is the key to the revolutionary changes which took place in the business. A simple illustration should serve to drive the point home.

In the 1920's over 60,000 steam locomotives were required by U.S. railroads to haul somewhat over 400 billion ton-miles of freight. By 1971 all but 13 of these steam locomotives had been replaced by only 27,000 diesels, even though total freight traffic had increased by about 85%. Thus each diesel was doing the work of about four of the steam locomotives which it replaced.

The main reasons for the superiority of diesel power are:

a. The diesel engine has a thermal efficiency more than three times that of the most modern steam engine.

b. The availability of an efficient diesel electric locomotive for useful work, when properly maintained, exceeds 95%, as compared to an availability of only 50% to 65% for a steam locomotive.

c. A diesel electric has much higher starting tractive effort than any steam locomotive, partly because all wheels are driving wheels and because its traction motors can exert full torque at zero speed.

d. The electrical system of a diesel electric can be used to stop or retard trains (dynamic braking), which is particularly important on downgrades. This allows

greatly improved train handling and faster safe speeds, and also saves thousands of tons of iron brakeshoes for freight and passenger cars annually.

e. Because of mass production and parts standardization, repairs on a diesel electric are much more economical.

f. Diesel electrics are much more versatile, allowing more continuous use and eliminating the need for many special purpose locomotives.

g. Diesel electrics can run for long distances with only minor service. Moreover, unlike steam locomotives, a single type can be used in mountains or in prairies. Thus, a single train can travel coast-to-coast without a change.

In the early postwar period most knowledgeable men in the railroad field realized that steam locomotives were so inherently inferior to diesel locomotives as to constitute liabilities rather than assets to the owning railroads. In other words, steam locomotives were so expensive to operate relative to diesel locomotives that a railroad could not afford to operate them even if they were obtained free from the builder.

The displacement of steam locomotives by diesels yielded another benefit which was not fully appreciated at the time. Diesels are much cleaner. Studies of the Department of Health, Education and Welfare recently concluded that railroads accounted for less than 1% of emissions to the atmosphere.*

The initial revolutionary development of diesel electric locomotives had been completed by the early postwar pe-

* HEW, *Nationwide Inventory of Air Pollutant Emissions 1968* (Aug. 1970).

riod, and within another ten years the steam locomotives had largely disappeared. General Motors had created an entirely new industry.

E. Reasons for the Superiority of General Motors Locomotives.

General Motors achieved its initial success in the locomotive business by pioneering in the development of diesel power. It has continued to be successful because of the superiority of its product and its leadership in introducing innovations and improvements. A few indications of this leadership are discussed below.

1. Mass Production Technology

A modern diesel locomotive is a complex product, consisting of some 250,000 individual parts and components and requiring over 1,000,000 separate shop operations to make. Unless manufactured by modern mass production methods, utilizing tools, dies and fixtures, its first cost would be so high that its economic advantage would largely be lost. (The old-line locomotive manufacturers never tired of arguing that the first cost of the diesel locomotive was prohibitively high.)

General Motors was the first company successfully to apply mass production techniques to locomotives. Applying its know-how from the automobile industry, it developed new manufacturing methods and factory controls to fit the new product and, there being few tools then available in heavy industry which were suited to high precision manufacture, even designed and built its own tools.

While it may appear now that the application of mass production to this industry was an obvious step, there was

a basic obstacle to its introduction in the 1930's. Mass production of course requires a standardized product. Yet the almost universal practice of the railroads in ordering steam locomotives was to specify a large number of individual variations, making it necessary to custom-build such locomotives by old-fashioned job shop methods. At first some railroads refused to accept the limitation that they order "off the shelf" locomotives, but in time they agreed that standardization was of great economic benefit. Today many railroad executives consider that standardization of locomotives was one of the most outstanding innovations that General Motors brought to the industry. No other builder of diesel locomotives adopted this philosophy until after World War II, and none ever applied it to the same extent that General Motors did.

2. A Revolutionary Design Concept: Standardization and Upgrading of Locomotive Components

Along with mass production and a standardized locomotive, General Motors introduced a basic locomotive design philosophy which has been one of the most far-reaching and significant cost-saving innovations in the history of heavy industry. Part of this philosophy is the "building block" concept, which involves the use of completely standardized and uniform components wherever possible in every locomotive in the line. Thus, in every General Motors locomotive engine—regardless of horsepower or number of cylinders—most of the important engine components have been interchangeable. Variations in horsepower from engine to engine have generally been accomplished simply by varying the number of standard cylinders (and standard cylinder components).

Other major components, such as electric traction motors, have also had exactly the same dimensions regardless of the size or type of locomotive on which mounted, so that a replacement traction motor in a railroad's spare parts inventory would fit any General Motors locomotive, regardless of size or type, from the smallest 600 h.p. switcher up to the largest road locomotive. Electric generators also were standardized to the several sizes necessary for the range of electrical output required in particular types of service.

Standardization of components not only has contributed greatly to General Motors' manufacturing efficiency (by reducing the amount of tooling needed), it has achieved important savings for the railroads by enabling them to carry less varied and hence smaller inventories of spare parts for their General Motors locomotives.

General Motors locomotive components have been standardized not only among the various models of locomotives being produced at any given time, but also among the different models produced through the years. Moreover, through the application of a revolutionary concept in engineering design, standardization has been retained *even though the components were continuously being improved.* This has been done by designing product improvements into components having the same physical configuration and exterior dimensions as the components they replace. For example, General Motors' current model electric traction motor has more than twice the horsepower of the 1939 model, but has precisely the same dimensions as, and is fully interchangeable with, that earlier model. This has also been true of crankshafts, cylinder heads and many other vital parts.

Thus locomotives built in 1939 could be repaired in 1972 with current production parts, and by the very process of repair older locomotives have constantly been upgraded and modernized through the replacement of worn out components with new, improved, longer-lasting, more powerful components. As a result, a General Motors locomotive built and sold ten years ago may, by the process of upgrading through repair, be intrinsically a better locomotive today than it was when new.

Moreover, even when a customer wants a new locomotive he can save a considerable amount of money by ordering what is called a "line replacement locomotive," which contains certain remanufactured parts and components. He trades in his old unit and certain salvable parts are removed. These parts are then remanufactured, modernized to current specifications and incorporated into a new unit.

3. Ease of Maintenance and Repair

General Motors' diesel engines have also been better designed than those of other locomotive builders from the standpoint of accessibility and ease of repair of vital moving parts. For example, removal of a power assembly (the cylinder head and liner, piston, connecting rod, and auxiliaries) from any General Motors locomotive engine is a relatively easy hand operation requiring no more than two men; however, on almost all models of competitive locomotive engines, a crane or chain hoist is required to effect the same repair because the pieces are far too heavy to be removed by hand.

The relative ease of repair of its locomotives has been an important factor in General Motors' success. In the early days of the diesel locomotive, when breakdowns were

more frequent than now and replacement (or standby) locomotives were less apt to be available, General Motors service engineers often rode on the trains with the railroad service personnel, literally living with the locomotive around the clock. As a result of the ability to make vital engine repairs without the use of a crane or hoist, it was possible, on a General Motors passenger locomotive equipped with two diesel engines, to make power assembly repairs on one engine while the other engine was pulling the train on its regularly scheduled run, without taking the locomotive out of service and without disrupting its schedule.* (One railroad repairman reported that it required exactly "42 miles" to change a piston on a General Motors locomotive engine on his assigned run.)

4. Service

Long before any other locomotive manufacturer even recognized the importance of providing such service, General Motors established after-sales service which has been outstanding in the locomotive industry. Under the guidance of the General Motors Institute, the first school in the industry was established at Flint (later at LaGrange) for the training of railroad personnel in diesel locomotive operation and maintenance. In addition to its permanent classroom at LaGrange, the school also outfitted railroad cars as traveling classrooms in order to bring instructions to the students. To date, some 35,000 railroad personnel have attended General Motors' locomotive training school at LaGrange and an additional 65,000 have been given on-site training in the traveling classrooms.

* In order to change a cylinder liner on a Fairbanks, Morse locomotive, by contrast, it was necessary to lift a crankshaft which alone weighed more than 2000 pounds. The operation normally took the locomotive out of service for a day.

Recognizing the importance of having necessary repair parts for its locomotives readily available to the railroads, General Motors located parts warehouses or repair depots at 13 strategic locations throughout the country, so that needed parts would be within quick reach of every railroad operating General Motors locomotives. In order to further speed up the repair process, General Motors utilized a program of "unit exchange" on major locomotive components, whereby a railroad can exchange a worn or damaged component for a reconditioned component without waiting for repair of the damaged part; General Motors then reconditions the worn component, upgrades it to current specifications and places it in its stock, billing the railroad only for the cost of the actual reconditioning involved. The tremendously broad scope of General Motors' unit exchange program, of course, is feasible only because General Motors has standardized so many of its major locomotive components.

By its efforts over the years, General Motors has earned a reputation for providing prompt, reliable service to its customers and for "keeping its locomotives running" with a minimum of inconvenience and expense to the railroad. In fact, in the early years, railroads even called upon General Motors service engineers to help solve problems on competitive locomotives.

5. Continuity of Improvement

Significant product improvements have been made by General Motors in virtually every important locomotive component over the years. A typical example is piston ring life, which has been increased from some 100,000 miles in 1945 to 400,000 to 500,000 miles today. Life of the piston itself has also been at least quadrupled during the same

period. One measure of the savings to customers which improvements in component life have produced is indicated by the fact that where in 1945 about 7655 man-hours of railroad labor were required to carry out each four-year cycle of scheduled maintenance recommended by General Motors for its then current model freight locomotive, the comparable figure for a current GP-40 locomotive is 3425 hours. At current railroad labor rates for locomotive maintenance, the saving in labor alone amounts to over $8,000 per year per locomotive.

F. Measuring the Superiority of General Motors Locomotives.

The ultimate measure of how well General Motors has succeeded in marketing the best possible locomotives is, of course, how well they perform in actual service. The evidence in that respect overwhelmingly establishes that General Motors locomotives have proven superior to those of other builders. This superiority can be measured in cold, hard dollars and cents, and is clearly apparent on the books and records of almost every American railroad.

Although comparable models of almost all makes of locomotives have about the same initial price, locomotives are not fungible commodities. The real price of a locomotive cannot be determined by reference only to its initial cost; more important is the anticipated cost of operating and maintaining it. Because a road locomotive may be expected to operate in the neighborhood of 10,000 miles per month (2,000,000 miles or more during the course of its normal useful life), it is obvious that even slight differences in operating and maintenance costs between different makes of locomotives are of overwhelming importance to railroads in their locomotive purchase decisions. For example, a large railroad like the Santa Fe operates its fleet of diesel

road locomotive units approximately 150,000,000 unit miles per year; thus on that railroad an average saving of only 1¢ per unit mile in costs of locomotive operation and maintenance would result in total savings of $1,500,000 per year.

Many railroads have compared their costs of operating and maintaining General Motors locomotives with their costs of operating and maintaining other makes of diesel locomotives. Over the years, on railroad after railroad, the difference in operating and maintenance costs between most models of General Motors locomotives and the next best make of comparable diesel locomotive has not been just 1¢ per unit mile, but rather has been in the neighborhood of 10¢ per mile or more. The more usual average saving of 10¢ per mile in operating and maintenance costs on a single General Motors freight locomotive represents a saving of approximately $200,000 over the useful life of that locomotive—an amount approximating its initial cost.

It is small wonder that these railroads (and others) have, on the basis of studies such as these, awarded their locomotive business to General Motors. Many railroads even have asked General Motors to repower competitive locomotives with General Motors diesel engines, and General Motors has performed such repowerings on virtually every type and make of competitive locomotive. General Motors has repowered a total of 238 competitors' locomotives with General Motors engines, but to our knowledge there has never been a single instance of another locomotive builder repowering a General Motors locomotive.

At the time of the Government's antitrust case the railroad executives who were responsible for the locomotive purchase decisions on almost every major railroad in the United States would have testified to a man that their

purchases of General Motors locomotives were based on their superiority.* The fact that their purchases of General Motors locomotives depended solely on the merits is demonstrated by the way railroad purchases varied according to differing preferences for the various types of General Motors locomotives. The historical record shows that in the past railroads found General Motors' passenger locomotives to have the greatest superiority over competitors' passenger locomotives,** its freight locomotives to have the next most marked superiority, and its switcher locomotives third. The available data at the present time does not permit such comparisons, and they are less significant in any event because the three types are now more nearly interchangeable. But where there were significant differences, General Motors' position varied according to the degree of product superiority, as might be expected in a competitive market.

In summary, the facts establish beyond any reasonable doubt that General Motors' position in the business is the result of innovation and product superiority. Its contributions to the railroads of this country were characterized by Mr. James M. Symes (then President of the Pennsylvania Railroad) in a 1955 speech, as follows:

> "The greatest single contribution to the economic and efficient operation of our railroads during my 40 years of association with the industry has been the development of the Diesel locomotive. We all know the important part General Motors has played in that development. Today they have 23 million horsepower operating on our railroads in more than 16,000 Diesel

* It is, perhaps, significant that the Alaska Railroad, which is Government-owned, has bought 100% of its road locomotives from General Motors.

** The greater reliability of General Motors locomotives was of special importance in passenger service where avoidance of breakdowns and delays was essential.

> units, some of which have made between 2½ and 3½ million miles and are still on the road performing quite satisfactorily. I would guess that this development alone is saving the railroads a minimum of 500 million dollars a year—with initial investments being paid off in 3 to 4 years."

The 1956 staff report of the Anti-Monopoly Subcommittee of the Senate Judiciary Committee (then known as the O'Mahoney Committee) stated:

> "* * * The diesel locomotive revolutionized the railroad industry. General Motors can point to its entry into this field as an example of the operation of a progressive company at its best—entry into a new field, with a new product satisfying an economic need, and offering progressive reduction in the pricing of its product." (S. Rep. No. 1879, 84th Cong. 2d Sess. 35 (1956))

In September 1972, the railroading magazine *Trains* devoted an issue to Electro-Motive. In the lead article "The LaGrange Influence," the editor of the magazine summed up General Motors' contribution:

> "The technology to replace steam was around even before GM was born, much less EMD—Dr. Diesel's engine, the dynamo, streetcar controls and motors, the works. And the principle of a self-contained electric went back even further—to Jean-Jacques Heilmann and his steam-electric *Fusée* of 1894. Conversely, it is a matter of record that while the little Electro-Motive Company, minus GM parentage and headquartered in Cleveland, still was selling put-put doodlebugs, diesel-electric locomotives were switching box cars in Jersey City and outpacing 4-8-2's on intercity expresses between Montreal and Toronto.
>
> "The moral is plain: commitment. Until General Motors, the diesel lacked a totally committed sponsor.

Until GM, the diesel suffered from being dependent upon suppliers and railroads with divided loyalties. GM alone was an outsider, free of any investment in the factories and forges and patents of steam or electric power. GM alone was young (1916), hence unencumbered by tradition. GM alone was large (of its automotive brethren, one may discount Chrysler as being not large enough and Ford as entering a troubled period). And GM alone was uninhibited, and already famous for its management structure, mechanical inventiveness, and promotional push. It is no coincidence that the corporation which supplanted steam simultaneously made Chevrolet No. 1.

* * *

"It is reasonable even at a birthday party to ask if the guest has been accorded an inappropriately large share of the credit for railroad dieselization. Certainly the salesmen of Electro-Motive would resent being called mere order takers. A review of the market evidence would give Alco major credit for ridding yards of 0-6-0's and 0-8-0's, pays homage to GE for electrical gear, cites Fairbanks-Morse for anticipating the high-horsepower era, and otherwise concludes that LaGrange never has enjoyed a monopoly on imagination or inventiveness in the diesel business.

"Yet the question can be answered fairly by asking other questions. Which firm sold 7 out of each 10 of the diesels that supplanted steam in America? What other engine has equalled the 567 in power increments, availability, and durability? If a popularity poll of builders was conducted among a cross section of chief mechanical officers, locomotive engineers, train dispatchers, electricians, railroad presidents, yardmasters, hostlers, security analysts, and trainmasters, which builder would win? What would be the state of the railroad art in 1972 if ground had not been broken for a new factory in that farmland along the Indiana Harbor Belt on the outskirts of LaGrange, Ill., on that blustery March 27, 1935?"

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II

Competition in the locomotive business has been vigorous and productive.

General Motors locomotives have been widely accepted by its railroad customers and it currently accounts for about 75% of the locomotives that are sold in the United States. This does not mean, however, that it had monopoly power in the locomotive business. The nature of the product and the market has thus far inevitably resulted in a small number of producers, but at the same time has resulted in extraordinary pressures for continual product improvement.

The General Electric Company is a strong existing competitor which is entirely capable of capturing the lion's share of the business if, for any reason, General Motors' product ceases to be as attractive to customers as it has been in the past. In addition, there are a number of substantial companies, both domestic and foreign, standing in the wings as potential entrants. Finally, in the field of mass passenger transportation entirely new approaches and technologies are continually being explored, by General Motors and by others, which may have a dramatic impact on market conditions.

A. The Number of Competitors and the Nature of the Product.

There is of course no particular magic number of sellers which is right for every product. The number to be expected depends upon the level of demand and the nature of the production process. In the case of locomotives domestic sales have been small in recent years—averaging about 1200

units a year. (For sales data, see Appendix B.) Moreover, locomotives are very large complex products requiring substantial engineering skill and modern manufacturing facilities. It is clear that, because of the economies of standardized production, a large number of U.S. producers would not be expected.

For over half of a century two or three producers have always accounted for the vast bulk of all U.S. locomotive sales. This was true before General Motors had even thought of entering the locomotive market, when General Motors was in the process of entering the market, and during the period when General Motors was the largest locomotive supplier.

Thus, there never have been more than a small number of U.S. producers. However, such small numbers do not indicate that the largest supplier (currently General Motors) can in any way control the total supply—the prime requirement for the existence of monopoly.

General Motors is now opposed by the General Electric Company, a substantial business by any test.* General Electric really entered the market in 1961 and now has approximately one quarter of the business. General Motors' current share of sales is about the same as it was in 1955 when there were three other domestic suppliers.** These

* Even if General Motors currently had all the business, it would not mean it had unlawfully monopolized. In *United States* v. *Grinnell Corp.*, 384 U.S. 563, 570-71 (1966), the Supreme Court stated that even "monopoly power" is not unlawful if it arose from "growth or development as a consequence of a superior product, business acumen, or historic accident." And Judge Learned Hand stated in *United States* v. *Aluminum Co. of America,* 148 F.2d 416, 430 (2d Cir. 1945): "The successful competitor, having been urged to compete, must not be turned upon when he wins."

** Alco, Baldwin and Fairbanks, Morse.

three companies have since withdrawn, but General Electric has demonstrated that it is entirely capable of expanding its business to make up the difference and it is unquestionably capable of expanding still further to supply the whole market if customer preferences dictate.

Moreover, the nature of the locomotive product is such that General Motors would feel substantial competitive pressure even if it were currently the only surviving domestic producer. In the first place, diesel electric locomotives are extremely durable capital goods. They are only bought in order to earn money for the purchasing railroad. Since railroads have not recently been a growth industry, almost all recent locomotive purchases have been for replacement purposes.

At the same time, however, locomotives are repairable—they can be maintained or rebuilt for extended periods of time. This means that a railroad rarely *must* purchase locomotives in any quantity, except to meet a growth in traffic. It can continue to use the locomotives already on hand until finally the point is reached where maintenance costs become prohibitive.

As a result, in order to make appreciable sales, the locomotive manufacturer must continually offer a better and better product for the money. Therefore, the manufacturer is competing as much against the existing stock of locomotives in use by railroads as against other locomotive manufacturers. In other words, a better product than your competitors' will avail you little unless that product is appreciably better than the locomotives already in use, including your own previous models.

In addition, U. S. locomotive producers compete for sales not only domestically but throughout the free world.

Their success in making export sales is substantial, and this success indicates the basic healthiness of the U. S. locomotive industry. While foreign producers have not achieved any volume of sales in this country, sales are solicited and some have been made.* The relative failure here of foreign locomotive suppliers is due to the outstanding performance of the domestic producers (discussed previously), not because opportunities are closed.

Finally, the real possibilities of entirely new entry act as a continuing competitive discipline in the locomotive business. Patents are of no importance in the production of diesel electric locomotives and there are no limitations due to scarce resources. The necessary components are readily available to prospective entrants. For example, all items of electrical equipment (e.g., generators, traction motors and control apparatus) have been staple articles of commerce, sold to all comers, since at least the 1920's. In addition, engines and engine designs suitable for use in locomotives are available, as General Electric found when it wished to enter the market. Products of General Motors divisions supplying its locomotive manufacturing operation, Electro-Motive Division (EMD), such as bearings, gears, radiators, oil coolers, etc., are available, and in many instances have been regularly supplied to competing locomotive manufacturers.

Of significance from the standpoint of both entry and exit is the relatively unspecialized nature of much of the plant and machinery required for locomotive production. This means that the tangible capital required can be shifted out of locomotive production with relatively little loss, viz., Fairbanks, Morse, which continued in the same facilities

* Krauss-Maffei sold 21 diesel-hydraulic locomotives to the Southern Pacific and the Denver & Rio Grande during the 1960's.

to make diesel engines, generating sets and oil-field drilling equipment. And it means that any sizable manufacturing concern in the heavy equipment field can enter locomotive production with relative ease, viz., General Electric and Fairbanks, Morse.

Conclusive evidence as to the relative freedom of entry and exit is provided by the fact that both have occurred as economic conditions warranted. At the end of World War II there was a large pent-up general demand for locomotives of any sort, and a specific demand for diesel electric motive power to replace steam. In response to this demand, Fairbanks, Morse began producing diesel electric locomotives, Lima commenced building diesel electric switchers, and Baldwin increased the range of its offerings to include diesel electrics other than switchers.

As these unusual conditions disappeared, U. S. railroad locomotive orders declined sharply from their peak of more than 3,500 units a year in 1950 and 1951 to less than 300 units a year in 1960 and 1961. In response to this drastic decline, Lima, Baldwin, and Fairbanks, Morse went out of the business—Lima by merger (with Baldwin) and the other two by conversion to other products.

At this point, expecting a rebound in demand to a level of approximately 1000 locomotives per year in the near future, General Electric entered as a supplier of diesel electrics for U. S. railroads. General Electric's expectations have been fulfilled—U.S. railroad orders for locomotives actually averaged approximately 1000 units a year for the 1962-1965 period and have averaged slightly over 1200 units per year since that time.

B. The Intensity of Rivalry and Its Effect on Performance.

U. S. locomotive producers are now engaged in intense and active rivalry, although this was not always the case. During the steam era there was a well-known continuing series of relationships between particular railroads and locomotive suppliers. Railroads rarely changed locomotive suppliers—everyone apparently prefering the easy life to the competitive struggle.

With General Motors' entry as a substantial supplier, the traditional accounts went out the window. Other producers were forced to start competing, and the railroads learned that this competition was to their benefit. There are no longer any safe or traditional accounts. For example, although General Electric did not even enter the domestic diesel locomotive business until 1961, by the end of 1964 it was able to announce in its Annual Report that: "In the U. S. 18 major railroads are now operating General Electric high-horsepower mainline locomotives."

More important is the form this rivalry takes. In the days prior to General Motors' entry, the rivalry of producers was largely in attempting to utilize technical developments of the particular buying railroad. There were few meaningful improvements in the product or in its method of manufacture for a quarter of a century or more. Whether or not the locomotive producers were really trying, the market was stagnant.

In this context, General Motors' entry into the market resulted in a major change in emphasis. Technological changes in the product have been rapid—first the change from steam to diesel and then the rapid developments

which increased the size and productivity of the diesel electrics.

This independent rivalry is well illustrated by the nature and timing of new features introduced by the locomotive producers. Size of the locomotive, for example, is of critical importance. A single large unit can haul freight faster and more cheaply than can two smaller units of the same aggregate horsepower, whether operated separately or as a single combined unit. Immediately after the war the largest single-engine diesels available were 1500 h.p. units. General Electric was the first to produce a successful 2500 h.p. unit in 1961; General Motors moved up to 2250 h.p. in 1962 and first reached a comparable 2500 h.p. unit in 1963. General Motors, on the other hand, was the first to offer locomotives capable of 3000 h.p. and 3600 h.p., only to see General Electric later expand into this range.*

Performance in the area of capacity has been matched by performance in the area of prices. During General Motors' early locomotive development period (through 1940) the savings it achieved as it reached higher volumes of production enabled it to make successive price reductions. Even in the early postwar period General Motors diesel locomotives were selling at prices which had not increased substantially above those initially established in the 1930's. This remarkable price performance was achieved despite a general increase in wholesale prices of more than 100% and in machinery prices of more than 50% (from 1939 to 1948), and despite an increase of more than 100% in EMD wage rates during the same period—from an average base rate of 75¢ per hour to $1.54 per hour.

* Baldwin had a 3000 h.p. unit (Centipede) right after the war and Fairbanks, Morse a 2400 h.p. unit (Trainmaster) in 1950-1953, but the Centipede was a total failure and the Trainmasters were generally unsatisfactory to the railroads.

Since the early postwar period, as everyone knows, there have also been substantial inflationary pressures. Starting in 1948, the general level of prices for machinery and motive products (BLS Wholesale Price Index) has increased more than 100%. During this same period, prices for diesel electric locomotives appear to have increased by approximately 60% for units of comparable horsepower (without taking into account technical improvement). If we were to take into account the relatively greater technical improvements, this contrast in price movements would be even greater.

The combined effect of progress in capacity and in pricing can be simply demonstrated. The 1500 h.p. GP-7 was brought out by General Motors in 1949 at $146,200 or $97.47 per horsepower. (Price per horsepower is a standard railroad measurement of value.) General Motors' current general purpose locomotive is the 3000 h.p. GP-40-2, selling at $243,000 or $81.00 per horsepower. Thus locomotives are now available to the railroads at a 16% lower cost per horsepower than in 1949. This remarkable result, after more than 20 years of continuously rising prices, is a demonstration of the effectiveness of competition.

This progress can be further dramatized by another comparison. In 1951, the highest unit production year in EMD history, 3,500,000 horsepower was produced in 2400 locomotives. In 1966, only fifteen years later, the same 3,500,000 horsepower was produced for the railroads but with only half, or 1200 locomotives. It cost the railroads $80,000,000 less for this horsepower in 1966 than in 1951. At the same time, the railroads have been saving some 20 million dollars a year in reduced maintenance because of improvements in the engine and components and, of course, reduction in locomotive units.

It is sometimes said that "concentrated" industries are non-competitive and cost the American consumer billions of dollars a year in excess prices. The record of the locomotive industry indicates, to the contrary, that outstanding performance for the consumer can occur in an industry with a small number of competitors.

C. New Developments in the Field of Passenger Transportation May Have an Impact on Competition in the Locomotive Business.

The depressed conditions of railroad passenger systems have increasingly become a matter of popular concern and recently some critics have attempted to pin the blame on General Motors. They have suggested that General Motors has deliberately held back the development of superior and cheaper locomotives in order to benefit its automotive operations.

This criticism is, first of all, based on a profound misconception of the problem. It is true that rail passenger service is depressed, but the reasons have nothing to do with General Motors or its locomotives. A simple illustration should illustrate this point. According to the *Railroad Facts* yearbook, revenue ton miles of freight carried increased from 655 billion in 1947, right after the war, to 765 billion in 1970. During the same period of time revenue passenger miles decreased from 46 billion to 11 billion. Since freight locomotives and passenger locomotives are essentially similar, it is obvious that the precipitous decline in the volume of passenger traffic must be attributable to causes other than the locomotive. In fact, since the cost of locomotives is typically less than 10% of the cost of a railroad system as a whole, General Motors could

give its locomotives away without having any appreciable impact on the volume of rail passengers carried.

It is necessary to recognize, then, that there is very little General Motors or any other locomotive manufacturer alone can do to reverse the trend away from passenger travel by rail.* At the same time, however, General Motors has repeatedly, if not always successfully, exerted its best efforts and spent its own money to develop more appealing modes of rail transportation.

Back in 1934 the experimental Burlington "Zephyr" initiated the era of streamline passenger trains. (See Exhibit 1) As we have seen, in the late 1930's the superiority of diesel power over steam was dramatically demonstrated in the competition between the Seaboard and the Atlantic Coast Line for the then lucrative Florida traffic. In 1945 General Motors pioneered in the development of "Astro-Dome" passenger cars. (See Exhibit 2) All of these cars were built to the General Motors design by outside companies and remained in service for more than 20 years. In 1955 and 1956 General Motors developed and extensively promoted the "Aerotrain", a lightweight passenger train. (See Exhibit 3) Despite its dramatic improvements in costs, comfort and convenience, however, this train was unable to stem the tide running against passenger service and only two complete trains were ever built.

General Motors has been experimenting with gas turbine engines for over 25 years. It is currently working on the development of electric locomotives and dual-pow-

* To a considerable degree, of course, the declining popularity of rail transportation is attributable to the increasing availability, lower cost and attractiveness of air transportation for long runs and of personal transportation by automobile for short runs.

ered rail cars (both gas turbine and external electric). We do not know today how successful these experiments will be, but significant efforts are being made. The Electro-Motive Division today has a staff of 35 engineers continually engaged in efforts to develop improved transportation systems.

Equally significant is the fact that other companies have also been continually engaged in research and development in this area. A recent issue of *Railway Age*, for example, features an article on a mass transportation vehicle being developed by the Boeing Vertol Co. The same issue reports on developments by other domestic companies not now in the business such as Rohr, Budd, Pullman-Standard and by companies in France, Canada and Great Britain. The ultimate outcome of these developments is still uncertain, but they demonstrate conclusively that competition is alive and vigorous. Perhaps out of this work will come another development as revolutionary as the diesel was over steam.

III

General Motors has achieved its present position in the locomotive business by proper means.

From time to time it has been charged that General Motors achieved its present position in the locomotive business by improper means—specifically by the acquisitions of two companies already in the business in 1930 and by using its position as a shipper of freight to foster the sale of its locomotives to railroads ("reciprocity"). These accusations were the cornerstones of the two *Electro-Motive* cases which the Government voluntarily dismissed. They are completely refuted by the facts.

A. General Motors' Entry into the Locomotive Business Was by Internal Expansion.

Contrary to the suggestions sometimes made, General Motors' entry into the locomotive industry was an internal development. It was not precipitated by the acquisitions in 1930 of the Winton Engine Company and the Electro-Motive Company. These companies were not in the diesel locomotive business. GM's entry into that business did not occur until 1935 and arose out of the series of events which have been described on pages 2-4 above. The only real connection with the prior acquisitions was the use of the Electro-Motive name and the talents of a few individuals.

1. Neither Electro-Motive nor Winton Was an Actual or Potential Competitor in the Locomotive Business.

In 1930 neither Winton nor Electro-Motive Company (nor General Motors) was selling or manufacturing or ever had sold or manufactured railroad locomotives, and if any railroad or locomotive official at that time had been asked whether he regarded any of them as "potential competitors" in the locomotive business, the question would have been regarded as a joke. In 1930 there were three manufacturers of steam locomotives (from whom 377 units were ordered, of which 49% were placed with Alco, 33% with Baldwin and 18% with Lima) and two manufacturers of straight electric locomotives. The product with which General Motors five years later entered the locomotive field as a *de novo* entrant, i.e., the diesel electric road locomotive, was not only non-existent as a commercially feasible product, it was not contemplated or envisaged by General Motors, Winton or Electro-Motive Company, and, indeed, it was technologically beyond the capabilities of either Winton or Electro-Motive Company.

In 1930 Electro-Motive Company was a small Cleveland firm with about 50 employes, occupying rented office space in the Winton Engine Company plant in Cleveland. It had assets (consisting entirely of some cash and securities, a few receivables, parts inventories and some office equipment) worth only about $1,000,000.* It had no manufacturing plant, and it was engaged solely in the design and sales of rail cars, not locomotives.

Rail cars were self-propelled railway vehicles (commonly known as "doodlebugs") which looked and worked much like streetcars or electric interurban cars, except that they generated their own electric power. They were used primarily to carry passengers, baggage and express in light service on railroad branch lines and secondary main lines, where their fuel and maintenance costs (at least until the late 1920's) enabled them to handle such light traffic more economically than could a steam locomotive pulling only one or two cars. These rail cars were powered with Winton gasoline engines and were built in the shops of other companies, such as Pullman and St. Louis Car Company.

By 1930, however, Electro-Motive Company's rail car business was facing extinction, and the market had fallen so low (there were orders for only 25 cars in 1930) that Mr. Harold L. Hamilton, the president and principal owner, regarded his rail car business as at "the end of the road."** The railroads, already hard hit by the depression and the rise of bus passenger service, trucking, and the private automobile, were cutting back the branch line passenger

* The purchase price in General Motors stock was based on book value of Electro-Motive Company assets. No factor was included for good will or going concern value as none appeared to exist.

** See Mr. Hamilton's uncontradicted deposition testimony in *United States* v. *General Motors Corp.*, Civ. No. 63C80 (N.D.Ill.) (the "civil Electro-Motive Case").

service which Electro-Motive's "doodlebugs" were solely useful to serve, and sharp increases in the cost of gasoline had destroyed the economic advantages which those gasoline-powered "doodlebugs" had had.

Although Electro-Motive Company was not failing in the sense of going into bankruptcy, there was no longer a market for what it had to sell, and Hamilton was looking for some other line of business into which to merge and use the talents of his small organization. He had in fact explored two other possibilities before the acquisition by General Motors.

That Hamilton's fears of a dismal future were well-founded was subsequently borne out by the fact that during the next two years, 1931 and 1932, Electro-Motive Company, as a wholly-owned subsidiary of General Motors, sold only 30 rail cars and incurred a net loss of $60,000. As a result, at the end of 1932 Electro-Motive Company personnel were absorbed into the Winton organization.

Winton, too, was faring poorly and probably by itself would not have survived the depression. It lost $217,000 in 1932, and $411,000 in 1933 (after absorbing Electro-Motive Company's personnel).

In 1930 Hamilton had no thought of designing road locomotives for main line service to compete with the steam locomotives then dominating the railroad scene; in his hopes for the future the most he thought of was a branch-line unit. His ideas were in the direction of finding an engine of sufficiently light weight and small size and burning a sufficiently economical fuel, such as diesel oil, to handle economically the few passenger and freight cars on lightly-traveled branch lines. This would permit complete

elimination from such branch lines of steam locomotives and all their expensive collateral services (coal bunkers, water towers, turntables, etc.).

As late as 1934, this was still the kind of service for which General Motors designed its first two 1800 h.p. locomotive demonstrator units (which were built at General Electric's Erie Works). These units had controls at each end, permitting them to travel back and forth on branch lines without requiring turntables at either terminal. It was the spectacular results of the railroads' successful testing of these and similar units in full road service which put General Motors into the main line passenger locomotive business.

2. *Neither Acquired Company Had the Capability to Produce Diesel Locomotives or Suitable Engines.*

Only a diesel engine appeared sufficiently economical and powerful for the branch line service which Hamilton contemplated. But to be usable even for such limited service, such an engine had to be able to stand up in railway service and could weigh only about 20 pounds per horsepower (in order to fit into a railroad unit), as compared to the 60 pounds or more per horsepower of any practical diesel engine then available; it had to have a crankshaft speed of at least 700 RPM (in order to permit use of a generator small enough to fit into a railroad unit), as compared to the 400 and 500 RPM of diesel engines of sufficient horsepower then available. At that time no diesel engine manufacturer (General Motors, of course, was not then a diesel engine manufacturer) had such an engine or seemed interested in trying to develop one. Basic research at the General Motors Research Laboratories by Mr. Kettering and his men was being done on a two-cycle diesel engine

(as compared to the four-cycle diesel engines then being made by American diesel manufacturers), which gave the best prospect at that time for a light-weight engine. Hamilton was aware of Kettering's research, but because of the technological problems involved believed that success was years away.

Moreover, it is abundantly clear that Winton was not a potential source for such an engine. Winton, although one of the leading diesel engine manufacturers insofar as the diesel industry had then progressed, made only slow, heavy stationary and marine diesels. Even the best it could make was too slow and too heavy for railroad service. In 1929, prior to the acquisitions, Electro-Motive Company had installed a Winton diesel in a switcher, using the most suitable diesel engine which Winton could then design and build, but it was a complete failure in test service and had to be junked. Moreover, Winton (and, of course, Electro-Motive Company) was not technologically capable of developing, and did not have manufacturing facilities capable of manufacturing, an engine suitable for railway service. The revolutionary light-weight two-cycle diesel developed by Kettering at General Motors Research, the first prototype of which was not introduced until 1933, was not only technologically beyond Winton's capabilities but, in addition, Winton's management had neither an interest nor a belief in the possibilities of such a development.

In fact, the Winton management, although excellent in the low volume marine field, continued to regard Mr. Kettering's two-cycle concepts as unsound even after it had been absorbed into General Motors' management. This attitude had the effect of delaying and opposing rather than helping General Motors' research and development

efforts. When General Motors decided in 1937 to design the new Model 567 engine as a purely locomotive engine (because of the shortcomings of the Model 201-A, which was a modified submarine engine), it had to take the project out of Winton, set up a separate research and design group at the Research Laboratories, and then manufacture the engine at the new LaGrange plant with precision tooling using automotive volume production techniques. Similarly, when General Motors embarked upon the design and manufacture of smaller diesel engines for trucks and buses, it could not do so at Winton but had to set up a separate development staff and plant for that purpose.

Although Winton (later Cleveland Diesel Engine Division) was a major Navy supplier during World War II, by the mid-1950's its business was reduced largely to supplying diesel engines made by EMD at LaGrange to commercial marine and industrial users; in 1961 its existence as a separate division was terminated, its plant sold, and its business transferred to EMD.

The following conclusions may therefore be drawn as to what might have happened if these acquisitions had not taken place:

(1) Electro-Motive Company would not have remained in the rail car business and in any case could not have become a designer, much less a manufacturer, of locomotives of any kind; and

(2) Winton Engine Company (if it had been able to stay in business) would not have produced a fast, light-weight diesel engine suitable for locomotive use, because it was not capable of producing, and its management was not interested in trying to produce, such an engine.

Whether General Motors would have manufactured diesel electric locomotives as soon as it did without the acquisitions of Electro-Motive Company and Winton is of course a matter of speculation. Certainly General Motors received from the acquisitions some highly competent personnel, yet almost all of the personnel and facilities necessary for the research and development of a suitable engine, and necessary for the manufacture and production of diesel electric locomotives, came from within General Motors.

3. Existing Locomotive Manufacturers Were Not Disadvantaged by the 1930 Acquisitions.

There was nothing about General Motors' acquisitions of Winton and Electro-Motive Company which in any way blocked development by General Motors' competitors of a diesel locomotive. Electro-Motive had no locomotive manufacturing facilities at all and General Motors' competitors had the finest in existence at the time. General Motors even had to turn to one of its competitors, General Electric, for the manufacture of its earliest locomotives.

Whatever diesel knowledge and manufacturing facilities Winton had were of a type just as available to Alco and Baldwin, then the two largest locomotive manufacturers in the world. Both of these companies, at about the same time that General Motors acquired Winton, acquired capable and well known diesel engine manufacturers,* and Westinghouse was building diesel engines under license from the Beardmore Company of Scotland.

* In 1929, Alco acquired the McIntosh & Seymour Corporation of Auburn, New York, which it characterized in its 1929 Annual Report as "a leader in the manufacture of diesel engines." In 1931, Baldwin acquired I. P. Morris & de LaVergne, Inc., also a manufacturer of diesel engines.

As for the application of internal combustion engine power to the electric drive of locomotives, both Alco and Baldwin had made experimental diesel electric road locomotives in the late 1920's (long before General Motors), Alco entered the diesel electric switcher business on a commercial scale in about 1925, and both General Electric and Westinghouse were highly knowledgeable in the technology of electric drive locomotives. General Electric, in fact, had manufactured the controls, generators and electric motors used by Electro-Motive Company in its rail cars (and later in the first General Motors diesel locomotives).

The 1930 acquisitions did not bring General Motors into the locomotive industry, did not affect actual competition in that industry and did not give General Motors any advantages over competitors. General Motors made a *de novo* entry into a depressed industry, and the effect of that entry was to revitalize the entire railroad industry and bring a new and important measure of competition into the locomotive industry. Thus, if the 1930 acquisitions made any contribution whatsoever towards making that entry possible or faster, the acquisitions were highly desirable from the standpoint of competition.

B. General Motors Did Not Use Its Potential as a Freight Shipper to Promote Locomotive Sales to Railroads.

The charge that General Motors induced railroads to buy locomotives by promising them freight business ("reciprocity") is unsupported by any evidence and is directly contradicted by 45 years of General Motors' business history.

1. General Motors' Long-Standing Policy Against "Reciprocity"

General Motors had a policy against using its purchases to induce suppliers to buy General Motors' products long before the issue of "reciprocity" became active in anti-trust cases. This policy was not based on any prognostication of legal developments but simply on the fact that any other course was poor business.*

General Motors has always believed that purchasing agents could not be held responsible for doing their job properly—that is, buying quality supplies at the lowest price with good service and reliable delivery—if their decisions were to be governed by the alien and irrelevant factor of the volume of suppliers' purchases from General Motors. Moreover, General Motors could not expect to operate efficiently and obtain from suppliers their best in price, quality, reliability and service if the suppliers knew that their success in getting General Motors' business was governed not by these factors but by the volume of goods they bought from General Motors.

The question of reciprocity was taken up for consideration before the corporation's General Purchasing Committee at least as long ago as August 1927. This Committee was a Central Office advisory staff which existed during the 1920's and was responsible for establishing purchasing policies and entering into general contracts governing the purchases of more than one division. Its members were the principal divisional purchasing agents and it was headed first by Mr. Alfred P. Sloan, Jr., Pres-

" * * for it is the most underling tradesmen only who make it a rule to employ chiefly their own customers. A great trader purchases his goods always where they are cheapest and best, without regard to any little interest of this kind." *The Wealth of Nations,* Adam Smith (Modern Library edition; 1937), p. 460.

ident of General Motors, and subsequently by the next ranking official, Vice-President Mr. John Pratt. The Purchasing Committee minutes reveal that a firm stand was taken against the practice of reciprocity:

> "* * * it was agreed that the whole subject of reciprocity was so fraught with complications that it should be our established policy that all purchase transactions be consummated on their merits; that is, on prices consistent with quality of product and service demanded, facilities and reliability and responsibility of suppliers."

Shortly thereafter, in January 1928, Mr. Pratt in a letter to Mr. Sloan made an unequivocal statement of the philosophy governing General Motors in this matter. Mr. Pratt said in part:

> "Nothing could be more detrimental to the morale of our Purchasing Agents, and to the general interests of our Corporation, than for any supplier to believe that anything can influence General Motors in choosing its sources of supply other than the three fundamentals of purchasing, namely—quality, service and price. I know you realize that as soon as any supplier feels that he can use collateral influence he is not as apt to give the utmost he can in quality, service and price to the one that deserves same, namely—the purchaser.
>
> * * *
>
> "I think that we are all pretty well agreed that we could not afford to use the principle of reciprocity in General Motors' purchases."

This policy against reciprocity has been continually restated and scrupulously followed. The current instructions on the subject read as follows:

"Reciprocity

"Many of our suppliers are also our customers. However, it is contrary to the policy of the Corporation to give any consideration or lend any weight to this circumstance in the course of dealings with customers in their capacity as suppliers. Each transaction must be evaluated on its own merits, and purchasing decisions must not be influenced in any way by the fact that a particular supplier may also be a customer.

"If the subject of reciprocity is interjected into negotiations by a supplier, such supplier should be advised in unequivocal terms of the Corporation's policy as stated above. If the subject is raised by letter, then the response should also be by letter."

2. *The Specific Application of the Policy to Railroads*

In February of 1935, at the very time that General Motors was about to enter the locomotive manufacturing business, Mr. Sloan restated the general policy against reciprocity as it applied to the specific situation of transactions with railroads. This statement is found in General Policy Letter No. 549, entitled "The Relationship of the Corporation with the Railroads," and it was sent to all of the corporation's General Managers of Operations, Group Executives, General Staff Officers, Financial Officers, Operating Staff Officers and Heads of Staff Sections. Because of its particular importance to the locomotive business, it is inserted here in its entirety.

PRINTED IN U. S. A.

GENERAL MOTORS CORPORATION

SUBJECT

THE RELATIONSHIP OF THE CORPORATION
WITH THE RAILROADS

No. 549

DATE February 15, 1935

TO

General Managers of Operations

COPIES FOR

Group Executives
General Staff Officers
Financial Officers
Operating Staff Officers
Heads of Staff Sections

The Corporation is probably the largest shipper of freight in the country. With the extension of the Corporation's activities in lines other than motor cars and due to the growing use of the highways by the railroads to supplement the rails, the railroads have become potential users in important volume of many of our products. A new relationship is thus developed which brings with it certain responsibilities.

It is desirable to establish a definite policy with respect to these responsibilities, which policy is defined as follows:

First. Freight is to be routed in accordance with the most effective and efficient service that can be rendered.

Second. All relationships between any Operating Division or Subsidiary of General Motors, with respect to the sale of any of its products to any Transportation Company, shall be promoted on the basis of quality, service and value of the product involved.

The considerations in determining your relationship with Transportation Companies shall be service and merit, and you are asked to see that this policy is definitely understood by all persons within your organization who have to deal with the subject.

Very truly yours,

ALFRED P. SLOAN, JR.
President
GENERAL MOTORS CORPORATION

Mr. Sloan's letter was sent to all Traffic Managers and its text is still quoted, as the policy governing the routing of General Motors traffic, in the corporation's *"Standard Practice Manual for Guidance of Divisional Traffic Departments,"* copies of which are given to all General Motors personnel responsible for routing any General Motors traffic.

Because of the nature of General Motors' business, the policy expressed by Mr. Sloan is essential if the corporation is to be operated in an efficient manner. General Motors literally could not operate effectively if its freight traffic were routed on any basis other than merit, for efficient traffic movement is vital to the conduct of General Motors' widespread business activities.

The railroads serving General Motors' plants are an integral part of the corporation's production lines, and each day thousands upon thousands of freight movements to, from, and between General Motors' plants must be coordinated with each other, all subject to timing considerations affected by production scheduling, delivery requirements, raw material availability, and supplier delivery capability.

General Motors would be acting against its own best interests if it selected carriers on any basis other than the requirements of its production lines, for if it did so production would inevitably be disrupted by delays in arrivals of needed parts. A delay of even a few hours could shut down an entire plant, which in turn would disrupt operations at other plants. To increase inventories to allow for such delays would involve an immense additional investment in inventories, as well as in space in which to store them.

Moreover, the compensation of every divisional traffic representative is related directly to his contribution to his own division, not to the sales of any other division. Those traffic representatives therefore have no incentive to subordinate their divisions' interests in the efficient movement of traffic to EMD's interest in selling locomotives.

Consequently, the other divisions' demands for the best railroad service preclude EMD from controlling or influencing traffic other than its own even if it wanted to use General Motors traffic to influence locomotive sales. However, EMD's management from the beginning, starting with General Motors' entry into the business in 1935, has believed that the use of traffic was a poor sales tool and an objectionable business practice. Every head of the division and every sales manager of the division has recognized that the only sound foundation for EMD's business was to compete on the basis of merit alone. They knew that resorting to traffic to influence sales was a "crutch" that would have weakened its efforts to develop and market the very best locomotives possible.

The railroad executives who made the buying decisions knew from long experience that the routing of General Motors traffic was not influenced by locomotive purchases, but depended entirely upon the quality of the freight service they could provide. The deposition testimony in the Electro-Motive case of Messrs. Fred Gurley (late Chairman and President of the Santa Fe Railroad) and Walter Tuohy (late President of the Chesapeake & Ohio Railroad) is typical. Mr. Gurley said:

> "Well, General Motors, of course, has a big organization. I think it has stronger policies on these matters

> [solicitation of traffic on the basis of purchases] than some people. I am quite clear that they pay no attention to your purchases in the routing of their traffic. That's always been my understanding.'' (Transcript, p. 281.)

Mr. Touhy said, discussing a conversation with William Lynch, Chevrolet Traffic Director:

> ''He said it was—he says, 'I am routing the traffic out of here, and it is on the basis of what you can give to me in the way of equipment, freight rates, service, et cetera, period, and that is all'.'' (Transcript, p. 61.)

3. Contemporaneous Evidence that the Policy Was Followed

Contemporaneous letters, memoranda, minutes and other documents,* written in the ''heat of battle'' throughout the years, show not only repeated recognition of the non-reciprocity policy on the part of General Motors and EMD personnel, but also that the policy was followed even in situations where such personnel believed (whether correctly or not) that business was being lost to competitors because of it. Even in those extreme situations, where there would be a strong temptation to compromise the policy, the documents show that EMD's sales efforts did not depart from the merits.** Even then General Motors' policy against reciprocity was followed, because it was believed to be the only sound business approach.

Pertinent excerpts from just a few of these documents are set forth here to illustrate the point far more convincingly than could any arguments.

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* These documents were uncovered during the Government's investigation of GM's files in the course of the Electro-Motive cases.

** In such situations EMD's sales policy was to attempt to show the railroad that savings from the use of General Motors locomotives would more than offset the value of any competitors' traffic involved.

July 7, 1941—Paul R. Turner, EMD New York Regional Manager, to O. F. Brookmeyer, EMD Sales Manager.

> "I have advised Mr. Norton [Chief Operating Officer of New York Susquehanna and Western Railroad] in no uncertain terms that the business of moving a plant from one point to another would be handled by the proper officials at the proper time and the decision would be based entirely on the merits of the move; that the purchase of locomotives by the Susquehanna would have absolutely no influence."

September, 1946—Excerpt from EMD Sales Convention keynote speech given by N. C. Dezendorf, EMD Director of Sales.

> "A third obstacle is a customer desire to 'split the business' or putting it another way, to recognize reciprocal interests, whether traffic, or financial, or personal preference of influential officials. We, in General Motors, are committed to a policy of selling our products on their merits."

December 14, 1949—Paul R. Turner, EMD New York Regional Manager, to N. C. Dezendorf, EMD Director of Sales.

> "With regard to the traffic angle I don't recall in our entire experience where we have brought pressure to bear on an order by threats to withdraw traffic if we failed to get the business or by promises of more traffic in the event it was awarded to us."

June 7, 1950—C. R. Osborn, EMD General Manager, to H. M. Hogan, General Counsel of General Motors:

> "It has been a standard policy of this Division since its inception that our entire selling effort would be concentrated solely and entirely on the basis of the superiority of our product, applying both to the complete locomotive and to the spare parts for servicing

of these locomotives. This sales policy extends over our entire Sales and Parts organization to the extent that everyone of our people understands that if any factor other than the superiority of our product is used in any form, their services with this Division will be terminated.

October 11, 1951—Paul R. Turner, EMD New York Regional Manager, to N. C. Dezendorf, EMD Director of Sales.

"I spent Tuesday evening in Boston with Messrs. Metzman [NYC President], Alger [NYC Vice-President of Traffic], Jerome [NYC Executive Vice-President], Austin [NYC Vice-President of Purchasing] and others, and Mr. Metzman and I discussed at some length the percentage of their Diesel locomotive business which we have been getting and we might expect to get in the future. He made the statement that the percentage of their Diesel business given to General Motors was very much more favorable than the percentage of General Motors traffic, going their way, received by the New York Central. He said, you better yours and I'll better mine.

"I told the President that this was an improper measuring stick for deciding on the purchase of Diesel power; that he should spend their dollars for the unit that could bring them the greatest possible return on the investment and we should ship our cars on the same basis. We agreed later in the evening that if this formula was effective, we would get all of their business and they would get all of ours. Seriously, however, he did pause to reflect carefully when he was shown that our passenger locomotives in 1950 on the New York Central ran 70,282 miles between failures, whereas the Alco's ran 14,902 miles and the Fairbank-Morse ran 11,142 miles between failures. This is the information that should be used in the purchase of Diesel power, not the traffic figures."

June 24, 1952—C. R. Osborn, General Motors Vice President (with jurisdiction over EMD), to R. S. McLaughlin, Chairman of the Board, General Motors of Canada, Ltd.

> "It has always been my point of view, which of course is shared by all of us in General Motors, that it is our responsibility to look after our stockholders' interests first and expect the other fellow to do likewise without depending upon freight traffic or any other outside factor to bring business to us. I have always felt and, of course, I have always taken the position that if freight traffic is allowed to enter our business dealings with the railroads that instead of adhering to the principle of manufacturing the finest products we know how to build at the lowest possible cost, we will then be depending upon a very weak crutch and start down a road which has no end."

September 14, 1953—D. S. Fricke, EMD Sales Representative, to A. O. Myers, EMD Southeastern Regional Manager.

> "On the evening of September 1, Mr. Whitaker [Assistant Vice-President of Purchasing, Southern Railway] and I met with Mr. Hyde [Vice-President of Purchasing, Southern Railway] in Mr. Hyde's office, and Mr. Hyde announced the split in the business. I made no attempt to conceal my disappointment and surprise, and immediately took the attitude that, with our vast superiority in the passenger power field, I was shocked to know that the entire order had not been given to us. Mr. Hyde stated that it was no lack of confidence in our product that caused the Southern to split the business, but rather other considerations rather than price and product. In other words, we omitted the Traffic Department in our sales effort. He indicated that where we made our mistake was to have nothing for sale but a locomotive.
>
> "In my discussions with Mr. Disosway [EMD Sales Department] prior to this announcement, I suggested

that we fight fire with fire and quote a few Traffic figures. Mr. Disosway explained that corporation policy would not permit this, and I honestly feel that this policy cost us over a million dollars and a half on this order. * * *''

November 4, 1957—H. H. Curtice, President of General Motors, to L. E. Faulkner, President of Mississippi Central Railroad (in response to a solicitation of traffic based on locomotive purchases), with copies to C. R. Osborn, General Motors Vice President (with jurisdiction over EMD), and W. R. Lynch, Traffic Manager, Chevrolet.

''In any event, for General Motors to award a carrier business on any basis other than overall merit in the light of the particular circumstances involved, and particularly where the carrier purchases our equipment, could lead to the unwarranted charge that business had been diverted from normal channels because of 'reciprocity'. I am sure that you are aware that this term is used rather loosely to describe business dealings between independent concerns when they make mutual concessions designed to promote their respective business or financial interests. General Motors does not engage in this practice. It is so obviously contrary to sound management policy that it cannot be justified on a business basis, particularly in a field that is as highly competitive as the marketing of automobiles. I am sure that you, as a substantial stockholder, appreciate this position.

* * *

''I am also confident that when the railroad of which you are President purchased locomotives from us, the matter was viewed only as a prudent business decision based upon a desire to obtain the most satisfactory equipment from the best possible source. That is the basis, of course, upon which we expect you and our other locomotive customers to deal with the Corporation.''

The contemporaneous documents, of which those quoted above are typical, demonstrate that General Motors' policy against reciprocity has been scrupulously followed even in the most trying circumstances.

Conclusion

This memorandum has demonstrated that General Motors did not achieve its present position in the locomotive business by acquisition or by improper means; it earned it by the superiority of its product. The degree of customer acceptance which General Motors currently enjoys is entirely consistent with the existence of effective competition.

Superiority of product is capable of accurate measurement by objective criteria, such as initial cost, fuel cost, maintenance cost, speed, pulling power, dependability, and overall operating cost per mile. Locomotives are basic capital items whose performance will have direct, substantial and continuing effect on the profits of the companies which buy and operate them. There is a relatively small number of highly sophisticated buyers, who have both the incentive and the know-how to evaluate the product they purchase. Moreover, if need be, the old unit can be kept operational more or less indefinitely with new purchases made only to handle increases in traffic or because the new unit is demonstrably cheaper and more satisfactory to operate than the existing fleet.

Where such objective criteria of product efficiency and performance exist and where the buyers of the product are sophisticated and fully informed of these criteria, competition naturally tends to reward the firm which is doing the

best job. The superior product captures a proportionately greater shares of sales precisely because it is measurably superior. The winner takes nearly all even when the score is close, precisely because the buyers all know the score. The second-best may not be able to overcome its disadvantage by cutting its price, because operating economies are much more important than minor variations in original purchase price.

General Motors, however, will retain its share of the business *only* as long as its products are demonstrably superior. There are capable competitors both in and at the edge of the market. They remain a competitive spur to General Motors and they have the potential to win the business away at any time they develop a superior product, which many of them are vigorously trying to do. The results have been a perfect example of what the competitive system is supposed to achieve.

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Appendix A

November 4, 1933 RAILWAY AGE 16

WE GO ON RECORD

STEAM has remained the dominating form of motive power throughout over 100 years of American Railroading.

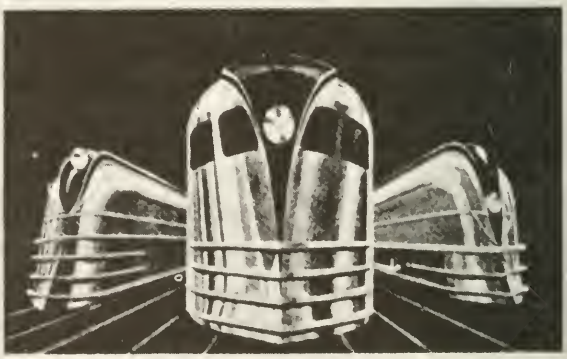
During this time, periodically, especially following the introduction of some new thought or experiment in transportation, there has appeared in the daily press obituaries anticipating the death and burial of the steam locomotive. But each time the steam locomotive must have taken a new gasp of breath for it rose again and again to greater heights in efficiency and economy of operation.

Just now much discussion is taking place regarding the amount of weight which has been added to rolling stock in the continued search for more and more safety. And from much of this discussion we would again suppose that the steam locomotive has at last been laid to rest.

The American Locomotive Company, therefore, wishes to go on record with the following statement — that come what may — extremely light weight trains, very high speeds, streamlining, or what not — steam designs are ready to meet every demand of our railroads with the least amount of experimentation.

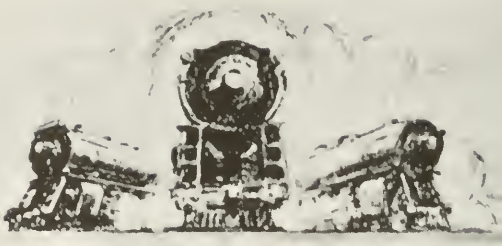
And the same factors peculiar to steam operation, such as low first cost, economy of operation, low maintenance, reliability, safety, high horsepower at speed, and the ability of being operated and maintained with present railroad facilities and organization, factors which have kept steam the dominating power in American Railroading for over 100 years, will continue to keep steam the dominating power for railroad transportation for a long, long time to come.

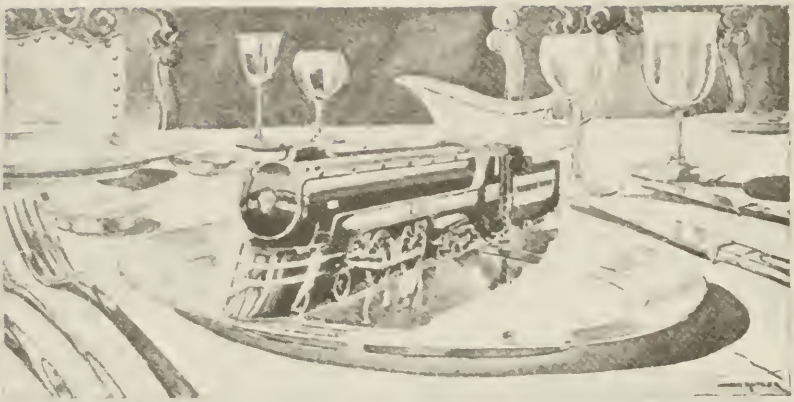
AMERICAN LOCOMOTIVE COMPANY



50 CHURCH STREET • NEW YORK, N.Y.

We are prepared to submit streamlined designs, steam or diesel powered as desired, to meet any or every demand of our railroads.





FOOD FOR THOUGHT

THE Canadian Pacific Railway is the largest travel organization in the world. They have been watching, studying, and thoroughly analyzing all the developments of late in ultra high speed service • • • It therefore, is significant that when the officers of this organization decided to install this service on their own line they unhesitatingly specified a steam power unit.

AMERICAN LOCOMOTIVE COMPANY

ALCO

30 CHURCH STREET • NEW YORK, N.Y.

Appendix A

HIGH SPEED

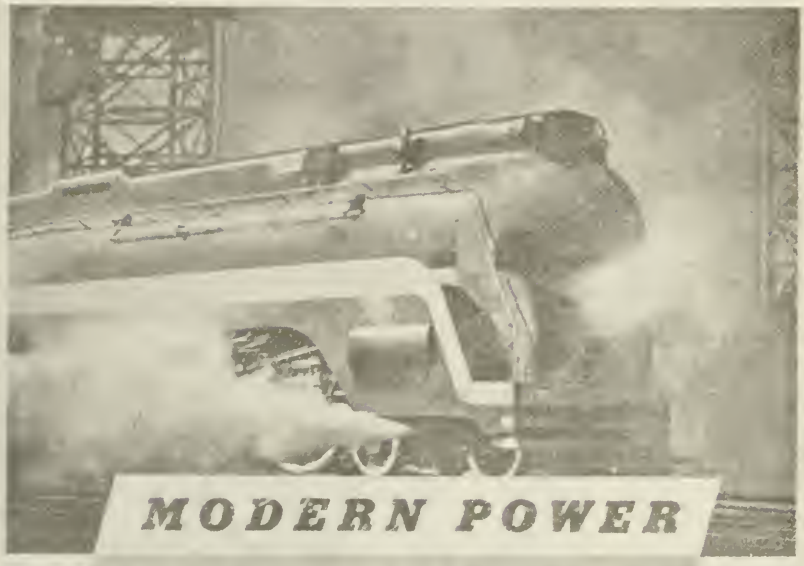
FOR high speed passenger service over long runs, with due consideration for the comfort and safety of the traveler, and economy for the operating company, the American Locomotive Company is more convinced than ever that the modern steam locomotive is best suited to the principles demanded by good railroading . . . . . .

ALCO

AMERICAN LOCOMOTIVE COMPANY

30 CHURCH ST., NEW YORK, N.Y.

Appendix A



MODERN POWER

Comes into the Picture

With traffic limited and many operating expenses fixed, the railroad problem is to produce greater net operating income.

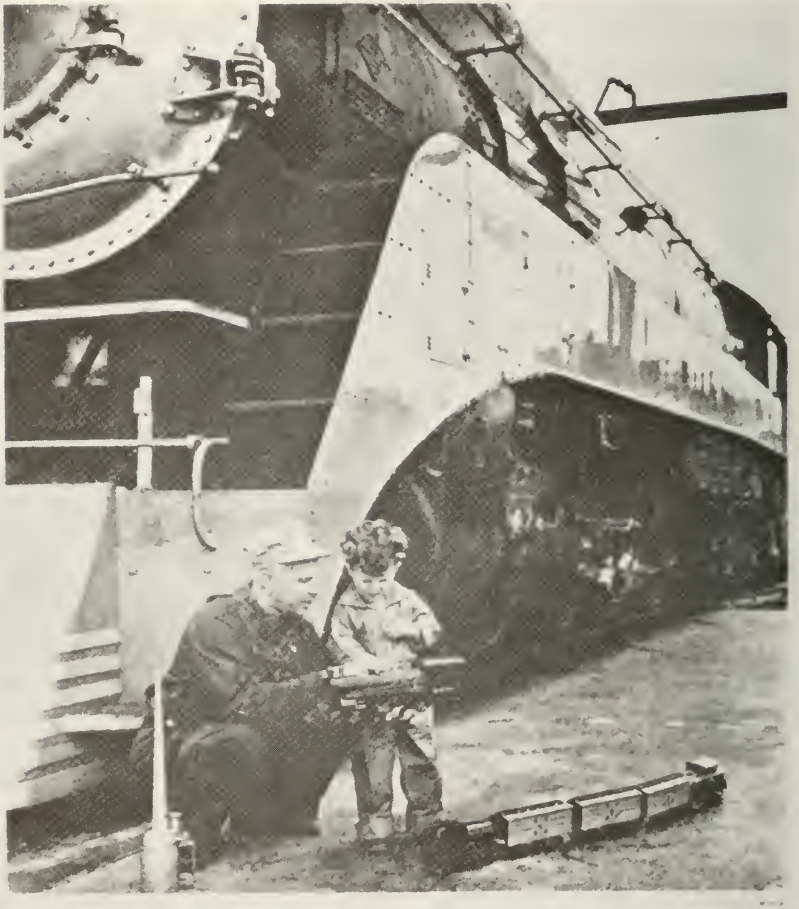
Here is where Modern Power—*with larger drivers, greater boiler capacity, higher steam pressure, higher superheat and lower steam consumption per horsepower*—comes into the picture.

Translated into terms of every-day operation, this means greater hauling capacity at speed, fewer locomotives for the same service and lower operating costs. The net result is better railroad earnings.

It takes Modern Locomotives to Make Money

THE
BALDWIN LOCOMOTIVE WORKS
Philadelphia

STEAM, INTERNAL COMBUSTION AND ELECTRIC LOCOMOTIVES
SPECIAL ENGINEERING PRODUCTS



"They'll still be using steam [illegible] you grow up, Sonny. That big one behind us is one of the four daily Southern Pacific 'Daylights' that are averaging 1508 passengers a day. Maybe, when you grow up, you'll be at the throttle of a faster and more powerful Lima built 'Daylight' than this one."

LIMA
LOCOMOTIVE WORKS
INCORPORATED
LIMA OHIO

HORN...OR WHISTLE?

AMERICAN LOCOMOTIVE

DIESEL · STEAM · ELECTRIC

Railway Age
November 29, 1941
p. 935

Appendix A

Steam is STILL SUPREME

As steam motive power bore the brunt of the war's transportation burdens, it likewise will be relied upon to meet the major transportation needs of the days ahead.

To keep pace with demands for still faster and more economical freight movement, modern Lima steam locomotives are built to haul heavy freights at sustained passenger train speeds

LIMA LOCOMOTIVE WORKS INCORPORATED, LIMA, OHIO

Appendix A

Excerpts from Speeches and Articles by Officials of Steam Locomotive Builders

Article by G. W. Alcock, of Lima Locomotive Works, entitled "Will Changes in Motive Power Revolutionize the Railroads?", Part I, appearing in *The Iron Age* Magazine for April 4, 1935, p. 14.

> ". . . I venture the prediction that until the designers of automotive-type equipment show that they are able to put the horse before the cart, and design motive power units to handle trains, instead of curtailing train weight to meet the limits imposed by their internal combustion motors, railroad men and the traveling public will look to steam locomotives to furnish the power to haul the trains of the future, as they have done in the past. . . ."

And from Part II of the same article, appearing in *The Iron Age* Magazine for April 11, 1935, p. 16.

> "From the record of experience, therefore, it is apparent that any large installations of Diesel locomotives in the future are problematical, and that for some time to come the railroads will depend, for main line work, on steam locomotives, modernized and improved as the exigencies of the service demand. As an approximation of the distribution it would seem that at least 70 to 75 per cent of the motive power units purchased in the next few years will be steam, the balance to be divided between electric and Diesel electric.
>
> "The conclusion cannot be escaped that the Diesel-electric principle has not yet demonstrated its flexibility, or ability to furnish the horsepower demands of the railroads, whereas railroad men can command steam power in any unit from 100 hp. to upward of 7000 hp., with the full knowledge that it can be produced in commercial units capable of delivering the

full power, at extremely low first cost, with unusual efficiency in operation, and absolute dependability over the economic life of the unit, which will be at least 20 years."

Article by William C. Dickerman, President, American Locomotive Company, entitled "There's Life in the Old Iron Horse!", appearing in *Scientific American* Magazine for April, 1935.

". . . Though some are promised, there is as yet no multi-motored oil-electric unit of required horsepower for main-line freight hauling in existence, let alone in service. Therefore it remains wholly debatable whether such a unit would stand up and whether it would be as efficient, in terms of fuel economy and all-round investment worth, as the modern steam unit, which costs initially not half as much and enjoys the unique distinction of being the simplest, most dependable, and long-lived of all overland power units. Moreover, under these circumstances, it would not seem to be either logical or reasonable to expect our roads, with their maintenance as well as their records and freight service predicated on steam, to provide special oil-electric facilities and experts to supplement facilities and mechanics required for steam units.

"For all of these understandable reasons, it is to my notion simply inconceivable, at least until the unexpected happens, that the oil-electric can as yet find place generally in main-line railroad freight hauling. And, to go no further, this conclusion militates against its general acceptance in main-line passenger hauling, especially when freight hauling is the bread-basket of the roads. . . .

* * *

"The steam unit—the new rather than the old iron horse—is not, for all these reasons and others that

might be suggested, done for. There's life in her yet! Indeed, I feel I may venture the thought that, far from being done for, the steam unit may take the challenge of the oil-electric as it took the challenge of electricity, in its stride, as it were, and continue to rule the rails—at least the main-line rails."

Address by Robert S. Binkerd, Vice-President, Baldwin Locomotive Works, entitled "Muzzle Not the Ox That Treadeth Out the Corn", delivered before New York Railroad Club on April 25, 1935. (Appearing in *Baldwin Locomotives* Magazine, April-July 1935, p. 11.)

"Today we are having quite a ballyhoo about streamlined, light-weight trains and Diesel locomotives, and it is no wonder if the public feels that the steam locomotive is about to lay down and play dead. Yet over the years certain simple fundamental principles continue to operate. Some time in the future, when all this is reviewed, we will not find our railroads any more Dieselized than they are electrified, and in each case a substantial portion of those operations will not be based upon what will produce the highest return on the investment, but on aesthetic considerations or compulsion of public bodies.

* * *

". . . But I also wish to point out with equal clearness that no one can predict with any certainty as to what the maintenance cost of a Diesel locomotive may be over a life of 20 or 25 years. And I do wish to say unequivocally that *there is not one scintilla of evidence to justify the claim that a Diesel locomotive of equal weight on drivers can be maintained at a cost as low as that of a steam locomotive of the same age after the first year or so.* Everything points to the probability of a substantially higher maintenance cost for Diesel locomotives than for equivalent steam locomotives of

the same age. *The only thing nobody knows is how much higher.* Anybody buying Diesel locomotives today and counting upon a substantial saving in maintenance cost to justify the greater investment had better take a hedge at the earliest possible moment. (Emphasis in original.)

* * *

"The inherent nature of the Diesel locomotive and its accompanying electrical equipment in the present state of development debar it from high speed road service because of the physical characteristics of the power itself, its excessive capital cost, and its probable high maintenance cost.

* * *

"... If anybody wants to look around to find out where the railroads can make the most money, he doesn't have to look around at all. All he has to do is just start out to supplant with modern steam power the oldest part of the existing steam inventory which is being used day by day; and that investment will vastly improve service, pay its interest, amortize the investment within the economic life of the power, and produce a substantial increase in net operating income.

"If anybody knows where the railroads of this country today can make more certain progress than that, I hope he will stand up this evening and tell us where."

Article by Robert S. Binkerd, Vice-President and Director of Sales, Baldwin Locomotive Works, entitled "Adaptability of Steam Locomotives to High-Speed Service", appearing in *Baldwin Locomotives* Magazine for July 1937, p. 10.

"From the point of view of the railroads, their problem is to furnish faster, better transportation, at the lowest investment of new capital, at the lowest possible oper-

ating expense, at the greatest profit in improved service to the public on the one hand and the greatest return on their capital investment on the other hand. With these points in mind we come to the conclusion that the bulk of that work must be done by the modern steam locomotive of today and tomorrow."

Address by William C. Dickerman, President, American Locomotive Company, entitled "The Possibilities of the Modern Steam Locomotive", delivered before the Western Railway Club in April, 1938. (Appearing in *Official Proceedings of The Western Railway Club* for April 1938, p. 13.)

"For a century, as you know, steam has been the principal railroad motive power. It still is and, in my view, will continue to be.

"True, other power units have challenged steam. This is as it should be. I say this, not because the company I have the honor to represent has long been a designer and builder of electric and diesel-electric as well as steam units, but because history shows, and it seems ordained in the everlasting truth of things, that there will always be room, and should always be a welcome, for any new unit or other invention which helps to expedite the movement of men and goods. Obviously any diesel-electric train which can clip fourteen hours from the running time of the fastest train between Chicago and the Pacific Coast is a useful tool of civilization and, in itself, a triumph. But steam has graciously met every succeeding challenge to its supremacy and, I feel sure, will in due course meet and improve on this challenge, at less initial and operating cost, with no sacrifice of passenger safety and comfort."

Appendix A

Article by Charles E. Brinley, President, Baldwin Locomotive Works, entitled "New Power for Modern Service?", appearing in *Yale Scientific Magazine* for April 1939, p. 8.

> "The Diesel-electric is not yet an active competitor of the steam locomotive in heavy freight traffic. Its characteristics, while fitting it admirably for switching and certain types of passenger service, do not appear as yet to be particularly well adapted to heavy freight service. A material decrease in train weight, which favors the Diesel electric locomotive and which has been accomplished in the case of certain passenger trains, is practically impossible in freight service, as the lading in a freight train constitutes the greater portion of the total weight. To build Diesel-electric freight locomotives that would be comparable in capacity to the modern steam unit would appear to involve a very high first cost, and it seems reasonable to assume that the steam locomotive will constitute the backbone of the freight motive power on our railroads for many years to come. . . ."

Article by J. E. Davenport, Vice-President of Engineering, Development and Research, American Locomotive Company, entitled "A Look at Tomorrow's Power", appearing in *Railway Age* Magazine for May 6, 1944, p. 851.

> "In concluding this discussion of motive power, I should like to emphasize one fact: While we may look forward with considerable interest to the appearance of more and efficient types of locomotives in the next ten years, there is no doubt that the steam locomotive will continue to play a major role for a long time to come."

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Appendix B

TOTAL DOMESTIC LOCOMOTIVE ORDERS—U.S. RAILROADS 1930-1965

(Includes Steam; Electric; Diesel & Miscellaneous Types, 600 h.p., 100 tons & larger)

	EMD	Alco	Baldwin	F-M	GE	Lima	Others*	Total	EMD % of Total
1930	—	183	126	—	12	68	36	425	—
1931	—	26	32	—	25	3	70	156	—
1932	—	—	1	—	—	—	4	5	—
1933	—	9	14	—	—	—	7	30	—
1934	7	51	21	—	15	10	70	174	4.0
1935	1	9	—	—	1	9	21	41	2.4
1936	40	155	155	—	13	99	48	510	7.8
1937	95	89	43	—	17	24	68	336	28.3
1938	99	29	12	—	—	6	37	183	54.1
1939	114	53	43	—	7	14	50	281	40.6
1940	167	155	90	—	3	51	22	488	34.2
1941	373	251	186	—	10	64	57	941	39.6
1942	474	275	269	—	5	105	85	1213	39.1
1943	407	317	231	—	—	77	126	1158	35.1
1944	354	188	165	—	—	75	30	812	43.6
1945	571	213	122	18	10	15	45	994	57.4
1946	810	357	113	42	—	10	8	1340	60.4
1947	1257	621	265	166	—	20	57	2386	52.7
1948	1375	495	281	130	—	48	12	2341	58.7
1949	1067	288	153	58	7	27	17	1617	66.0
1950	2352	581	299	163	14	92	17	3518	66.9
1951	2279	780	369	114	10	—	21	3573	63.8
1952	1142	379	98	69	25	—	15	1728	66.1
1953	1290	302	104	101	2	—	—	1799	71.7
1954	736	139	31	58	—	—	—	964	76.3
1955	1135	182	17	90	42	—	—	1466	77.4
1956	1029	191	—	86	2	—	—	1308	78.7
1957	742	122	—	26	30	—	—	920	80.7
1958	472	117	—	—	—	—	—	589	80.1
1959	409	64	—	—	22	—	—	495	82.6
1960	179	22	—	—	66	—	—	267	67.0
1961	230	38	—	—	16	—	—	284	81.0
1962	710	75	—	—	64	—	—	849	83.6
1963	458	77	—	—	100	—	—	635	72.1
1964	946	173	—	—	211	—	—	1330	71.1
1965	924	107	—	—	194	—	—	1225	75.4
1966	921	122	—	—	236	—	—	1279	72.0
1967	726	64	—	—	224	—	—	1014	71.6
1968	561	28	—	—	302	—	—	891	63.0
1969	1232	—	—	—	418	—	—	1650	74.7
1970	894	—	—	—	222	—	—	1116	80.1
1971	1093	—	—	—	301	—	—	1394	78.4
1972	1060	—	—	—	327	—	2**	1389	76.3

* Includes Manufacture by Railroads in Their Own Shops.

** Montreal Locomotive Works.

Source: Railway Age, Locomotive Orders.

Note: In the case of steam and electric locomotives non-railroad orders are included.

Exhibit A-1

Exhibit A–2

Exhibit B

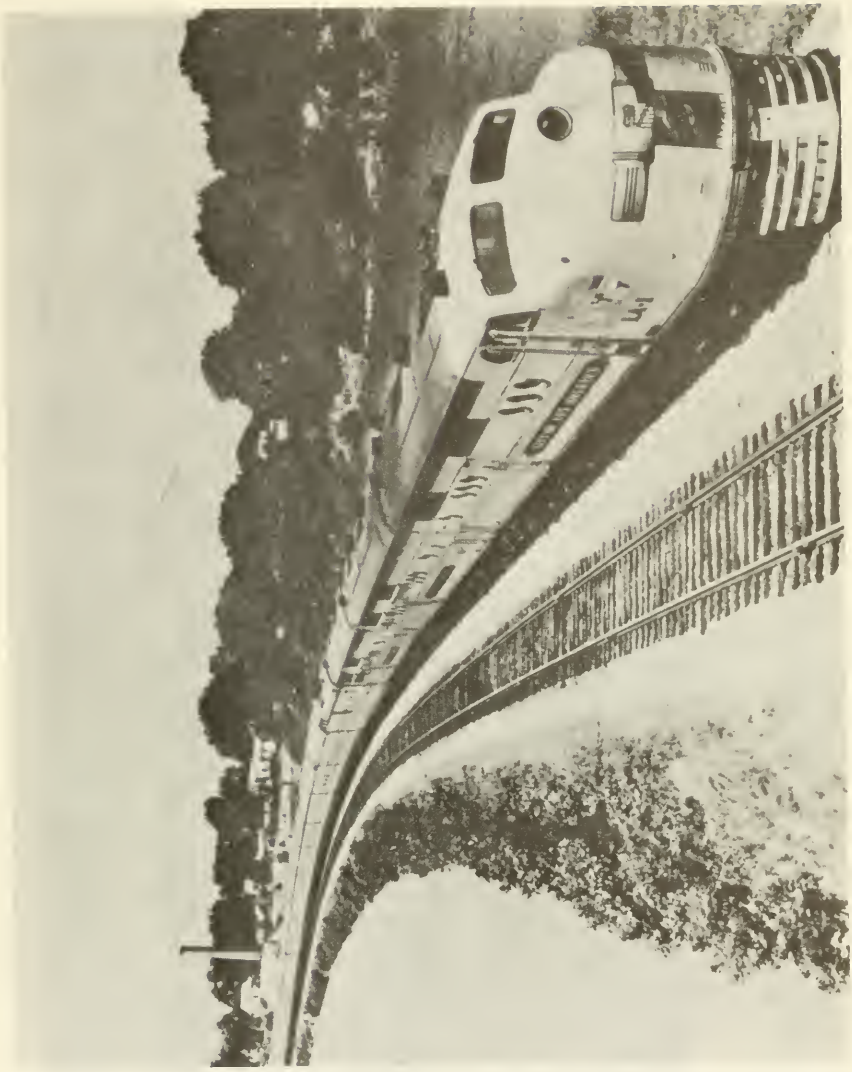

Exhibit C

Exhibit D-1

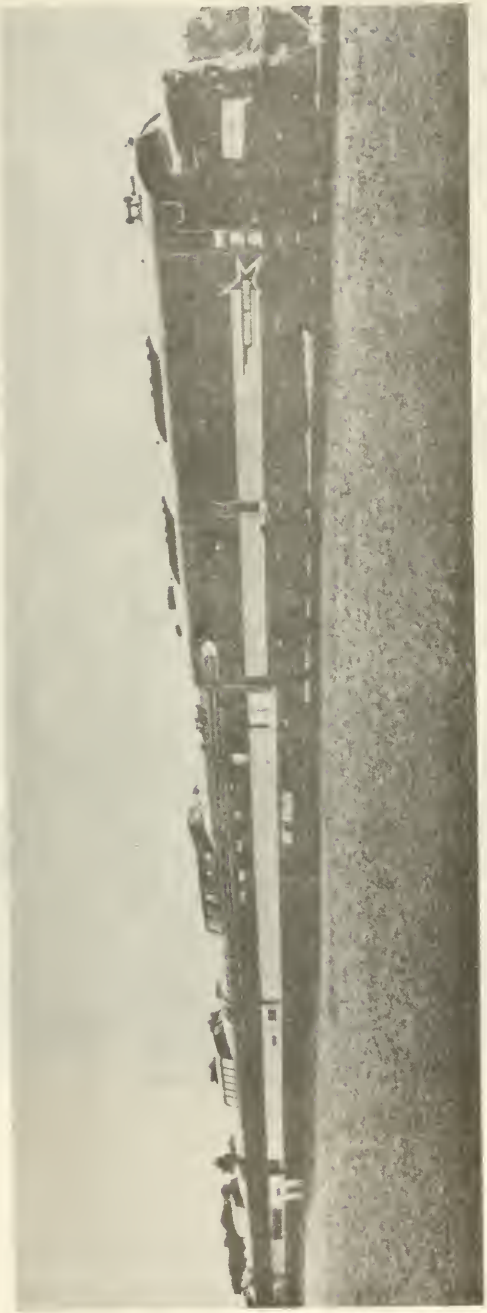

Exhibit D–2

Exhibit E-1

GM Experimental Free Piston
Gasifier Locomotive

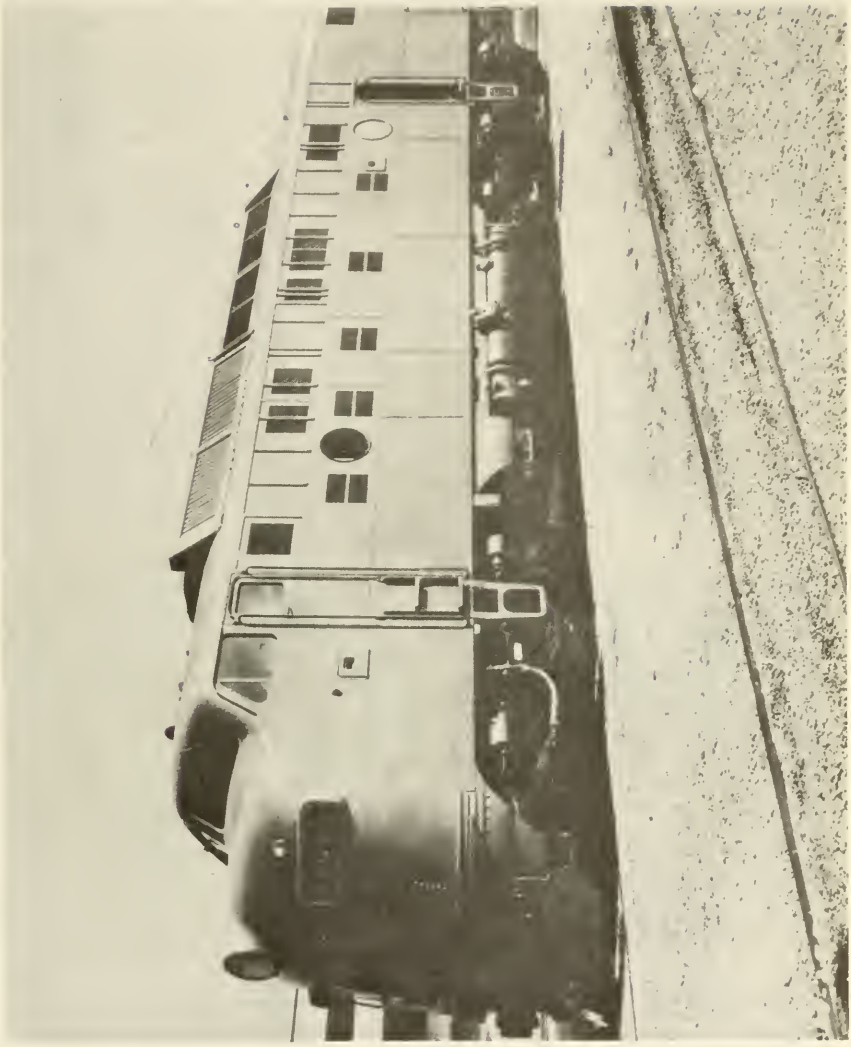

Exhibit E–2

GM Proposed Electric Locomotive

Exhibit 25.—Excerpt From ICC Reports Re Passenger Fares, New York, New Hampshire, and Hartford Railroad Co.

No. 33332[1] (as supplemented)

PASSENGER FARES, NEW YORK, NEW HAVEN AND HARTFORD RAILROAD COMPANY

Decided August 16, 1961

1. Increased interstate one-way and commutation passenger fares on The New York, New Haven and Hartford Railroad, found to be just and reasonable and otherwise lawful.[2]

2. Recommendations of the Commission relative to ways and means by which the New Haven Railroad may improve its financial condition and its service to the public.

3. Recommendations of the Commission relative to insuring the continuance of essential passenger transportation services by the New Haven and other railroads. Proceedings discontinued.

J. W. Grady, John D. Lane, Thomas J. O'Sullivan, and *Eugene E. Hunt* for respondent-applicants.

Clifford J. Woodley, Paul G. Ehmann, William H. Y. Hackett, Jr., Jonathan S. Towle, E. L. Stone, Nathan S. Pavan, David J. Saliba, Irvin Libenson, Harry G. Herman, John L. DeLius, Robert T. Gilhuly, Thomas F. Kelly, Donald W. Whitehead, William A. O'Connell, John B. Hedges, John Bradley, Edward C. Bates, Edward C. Ness, Jr., Herbert F. Koelsch, Nelson Polsby, Henry M. Hogan, and *Walter R. Frizzell* for interveners

Eugene S. Loughlin, Henry B. Strong, and *Basil P. Fitzpatrick* for Connecticut Public Utilities Commission.

George A. McLaughlin for Division of Public Utilties, State of Rhode Island.

Troy T. Murray for Massachusetts Department of Public Utilities.

Daniel M. O'Donoghue for Bureau of Inquiry and Compliance, Interstate Commerce Commission.

REPORT OF THE COMMISSION

BY THE COMMISSION:

For several years the Commission has been concerned about the rapidly deteriorating physical and financial condition of the New York, New Haven and Hartford Railroad Company. Early in 1960 we anticipated the need for full information as to the carrier's financial condition, the caliber of its management, and its prospects for the future. An extensive investigation was instituted by our supplemental order of March 17, 1960,[3] for the purpose of determining, *inter alia,* the carrier's need for revenues sufficient to enable it "under honest, economical and efficient management" to provide adequate and efficient service. These proceedings were assigned to COMMISSIONER Charles A. Webb and Hearing Examiner Richard S. Ries for hearing. The Commission's Bureau of Inquiry and Compliance, hereinafter called the Bureau, was authorized and directed to participate.

The recommended report and order of the hearing officers was served on November 21, 1960. Exceptions of the New Haven were filed on February 13, 1961, and the reply of the Bureau filed on March 3, 1961. General Motors Corporation on February 13, 1961, filed a petition for leave to intervene for the purpose of filing exceptions to the recommended report. The petition was granted by order of the Commission on the same date.

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[1] This report embraces also fourth-section applications Nos. 35929 and 36266, both entitled Passenger Fares, New York, New Haven and Hartford Railroad Company.

[2] Authority granted to establish and maintain increased passenger fares between stations Route 128, Readville, Hyde Park, and Mount Hope, Mass., and stations on the New Haven Railroad, East Greenwich, R.I., to New York, N.Y., inclusive, and between those four stations in Massachusetts, and points on connecting lines west and south of New York, N.Y., without observing the aggregate-of-intermediate rates provision of section 4 of the Interstate Commerce Act.

[3] The investigation was begun following the filing of schedules to become effective February 4, 1960, in which the New Haven proposed to increase its interstate commutation passenger fares 10 percent and its interstate one-way fares 10 cents per ride subject to a maximum of 10 percent. Said schedules became effective without suspension but, by Commission order dated February 1, 1960, an investigation was instituted concerning their lawfulness. This investigation was broadened by the supplemental order of March 17, 1960.

On March 31, 1961, the Commission issued its interim report in this proceeding, 313 I.C.C. 411. The interim report dealt exclusively with the conclusion in the recommended report that reorganization under the Bankruptcy Act would not solve the basic problems of the carrier and with closely related issues. The Commission found (1) that the New Haven's passenger deficit was the primary cause of its current financial difficulties; and (2) that reorganization under section 77 of the Bankruptcy Act would not be an adequate solution for the basic problems of the carrier.

On July 7, 1961, the New Haven filed a petition under section 77 of the Bankruptcy Act with the District Court of the United States for the District of Connecticut. On the same day the court approved the petition as properly filed. The court's appointment of three trustees on July 26, 1961, was ratified by the Commission on July 31, 1961. At page 426 of our interim report, we said:

"We would be remiss in our duty if we failed to point out that the Bankruptcy Act is not a statute dealing with transportation as such but with financial reorganization. Although a major purpose of section 77 proceedings is to assure the continuance of transportation service required by the public convenience and necessity, the statute presupposes that financial adjustments are an adequate means to that end. Usually that is the case. We are unable to find, however, that the essential service of the New Haven can be perpetuated solely by an exercise of the authority conferred by sction 77 on this Commission and th courts. If the major problems of the New Haven require political solutions, the many interests directly affected might reasonably conclude that the section 77 procedure is not an adequate mechanism for the effectuation of their desires. This is not to say that the courts or this Commission would be insensitive or indifferent to appropriate pleas of elected public officials, employee organizations, shippers, or commuters. However, the interests of these diverse groups lie somewhat beyond the main thrust of a section 77 proceeding. Although it might be possible to a safeguard these interests in the course of reorganization proceedings involving the New Haven, it would be impossible to do so if such a proceeding were widely regarded as a substitute for determined, cooperative action by all concerned."

Our aim in this report is to spell out the kind of "determined, cooperative action" that is required for the New Haven, without any drastic curtailment of essential transportation services, to emerge from reorganization as a viable private enterprise. In the interest of brevity we will not discuss the fare schedules placed under investigation in this proceeding. Nor will we comment on all of the factors contributing to the decline and fall of the New Haven Railroad, These matters are discussed at length in the recommended report and to a large extent are not the subject of exceptions. We adopt as our own the findings of fact and conclusions set forth in the recommended report except as modified herein.[4]

This report will deal with the New Haven's problems and its prospects for the future under the following five sections: (1) the New Haven's present financial condition; (2) the principal causes of the New Haven's downfall; (3) recommended measures of self-help; (4) recommendations for State and local assistance; and (5) recommendations for assistance by the Federal Government.

2. *Locomotive policy.*—Beginning in 1955 the New Haven pursued a policy looking toward the progressive elimination of all electric locomotive operations. The hearing officers found that the New Haven's purchase of new diesel-electric locomotives to replace electric locomotives was consummated contrary to the advice of its own expert consultants and without any thoughtful analysis by management of the sellers' representations as to savings; that the anticipated savings proved to be a mirage; that no sound justification for the abandonment of electric locomotive operations was offered; and that, by 1960, even the management recognized that a searching reappraisal of the New Haven's electric operations was imperative. No exception was taken by the New Haven to any of the critical comments and conclusions in the recommended report concerning the locomotive policy pursued from 1955 until mid-1960.

General Motors Corporation, an intervener, takes exception to that part of the recommended report finding that its estimates of savings to be derived from the locomotive purchase program were erroneous and inflated. We have considered intervener's exceptions but find them to be without merit.

We do not suggest, nor did the hearing officers, that General Motors was guilty of any fraudulent misrepresentation. As a seller of locomotives, General

Footnote 4 not available.

Motors had every reason to assume that New Haven officials could and would evaluate the estimated savings claimed in its engineering study. In the light of the circumstances shown by the record in the proceedings, we conclude that the sales representations of General Motors were mere puffing. Actually, General Motors attempted in its engineering study to construct an ideal plan of locomotive utilization based on the purchase of 88 new multipurpose diesels and the retirement of all electric locomotives, most of which were ready for retirement. We are unable to find that intervenor's locomotive utilization plan was unsound. However, a seller of electric locomotives, we believe, could have constructed a similar plan involving the purchase of new electric locomotives and the retirement of old diesel-electric locomotives and, with equal justification, could have estimated comparable savings. In other words, the huge savings held out by General Motors stemmed primarily from the locomotive utilization features of its plan rather than from the use of a particular type of equipment. We agree with the hearing officers that it is "manifestly absurd" to contend that 88 locomotives, with an aggregate delivered-to-the-rail horsepower of 126,000 can supplant locomotives with a total rail horsepower of 288,260 (plus 16 switching engines) assuming, of course, that 288,260 horsepower are required to meet the power requirements of the railroad.

With respect to the New Haven's locomotive policy, the hearings officers concluded:

"That the New Haven management continue to produce power at its Cos Cob p'ant for approximately 5 years and during such period increase its consumption of energy with a view toward giving Cos Cob a more economical base load; and that the New Haven initiate studies looking toward the eventual disposition of the Cos Cob plant and the acquisition of additional electric locomotives to operate between New York and New Haven." [Sheet 76]

On the basis of the record, the foregoing conclusion is fully justified. However, no real effort was made by the respondent to prove the economies that might be derived from full dieselization. We believe that the trustees should authorize a thorough study of the relative advantages of full dieselization versus the increased use of electric locomotives between New York and New Haven. And, in view of the great advances in railway electrification made in Europe and in the Soviet Union, the economic feasibility of complete electrification of the New Haven's main line, with outside research and development assistance, should not be ignored. What is most important, however, is that the future of the New Haven's existing power distribution system be promptly and wisely resolved. An unwise decision or a failure to decide the question might well result in the waste of mi'lions of dollars.

CONCLUSION

In view of what has already been said, we do not believe it is necessary to recapitulate our findings and recommendations herein. For the New Haven, and for railroad passenger service generally, the future seems bleak. However, it is not hopeless. A nation that is serious about propelling a man to the moon should be able to solve the mundane problem of moving its citizens dependably and comfortably some 50 miles or less from home to work without multiplying ribbons of concrete and asphalt that would strangle the central cities they are supposed to serve.

An appropriate order will be entered.

Exhibit 26.—Excerpt From American Institute of Electrical Engineers, Paper 54–29, Re Electric versus Diesel Locomotive

A Reappraisal of the Economics of Railway Electrification: How, When, and Where Can It Compete with the Diesel-Electric Locomotive?

(By H. F. Brown and R. L. Kimball)

[Figures and tables omitted.]

Synopsis: The diesel-electric locomotive has been universally substituted for the steam locomotive on most of the railroads in this country. Railway electrification has not had further application during this period. Many believe this to be an indication that the economies of the diesel over the steam locomotive apply equally to electric operation as well. This opinion is debated. Power costs, investment costs, fixed charges, maintenance costs, and other operating costs of

both diesel-electric and electric operation are compared. Stress is laid on the greater rise in maintenance costs, with age, of the disel-electric than those of the electric locomotive. It is believed that when the difference in all this costs is fully determined, electrification will again be applied to certain parts of the American railroads having good load factors where electric power is available because of its greater economy. Commercial frequency applied to the contact wire at higher voltage, and the rectifier locomotive, offer means of standardizing future railway e'ectrification. Examples are cited of studies recently made for electrification of this type in South America, and for a hypothetical installation in this country, to illustrate cost comparisons brought out in the paper.

The rapid change from steam locomotives to diesel-electric motive power during the past 10 years on all but one or two of the railroads of the United States has been revolutionary. This change is shown graphically in Fig. 1. Today there are more than 22,000 diesel-electric locomotives in service, and the number of steam locomotives has been reduced to approximately 17,000.

Electric operation, introduced first in 1895, and applied more extensively between 1905 and 1925, had one more major installation in 1938. The total number of electric locomotives then in service was approximately 800. Since 1938 there has been no further important growth in railway electrification in this country, and the number of electric locomotives has remained more or less constant since that date.

This fact, coupled with the steady and almost universal application of the diesel-electric locomotive since 1940, has caused most laymen and many skilled railroad operators and technicians to believe that electric operation is outmoded and that the economies of diesel-electric operation over steam operation apply equally to electric operation as well.

This paper debates that thinking and points out under what circumstances and by what factors electric operation not only can, but probably will, grow again and compete economically with the diesel-electric for general railway operation.

Brief Review of Existing Railway Electrification

Space does not permit a detailed review of the existing railway electrification in the United States today. Nearly all of this electric operation was installed to solve special operating conditions and problems for which the steam locomotive could no longer serve economically, if at all. Much was installed for new railway operations such as new underground or enclosed passenger terminals, designed especially for electric operation and to accommodate heavy suburban traffic.

It is true that the diesel has superseded electric operation on one or two of the shorter railroad electrification installations, and it is possible that it may take the place of electric operation on other short tunnel installations which are a part of long through runs. On most of these electric operations, however, conditions are such that the internal combustion type of locomotive, even with its reduced amount of smoke and gas, must still be excluded as was the steam, even though both these types perform the major portion of long runs entering the electrified territory. It will be pointed out later that even if the diesel could be allowed in some of these electrified terminals and territories, it probably could not compete economically with an existing electrification. To this extent, then, electric operation is already competing, and will continue to compete, with the diesel-electric just as it has in the past with steam.

All these electrifications, because of their special conditions of application, have been very difficult and expensive to install and to maintain. To keep costs to a minimum in each case, a number of various "systems" have been devised, which has somewhat confused the issue in making electrification more acceptable to the railroads. It is probable that none of these systems varied more than 10 per cent in their over-all costs. All have proved their economy over steam.

Of all the various systems installed in this country one finally became outstanding in its application, namely the 11-kv 25-cycle single-phase system. This system is used today on half of the existing major railway electrifications, and accounts for more than 75 per cent of all the electrified track mileage. This same system, at a lower frequency, is widely used also in Europe.

By contrast with electrification, the railroads have found it comparatively simple to finance and apply by easy stages a more or less standardized type of diesel-electric power to replace worn-out and less economical steam power for

general operations. Does it seem possible or probable that electric operation with systems not yet standardized and with its handicap of a contact system, can compete with the diesel for this general railway operation? If so, how, when, and where can this be done? Obviously, all the factors must be carefully weighed.

POWER SUPPLY—OIL

The distribution of oil through pipe lines in the United States is as remarkable as the growth of the automotive industry and closely linked with it. No railroad has any difficulty in securing at any terminal adequate supplies of liquid fuel for diesel operations. The price of diesel oil, however, has increased during the past 10 years at a greater rate than the price of coal; see Fig. 2. Even so, the railroads are saving on their former fuel bill because of more efficient utilization of the fuel. Since all the diesel oil consumed for traction purposes on the diesel-electric locomotive is used to produce electricity, the cost of this electric energy, per kilowatt-hour (kw-hr), delivered to the traction motors can be expressed by a very simple equation

$C=0.09P$

where C is the cost in cents per kw-hr for electric energy and P is the price of diesel fuel oil per gallon. The contant 0.09 is derived from the fact that there 3,413 Btu's in 1 kw-hr and 138,000 Btu's in 1 gallon of diesel oil, together with the assumptions that the diesel engine has an average thermal efficiency of 30.5 per cent and the electric generator with its auxiliaries has an average efficiency of 90 per cent. This constant favors the diesel somewhat as it is doubtful if this is always operating at this high efficiency at all loads and at all times between overhauls. This equation is shown graphically in Fig. 3 for diesel fuel at various prices.

It will be seen that electric energy generated on the diesel-electric locomotive takes about 12,400 Btu per kw-hr. This is comparable with the fuel rate of some not-too-modern central stations. With diesel oil at the current price of 10 cents per gallon, the cost of electric power on the locomotive is 9 mills per kw-hr. This is already higher than the "energy cost" of electric power for railroad traction power under some existing railroad contracts. This means that already, especially for "off-peak" operations, diesel-electric railway operation is costing more for fuel than is paid for electric power on some of the larger electrified railroads having general electric operation. This fact should be of interest to those railroad operators who would increase the utilization of idle diesel power by operating such into existing electrified territory in the place of electric locomotives. In most cases the cost of power alone for diesel operation would be greater than for electric operation.

Diesel oil will probably continue to be plentiful for some years to come. It is slowly rising in price, and there are no important factors in view to indicate a long-term change in this trend. It can be made readily available at any railroad terminal. It requires some transporting, storage, and handling facilities on the part of the railroads which add slightly to its cost on board the locomotive. These might be analagous to transmission and distribution losses for electric power.

POWER SUPPLY—ELECTRIC

Many of the earlier railway electrifications were obliged to build and operate their own power plants because the commercial power stations were too small for their requirements. Even today some electrified railroads must continue to operate their own plants because there is no adequate supply of the required typ of power available, and conversion equipment with purchased commercial power would be a greater expense.

Conditions, however, have changed materially during the past two decades relative to electric power generation. Large generating stations no longer are concentrated solely at or near large communities or industries. They are now being located nearer fuel sources, or at developed water-power sites, and are linked together by high-capacity transmission networks. Such networks, operating in synchronism, span not only entire states but groups of states in the more densely populated areas of this country. These networks and their supply stations have been increasing in area and in capacity at a very rapid rate during the past 10 years. During this growth the trend in the price of electric energy has been downward, in spite of its close relationship to the price of coal, which has had an upward trend; see Fig. 2.

Because of past limited supply capacity on the part of the power companies and the unattractive peak loads with poor load factors for the special railroad loads involved, power rates for railway electrification usually have included separate demand charges which appear high compared with the energy charge. On those railroads that have extended terminal electrification to include further operation of passenger, freight, and in some cases switching service, the load factor has been materially improved, sometimes above 60 per cent, and the demand charge, spread over more kw-hr, has been reduced to a smaller percentage of the energy charge and of the total unit cost per kw-hr. Such a load becomes more attractive to power supply companies, especially because of the diversity factor. General railway operations are as heavy at night as during the day, which gives a good diversity when combined with the usual industrial and commercial loads.

With the continuing growth and expansion of the electric power industry there will be an increasing probability that the general railroad loads, as distinct from the special railroad loads of the past and present, will become more and more attractive to the power industry as a valuable potential base load. This will be especially true if new sources for producing electric energy, possibly including atomic energy, should be developed. These, also, appear to be nearer realization than predicted 5 years ago. All these factors will tend to widen the present small difference in price per kw-hr at the locomotive between diesel-electric power and central station power for railroad operation. At present, spot checks indicate that for large blocks of power at load factors of above 60 per cent, there is already 1 mill difference between central station and diesel-electric power, in favor of central station power.

To avail itself of this power in the most efficient way, future railway electrification must use commercial frequency directly on the contact wire ,and eliminate all expensive conversion equipment costs and losses. The means for doing this are now known and quite well developed.

FIRST COSTS AND FIXED CHARGES

It has been comparatively easy to finance the change from steam to diesel power, a few units at a time, without drastic changes in the capital structure of the railroads. Electric locomotives can also be financed in the same manner, but of necessity the power supply and contact system must be financed and completed before any such locomotives can be operated. It is a sudden, wholesale change instead of a gradual substitution over a period of years. Electrification, in addition to the motive power, requires at present a different type of financing more difficult to negotiate than "equipment trust certificates." Nevertheless, if there should appear to be sufficient economic inducements in the future in favor of electrification, doubtless new financing methods could be devised for such new investments. The large financial institutions of this country are ever alert for promising investment opportunities. In some states, the taxation of railroad fixed property must be considered in the additional fixed charges.

All past railway electrification has been of a long-term investment by its nature. Even those installations which have been abandoned have had at least a 35-year life. This long life has applied to the locomotives as well as to the contact line and power supply. To place a life expectancy of at least 40 years for all the factors involved in electrification is justified by the large background of past experience.

The diesel-electric locomotive, on the other hand, cannot be expected to last this many years. By its very nature, containing a prime mover of the internal combustion type with all of its associated auxiliaries, and a multiplicity of precision-fitted reciprocating parts, constantly subjected to wear, it will of necessity have a much shorter life. Railroads today are allowed by the Interstate Commerce Commission to set up depreciation rates for diesel motive power on a 20-year life basis. There are indications that this should be reduced to 15 years in certain cases. This may be economical from the standpoint of more intensive utilization when compared with steam, but if compared with electric locomotives with the same high availability and utilization factors and a longer life, the fixed charges are going to be greater for the diesel by a ration of two to one.

Diesel-electric locomotives currently cost between 100 and $110 per engine horsepower. This is equivalent to $125 to $135 per rail horsepower. There are indications that these prices may increase rather than decrease in the future

due principally to the probability of future production in smaller quantities as the market becomes saturated.

Electric locomotives have been manufactured, currently, in much smaller quantities for about $125 to $135 per rail horsepower, equivalent to the diesel price. The trend in costs, however, for production if in larger quantities than at present, would be downward. Thus, motive power costs are more or less equivalent at present. Over the expected life of the electric locomotive, two diesel-electric locomotives must be purchased.

If the power supply equipment and contact system for a given railway electrification could be designed to cost no more than the cost of the motive power required, the total fixed charges over the life of the electrification would be less than the fixed charges for diesel-electric equipment for the same opration and period of time, as shown in Fig. 4. One criterion, therefore, to justify electrification is to insure that the contact system and power supply equipment do not exceed the cost of motive power for a given general railway operation. This would be one method of quickly determining whether or not an electrification project might be economical.

OPERATING COSTS

Operating costs include, in addition to the power or fuel costs already discussed, wages of crew, locomotive maintenance costs, engine terminal expense including lubrication, and (for electrification) maintenance of contact system and power supply equipment.

Obviously the personnel required to operate either the electric or diesel-electric locomotive is the same. Both can be operated in multiple unit when required by one crew. The other three items will require careful consideration, for they contain the principal factors which ultimately will determine the ability of electrification to compete economically with the diesel-electric locomotive.

The item which appears to show the greatest differential is locomotive maintenance. The differential in engine house expenses and lubrication would increase this differential. The line maintenance will reduce it.

LOCOMOTIVE MAINTENANCE COSTS—ELECTRIC

The electric locomotive, being simply a power conversion machine and not a prime mover, has established the record over the past 45 years of operation of having the lowest maintenance cost of any form of motive power yet devised.

In order that the maintenance costs of locomotives of different weight and capacity and types may be equitably compared, it is necessary to have a common denominator of work performed. One way of doing this is to prorate maintenance costs over a unit-mile basis, the unit consisting of 1,000 horsepower measured at the rail. Thus, for a 4,000-horsepower electric locomotive the maintenance costs per locomotive-mile would be divided by 4 to give the costs for a 1,000-rail-horsepower unit-mile.

On this basis, current costs of maintenance of electric locomotives 40 years old have been investigated and found to be as low as 21 cents per 1,000-rail-horsepower unit-mile. Such costs, as well as current costs of maintenance of other electric locomotives of lesser age, on two important electrified railroads are shown in Fig. 5. It will be seen that these costs form a definite slowly rising pattern.

LOCOMOTIVE MAINTENANCE COSTS—DIESEL-ELECTRIC

Diesel-electric locomotives are still new. They have not yet had the years of operation that the steam or electric locomotives have had. Moreover, they are still being applied in such large numbers each years that it is very difficult to obtain, except in isolated cases, a true picture of the way maintenance costs will rise with the age of the individual unit. Many railroads keep records of maintenance costs simply on an entire class of equipment regardless of its age. Obviously with a continual influx of new units each year, the maintenance costs of such a class of equipment will be low and will remain low, or rise very slowly. It is only when a railroad has become entirely diesel-equipped, and has ceased to purchase new equipment in quantities, that it will begin to get a true picture of the rate of rise of maintenance costs.

Furthermore, there is at present a divergence of opinion as to just how such costs should kept. One set of recently published maintenance costs covering several years shows these costs in "per cent of total operating costs." Obviously

one has to know just how wages and fuel costs have changed over the same period before the true value of maintenance costs can be found.

Another proposal has been made that since the diesel engine will need periodic major repairs and replacements, the cumulative costs divided by the accumulated miles of service should be reported for each period. Obviously such a record would show evenutally only the average cost of repairs over the life, and would not show the true rise, nor the point at which consideration should be given to replacement because of such high costs.

Occasionally it is possible to get maintenance figures for a group of locomotives classified by age. The data included herein are from authentic records of several railroads which were accessible. In Fig. 6 are shown costs of maintenance obtained in 1950–1951 of one type of diesel-electric locomotives used in combined passenger and freight service on one railroad, by age groups. All units were of same manufacture and capacity. All costs were within the same 12 months. The unit is reduced to 1,000-rail-horsepower unit-mile, the rail horsepower being taken as 80 percent of the reported engine horsepower. The rise in costs is startling.

In Fig. 5 are shown, for comparison with the electric locomotive maintenance costs already referred to, current maintenance costs on another railroad of various types of diesel power, all reduced to the 1,000-rail-horsepower unit-mile basis. The comparison speaks for itself. Both railroads operate in nearly the same regional area and the service performed is comparable.

Because these are isolated cases, an analysis has been made of data, unpublished but authentic, compiled by one manufacturer from information furnished by more than 30 railroads, covering the costs of operation and maintenance of diesel-electric locomotives of different manufacture for the year 1951. These data are tabulated in Table I and are shown graphically in Fig. 7(A) for freight service and in Fig. 7(B) for passenger service. It will be seen that these data cover groups of locomotives of "average age" for each group. The results, as would be expected, are scattering, and lower than the costs shown in Figs. 5 and 6.

Nevertheless, the general trends indicate that diesel-electric maintenance, reduced to the same common denominator, will be for locomotives 10 years of age at least twice the maintenance costs of electric locomotives.

All of these last-mentioned data could be further subdivided into "engine repairs," "electrical repairs," and "other repairs," and the average percentage of total repair costs is as follows:

Using these percentages, and analyzing the various parts requiring repairs on both electric and diesel locomotives, the tabulated data shown in Table II are derived. The results shown substantiate the ratio of two to one for diesel-electric maintenance costs compared with electric maintenance costs. This is to be expected since the diesel-electric locomotive is an electric locomotive with the addition of a power plant which is very expensive to maintain.

All of the maintenance cost data analyzed seem to indicate that such costs for all types of diesel-electric and electric locomotives start at between 5 and 6 cents per 1,000-rail-horsepower unit-mile, and that in 10 years there will be a difference of at least 10 cents, per 1,000-rail-horsepower unit-mile between the diesel and the electric, the diesel being the higher figure. Taking this differential as the average difference in maintenance costs ovr 20 years (the life of the diesel), a figure is obtained which is a fair indication of the major economies of the electric locomotive over the diesel. At the end of 20 years a new diesel will be compared with an old electric. The differential is maintenance costs will be less for the next 20 years, as shown in Fig. 8. The average differential over 40 years will be at least 6.5 cents.

If this figure, capitalized, is great enough not only to pay for the power supply equipment and the contact line but can show a substantial profit in addition, and if electric power can be made available, it is a logical conclusion that the electric locomotive must eventually replace the diesel. There are several minor items which can increase, and decrease, this major figure.

ENGINE TERMINAL EXPENSE INCLUDING LUBRICATION

It is obvious that the diesel-electric locomotive needs more attention between runs than does the electric, cleaning, fueling, and lubricating being the principal difference. Of these items, lubricants alone are 0.7 cent per 1,000-rail-horsepower unit-mile, as given in the manufacturer's data referred to previously. The other two items can easily increase this differential figure to 0.75 cent per 1,000-rail-horsepower unit-mile.

FUTURE CONTACT LINE COSTS

The future contact line must be lighter and cheaper in cost than any previous construction, excepting possibly that used on the later a-c systems. This can be accomplished by the use of commercial frequency at a nominal voltage of 25 kv on the contact wire. Recent studies made for the possible electrification of two different railroads in South America using this system indicate that costs can be kept to within $18,000 per mile of track for such construction. Treated wood poles might be used in this country for much of such light construction; see Fig. 9. Such light construction can be designed to be as stormproof as any existing railroad contact line or transmission line.

CONTACT LINE MAINTENANCE COSTS

The maintenance costs of the contact system always appears to be large on existing electrifications, since they are frequently for low load-factor operations. Such costs can be prorated either against the cost of power delivered to the locomotive (which is the most logical procedure), or against train mileage and added to the cost of locomotive maintenance, for comparison with other types of motive power.

On most of the existing electrified lines the current maintenance costs of the line, prorated as mentioned, are about for d-c lines 2.5 to 2.6 mills per kw-hr or 6.0 to 7.0 cents per train mile; for a-c lines 1.5 to 1.75 mills per kw-hr or 4.0 to 5.5 cents per train mile.

The wide variation in these figures reflects traffic density and load factor. They also reflect the very expensive type of contact systems installed. There is every reason to believe that lighter, less expensive types of contact systems will haae lower maintenance costs of about 0.9 to 1.1 mills per kw-hr or 2.5 to 3.0 cents per train mile.

Obviously such costs would have to be included in any over-all comparison with diesel-electric operation.

POWER SUPPLY EQUIPMENT

With commercial frequency used on the contact system, the necessity for all conversion equipment disappears, as well as its operating and maintenance costs. Simple transformer and switching stations will step down and control the voltage from the power system netork. The figures just given for the maintenance costs of the contact system are ample to include the low maintenance costs of such simple supply tie equipment. Phase-balancing and power-factor correcting equipment are not envisioned in these future general railway electrifications, as it is considered that the power factor will be high with the type of motive power used, and that the load factor will also be high, and the load ill be divided over all three phases of the power network. Phase-breaks in the contact system are nothing new, as they have been in use on the existing a-c lines for many years.

Phase-balancing power-factor correction, inductive co-ordination, and elimination of harmonics cannot be ignored in special cases, nor should they be overstressed. All have been problems in the past, and not confined to any one system. The economical solution for all these problems is known, and if required must be included. They have not prevented the application of economical electrification in the past, nor will they in future.

SCHEMES TO MAKE ELECTRIFICATION ATTRACTIVE TO LIGHT TRAFFIC LINES

In some cases, to develop new areas such as in South America or in Africa or possibly some sections of this country, combined power transmission and railroad contact systems could be made at the start, and could later be separated as industry or traffic growth arranted. Such a scheme is outlined in Fig. 10, where a 3-wire commercial frequency railway contact system and its feeder is part of a 3-phase line supplying power along the railroad. Such a scheme could readily utilize natural water power sources in countries lacking fuel, for railroad lines of even very light traffic, as the electrification would cost but little more than the power transmission system alone.

Other schemes suggest themselves. Fig. 11 shows a 3-wire scheme proposed for a South American railroad using power from an existing power netork of more than 100,000-k capacity. The railroad load would total about 30,000 kw and would be distributed over all three phases. Fig. 12 shows another scheme suggested for the operation of another South American railroad with lighter

traffic. Here the transmission line would have to be constructed along with the railroad electrification, but would serve communities now without electric power of any kind. Power would be obtained from a relatively small thermal station. Although the railroad load would be distributed over all three phases, some phase-balancing equipment is indicated. as the railroad is half of the supply capacity. Fig. 13 is another scheme studied for this same project using a higher troller contact voltage, which eliminated all transformers.

The comparative costs of the scheme shown in Fig. 11 with 3,000 volts d-c electrification are shown in Fig. 14. In Fig. 15 are shown the comparative costs of the schemes shown in Figs. 12 and 13 with 3,000 volts d-c electrification and with diesel-electric locomotives. Both Figs. 14 and 15 clearly show the savings which may be realized in contact line and power supply equipment costs by use of the high-voltage commercial frequency system. In the latter study shown in Fig. 15, it was estimated that were diesels to be used the additional maintenance costs of the locomotives would pay for the additional capital costs of the a-c electrification in less than 13 years.

THE FUTURE ELECTRIC LOCOMOTIVE

To enable the use of single-phase commercial frequency (60 cycles) on any future railway electrification in this country, two types of electric motive power are now available.

1. The motor-generator type of locomotive with d-c motors.
2. The rectifier type of locomotive, also with d-c motors.

Presumably the motors could be identical with the motors now used on diesel-electric equipment.

The motor-generator locomotive would probably be limited in its application to a single frequency. It might be possible, but somewhat more difficult, to design a motor-generator set to operate on both 25 and 60 cycles. A motor-generator set would certainly set to operate on both 25 and 60 cycles. A motor- although in the future general railway electrification envisioned suburban passenger service may not be so important a factor in the traffic handled as in the existing special installations.

The rectifier locomotive has its appeal because of its apparent applicability to any existing system of electrification looking toward the eventual realization of a "Standard System of Electrification." Locomotives of this type are now under construction for one important electrified railroad in this country which will operate on 600 volts third rail in the terminal and on 11 kv 25 cycles a-c out on the main line.

It requres very little imagination to visualize some of the existing 25-cycle 11-kv systems extending for longer runs with 60 cycles 25 kv. The same transformers can be designed to operate on both these frequencies and voltages. Rectifier multiple-unit cars have been in successful operation for several years. One hundred more are nearing delivery for one a-c railroad in this country.

The future commercial frequency electric locomotive probably will be built to the same general designs as present diesel-electric equipment, with same type of motors, trucks, wheels, and underframe. This would make it possible to convert eventually some of the diesels into either rectifier or motor-generator locomotives when a major electrification is again considered. This could save a substantial investment in new motive power.

The application of commercial frequency at high voltage with the rectifier locomotive and the multiple-unit car are two comparatively recent developments which will do much to standardize future railway electrification. This will bring the fixed property investment costs well within the limits which can be financed by the savings to be realized in motive power maintenance, lower power costs, lower engine terminal expense, and lower fixed charges.

The railroads will profit from more economical operating costs. The electric equipment manufacturers will find ne business to take the place of the falling off of the diesel-electric market, now under ay. The electric power industry will profit from steady base loads having good load factors and diversity factors. The large investment institutions will find a good field for safe investment of large blocks of capital. The general public will gain improved transportation facilities.

Electrified railroads have always wanted to get out of the electric power generation business. All railroads are in this business now, in a more expensive way than they ever conceived they would be. Eventually all are going to look for ays and means of getting out of the diesel engine repair business, as well as the electric power generation associated with it.

SUMMARY

How? Future railway electrification can compete with present diesel-electric operation chiefly through the ultimate savings to be realized in lower motive power maintenance costs, lower engine terminal costs, lower power costs, and lower fixed charges.

When? Serious attention will be given to a more economical type of motive power after the present diesel motive power has had at least 10 years of service and when the maintenance costs of the pool of this class of power are no longer kept at an artificially low level by the continued influx of a large number of new units each year. Also when the remaining steam locomotives are worn out and require replacement with new power.

A further impetus would be given by any application of studies now under way to utilize other energy sources to produce cheaper electric power.

Where? The first of these new installations will probably be made on the longer line railroads having a good traffic density and good load factor, in those districts served by adequate electric power networks and supplies. This does not necessarily mean water power, although such large developments could have an important influence on future railway electrification. It is also possible that some of the larger existing electrified lines, particularly those already operating on single-phase, may within the next decade decide to extend their electrification further. If so, commercial frequency and the rectified locomotive will certainly be given careful consideration.

CONCLUSION

To illustrate all of these points, a study has been made of a hypothetic 300-mile section of a 2-track transcontinental railroad for electrification with 25 kv, 60 cycles single-phase, using the 3-wire system with 50 kv across the troller-feeder. The section is assumed to include a heavy grade. Power is considered to be available from an adequate network, partly from water-power sources. The traffic consists principally of 17 freight trains per day in each direction, each requiring 6,000 rail-horsepower in motive power.

The profile of the line is shown in Fg. 16. Helper service is assumed on both sides of the heavy grade. The power supply equipment, transmission, and contact wires are shown in Fig. 17. For this study it is further assumed that the line is equipped with modern coded track signals. Other assumptions are detailed in Table III, which also shows the investment costs for electrification and diesel-electric locomotives, and those annual charges which would be different for the two types of operation compared.

This comparative study indicates that for the long term covered by the life of the electrification, the total investment required for electrification is actually 13.5 per cent less than that required for diesel-electric locomotives. The savings amount to $6,600,000.

For electrification an investment in addition to the cost of diesel locomotives is required for the first 20 years (the life of the first set of diesels) amounting to $17,700,000. The average savings in annual charges during this period will be $2,905,000, or an average annual gross return of 16.4 per cent on this additional investment. The standardization of electric locomotive manufacture could reduce the cost of electric locomotives in the order of 25 per cent over present costs. Applied to this study this would reduce the "additional investment" for electrification to $11,700,000, and the gross annual return would then be approximately 25 per cent.

Exhibit 27.—Prepared Statement of Mr. Spreitzer

PREPARED STATEMENT OF WILLIAM M. SPREITZER, GM RESEARCH LABORATORIES

I am William M. Spreitzer. My responsibility, as Head of the Transportation and Urban Analysis Department of the General Motors Research Laboratories, is to administer the efforts of a group of scientists exploring ways of improving urban public transportation.

My objective today is to respond to Senator Hart's inquiry about what GM has done to promote mass transportation. Our reputation is building superior buses and locomotives is well established and, in itself, demonstrates GM commitments in the area of public transportation. But in addition, we have been working on ideas, concepts and new technology for improvements in urban mass transportation. Our efforts have ranged from rail transit and bus transit to the new technologies which are now being considered as candidates for improvements in transportation as they might exist years from now.

While there have been a number of projects in GM which did not meet the requirements of technology or economics or the ultimate test of public demand, there have been a number of successes. Several will be discussed later.

GM has been interested in whatever types of propulsion systems might be best suited to transportation needs—whteher they be electric, gasoline or diesel. For example, we have supplied transit vehicles with electric propulsion because they appeared at the time to meet the needs of particular customers.

During the 1930's, our coach company made troller coaches for Kenosha and Milwaukee, Wisconsin; and Flint, Michigan. These coaches had the advantage of eliminating the capital cost of tracks but not the overhead electric wires. However, they were limited in use since the trolley coaches could only go where wires were located. Our coach company also built so-called 'all-purpose' trolley coaches which were operated with hybrid propulsion systems, either gas-electric or diesel-electric. These vehicles could be operated with electric power from the trolley wire and when they reached the end of the line they could continue operations on conventional streets and roads with power generated from the gasoline or diesel engine.

The particular vehicles shown in Figures 1 and 2 were used at Public Service of New Jersey[1] During the period from 1935–1937, our coach company supplied 356 of these vehicles to this customer. One was also tried by Baltimore.

GM also experimented in the late 1960's with a 35-passenger coach, shown in Figure 3, using a gasoline driven electric generator to supply power to storage batteries which, in turn, were used to propel the vehicle through an electric motor.

Organizations like ours (manufacturing organizations) attempt to build what the public agencies, the transportation operators and the private individuals want. This explains why GM has devoted constant attention over the years to the search for improved transportation products.

Some major GM innovations which contributed to improved bus transportation over the years include: 1. The monocoque or integral construction which provided a stronger and lighter vehicle than the old type with a body put on a modified truck chassis. 2. The two-cyle diesel engine which provided substantially lower operating costs than competitive coaches powered with gasoline engines. 3. The automatic transmission which provided smoother operation more comfortable to the passenger and eliminated gear shifting which promoted safer operations by avoiding this distraction to the driver's attention. 4. Air suspension which provided for a smoother ride.

Such innovations led to the widespread customer acceptance of GM buses. But we have always had substantial competition and today many manufacturers successfully compete with us for the bus business. There are buses made today by: Flxible, a division of the Rohr Corporation, with vehicles such as the one shown in Figure 4. AM General, affiliated with American Motors, with the vehicle shown in Figure 5. Eagle International (the U.S. factory branch of Bus and Car Co., a Belgian concern), as shown in Figure 6. Motor Coach Industries, as shown in Figure 7. Highway Products, as shown in Figure 8. Prevost Car (a Canadian manufacturer that has sold in the United States), as shown in Figure 9.

As may be determined from the statistics in Dr. Duncombe's statement, sales figures indicate that GM's competitors had 57% of the bus business last year.

Additional companies are entering the field. Some examples of companies which have either introduced or have announced their intention of introducing buses in the U.S. marketplace are as follows:

As shown in Figure 10, British Leyland—a 70-passenger double-decker transit bus to be purchased by New York Metropolitan Transportation Authority.

Neoplan (West Germany)—a 79-passenger double-decker commuter bus to be purchased by Southern California Rapid Transit District as shown in Figure 11.

Figure 12 shows Winnebago—a 20 and 24-passenger shuttle bus.

Otis Elevator Company (Electro Bus Division)—a 21-passenger bus shown in Figure 13.

Figure 14 Westinghouse Electric Corporation—an 18-passenger electric bus.

Flyer Industries (Winnipeg)—a troller bus, depicted in Figure 15.

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[1] The figures and exhibits referred to heerin are submitted to the Subcommittee in Appendix A to the original of this statement.

Shown in Figure 16 is a picture of a new bus, the RTS–2, which GM developed, and which will be introduced next year. A prototype of this vehicle is parked outside the Senate Office Building for your examination. GM has been actively pursuing the development of a number of new bus designs since 1964. In May of last year we announced an expenditure of $32 million for tooling and equipment to produce this new line of coaches. If you haven't already had a chance to look at the RTS–2 in detail, we would invite your attention to its key features:

Modular construction—the vehicle is manufactured from standardized five-foot long sections in an effort to reduce manufacturing cost, Expanded glass area, Fiber glass exterior panels for ease of repair, A lower floor, A 'kneeling' feature which permits the bus steps to be lowered to curb level, a real assistance to the handicapped and the elderly. A general attention to the comfort of the passenger is provided while maintaining the reliability, maintainability and durability or long life of the vehicle.

The RTS–2 has created great interest among transit operators. They eagerly await its availability.

We are also cooperating with the Urban Mass Transportation Administration in producing three prototype buses involving new design concepts.

Let me now explain more specifically the activities of the Transportation and Urban Analysis Department. The Department was organized in 1966 pulling together prior GM work in the public transportation areas. The assignments were clear and unmistakable—to do long range work to help identify new transportation needs, potential solutions and products. Any mode of transportation that would fill a social need would interest us.

Our Transportation and Urban Analysis Department presently has a staff of 29 people, with backgrounds in a variety of disciplines bearing on mass transportation. Working relationships are established with a number of public agencies and unrestricted grants are or have been in force supporting transportation-related and urban studies work at the Massachusetts Institute of Technology and the University of Pennsylvania.

A wide variety of transportation concepts has been reviewed and analyzed—from rail transit to innovative rubber-tired bus rapid transit. Included are the inventions and concept developments of individuals from several GM Staffs and Divisions—the Electric-Motive Division, the GM Design Staff and the GMC Truck and Coach Division.

Representative examples of some of these concepts follow:

Figure 17 shows *Rail Ferry*—an electrically propelled rail car train equipped to carry small buses or automobiles 'piggyback' for relatively long distance trips within metropolitan areas.

Dual Powered Rail Transit Cars are shown in Figure 18—a commuter rail car with a dual propulsion system, either diesel-electric or straight electric in order to extend operations beyond the electrified portion of the rail line much like the 'all purpose' trolley coaches built for Public Service of New Jersey in the 1930's.

Network Cab, shown in Figure 19, is a HOVAIR (GM-patented) air-suspended, electrically propelled 'people mover' studied in the context of the downtown transportation needs of the City of Philadelphia in the year 1990.

Multi-modal Capsules—an extension of the Network Cab concept just explained to provide door-to-door airport access service for people and freight by transporting the small people mover containers over their own guideways or 'piggyback' on flat bed rail cars or flat bed trucks, shown in Figure 20.

Demand Responsive Jitney or DIAL-A-BUS (Figure 21). The now familiar public transit small bus service that operates door-to-door, requested by telephone, and providing taxi-like service at bus-like fares by sharing the ride with others.

Bi-Modal Bus—the forerunner of what the U. S. Department of Transportation now calls 'Dual Mode Transit' is shown in Figure 22. It is essentially a DIAL-A-BUS driver-operated on surface streets or highways and in an automated driverless fashion on fixed, elevated guideways completely separated from other traffic.

Autoline (Figure 23)—an automated highway concept for city-to-city transportation improvements for distances of 200 miles or longer.

Bus Trains—the operation of transit buses mechanically linked together into groups of three or four vehicles or more—like a train operating on an exclusive guideway separated from other traffic as shown in Figure 24.

People Movers for New Towns—a variety of public transportation concepts were considered for meeting the specialized transportation needs of so-called 'New Towns'. More detailed analyses were made of an automated, electrically-propoelled, steel wheel on steel rail system for a particular 'New Towns' development as depicted in Figure 25.

Two considerations are of particular significance with regard to these transportation concepts.

TRANSPORTATION DEMAND ESTIMATION

The first major consideration is "How many people will really use that new or improved transportation system being proposed?" GM's approach to this question emphasized consideration of individual attitudes and opinions obtained in home interview surveys. Attitudes toward a wide range of things like transit fare, comfort of seats, door-to-door service, assurance of arrival time and many other factors are collected from many different kinds of people for several different kinds of transportation. We want to find out how potential transportation system designs can be made more attractive to potential passengers. Our goal is to be able to predict with some greater accuracy the number of people who are likely to use a particular transportation system design under varying conditions of travel time, fare, level of service and other factors.

These demand estimation procedures have been developed and applied in a case study of a DIAL-A-BUS System for a community that is hopefully representatives of maybe 100 other American cities. In addition, the procedures were cross-validated by application in a somewhat different community—a "new ton"—in a cooperative study with a graduate student from the University of Minnesota.

These types of analytical techniques are now being used by the GM Transportation Systems Division, which will be discussed later, in their Dual Mode Transit study under contract to the U. S. Department of Transportation.

"MATCH"

The second consideration is that what is a good transportation system for one community—like Washington, D. C.—may not be good for another—like New York City. Washington and New York are two cities with general familiarity to us all. How are they similar and how are they different particularly with respect to their transportation-related characteristics? How might this information be used in the definition of national transportation needs and product opportunities?

GM's approach to this problem is a computerized statistical evaluation of the significance of differences and similarities mapping cities affecting their transportation needs. This approach is called "MATCH", for *M*etropolitan *A*rea *T*ransportation *CH*aracterization techniques. The objective is to use the computerized technique to group and classify metropolitan areas on the basis of such things as transportation-related characteristics. Such a grouping of cities with similar transportation profiles is being used to help forecast the success and market potential of new and innovative transportation systems.

GM METRO-MODE AND METRIP

The final examples I wish to offer today relate to the current recognition of the potential for immediate and relatively inexpensive improvements in transit justifiably claims credit for much of the current success. Two basic ideas are involved: (1) METRO-MODE—bus rapid transit through the use of high speed exclusive lane on freeways and (2) the more efficient use of buses through exclusive existing downtown streets—we call that METRIP.

Let's look at METRO-MODE first. This is a rapid transit system provided by an exclusive bus lane built into the freeway. It has some important advantages. It permits the buses to carry high volumes of passengers without getting tied up in rush hour traffic. At both ends of the expressway the buses can collect and discharge passengers on the local streets, thus enabling most passengers to avoid transfers. And the capital cost, as demonstrated by studies made by the Southeastern Wisconsin Regional Planning Commission for the I-94 corridor running west of Milwaukee, was about half that of rail rapid transit, a factor of importance in transportation projects costing millions of dollars.

GM has promoted Metro-Mode through scores of speeches to transit systems, civic groups, highway departments, motor bus associations, city governments

and any interested group. As example is the address made by Mr. E. F. Lewis, formerly Coach Sales Manager, before the Indiana State Transportation Committee at Indianapolis on October 2, 1967 (copy attached).

Brochures were also widely distributed, such as the attached booklet called Metro-Mode describing the Milwaukee Project. Since the 1950's GM has distributed widely a series of promotional films which it prepared on the subject. There are 35 copies available of the most recent version of those films, one called "Winning Ways". Some transit operators have purchased their own copies of the film for local showings on a continuing basis. The earlier versions of these films have been widely circulated to transit operators and transportation authorities throughout the United States, including copies supplied to the Federal Highway Administration which has utilized some of the ideas and even borrowed actual scenes from the film in producing and distributing its own film on the subject throughout the country. In facts, a recent study commissioned by the U. S. Department of Transportation evaluating 21 low cost alternatives to 'capital-intensive' transit solutions, opted for exclusive bus lanes on freeways as the most promising technique.

(EXCERPTS FROM FILM "WINNING WAYS" SHOWN)

These movies stress that the bus, as compared to the automobile, is a more efficient way of moving people in congested areas. The movies advocate that buses are entitled to special rights-of-way because one bus can carry up to 20 times as many people as two automobiles. GM films and booklets have been bus operations being promoted by the U. S. Department of Transportation. GM a major factor in the renewed interest in buses as an improved form a rapid public transportation.

With the experience gained in the early 1960's with Metro-Mode buses traveling *non-stop* in exclusive lanes, the GM Research Laboratories then extended its work (theoretical and experimental) to a study of what might be accomplished in start-stop type operation: buses still in a reserved lane but with on-line stations to pick up and deliver passengers. In this fashion the advantages of the exclusive lane might be extended into and through downtown areas.

The simple principle involved here (which we call METRIP as contrasted to Metro-Mode) is to operate buses follow-the-leader fashion in groups of three, four, five or six, leaving gaps between the groups. In this manner, transit buses could be operated platoon fashion on existing city streets (albeit in a reserved curb lane), loading and off-loading simultaneously, leaving gaps in the bus traffic between platoons to accommodate normal cross traffic. Advantages are demonstrated in proving ground experiments in the area of average operating speed. Passenger boarding advantages and the ultimate validation for such a system could only be done in the real world. Therefore a search was made for an optimum location to do such a demonstration and a project is currently underway with the cooperation of the Rochester Genesee Regional Transportation Authority and the Regional Transit Service of Rochester, New York.

The METRIP system includes electronic transmitters on the buses, changeable message passenger boarding signs in "station" areas on which advance information can be provided to people waiting for a specific bus route and a computer to tie the elements together. Two station areas are presently provided along a stretch of Main Street in downtown Rochester. GM has supplied the funding for out-of-pocket expenses to provide the METRIP-related hardware and a study team of professional researchers.

Final results are about to be obtained and an analysis of the potential of GM METRIP for application in Rochester and other cities will be available later this year. As usual, the path to ultimate success is tenuous. It's been almost 17 years from thoughts in the scientific vein to possible application and we still don't know whether success is in hand or not. It's one more example of the Corporation's commitment to the search for better transportation.

A few final comments—General Mottors has recently underscored its commitment to the achievement of better urban transportation systems by establishing a new GM Transportation Systems Division which the Chairman of General Motors has said "will coordinate, intensify and enlarge GM's activities in urban and public mass transportation systems. It will enable us to employ the full resources of General Motors towards participation in the overall transportation needs of the United States." Among the expertise utilized will be that

of the GMC Truck and Coach Division in bus transportation, Electro-Motive Division in rail transportation, Delco Electronics Division in guidance and control systems, Detroit Diesel Allison Division in power trains and the advanced scientific techniques of the GM Research Laboratories. The Division will draw upon all the capabilities of General Motors in working closely with the federal government and municipalities to develop and implement the transportation systems these public agencies want and need.

It is recognized that you are all well aware of the incredibly complex situation in which the urban transportation issue is imbedded. Much more than hardware is involved. Simplistic solutions fail in the fact of the fact that all cities are somewhat different. What works in one may not work in others.

GM's forte is hardware manufacturing and systems management. We are applying those talents to the continued search for better public transportation.

Exhibit 28.—Excerpts From Business Week, March 16, 1974, Re General Motors and Small Cars

COMPANIES: THE AUTO GIANT SHIFTS INDECISIVELY—THE SMALL CAR BLUES AT GENERAL MOTORS

When the 1975 automobile model year begins next fall, the Ford Motor Co. will be ready with seven small cars, two of them new, in response to a market trend that President Lee A. Iacocca calls "irrevocable." Chrysler Corp., lampooned widely for picking the current model year to launch a new line of big cars, will nevertheless have 60% of its production capacity committed to compacts. American Motors Corp., the only automaker showing sales gains this year, is showing them all on small cars.

And how is General Motors responding to the small car boom? The world's largest manufacturer is rife with confusion, indecision, even panic. "We don't know what the hell is going on," says a frantic middle manager at GM's Oldsmobile Div. "First we were told we were going to shut down our big car lines from April until August, then that it would be for only a month or so this spring. Now I hear that we are going to build X-bodies [compacts]."

GM, the drummer that the industry has marched to for almost 50 years, cannot decide whether to swing heavily into the small cars that the turbulent, tricky market seems to be demanding or to continue to push the bigger cars that deliver the bulk of the company's earnings. As a result, the company that last year amassed 44.4% of industry sales, including imports, has seen its market share drop to 37.5% in the past two months—a massive tumble in the auto business. Sales for the year through March 10 are down a huge 37%. As things stand now, Ford, with two-thirds of GM's sales volume and a traditional quarter market share in autos, will be able to produce more compact and subcompact cars next fall than GM.

Right into this month, GM's chairman, Richard C. Gerstenberg, 64, was indicating that the company would respond to soaring demand for fuel economy ambivalently, with compacts and subcompacts but also with intermediates that do not look much smaller than so-called full-sized models. "We've got some pretty good plans for intermediate cars down the road," Gerstenberg said. They and full-sized cars will represent 60 percent of production capacity this fall, the company figures.

GM is thus taking a decidedly different tack than its competitors in reacting to a marketing phenomenon that Gerstenberg described to a Chicago audience last week: "Customer preferences which we foresaw for the late 70s have become evident right now, even before the mid-70s." The company had just witnessed a precipitous 42 percent production decline in January and February, and recent cost reduction decisions point up the company's trouble. It has halted construction of two new assembly plants, a car plant in Oklahoma City and a truck plant in Memphis, and delayed expansion plans for the Oldsmobile and Buick divisions. Last weekend it announced temporary layoffs at 16 of 22 assembly plants to bring big car inventories in line with sales. It also cut out the second shifts at three plants. To make matters worse, the troubled, super-automated Lordstown, Ohio, plant, GM's biggest Vega assembly facility, suffered a new walkout.

PERIOD OF UNCERTAINTY

It is conceivable, of course, that time will show GM to have been strategically hedging its bets, straddling the whole gamut of car sizes. It is uncertain now whether termination of the Arab oil boycott, for example, will sweep away the market's uncertainty and send consumers back to the full-sized gas guzzlers. Ford, American Motors, and Chrysler, however, think that the small car trend is massive and irreversible. Says Arjay Miller, dean of Stanford Business School and former president of Ford, "The energy crisis has had a permanent effect on the mix of cars to be sold." If he and the competition are right, GM faces two or three of its roughest years ever trying to catch up.

GM was headed for trouble well before the end of last year. While 1973 earnings climbed 11 percent to a record $2.4-billion, they declined 22 percent in the final quarter. This year, Wall Street analysts think the company will be lucky to earn half what it did last year, and they do not see earnings rebounding to 1973 levels until 1976 or 1977. By midweek, about 70,000 GM workers had been permanently laid off, and dealers were waiting in lifeless showrooms with immobile inventories of 890,000 GM cars, or an 81-day supply, about 30 days above normal. Industry figures for January and February told much of the story. Small car sales were up 2 percent for the period, but intermediates were off 27 percent, and full-sized cars fell 50 percent. The driver waiting in a gas line with a Buick that gave him as little as 10-mi. per gal. was not so sure he would really rather have another Buick.

The opportunity for a major redirection looms later this year with the retirement of Gerstenberg, a financial specialist, and President Edward N. Cole, 64, an engineer. But there is no probable successor who is a product man, like Cole, at a time when product decisions are the most crucial facing management. Nor is there anyone in the wings who is strong enough and young enough to build a new corporate identity and burst through the dull gray managerial mantle that has shrouded the company since the reign of Harlow Curtice, who retired in 1958. Moreover, the financial types who have come to dominate the top executive cadre may have been maximizing short-term profits at the expense of the long-term and product development. It is well known inside GM that Ed Cole's influence has deteriorated over the years. That may lie at the core of GM's delayed response to the small car trend. Some critics say GM now needs a man like John Z. DeLorean, a flamboyant, youthful executive —and potential chief executive—who resigned last spring as head of the Car & Truck Group because he felt frustrated.

SYMBOL OF CAPITALISM

For years, General Motors has been the unparalleled prototype of American capitalism. Few companies could touch its marketing genius, its financial control, its management expertise and facility for breeding new managers, its reputation for citizenship in its communities, its bold if tardy efforts to employ and train minority groups, and its uncanny knack for fattening earnings in defiance of economic laws that say the bigger a company is, the slower it grows. In 1954, GM was a giant with sales of $9.8-billion; last year, sales were up to $35.8-billion.

GM is the industry's acknowledged pricing leader. Ford and Chrysler have been forced into embarrassing price rollbacks on new cars after GM announced lower prices. In many ways, GM is also the styling leader, if not the top innovator. After a disastrous styling departure with the fabled "fins" of the early 1960s, Chrysler reverted to GM's basic sculptured design. As Chrysler Chairman Lynn Townsend explained: "GM sells five of every 10 cars, and we sell ony two." Chrysler's new big cars are unabashed copies of successful GM products.

Even before the Arab oil embargo, critical rumbles were shaking the GM edifice, no doubt a consequence of being the No. 1 automaker. In an environment where social critics chastized companies for single-minded devotion to profits, consumerists attacked GM for building dirty and unsafe cars on dehumanizing assembly systems, and for blind waste of resources. GM has also been charged with seducing consumers into buying bigger cars than they needed and to trade them in for new ones sooner than necessary.

Some congressmen, notably Senator Philip A. Hart of Michigan, even talk about breaking up GM. One target is the automaker's strong franchise in mass transportation on the grounds that its power could be used to thwart mass transit development. In recent testimony before Democrat Hart's antitrust and monopoly subcommittee, Los Angeles Mayor Thomas Bradley charged that in the early 1940's, GM bought the Los Angeles street car system only to tear it down.

The company makes diesel engines, locomotives, and buses, and in January it formed a transportation systems division. But critics doubt that GM can put its soul behind it. "To the extent that buses thrive, cars don't," says Robert Heilbroner, the New School economist and author. He suggests that GM's bus business might be divested. "Pushing private cars in one case and public transportation in another results in a conflict of interest," he says.

THE AILING BOP LINES

Most of what ails GM comes down to big and medium-sized Buicks, Oldsmobiles, and Pontiacs—the BOP lines, and to a lesser degree, Cadillac. GM makes its greatest per-unit profit on Cadillacs and the least on Chevies, although Chevrolet is far and away the company's sales leader. The production cost difference between a Chevrolet Caprice and a Cadillac de Ville with comparable equipment is $275 to $300. But the selling price differs by $2,700, giving GM a $2,400 extra gross profit on the Cadillac. GM, unlike the other companies, learned to exploit those differences in the fat medium price range. The profit difference between that Caprice and an equivalent Oldsmobile is $1,200.

Ford and Chrysler's Plymouth have always been able to compete effectively in Chevrolet's market and in recent years, Lincolns and Mark IVs have managed to ship away at Cadillac. But neither Ford Motor nor Chrysler is much of a threat at the BOP market. Ford's worst attempt was the Edsel, a $250-million casualty. Chrysler's De Soto also tried and failed. "GM's strength has been in the full-sized car," says Chrysler's Townsend. "That has always been our weakness." Adds Bennett E. Bidwell, general manager of the Ford Div.: "Before, we never really cut into GM's penetration. They were the Bank of America."

Another critical factor in GM's profitability in recent years has been vertical and horizontal diversification. The company makes some or all of every component it uses except steel and glass. More and more, the company fosters intra-divisional use of standardized engines, axles, transmissions, bodies, and other components to achieve economies of scale. And now the Assembly Div. builds all GM cars not manufactured in the car divisions' home assembly plants. It is no wonder that GM's return on investment—19.1% last year—is consistently the industry's highest and one of the highest for all industrial companies.

Now, in a sense, GM is a victim of its own success. "Other companies don't have the same relative exposure to trouble now because they had to devise strategies in the past that emphasized areas that GM was not strong in," says an auto analyst. GM, by contrast, hesitates to play with a profit formula that works. As a result, Paul W. McCracken, University of Michigan professor and former chairman of the Council of Economic Advisers, sees market penetration shifting around as Ford, Chrysler, and American Motors swing into small cars. "There is more fluidity in how the market penetration will be shaping up here than we have seen since the 1920s," he says.

The 20s were Ford's Waterloo. The market collapsed in 1921 following an extended boom. GM was floundering, hanging onto only 12% of the auto market compared with Ford's 60%. Alfred P. Sloan recalled in *My Years with General Motors:* "Not only were we not competitive with Ford in the low-priced field where the big volume and substantial future growth lay—but in the middle, where we were concentrated with duplication, we did not know what we were trying to do except sell cars which, in a sense, took volume from each other." Ford, meanwhile, was riding high with the plain, black, single-line Model T.

Sloan and GM redefined the niches in the marketplace, made decisive moves in paring the company's automotive operations from seven to five, gave each division operating autonomy, and gave each car a distinctive price and style

category in response to a growing consumer demand for diversity. Ford ignored those moves. And ultimately, Ford had to junk the Model T. The penalty was a total shutdown for almost a year as the company switched over to the Model A. But by then, GM was well en route to capturing half the domestic car market.

LACKING THE SMALL CAR IMAGE

This time around, the Model T may be GM's. Even as it tries now to expand its small car capacity, it cannot rely on the 70% automatic return business it gets on big cars because driver loyalty tends to diminish as cars get smaller. Further, unlike Ford, American Motors, and the importers, GM lacks a small car image. GM dealers' huge BOP inventories include many unsold smaller cars because shoppers rarely think GM in going out to buy one. Through its strength in compacts and subcompacts, Ford is betting it can extract 5% additional market penetration in the next two years from GM—an astounding achievement in an industry that heralds a 1% gain.

Even for Ford, though, the market today is a can of worms. It is awash with uncertainty, and even the small car market is showing signs of softness. People are depressed over Watergate, inflation, gasoline shortages, and generally bad news, says Jay W. Schmiedeskamp of the University of Michigan's Survey Research Center. This, he says, creates uncertainty. "Uncertainty feeds on itself. The biggest thing that is killing the big car is the uncertainty. The key factor in the energy crisis is the U.S. Government in which people have zero faith." Said Gerstenberg in Chicago: "The public needs to be told, clearly and with consistency, where we stand with respect to gasoline availability."

Schmiedeskamp suspects that if all the uncertainty were to dissipate, the big cars would come back, though not in previous record number. "There is a hard core of big car buyers who are going to give them up reluctantly," he says. "Desired behavior trends tend to change rather slowly. Some of these people are entirely resistant to the small car."

Phenomena far more profound than fears of gas shortages also seem to be wafting through the marketplace. Families are smaller, gas is costlier, parking space is scarcer—factors that stimulate small car sales. Many of those sales have been going to imports, which now hold 15% of the market despite the loss of their pricing advantage. "We are in a pie that is growing bigger," says Norman Leau, Toyota's U.S. sales manager, with great enthusiasm. Ronald Glantz, an auto analyst with Mitchell, Hutchins, Inc., sees an "increasing percentage of Americans who don't want what Detroit offers and specifically what General Motors offers." Harvard sociologist David Riesman perceives a "downward spread of aristocratic values."

"If you visit colleges in non-cosmopolitan areas," Riesman says, "you will still find both faculty and students driving tanks." But, he says, the move to smaller cars is like "the tipping of a neighborhood," in that nothing much happens until a sort of critical mass is reached when things happen very fast. First there is "the realization that whatever the desirability of a big car, it isn't stylish anymore," and second, "the realization that a certain proportion of people are doing something else." What Riesman calls "aristocrats" have lost their desire for showiness. And he adds: "Showiness has been so long satirized that it has become an embarrassment."

A CALM PUBLIC FACE

Publicly, General Motors executives seem unperturbed by all that is spinning around them. Pushing a button under his big walnut desk to close the door, Gerstenberg explains to a visitor: "It is easy to overestimate where that thing [the market] is going because of the situation we've been in here for the past 60 days. The rules have changed a little bit. We're down in penetration, and we're working hard to get it back."

Elliott M. "Pete" Estes, executive vice-president, operations-staff, seemed equally self-assured at a recent Detroit press gathering. "Things are not as good as we would like them to be," he said, "but they indicate that we've bottomed out, and I'd have to say that I'm optimistic." The head of the Chevrolet Div., F. James McDonald, is outright bullish. At the Chicago Auto Show a few weeks ago he declared: "We think that 1974 could be our second best year." However, reports from inside GM's massive headquarters on West Grand

Boulevard in Detroit indicate that the quiet executive demeanor is a well-staged facade.

Says a Ford man: "While that Olds guy is telling you that big cars are here to stay, he's screaming like hell in those executive committee meetings, 'I've got to have a small car or my dealers are going to take gas.'" Now and then, the confusion surfaces, as it did following a decision to expand 6-cylinder engine production at the Flint (Mich.) plant. One day in Detroit, Gerstenberg was explaining that other plants would also be used for six-cylinder production, while Estes was telling reporters in Chicago that the Flint facility would be the sole source of sixes.

The corporate aplomb breaks down further among dealers. A Los Angeles dealer with enough Olds 88s and 98s to last through the end of the year is bitter. "I'm losing money badly right now, and it won't be too long before I'll have to decide on weathering it out or not," he says. "What it boils down to is that the company has been too slow to wake up to the energy crisis and do what the dealers need."

Labor is just as anxious. "I wake up in the middle of the night and just worry how this thing is going to be settled," says Irving Bluestone, the United Auto Workers vice-president in charge of the GM department. "We've got 65,000 or more members on permanent layoff and thousands more on temporary leave."

GM is, at least, keeping an eye on its flanks. Since the end of its 1973 model run in September, the company has converted one plant from intermediate (112-in. to 118-in. wheelbase) to small car production. It has boosted production of the subcompact Vega at the Ste. Therese, Quebec, plant by 40% and will start tooling up Apr. 5 for Vega assembly at the Southgate (Calif.) facility which had been assembling big Chevrolets, Buicks, and Pontiacs. This spring GM will also switch from building big Chevys to compact (108-in. to 111-in. wheelbase) Chevy Novas and Pontiac Venturas at its Tarrytown (N.Y.) plant. Those conversions will increase GM's small car capacity to 40% of the total by next fall.

That is still far under its competitor's goals. Some critics also wonder whether GM might have missed an opportunity to take advantage of its delays and build a better small car. An equivalent of the German Audi or the Swedish Volvo, for example, would give the company muscle in the high-profit, medium-price market while meeting demand for fuel efficiency. So far, the only such initiative that GM is known to be planning is a scaled-down Cadillac to be launched late next year. But it will be trailing Ford again. In September Ford will introduce two mini-luxury cars—the Mercury Monarch and the Ford Grenada—in the $4,000-plus category. Both cars resemble the Mercedes.

Arjay Miller is convinced GM will make the right moves eventually. "There will be some dislocation in the short run because of the energy crisis," he says. "But GM, both the company and its dealers, have the financial resources and the credit, if they need that and I doubt it, to turn it around. You go back through the years and you have a pretty hard time marking GM for not being responsive."

BIGNESS GETS IN THE WAY

Still, wherever GM goes with small cars, it will travel a road littered with corpses. Off and on for years, Americans have been offered small cars—the Crosley, the Henry J, the Nash Metropolitan, English Ford's Cortina and Anglia, Chrysler's French-made Simca—all of which have perished or been pulled out of the domestic market. GM's Corvair went down under Ralph Nader's gun. Ford found a successful candidate in the Falcon, but it robbed volume from other Ford lines.

GM may be the worst positioned of any auto maker to move boldly into new products. "Big companies get so diffused by their bigness that they can lose focus," claims Eugene A. Cafiero, Chrysler vice-president for North American operations. Says economist McCracken: "The very characteristics which make for effective low-cost management in a stable market are the same that make it hard to make 90-degree turns." Adds William J. Abernathy, a Harvard Business School professor, who is launching a major government-supported study of the auto industry: "You can't have great efficiency and real innovation. There's no such thing as a free lunch."

That may be a matter of opinion. "I wouldn't agree with Abernathy at all," says Miller, the former Ford president. "A larger company can gamble because it has the money to do so. Look, General Motors put $50-million on the line for the Wankel engine. American Motors could not have done that."

Nevertheless, GM has trailed the industry in recent years in innovation. Ford's original Mustang, this year's new Mustang II, and the Maverick all beat comparable GM products into the marketplace. No auto maker has been able to match the public relations clout of American Motors' Buyer Protection Plan. GM's few notable departures in recent years have been the ill-fated, rear-engined Corvair and the Lordstown plant, an innovation in automation. Lordstown's workers struck last year, however, not over the usual grievances, but over working conditions.

But despite this background—and the shocking sales reports and dealers' wails—many industry watchers are confident that GM will manage simply because it is GM. Dealers, they not, have always cried when sales slipped. "All the resources are there," says analyst Donald DeScenza of Donaldson, Lufkin & Jenrette. "It's just a question of time." Adds Miller: "GM has the money. They are planning fast. They will be in the finals."

Indeed, new tactics do appear to be poking through the clouds over GM. They include deemphasizing the biggest cars in favor of intermediates, a belated stress on compacts and subcompacts, and loading the smaller cars with high-profit options. Additional subcompacts will be made or imported to round out the lines of Pontiac and Oldsmobile, which do not currently offer such cars. Production of 6-cylinder and smaller 8-cylinder engines to improve the fuel economy of intermediate cars will be increased. And GM may also revive the fundamental divisional and product line identities that were created in the 1920s and 1930s. They were dissipated over the past decade as component and assembly commonality was emphasized.

Restoring the old distinctions would be the most significant. Rationalizing manufacturing has, as intended, buttressed earnings. But it may have stifled earnings improvements in other respects. By reducing divisional autonomy—a cornerstone of the 1920s recovery—the company may have sacrificed intra-divisional competition and the quest for innovation, leading to largely superficial differences among GM cars. Years ago, a buyer could choose among the Buick Dyna-Flow, the Olds Hydramatic, and the Chevy Power-Glide automatic transmissions, for example. Today there is only one. Price distinctions have softened, too. Today a consumer can buy a Buick, Olds, Pontiac, or Chevy for $4,000.

In rounding out the car lines with subcompacts, GM is planning a Vega-derivative for Pontiac, similar to the Pontiac Astre sold in Canada, and is rumored to be scheduling an as-yet-unidentified import for Oldsmobile. "Our best knowledge from Oldsmobile," says Dallas Olds dealer Jerry Freeman, "is that we will have an imported small car by this fall. That's the rumor anyway." Olds may also get the Wankel-powered minicar originally planned for Chevrolet, and Chevrolet is scheduled to get another Vega-like car next year to compete with Ford's Mustang II.

KEEPING THE DEALER AFLOAT

Imports, to be sure, are only a stop-gap, intended to give dealers who are awash with cars they cannot move something to keep them afloat. Further down the road, GM appears to be planning a subcompact for Chevrolet that will be smaller and lower-priced than anything its sister divisions will be selling. Says Gerstenberg: "We're watching what's happening to a couple of small cars in our overseas operations—the new Opel Kadett we introduced in Germany and a new Chevette in Brazil. Where the Vega is 2,300 lbs. to 2,400 lbs., those cars are 1,750 lbs. to 1,800 lbs."

With small cars likely to dominate GM production eventually, observers wonder whether the company should continue to try to support five divisions. Ford and Chrysler each have two car divisions. Says Stuart Perkins, president of Volkswagen of America: "My feeling is that there are too many divisions at GM. They will go through a process of simplification." Adds a GM competitor: "It's got to be a problem. How can they support four big car divisions when there is only one place to go, and that's where Chevrolet is?" Gerstenberg admits that the big car divisions are hurting today, but he denies some Wall Street reports that one or more may be losing money. "I think that every one of those BOP divisions will be viable outfits down the road," he says.

Such optimism has done little to placate GM's strong and usually loyal dealers. Never before have they seen the bottom fall out of their bread-and-butter products so fast or so far. A man who knows GM well sees Ford making hay of the dealers' plight. "Iacocca seems to have made the right moves in adding more small cars to the company's product mix," he says. "Now if you are at Ford, and you are on the ball, you figure how to take 500 BOP dealers for Lincoln-Mercury. If Ford stays tough, the doors are wide open." A Pontiac executive says he faces losing 10% of his dealership next month.

Jerry Freeman, the Dallas Olds dealer, says he lost $48,000 in December and $12,000 in January. "We don't have a single small car for attracting the public," he says. In Atlanta, Buick-Opel dealer D. L. Claborn says that "it will be rough for the next couple of years." So he is cutting advertising and staff.

Part of the problem is image. People are looking to small car companies for small cars. Datsun, for example, sold almost 34,000 cars in January and February, up 10% over the same month last year. Another problem is that BOP dealers never really had to move small cars. They would use the compact Buick Apollo or Pontiac Ventura to lure customers into the showroom and then super-sell a big car. And then, many of the small cars BOP dealers have on hand feature thirsty V-8 engines. So the compacts the BOP dealers do have are not selling much better than bigger cars. At the end of February, Buick had a 138-day supply of Apollos on hand. Says Edgar Fleck of San Francisco's Lesher-Muirhead Motors, Inc., an Olds dealer: "We think GM's long-range planning has proved unrealistic. It has people working on this who should have come up with the right answers."

DID GM MISS THE BOAT?

The right answers may have been two small-car programs that top GM management pigeon-holed a couple of years ago. One was the so-called "K-Program," a far-reaching concept that proposed squeezing all cars, from the intermediate level down, into lighter, smaller packages with smaller engines. The other program called for shrinking the full-sized cars into intermediate sizes. Either approach would have borne fruit by now, and in view of current developments, both are back under review.

George Qua, a Cleveland Buick dealer, says that former GM executive John DeLorean pushed management to adopt smaller cars, including those that would have been borne of the K-Program. But, says Qua, "nobody wanted to call off the party since it was going so good. Guys like DeLorean could see this thing coming, but nobody would listen to them." The company may be learning. In the past year, Chevrolet began an "Alternate Futures" program designed to anticipate rapid market changes and to build enough flexibility into the manufacturing system to respond quickly.

Gerstenberg, nevertheless, sees most of the difficulty in sales terms. "We've got a selling job to do with the dealer," he says. "And he has a job to do with the customer." He doubts that many dealers will drop out. "Oh, I hope not," he says. "They are coming off three awfully good years, and hell, they are good businessmen. They are going to adapt to the needs of the market."

The company is, nevertheless, making things a little easier. It is not forcing big cars on dealers, for example, and in many cases it is offering cash bonuses —$250 at Chevrolet—for selling full-sized cars. They can use it. Some are still stuck with 1973 models. Hansord Pontiac of Minneapolis, for one, started the new year with 350 of last year's cars on hand.

Dealers want more help. They are asking GM to deliver cars on consignment or to extend payment terms from 20 to 60 or 90 days. But Gerstenberg says the company will not consider sending out cars on consignment, and Murphy Wright of Taber Pontiac in Atlanta says: "We have pushed for a 90-day floor-plan [inventory and financing], but we have gotten nothing." Says DeLorean: "I think if I were still at GM, I would find a way to give dealers 90-day floorplanning right away."

General Motors Acceptance Corp., the financing arm that bankrolls dealer inventories, has apparently adopted a pick-and-choose policy in assisting dealers. Some Chicago dealers say GMAC lowered interest rates 1% in February, while San Francisco's Fleck says the financing company has not budged a fraction.

General Motors' troubles today come down ultimately to the men in charge, their push for quarter-to-quarter earnings gains, and their devotion to financial control. "The guy who takes a nickel out of a switch around here is a hero," says one GM man. The moves toward consolidating divisions and component commonality certainly had their roots in corporate desires for tighter financial control. And if the finance side of the company takes the credit for GM's earnings performance, it must also take the blame for getting caught short on product innovation and responses to market changes.

THE SHUFFLE AT THE TOP

With Gerstenberg and Cole retiring, the odds-on favorite to succeed Gerstenberg as chairman and chief executive is Vice-Chairman Thomas A. Murphy, 58, a financial man with some operating experience. For the president's job, neither of the two front-runners has Cole's stature as a product expert. One is Richard L. Terrell, 55, executive vice-president for car and truck-body assembly, who spent most of his 36 years at GM in the non-automotive Frigidaire and Electro-Motive divisions. The other, Pete Estes, had 34 years of divisional experience at Pontiac and Chevrolet. But Estes, 58, is blamed for letting Chevrolet lose market share from 1965 to 1969.

Death and resignation have thinned the top ranks. DeLorean's departure was seen as a serious blow to product development. In 1968, the company lost another top product man, Semon E. "Bunkie" Knudson, who quit after the presidency went to Cole. One promising comer was John Beltz, Oldsmobile Div. general manager, who died of cancer two years ago at 46. Then last December the highly regarded former head of GM in Canada, John D. Baker, died unexpectedly after only two months running Oldsmobile.

There are also signs of conflict. Last year's appointment of Oldsmobile's head, Howard H. Kehrl, to succeed DeLorean as group executive for cars and trucks touched off grumbling among other car divisional managers, all but one of whom had more experience than Kehrl and did not like being bypassed.

Whatever the makeup of GM's next first team, it should find a timely message in words that Alfred Sloan set down: "Even mistakes played a large part in actual events . . . And if our competitors—Mr. Ford among them—had not made some of their own of considerable magnitude, and if we had not reversed certain of ours, the position of General Motors would be different from what it is today."

Exhibit 29.—Excerpts From New York Times, March 24, 1974, Re GM Emphasis on Big Cars

THE ENERGY TRAUMA AT GENERAL MOTORS * * * WITH ITS EMPHASIS ON BIG CARS

PROFITS TUMBLE AS A FUEL-CONSCIOUS PUBLIC SHUNS BIG CARS—MANAGEMENT IS CRITICIZED FOR MISJUDGING LONG-RANGE ENERGY PROBLEMS

By Marylin Bender

Probably no American company has suffered so swift and stunning a blow from the energy crisis as the General Motors Corporation, the quintessence of infallibly managed business enterprise, the Goliath of the world's industrial concerns, with Ralph Nader likens to a nation-state. Since last October:

G.M. has slid into its worst sales slump since the 1958 recession. So far this year, its car sales are down 35.7 percent.

G.M. has been toppled from its pedestal as America's most profitable industrial corporation and replaced, ironically, by the Exxon Corporation. Bewildered security analysts are predicting first-quarter earnings for G.M. of anywhere from 35 cents to $1 a share, a staggering decline from $2.84 a share in the 1973 first quarter.

G.M. has closed as many as 15 of its 22 automobile assembly plants and three of its four body plants to reduce the glut of unsold big cars and convert more production to its popular smaller cars. Still, G.M. will be making fewer small cars next fall than its archrival, the Ford Motor Company, No. 2 in the industry.

G.M. has laid off 65,000 workers and has put 57,000 more on temporary furlough. And the troubles of the company, the major influence in the nation's

leading industry, have rippled into the economy through G.M.'s 13,000 franchised dealers and 45,000 suppliers.

G.M. has attracted fresh attacks from its critics. They are charging violations of antitrust laws and accusing the foremost automobile company (which also happens to be the dominant United States manufacturer of buses and locomotives) of thwarting mass transit for selfish corporate gains.

Eighty-four percent of G.M.'s net income last year came from made-in-America automotive products. The giant company earned $2.4-billion in 1973 on world sales of $35.8-billion, a strong increase from the previous year's profit of $2.2-billion on sales of $30.4-billion. But earnings dropped 22 percent in the fourth quarter of last year, and the decline has accelerated.

The lifting of the Middle East oil embargo last week had been eagerly awaited by G.M.'s executives as a move that would alleviate their company's distress. They had blamed the embargo for sowing "uncertainty and confusion" among car buyers.

Last week Richard C. Gerstenberg, 64-year-old chairman and chief executive officer of General Motors, announced that "business is getting better" and that G.M. was cancelling some of its plans for further temporary plant closing during the next two weeks.

"With the prospect that more gasoline will be available soon, we are watching closely for further signs that customer demand for new vehicles will turn up sharply," Mr. Gerstenberg said. But he bypassed the question of whether the energy crisis has made an irreversible impact on the auto industry. Many informed observers believe it has.

John Z. DeLorean, 49, who was G.M.'s maverick vice president and small-car advocate until he resigned a year ago, insists: "The Arab embargo just took a curve and accelerated it. The small-car trend has been growing in momentum for 10 years."

But Mr. Gerstenberg retorts, "All of us are blessed with almost perfect hindsight, and DeLorean's is no exception."

G.M.'s problem is that the shortage of gasoline and its soaring price caused customers to stay away from automobile showrooms, particularly those stocked with standard-size automobiles with thirsty engines. Once the object of a national romance, these all-American land cruisers suddenly were tagged with the epithet "gas guzzler."

General Motors has more of these land cruisers than anyone else—4,500-pound Chevrolets and 5,500-pound and 19-foot-long Pontiacs, Oldsmobiles, Buicks and Cadillacs. But G.M. doesn't have enough small cars like its 2,800-pound subcompact Vega.

The late Alfred P. Sloan, Jr., who built the corporation on the chaos left by its founder, William C. Durant, preached the gospel that bigger is better. And the Horatio Alger heroes who have since managed G.M. have faithfully observed his tenets—more add-on equipment brings higher prices and profits.

The first Henry Ford had provided America with a basic black passenger car, produced as cheaply as human labor could be exerted on an assembly line. The Model T was priced at the lowest possible level. Mr. Sloan converted the public to higher aspirations of affluence and mobility through his merchandising strategy of color, product improvement and annual model changes.

G.M. straddled its markets by offering the top quality and price in each consumer category. At the bottom, the Chevrolet division grew to the dimensions of the nation's fifth largest corporation. At the top, Cadillac was preeminent in luxury and profit per unit. In the middle, Pontiac, Oldsmobile and Buick consistently supplied earnings corpuscles to the corporate bloodstream.

In recent months, however, the latter-day products of the Sloan strategy have been stalled, undelivered from assemgly plants or gathering dust and 11 percent finance charges in dealer showrooms.

G.M.'s profit sag would be traumatic for any corporation, but at this paricular company the pain is excruciating. Profits are the machismo of Mr. Sloan's heirs in management. He designed the incentive program through which they take home some of the highest salaries in corporate America.

The program credits a portion of earnings, based on a complicated ratio related to net capital, to a bonus and stock option fund. This is administered by a bonus and salary committee of the board of directors. The committee will also choose Mr. Gerstenberg's successor when he retires in November at 65. In

September the committee will choose a successor for Edward N. Cole, G.M.'s president, when he retires.

In 1972 Mr. Gerstenberg was the nation's highest paid chief executive, drawing $875,000 in salary and bonus. His 1973 compensation and that of his colleagues will undoubtedly be shown to have been still higher when the proxy statement for G.M.'s annual meeting discloses the details next month. The bonus committee has credited $112.8-million, the maximum allowable from 1973 earning, for awards to some 7,000 salaried employes and executives. Management thus escapes any penalty for the recent earnings decline.

Whether the energy-crisis blow will affect the committee's choices for the top posts is the subject of much speculation by G.M. watchers.

The torch tends to be passed to loyal insiders, and these are an exceedingly homogeneous group of professional managers, who eschew the cults of personality and youth. Except for a few converts to hair coloring, they are grizzled conservatives in dress and philosophy. Only Mr. Gerstenberg has permitted sideburns to grow below his ears.

The typical G.M. executive, born and reared in the Middle West, was educated at a university near home or the General Motors Institute, the company's in-house engineering college. He has spent his entire career of 11-hour days in the service of one employer.

In recent history, only DeLorean violated that tradition. A creative engineer, a 6-foot-4-inch hedonist and a connoisseur of racing cars and women, he was hired away from Packard in 1956 by Semon E. (Bunkie) Knudsen, a G.M. pioneer's son who quit when he didn't win the G.M. presidency.

Mr. DeLorean revived the Pontiac and Chevrolet divisions and was rewarded with a corporate vice presidency. He argued for smaller cars on grounds that the rising cost of owning and operating a car and the anti-conspicuous materialism of youth was altering consumer tastes.

His ideas were backed by Mr. Cole, at least up into the executive committee meetings, where the ideas were throttled. Mr. DeLorean's departure leaves open the question of whether an independent in flagrant contact with the world beyond Detroit could ever make it to the summit at General Motors.

These days Mr. DeLorean is driving a German-made BMW around suburban Bloomfield Hills, where most G.M. executives live. He is a partner in a Cadillac dealership in Florida and is working on producing a small "ultimate" sports car and a "commuter" mini-car that would yield 80 miles per gallon.

The men who do succeed at G.M. accept compromise by committee. They govern from the southeastern wing of the 14th floor of corporate headquarters, a gray edifice on Detroit's West Grand Boulevard furnished in faint-hearted modern monotony. (Their offices on the 25th floor of the General Motors Building in New York, where they come for monthly board meetings, are uniformly grander.)

In Detroit they are paired in executive suites with pale blue carpeting and identical leather-topped desks equipped with push-button controls for closing and locking doors. On their wood-paneled walls are color photographs of their peers, G.M. cars and mass-copy oil seascapes and autumn scenes.

Always within reach is Mr. Sloan's manual, "My Years With General Motors" (Doubleday, 1964). It is conferred on important guests such as Nikolai S. Patolichev, Soviet Minister of Foreign Trade, whose copy was autographed by Mr. Gerstenberg.

The insulated G.M. atmosphere may be perceived by outsiders at public events like stockholder meetings or the annual Conference on Areas of Public Concern, held last month for 250 institutional investors and opinion molders at the G.M. Technical Center in nearby Warren, Mich. In the three previous years, the conference had been staged to counter the growing movement for corporate responsibility on such social issues as safety, the environment and doing business in South Africa.

At this year's conference, as the pension fund manager for a major insurance company recalled, the chief concern of the guests was "how G.M. was going to anticipate change over the next few years based on a major change in the energy supply.

After six hours of lectures, slides, an unrevealing technical peepshow and a luncheon at which Mr. Gerstenberg preached his favorite sermon on profits for progress, the fund manager was "disappointed," he confessed.

"I had the impression of an extraordinarily defensive, almost one-dimensional, attitude," he said. Subsequently, he lightened up on the holdings of G.M. stock in the pension funds his company manages.

To outsiders, General Motors presents unwavering and self-justifying positions on energy-related issues of production, safety, pollution and public transportation. Sometimes its stands are overruled by events, such as the halting of production of motor homes, a venture embarked on last year well within sight of the energy crisis.

* * * * * * *

But a more significant figure, return on equity, has ranged between 17.5 percent and 27.7 percent over the last decade except for 1970, when there was a three-month strike. The average return on equity for all manufacturing companies as well as for the oil companies (who explain their recent profit increases as catch-ups) has been about 10 percent during the last five years.

The exact profit margin for each of G.M.'s five automobile divisions "is a secret as well guarded as the ingredients of Coca-Cola," says Bradford Snell, counsel to the Senate subcommittee on antitrust and monopoly. (The subcommittee is headed by Senator Philip A. Hart, Michigan Democrat.) Mr. Snell is author of a proposal for breaking up the auto companies.

However, auto industry sources estimate that the difference in labor cost between an intermediate-size Chevrolet Chevelle and a Cadillac Coupe de Ville may be $300 while the difference in the retail price can be $3,000.

There are slight engine and transmission differences between the two cars. Interchangeability of components—most of which are manufactured within the G.M. empir—has been one of the titan's strengths. But increased profit-oriented standardization has erased product distinctions.

"G.M. is caught in an inversion," Mr. Jouppi said. "Its profitability is declining fast because the big cars, on which it always realized its profits, are not selling. It has investment lying idle in the big-car plants it has shut down.•

"The profound devotion to return on invested capital and on net worth meant they were always there to meet the market if it didn't change too fast. The critical thing now is that the market changed faster than the G.M. 14th floor."

"I can't say we will make as many dollars on the Vega as on the Cadillas," Mr. Gerstenberg said, avoiding confirmation of G.M.'s reported plan to offer a $10,000 Cadillac compact in 1976. Across the board, the Sloan strategy of add-on will be applied to small cars with luxury options. "We're looking for people to upgrade," he said.

However, the conviction rests that the large car will not disappear from American affections—although, Mr. Gerstenberg concedes, "people may be satisfied with a more fuel-economical engine with less acceleration and performance."

Along with the furious product development of petite luxury models, it seems, will go equally strenuous efforts toward an average of 15-miles-a-gallon efficiency on all cars. This should bring them back to where they were a decade ago and still below what the Vega and many small imported cars can deliver on a highway.

The reason given for confidence in the behemoths is not only profitability but also encouragement from sales in Canada where fuel remains plentiful. The G.M. vision of the American family and its needs remains intact.

"The man with a wife and four kids and a shaggy dog can't get into a Vega," said Mack Worden, G.M.'s vice president of marketing and father of seven children.

The executives on the 14th floor felt the small car was coming—but not really until "the late seventies." They argue that they had tried small cars several times since 1959, starting with the Corvair, but had been rebuffed in the marketplace. In the nineteen-sixties, they say, customers wanted bigger cars and higher-performance engines. G.M. spent $50-million to build six-cylinder engines, but customers then begged for V-8's. Now G.M. can't produce enough sixes for its compacts.

While conceding that small cars may soon account for 65 percent of the market, Mr. Gerstenberg adds: "I don't know that we have a good fix on where the market is going. Soundings are pretty confused now."

Amid the confusion, the energy crisis has heightened public pressure for mass transit. In January, General Motors acknowledged it—characteristically—by adding a division.

To head the new Transportation Systems division it appointed Donald J. Atwood, 49, an engineer who had previously directed part of G.M.'s Government contract work supplying guidance systems for the Apollo space missions.

"The same command and control capability that G.M. provided for the space program can be applied to public transportation," said Mr. Atwood.

"Through the nineteen-eighties, it could be a $150-billion total market," he said.

Though sales of railway and bus equipment account for less than 1 percent of G.M.'s volume, the auto giant is the major presence in the public transportation market.

Through its Electro-Motive division, G.M. sells 73 percent of the nation's diesel locomotives. Though Electro-Motive is prolucing to capacity—four and a half locomotives a day—it resists the gathering impetus toward coal-based electrification of the railroads.

Harold L. Smith, Jr., manager of Electro-Motive, said: "Prior to the petroleum shortage I would have said electrification would never happen. But, since a number of our customers are studying it, we're preparing to be manufacturers of the straight electric locomotive."

Mr. Snell, of Senator Hart's subcommittee, has charged that General Motors coaxed the railroads away from electrification toward dieselization, using its influence as their largest freight customer.

A pending Federal suit by the City of New York against G.M. alleges that the auto company monopolizes city bus manufacture as well as intercity bus market by its own production and the dependence of its competitors on G.M. for diesel systems and components.

For half a century General Motors has repelled antitrust attacks, with one significant exception that did not impinge on its manufacturing capability. In 1962 the United States Supreme Court ordered E. I. du Pont de Nemours & Co. to divest itself of its 23 percent interest in G.M.

Clearly, G.M. is not about to be transformed into a mass transportation company. The annual report sets out this statement of purpose: "Cars and trucks are the backbone of American transportation and will continue to be in the foreseeable future."

G.M.'s Pollution-Control Battle

It looks like an oversized, stainless steel hot water bag. It will add 30 pounds and $150 to the cost of a 1975 automobile. It's called the catalytic converter and it affords a dramatic example of G.M.'s unrivaled ability to make a controversial investment decision entailing hundreds of million of dollars and thereby impose national standards.

The catalytic converter is also a symbol of the somewhat dented romance between G.M. and the oil companies. That affair goes back to 1924 when G.M. and Standard Oil of New Jersey (now the Exxon Corporation) became equal partners in the Ethyl Gasoline Corporation to market the antiknock leaded gasoline needed by high compression engines. (In 1962, they sold their interests.)

G.M. also spurred the oil industry to develop premium gasoline up to 100 octane for big, high-performance engines, a major cause of air pollution. Later, the oil companies and the auto makers were united in opposing the Clean Air Act of 1970 and what they asserted were its unreasonable standards for reducing engine exhaust pollution.

Since 1970, G.M. has spent $800-million for emissions control research, including close to $100-million related to development of power plants other than the internal combustion engine. But G.M. and the oil industry split on their antipollution tactics. In 1970, G.M. announced all of its cars would be capable of operating on 91 octane low-lead or unleaded gasoline. The oil industry has expressed resentment at the extra refining costs entailed.

However, G.M. was preparing the way for its catalytic converter, an add-on device which oxidizes the offending hydrocarbons and carbon monoxide from engine exhaust. With pollutants thus cleaned from the exhaust, the engine can be tuned to give the better mileage that customers are demanding.

G.M., however, has lowered the promises made for the converter from an 18 percent improvement in mileage to about 8 percent, and even this figure is considered optimistic by G.M.'s rivals, Ford and Chrysler. The oil companies and the other auto makers have denigrated the converter's effectiveness.

They preferred to press the Environmental Protection Agency to persuade Congress to extend the 1975 standards and give them time to modify or replace the conventional internal combustion engine. Last April, the E.P.A. agreed to a one-year deferral but imposed interim standards, including a rigorous one for California requiring use of the converter.

G.M. has plunged ahead with its converter program through its AC Spark Plug Division at Oak Creek, Mich. Starting April 29, a new plant there will begin turning out six million catalytic converters a year for G.M. and other customers such as American Motors. G.M. has contracted for $100-million worth of South African platinum and palladium for the catalyst.

However, G.M.'s commitment to the conventional internal combustion engine with the add-on converter is being called into question. Chase Econometric Associates, a Chase Manhattan unit, recently forecast that the stratified charge engine, which combines air and fuel in a new, nonpolluting way, will power two-thirds of new automobiles by 1985. The Honda Motor Company of Japan already has one in use.

The Chase subsidiary also forecast that the rotary engine, representing a far more fundamental engine change, would capture a quarter of the auto market. G.M. has secured the rights to the German-developed Wankel engine for $50-million but has been forced to postpone its introduction in the 1975 Vega until its mileage performance can be improved.

Edward Cole, G.M.'s president, is regarded as the mentor of both the Wankel and the catalytic converter. Lately, he has denied research reports that the converter throws off potentially dangerous chemical byproducts. "Everyone likes to make me the bad actor for the catalytic converter," he said. Then he added stoutly:

"Barring inventions, the internal combustion engine will be the engine for the 1980's."

Smaller Share of Market

Under the impact of the energy crisis, new-car sales of the General Motors Corporation have dropped more sharply than those of its competitors.

G.M.'s sales fell 35.7 percent during the Jan. 1-March 10 period, compared with declines of 20.5 percent for the Ford Motor Company and 18.5 percent for the Chrysler Corporation. Meanwhile, there was an 18.1 percent sales increase at the American Motors Corporation, which specializes in small cars.

G.M.'s share of the domestic market has fallen to 45.3 percent.

Its competitors attribute G.M.'s shrinking share of the market to the fact that it did not switch fast enough to the production of smaller cars.

G.M.'s share of the auto industry's total sales, including imports, peaked at 52 percent in 1962, dropped to 47 percent in 1969 and fell below 45 percent in 1973. For the first two months of this year, G.M.'s share of the industry total was only 38 percent.

General Motors has cut production by 45.1 percent through mid-March. Ford's output is off 28.2 percent, and Chrysler's is down 23 percent.

Despite the production cutbacks, G.M. is still hurting more than its rivals in terms of inventory. While the industry as a whole has a 74-day supply of cars on hand, G.M.'s backlog of unsold cars is 888,000 or 51.1 percent of the total invenory, enough to last 81 days at current sales rates.

Ford's backlog, constituting 27 percent of the total, is equal to a 69-day supply. Chrysler's share of the backlog is 18.9 percent, a 75-day supply. American Motors' unsold inventory is only 51,400, or 3 percent of the industry's backlog.

G.M.'s problem is too many big cars on hand. Its Buick, Oldsmobile, Pontiac and Cadillac models have not been selling well. Its medium-priced cars are experiencing greater sales declines than those of the competition.

Nevertheless, General Motors is still the sales leader. Its Chevrolet division has long topped the industry except for some strike years like 1970.

In pricing, the manufacturers stay close. The regular Chevrolet and Ford four-door sedans both have base prices of $3,695, while the Plymouth Fury is $3,692. G.M.'s subcompact Vega, however, is only $2,380, well below the Ford Pinto's base price of $2,442.

Auto-industry analysts consider shares of the sales market significant. They note that in four months of the energy crisis—November through February—small cars accounted for 50 percent of the over-all market. Ford had 51 percent of its sales in the small-car sector, and Chrysler had 50 percent. However, G.M. could muster only 30 percent of its sales in the small-car field.

The auto industry's 10 best sellers so far this year are:

Car	Size	Maker
1. Chevrolet	Full-size	General Motors.
2. Vega	Subcompact	Do.
3. Pinto	do	Ford.
4. Ford	Full-size	Do.
5. Valiant	Compact	Chrysler.
6. Torino	Intermediate	Ford.
7. Mustang	Subcompact	Do.
8. Chevelle	Intermediate	General Motors.
9. Nova	Compact	Do.
10. Dart	do	Chrysley.

Exhibit 30.—Letter from Dr. Duncombe, GMC, Transmitting Various Information Requested During Testimony

GENERAL MOTORS CORP.,
May 15, 1974.

Hon. PHILIP A. HART,
U.S. Senate, Washington, D.C.

DEAR SENATOR HART: I am writing this letter to answer for the record questions which were left open at the Hearing on April 10, 1974, and to supply additional pertinent material which we also submit for inclusion in the record.

First, General Motors has agreed to supply to the Subcommittee additional information on the data which was used in arriving at the estimate that GM accounted for 43 percent of the 1973 bus sales in the United States. (See Transcript pp. 833–35.) As indicated to you at the Hearings, this percentage relates to those types of buses which are covered by the Consent Decree entered into by General Motors on December 31, 1965, *United States* v. *General Motors*, Civil No. 15816 (E.D. Mich.). That Decree defines "bus" as follows:

> "'Bus' shall mean a new, rubber-tired vehicle of integral construction (the chassis of which, if any, is assembled by the manufacturer of the body) having an internal combustion engine and a seated passenger capacity of twenty-one (21) or more adults and delivered in the United States. The term 'bus' shall not be deemed to include a vehicle sold primarily for school service."

Many vehicles excluded under this definition engage in city transit service. "Dial-a-bus" or "Mini-Bus" services, which employ vehicles with less-than-21 passenger capacity, are in use in many cities, including Washington, D.C., Detroit, Los Angeles and San Francisco. Buses with nonintegral construction are also used in city transit service.

Total 1973 deliveries in the United States of "buses," as defined in the Decree and reported to the Department of Justice, were 1849 units for General Motors and an estimated total for all suppliers of 4260. This yields the 43-percent figure referred to at the Hearings. Of this total, General Motors sold 1462 units for city transit service and other suppliers sold an estimated 1592 units for such service. We have no figures on deliveries by others of buses suitable for city transit service which fall outside the definition in the Consent Decree. If such buses were added to the total, General Motors 'percentage share would be smaller.

It is perhaps worthy of note that the entry of AM General (a subsidiary of American Motors) has become fully effective since 1973. That firm is now in active production and is delivering buses for city transit service in large volume.

We would also like to comment briefly on two additional matters which were left unresolved at the Hearing. The first involves the inquiry by Mr. O'Leary with reference to a possible connection between General Motors and Metropolitan Coach Lines. (See Transcript pp. 824–25.) Our submission, entitled "The Truth About 'American Ground Transport'—A Reply by General Motors," contains the following statement (p. 32):

> ". . . the conversion from streetcar to bus operations continued into the 1950's and 1960's when the [Pacific Electric] system was run by Metropolitan Coach Lines, which had no connection whatever with GM. . . ."

Mr. O'Leary questioned whether this statement was "quite correct," stating that the president of Metropolitan Coach Lines had been an officer and a "substantial shareholder in Pacific City Lines, in which GM [also] owned a substantial interest." Mr. O'Leary has since supplied us with a copy of an SEC Form 10–K filing which indicates that in *1946* this individual was a substantial shareholder in Pacific City Lines.

The point made in GM's Reply, however, was that Metropolitan Coach Lines continued the conversion to buses in the 1950's. Metropolitan was not even formed until 1953, and its president had nothing to do with Pacific Electric prior to that time. This was a full four years after GM had disposed of its investment in National City Lines, the successor-in-interest to Pacific City Lines. The mere fact that at some time in the past, the president of Metropolitan and GM had been substantial shareholders in the same third company does not establish any connection whatever between Metropolitan and GM and certainly does not support an inference that GM was in any way responsible for the management policies of Metropolitan. The statement in GM's Reply is therefore entirely correct.

Mr. O'Leary's second inquiry requested information on the allegations that General Motors had engineered the purchase and conversion to buses of rail systems in Fresno, Stockton and San Jose, California. (Transcript p. 823)

The record shows that these allegations are untrue. In *San Jose*, the conversion to buses had been completed *before* the property was acquired by National City Lines. The conversion in *Fresno* was approximately half complete at the time of the acquisition by National City Lines, but the entire conversion had been decided upon and approved *before* the acquisition. (See *National City Lines*, Supreme Ct. Record, p. 471; Fresno Ordinance No. 2464, dated Nov. 25, 1938.)

Approval to convert the system in *Stockton* was not actually obtained until after it had been acquired by Pacific City Lines in 1939. As early as 1934, however, the California Railroad Commission observed that streetcar passengers had declined approximately 50 percent in the previous five years and pointed out that the city planners favored the substitution of bus service. (Decision No. 26781, dated Feb. 5, 1934) The Railroad Commission later approved the substitution of bus service. (Decisions No. 33633, dated Oct. 29, 1940; No. 34573, dated Sept. 10, 1941) At the time the streetcar tracks were removed, the *Stockton Record* reported:

> "City officials, local and State Chamber of Commerce committees and the East Stockton Improvement Club have taken turns in endeavoring to promote the project *in the last eight years.*" (*Stockton Record*, Nov. 8, 1949) (emphasis added)

After five years' experience with buses, the *Record* reported:

> "Despite the congestion on certain lines, it is recognized that the bus service is a 50 per cent improvement over the old streetcar system. Without the change and the flexibility of the bus system, Stockton's war facilities, military establishments, and new residential districts could not have been served." (*Stockton Record*, July 2, 1945)

The story of what took place in Fresno, Stockton and San Jose is thus entirely consistent with what occurred in other cities, as set forth in the Reply by General Motors.

Finally, we would like to submit three additional items for the record.

The first relates to World War II. You will recall that on April 10, we offered for the record a letter from Philip W. Copelin refuting the accusation that GM had cooperated with the Nazis. In that letter, Mr. Copelin described a meeting that took place in January 1942, at which General Motors overseas representatives supplied wide-ranging intelligence information on Germany to the Office of Strategic Services (OSS).

Mr. Copelin has just located the enclosed letter sent to him by General William J. Donovan, wartime head of OSS, written shortly after the meeting which Mr. Copelin described. (There is an obvious typographical error in the date at the top.) This letter thanks Mr. Copelin for the "detailed, precise kind" of intelligence information provided as a result of the meeting with Messrs. C. R. Osborn, R. K. Evans and E. S. Hoglund of the General Motors overseas organization.

The second item submitted for the record is an excerpt from the testimony of UAW president Leonard Woodcock on April 23, 1974, before the Senate Committee on Commerce in connection with its consideration of the Consumer Energy Act. Mr. Woodcock addressed himself at that time to "proposals to break up the automobile companies" and his comments are pertinent to the Industrial Reorganization Act and the Hearings conducted by the Antitrust Subcommittee. We request that the excerpt enclosed with this letter be made a part of the Subcommittee's record.

The last item submitted for the record with this letter is a statement prepared at our request for the Subcommittee, by Professor John S. McGee of the University of Washington. Professor McGee has recently published a study, financed by the Ford Foundation, on "Economies of Size in Auto Body Manufacture." His statement draws upon that research and is directly responsive to the claims of the Subcommittee witness Professor Lawrence J. White and of others that fragmentation of the auto companies is feasible because manufacturing scale economies are exhausted at a level of approximately 400,000 units per year. Professor McGee's research demonstrates that, on the contrary, these scale economies persist into the millions. Moreover, he concludes that, even if they did not, it would not justify the artificial dismemberment of enterprises.

I would like to thank you for this opportunity to clarify the record of the Subcommittee Hearings and to submit these additional materials.

Sincerely,

HENRY L. DUNCOMBE, JR.,
Chief Economist.

Enclosures: (3).

Enclosure 1

COORDINATOR OF INFORMATION.
Washington, January 23, 1932.

Mr. P. W. COPELIN,
Motor Transport Division, Office of Quartermaster General,
Washington, D.C.

DEAR MR. COPELIN: I have read with great interest the report of your interview with Messers. Osborne, Evans, and Hoglund, and I should like to take this opportunity to thank you for the time which you and they spent in preparing it. The information provided on many points is of that detailed, precise kind which is all too difficult to obtain these days. In fact, we have recognized that your report had an interest much wider than that of this organization alone, and have, therefore, taken steps to distribute it to other defense agencies.

Permit me to thank you again for your efforts and to congratulate you on a most able presentation.

Sincerely,

WILLIAM J. DONOVAN.

Enclosure 2

U.S. SENATE COMMITTEE ON COMMERCE

HEARINGS ON THE CONSUMER ENERGY ACT

Washington, D.C., April 23, 1974.

TESTIMONY OF LEONARD WOODCOCK

(Transcript pages 292–295)

Mr. WOODCOCK. In this whole area of antitrust, Mr. Chairman, I must confess that I wonder as to its applicability and effectiveness in this new age of the giants. Speaking of an industry of which I have much greater knowledge, the proposals to break up the automobile companies, I think the economies of scale

are such that the old fashioned antitrust remedies are clearly not going to accomplish that kind of purpose, and I think the same sort of thing would be applicable here.

That is an additional reason why I think a federal corporation makes even more sense.

Senator TUNNEY. Senator Long?

Senator LONG. Mr. Woodcock, it is always good to have a chance to visit with you, because you do a fine job, and I admire very much your representing the very fine union which you head.

I am not sure that I understand what your view would be with regard to breaking up General Motors, for example, into more than one manufacturing entity. Do you feel that that would be a good idea, or do you think that they should be permitted to operate as one big automobile producer?

Mr. WOODCOCK. Well, the notion of breaking them up is that if they were broken up, there would be more competition, and prices would be reduced and so on. The fact is, Senator, if we set aside the present abnormal period, when General Motors is the most beleagured of the companies because of their adherence to the bigger cars than the others relatively, the fact is that in normal times the General Motors Corporation is most efficient and best able to reduce prices, and the smaller are relatively disadvantaged.

So that quite clearly the old antitrust remedy of breaking them up in bits and pieces would work in the opposite direction, and I am positive it would increase prices and reduce efficiency. That doesn't mean I am happy with that state of affairs, but that is the conclusion I am driven to.

Senator LONG. It seems to me that these major companies ought to be encouraged by regulation insofar as there is regulation, and certainly by tax laws, to standard laws on the size of their parts and things of that sort so that the maximum number of parts could be interchangeable, and to achieve as much efficiency and economic uses as we can of things that we produce.

Now if you did that, it would seem to me that one would have a case that you have more effective competition in this country if you had five corporations instead of one, where it was General Motors.

I like the idea of being able to interchange parts. That you can do to a certain extent, but that company appears to be operating almost as though it were four or five companies, does it not? It seems to me as though that company is so built that the Buick division seems to compete very effectively with the Cadillac division and the Pontiac division and the same thing works the other way around.

Isn't that sort of true for that company? My impression is that they try to make each division compete with the other division.

Mr. WOODCOCK. The reason that the General Motors Corporation, Senator—you are absolutely right—has been able to defeat the economic law of diminishing returns, is that they have within the compass of the General Motors Corporation effective intradivisional and interplant competition. They have a sort of microcosm of the capitalist system in effect, and that is why it works as well as it does.

Enclosure 3

APRIL 2, 1974.

STATEMENT OF DR. JOHN S. MCGEE, UNIVERSITY OF WASHINGTON, SEATTLE, WASH.

I am Professor of Economics in the University of Washington, Seattle. In addition to having a general interest in Industrial Organization and public policies toward business, I have also studied a variety of specific industries, including automobiles.

A Ford Foundation Faculty Research Fellowship enabled me to do research in Europe during the academic year 1971–1972, during most of which period I studied the manufacture of automobile bodies. This research eventuated in an article entitled "Economies of Size in Auto Body Manufacture" which was published in the October 1973 issue of The Journal of Law & Economics.

Because of this and other research and writings on economies of size in general, and on automobile bodies in particular, General Motors Corporation retained me to prepare a statement. All findings, conclusions, and opinions are my own. No one else is in any way responsible for them.

With that introduction, I come to the main body of my statement. From time to time, various numerical estimates that originated in Ph.D. theses and other

sources find their way into public policy deliberations. Since numbers come to have an authority and life of their own, they should bear some relationship to reality, and they should be relevant to the policy discussion into which they are flung.

My principal purpose is to note and comment upon some arithmetic that should not be left to stand, lest it solidify into durable myth and cause recurring mischief. I want also to comment upon the limited policy relevance of such numbers in general, whatever their true magnitude might be, and—very briefly—upon legislative proposals like the Hart Bill, which would artificially change industrial structures.

In 1971, Professor L. J. White's Ph.D. thesis was published in book form under the title of "The Automobile Industry Since 1945." More recently, White also testified before this Committee as an expert on the U.S. automobile industry. Among other things, my published article, "Economies of Size in Auto Body Manufacture," deals with various other studies of automobile manufacture, including White's. A key element in White's thesis is that economies of size in metal stamping are limited to 400,000 vehicles per year, since the dies wear out in producing 400,000 panels and would have to be replaced for higher volumes. As Professor White put it in his book,

"Modern heavy presses are capable of ten or more strokes a minute, the smaller presses of as many as eighteen a minute.

"Ten strokes a minute means that 9,600 pieces are produced in a two-shift day, or approximately 2.5 million pieces in a year. If the dies lasted that long, this would indeed be an impressive minimum efficient scale of production. But, in fact, dies do not last that long. The best dies last only for 'several hundred thousand pieces'; this author's estimate is that somewhere around 400,000 stampings is the limit for die life. Lower volume dies down to lives of 100,000 stampings are available, but the unit cost on the high volume dies is lower, and they require fewer die changes on high volume runs. Below 100,000 pieces, only very low volume dies (some of them of plastic), good for 5,000 to 10,000 pieces, are available. Despite earnest industry efforts, no intermediate volume dies between 10,000 and 100,000 have been developed. The basic problem seems to be that the smooth surface necessary for an outer-body stamping can only be obtained from a high quality steel die that will last 100,000 stampings anyway.

This 400,000 figure, then, represents the basic efficient scale of stamping. Any higher volume of production will require replacement dies for the worn-out sets."

This is how White got his figure of 400,000 units per year, which also appears in the statement he made before this Committee.

White is not merely wrong. He does not even come close. The fact is that if there is any limit to the economic life of major body dies, it is in the millions of parts, not 400,000. I have personally seen a variety of dies each of which has produced many more than a million parts. I have seen some that have produced several millions of parts. None of them was "worn-out." Furthermore, it is simply not true that only a "high quality steel die" will do; or that only the best steel dies last for as many as 400,000 parts. Major dies of cast-iron are very common, and produce excellent panels. Anyone who has even casually inspected the finely finished cylinder bores and valve-ports of a good cast-iron engine should have expected it, even if he had never seen a cast-iron die. As a matter of fact, die durability can be extended past the millions of parts of which cast-iron dies are capable.

The production rate that White cities for "heavy" presses—around 10 strokes per minute—is in fact often observed; but there are heavy presses that can significantly exceed 10 strokes per minute. And, for smaller parts, there are presses that can operate at very much higher rates: 60, 400, 700, and even 1,800 strokes per minute. In any case, it is important to note that, for presses as well as dies, output capability tends to rise faster than the purchase cost of obtaining it.

Anyone who takes White seriously will be badly misled not only about automobile production but about the economics of stamping processes more generally. In the first place, it is not technological imperative that requires car bodies to be made of panels produced from dies. I have visited several plants making bodies from metal panels that were, in part or whole, produced by hand. For truly small-volume production, that is the way to do the job. Some consumers are not only happy to defray the substantial costs involved, but to put their names on long waiting lists in order to do so. Some other production cars currently use bodies made from re-inforced plastics. Economics governs how

car bodies are made: consumer demands and costs dictate the result, which seems to me both fair and efficient. For relatively small markets, there are various alternative production techniques. To serve mass markets, dies and presses do, appropriately, come into play.

But all parts, dies, and presses are not alike. This is true over the whole spectrum of manufacturing industries; it is also true within the auto industry itself. Stamped parts differ enormously in complexity and size, and in the kinds of materials from which they are made. There are corresponding differences in the dies and presses used to make different kinds of parts. Some parts are stamped from highly abrasive or very hard materials, as in the cases of magnet laminations, saw and razor blades, and piston-ring expanders. Even so, the dies used in such applications last for many millions of parts, as my article shows. Materials used to produce panels for car bodies are not that hard on dies.

Depending upon the sizes and kinds of parts, and the annual output rates and total model volumes planned, some die materials and types and some press sizes and types are more economical than others. Starting at the low-rate and low-production volume end, one can use relatively soft dies—including those of lead and zinc alloys. For larger output rates and volumes, dies of cast-iron are wholly satisfactory. If additional durability were required for the specific production program planned, it could be gotten by producing dies partly or wholly from semi-steels, steels, and high-alloy steels of various kinds. Even higher degrees of durability could be gotten by heat-treating or plating dies and—for smaller parts—by using carbide dies. Some important things to note from all of this are that increased die durability can be bought at a declining cost *per part;* and that even cast-iron dies are satisfactory and enormously durable so far as producing auto body panels. Even for cast-iron body dies, durability is indefinitely long. Furthermore, increased durability can be gotten at a declining cost per part.

Thus, one reason White is wrong about economies of size in stamping and about his proposal to tear apart the three largest U.S. automobile producers is that he grossly understated die life. But that is not the only reason why White's conclusions are wrong: he also minimized or completely overlooked other factors that may be even more important.

One factor is learning: Costs are lowered and other results are improved when people learn more about what they are doing. Personnel in companies that mass-produce complex goods learn a lot partly because, collectively, they see and do a lot. Some companies systematically codify and pool learning in various ways, including maintaining for their product and tool designers exhibits showing parts which, in the past, caused important design or production problems and illustrating how they were solved. Much of this learning is transferrable to present and future problems. This is one kind of resource and one kind of mass-production economy that is easy to overlook and hard to quantify.

Second, if—contrary to experience—a company should actually wear out its body dies, duplicates would cost significantly less than the originals. This is only partly because of learning and the fact that significant costs of designs, models, and the like could be spread over the duplicates. It is also true that the tooling and production organization employed to make the dies would differ if several sets of duplicate dies were planned, and that unit costs would fall.

A third economy of mass-production is not so obvious. It *is* obvious that die costs per vehicle can be reduced if one succeeds in producing what more people want to buy and, thus, gets more total output from a set of tools.

In addition, with exceptional management, an automobile firm can economically mass-produce for a wide spectrum of different consumer demands without correspondingly increasing its tooling and other expenditures. Although this happy result is not confined to bodies, I will use them to illustrate the principle. A whole stable of different car models can be carefully designed both to offer consumers wide choice and to do it economically. One way is to use some identical panels and parts for two or more different models. Another is to design body dies so that they can be fitted with additional close fitting portions—die "inserts"—to produce two or more distinct parts variants from the same "parent" dies. As a consequence, under good management, the number of different models and total sales can be increased without proportionally increasing either the number or costs of dies and other major tools.

A fourth economy arises from the nature and costs of different kinds of presses, in which body dies do their work. Presses differ greatly in size, power, and output capability. For high production rates and volumes, it pays to buy

presses of relatively high speed and to build in mechanical handling devices that permit that output capability to be realized. Although such presses are very costly, this increased output capability is bought at lower cost per part.

Fifth, higher outputs generate significant cost savings because they permit a higher rate of utilization for both presses and dies; because they permit a more economic specialization of presses to a narrow range of parts and mechanical operations; and because they avoid changing and moving dies. To produce cars at very low rates and volumes, it may not pay to buy any presses or dies at all. For somewhat higher rates and volumes, it may pay to use relatively soft dies and one or a few presses. To produce intermediate rates and volumes, cast-iron dies and heavy press-lines come into play. But each major die will spend only a short time mounted in a press. At substantial costs, dies are rotated in and out of the presses to produce a large number of parts from a smaller number of general-purpose press-lines. For still higher rates and volumes, automatic materials handling equipment is used and dies run from longer periods.

VW's Beetle holds the all-time record for total production of one basic model. For production rates and volumes that high, some—but not all—dies can be permanently mounted in specialized and more ideally matching presses, and extremely expensive, highly specialized machines can be used to assemble and weld the panels. But no one, not even VW, has ever been able to produce enough cars to exhaust all of even the technical economies to which I have so far referred. No one has ever produced enough cars to make it feasible to mount all major dies in the presses and leave them there, banging out the same parts over the whole model run.

Instead, the dies must be "cycled" in and out of the presses, so that each press and press-line typically produces several to many different parts, in each case using different dies to do so. In the usual case, most dies must be idle most of the time. In fact, most dies are idle most of even that time during which the presses are working. In addition, there are substantial out-of-pocket costs of die cycling: the dies must be changed, moved to storage, broken out of storage, installed, re-fitted, and tested. While the dies are being changed, the presses are idled. The dies wear more when they are cycled. Under cycling, different parts must be produced by the same presses, which means that the fit or match of dies to presses must be a compromise. At sufficiently high rates and volumes, costs could be further lowered because the presses and handling devices could be more completely specialized and more ideally matched.

The tooling, body, or any other part of the "cost" of a car, or family of cars, is no simple matter. Everything depends upon precisely what the car is, and how its tools and designs are related to others in the stable; whether and to what extent tooling can be carried over from earlier or carried forward to later models; at what rate it is to be produced and for how long; and so on. It makes no sense to talk as though "costs" are easily and precisely estimable until one specifies, in full detail, the production program he is talking about. Even then, it is not easy, among other things because costs are really not settled till a whole series of runs are finished, for better or worse.

Under present technology no automobile firm in the world is large enough to exhaust the various technical economies in press-plant operations. Though I have only analyzed car bodies here, similar forces are also involved in the production of other major components that go to make up a car. Other things the same, that firm which sells the most can produce for less—if the firm is set up for the larger production program.

But it would be a great mistake to interpret this conclusion mechanistically. There is nothing automatic about achieving these economies: There are substantial economies of large size; but that does not tell us how to get there. Production is only one of the business functions; economies and talent have powerful roles in the other ones as well. In the first place, someone must try to judge the market, with respect to the duration and magnitude of demands for different designs and models. This often means forecasting three or more years ahead. Second, someone must decide, in detail, the physical characteristics of each model in the stable and how they can best be fitted together; the characteristics of all of the necessary parts and how they will fit together. Third, someone must decide precisely how to tool to produce each of the parts. Fourth, someone must allocate and schedule production so as to minimize costs. And, finally, someone must sell enough of the cars at such prices as will make the whole venture worthwhile.

Mistakes at any stage jeopardize the whole. One can design well—by technical standards—but fail to provide what consumers really want. One can design well

for the market, but design parts or tools poorly for production. One can simply make a mistake about the size or duration of a market, and under- or over-tool. And so on. A small firm can prosper if it hits upon designs that appeal strongly, and executes them well. In short, technical economies mean a lot, but they do not explain all of the differences in the costs or success of firms in either the automobile or other industries.

There are obviously economies of size in production, in general administration and management, in multiple-plant operations, research, and so on. But it should also be recognized that there are substantial differences in the qualities and competence of the different teams that go to make up different business enterprises. There is no reason to believe that all firms will be equally good at everything.

Costs differ amongst firms in a variety of ways and for a variety of reasons. Some economists would say that firms are equally "efficient" if, in principle, they could all climb onto the same cost function. That is not enough. Actual results also crucially depend upon whether the firms in question were also equally efficient in making crucial managerial choices. Those who make better choices are more efficient, no matter what the putative cost curves for identical choices might look like. There are many reasons why firms within one industry differ in size, and many reasons why, on average, firms in one industry are larger than those in another. Concentrating solely upon something called economies of size not only ignores much of the problem; it colors the rest.

We live in a complex and uncertain world. Individuals are not all alike. The teams that make up business firms are not alike, and the effectiveness of firms differs. In the usual text-book analysis of economies of size, costs are determined by a firm's size. In the real-world, it is often the other way 'round: the size of a firm is strongly influenced by the cost-level, and quality level, that it manages to achieve.

Many firms grow large simply because they are efficient and well-managed, which is a very different and a more important phenonmenon than whether hypothetical firms would have to be of a certain size in order automatically to achieve some level of technical efficiency. In the real-world, different qualities of management lead to differences in the sizes and effectiveness of firms whether there are or are not any economies of size in the usual sense. Similarly, firms differ in size and effectiveness in part because the things they sell offer consumers different values relative to the costs incurred in providing them.

Whether one tries to measure and attribute these differences to differences in managerial quality, or simply infers differences in managerial quality from the different performance resulting, surely makes no difference to the result that different firms actually manage to produce. But the first approach is virtually impossible to use: There really is no way to evaluate management efficiency apart from how well enterprises do. There are cases in which two or more firms would have identical costs for a given output program, but only if they made identical choices, and only if consumers valued their products equally. In an uncertain and changing world, differences in efficiency result even from different appraisals of what the appropriate techniques and best long-run cost function really are.

Similarly, it is extremely difficult, if not impossible, to avoid confounding several other things. Low-cost mass-production techniques are risky, among other reasons because they commonly involve longt-erm commitments to apparatus and organization that are specialized. If the plans prove to be wrong, specialized techniques are expensive to convert and very burdensome. The degree of risk to which a firm subjects itself, and that risk to which it is necessarily subject, at minimum, are, in the actual market result, commingled with any special ability it may have devised in coping with whatever kind and degree of risk it faces.

Many discussions of economices of size are naively mechanical, and abstract from, or casually deny the kinds of differences amongst firms that I have outlined here. That is too bad, since both logic and history suggest that they account for some outstanding industrial successes, as well as failures.

I want now to summarize, before going on to discuss, more broadly, the limited relevancy of "costs" to economic efficiency, and before appraising legislative attempts to modify industrial structures.

My own research into real-world manufacturing processes convinces me that, in at least some cases, even the purely technical economies are a long way from being exhausted, and that there are also economies of size in other business functions besides manufacturing. I am also convinced that, over long periods,

some firms are better-managed than others. Frthermore, some economists mistakenly believe that "multiple-plant" firms merely oversee a group of identical factories, which—as duplicates—could readily be split apart. Apart from ignoring that overall management actually does something valuable, this vision of the world is wrong about the facts with respect to "plants."

In 1972, for example, a number of automobile producers each had several stamping establishments. In each case, such establishments were specialized parts of a single articulated plant-complex and were not duplicates. So far as I could determine, no producer had more than one stamping "plant" in an economically meaningful sense. The same thing occurs for many processes and products within the automobile industry, and in other industries as well.

But the point I want to make now is that, even if some firm or firms had actually grown past the output rate and volume for which unit cost is minimum, this does not justify breaking them up or otherwise inducing them to shrink. Experience abundantly demonstrates that in a specific case it is not easy to quantify the relevant cost curves, and that many economists have virtually no idea of what is really going on. But, in addition to the expense, difficulties, and mistakes involved in discovering what costs really are, the fundamental problem is something else: the naive view misconceives what an economy should be minimizing and what it should be maximizing. Consumers are often not indifferent to various characteristics of products, and there is no reason why they should be.

No study of "costs," no matter how well done, is sufficient for policy or normative judgments about the "proper" size of firms: In any question of economic "efficiency," consumers' satisfactions are at least as important as costs. I also believe that ignoring what consumers want is tyranny. The objective of economic efficiency is presumably to maximize individuals' satisfaction. It makes no sense to "minimize costs" of stuff consumers do not want, or to prevent consumers from buying goods they want because someone claims they were not produced at the lowest point on some hypothetical average cost curve.

When property and markets are at work, and consumers are permitted to choose what and from whom to buy, it is not very important what the facts of economies of size are, let alone what economists and engineers have to say about them. Consumers will choose products and firms that offer what is to their tastes the best deal. Consumers will make the trade-off between prices and product qualities. The prices they pay for the qualities they buy are signals to anyone who would do better by them. They will calculate trade-offs between prices and costs. Such economies as there are will assert themselves. In all these ways, firms are daily obliged to justify their size—and their very existence—to millions of consumers and to anyone who would do better by them.

If any firm should be larger than efficiency requires, and charges higher prices than the costs of its present and prospective competitors, they and the market will shrink it. If any firm should innovate better techniques, or offer a superior product at the same costs as its competitors, the market will respond and it will grow. If any firm offers the same product as its competitors at lower costs, it will prosper and grow. If any firm is so large as to be inefficient, there will be internal and external challenges to put things right. If they are not, its present and prospective competitors will outstrip it. Consumers are the ultimate and best judge of efficiency.

Apart from governmental interferences, the only way a firm can hold or improve its position is by offering consumers equal or greater value per dollar, with respect both to what consumers pay and what the firm expends. If there are differences in the competence of firms so far as qualities of product or cost of providing it, some firms will be bigger and do better than others. This seems to me to be both fair and efficient. It provides an incentive to excel, which serves both consumers and those who achieve the superior performance.

When consumers are free to choose, superior firms rise to the top. Law that strikes at the characteristics of the best discourages, in them and in others, the good performance by which one earns those very characteristics.

We are now clearly in danger of penalizing beneficially superior performers, by striking directly at the characteristics of successful survivors—like their size and profitability—rather than at any specific bad things they can be shown to have done.

The market is an enormous information network that signals when opportunities exist, and moves resources to take advantage of them. In the process, con-

sumer benefits are really maximized, within the real-world constraints of the amount and qualities of resources, information, and the competence of different firm-teams.

Some economists, and proposals like the Hart Bill, would force firms to justify their size and existence on the basis of purely nuts-and-bolts economies that are, first, due purely to large size, and second, that could convince some tribunal. In a market system, large and successful firms have already justified themselves to those who should really matter: consumers and competitors. Unless an efficiency tribunal ratifies market results, it substitutes its decisions for those millions of free individuals.

Industrial reorganization schemes have very much the same results as simply dictating to consumers what and from whom they can buy. In my view this is both anti-economic and tyrannical.

A policy of forced industrial deconcentration is also discordant with the basic spirit of antitrust law itself. In breaking up a firm an industrial reorganization statute would deny a particular firm-team and bundle of resources access to the market. If this were attempted by private parties, it would be called "monopolizing." Indeed, the total result is likely to be much worse than Sherman Law monopolizing: denying a firm access to, say, some geographic market segment, would be illegal and, presumably, bad enough. But the same teams could still serve the rest. "Deconcentration" destroys the whole organization without correspondingly increasing the capability of others to serve.

Exhibit 31.—Prepared Statement of Judson B. Cornwell, Pleasant Ridge, Mich.

I am Judson B. Cornwell of 18 Maywood, Pleasant Ridge, Michigan. I was born in Detroit as well as both of my parents and some of my grandparents and great-grandparents. I was first employed by the Fisher Body Corporation. General Motors at that time had only an interest in Fisher which it had obtained in 1919, not acquiring all of it until 1926. I worked for Fisher Body from January 20, 1924, through December 14, 1929, when there was a reduction in force.

I was unemployed until January 4, 1932, when I started to work for the Ternstedt Division of the Fisher Body Division and was employed there until March 1, 1948, when I was transferred to the Industrial Engineering Section of the General Motors Corporation as a Senior Analyst. This department became the Schedule and Statistics Section in October of the same year. I continued with the Schedule and Statistics Section as a Staff Assistant until October 1, 1964, when I became Administrator of Production Scheduling for the General Motors Corporation. I continued in this position until July 1, 1966, when I became Assistant to the Executive in Charge of Production Control—Scheduling, where I stayed until October 1, 1967, when I had to leave due to a disability and never returned to the Corporation.

I am sorry that I am unable to appear in person to testify, but I am a semi-invalid and my doctor did not think I should endanger my health. A few years ago I had to install a stair inclinator in our home so you can judge from that I am unable to go very far or for very long. I do appreciate being asked to appear by the Minority Counsel, Mr. Chumbris, and hope that this will partly take my place, but I know that I could tell my story in person a lot better than I can write a statement that will have to be read.

I am more of a figure man than a speech writer.

In no way has any person from any of the Big Three, if you wish to call them that, influenced me. For that matter, I have not contacted any of the personnel except to get information that is available to any stockholder if they contacted the Stockholders Relations Department.

My years in the Auto Industry were very rewarding in that I gave of myself in every possible way and my endeavors were well-received, as you can judge from my record as a clerk to Assistant-in-Charge of Production Control. I only wish that I could live all my days with General Motors over again as each and every one was enjoyable, and in 99.99% of the time the men above me were honest and loyal to the Corporation, the employees under them and to the Country. I do not think that a day went by in my over-42 years that I did not try to do a little more than my best, and my sorriest day was when I had to leave about 10:00 one morning and was in the hospital at 11:00 a.m. the same day, going in under my own power, though it was a very weak power.

Mrs. Cornwell and I own jointly 629 shares of General Motors Corporation common stock. The first few shares I acquired in 1932, the year before we

were married. In my own name I own 919 shares, so I have holdings in more than what I call a Small Stockholder's holding, of 1,000 shares or under. Mrs. Cornwell and I do own 50 shares of Chrysler Corporation stock, some of which was acquired as early as 1954, and we also own jointly 25 shares of Ford Motor stock, the original 10 shares purchased when it was first offered to the public in January, 1966, so I think the last two facts cited allow me to come under my interpretation of a Small Stockholder.

I have checked into the number of Small Stockholders at both Chrysler and General Motors and I think you will be astounded at the figures. General Motors in the Annual Report for 1973 on page 20 state that of its 1,306,000 shareholders, 40% own 25 shares or less and 78% own 100 shares or less. Chrysler Corporation advised me as to how they stood at the end of 1973, and the figures quoted me by the Stockholders Relations Department were of 208,771 shareholders that approximately 205,000 owned 1,000 shares or less. I was unable to obtain any information from Ford Motor but would judge that it would fall into the same pattern. I did check one other company, a public utility, and they advised me that 97% of their stockholders owned 1,000 shares or less. (See attached Addenda.)

My thinking is that if we small shareholders wanted to buy into small companies we would do so of our own volition and not be forced to have it done by a law passed by a majority of 100 persons in one body and the majority of 435 persons in another body, notwithstanding Mr. Weeden's statement in his testimony, a copy of which Senator Hart was kind enough to send me though I did write and ask for further information from him giving the opposite view, having, however, as yet received no material or an answer to my letter.

I would like to ask you, gentlemen, if any of you saw the last financial report of Weeden and Company?

If that is any basis of how he arrived at his decision that the Motor Industry would be better off, or rather the shareholders would be better off, then I think we would say: Stay the way we are now and make no changes. A deficit is something no stockholder likes to see occur.

In my letters to Senator Hruska and Senator Hart I showed that there were more stockholders than employees and that they have very little to say as far as this Committee is concerned, and I took upon myself with indignation the fact that we were not represented and thought that we should be.

I will now go into some of my objections as a Small Stockholder as to why I do not think that Ford, Chrysler or General Motors should be split into small segments as it affects the stockholder as well as the public in general.

Over the years there have been more than 3,000 makes of cars and trucks that have been produced in the United States, by over 1,500 manufacturers, starting with the A.B.C. Car from 1906–1911, to the Zipp in 1913, and now we have the Big Three, American Motors, and a few truck companies, the survivors. I think that any of you will know that it was just a case of survival of the fittest, and this applies to whether or not you are an animal, a bird, a plant, a person, or a manufactured article. If you are not the best you just do not survive. This is not something new but has been going on for millions of years.

Any artificial stimulation by Government interference will not help you survive for a very long period of time under any circumstances. It may help for a short period but if you do not have the initiative, the know-how, and the wherewithal you must fail, as the thousands of auto and truck companies already have.

If you were to break up the Auto Industry into small segments it would mean the end of such things as the Proving Grounds, that all of the Big Three now have. I am not familiar with American Motors but suppose they must have some place for the testing of their products. General Motors has four located in four states. Anything of the size and structure of a Proving Ground could not be afforded by a single company, and the end results would mean a poorer product would be produced unless the Government was to step in and run the operation for all the companies, and I do not think that even Senator Hart would be in favor of that kind of expenditure of taxpayer money. These Proving Grounds help to make the cars and trucks we use a lot safer to drive and also give them more reliability and a much longer life span.

Other things that would have to be eliminated would be such developments as the Technical Centers. I will have to use General Motors as an example in this case, for I am more familiar with it, though I am sure that the other companies

have similar projects but maybe not as large. I will quote from an article that appeared in the "Motor News" of May, 1974, a magazine published monthly by the Automobile Club of Michigan and sent to all its members. It reads as follows:

"General Motors Technical Center, another marvel of our industrial age. But unlike the Rouge, the GM Tech Center specializes in research laboratories, test facilties, design, engineering, environmental activities and manufacturing development.

"The Research laboratories generally specialize in broad, long-range research programs of major corporate and national interest.

"The Engineering staff is currently conducting exploratory projects in vehicular controls, transportation systems, gas turbines, emission control, vehicle structures and vehicle fuel economy. The Design staff is the central facility for design of GM automotive and non-automotive products.

"More than 18,500 scientists, engineers, designers and more highly skilled supporting personnel are employed at the 1,000 acre facility at 12 Mile and Mound Road."

This is located in Warren, Michigan, a suburb of Detroit.

I am sure that both Ford and Chrysler have similar operations on a smaller scale. No single unit if broken out of any of the Big Three could afford to have anything of this nature, and in turn we would all suffer for those are the transportation ideas of tomorrow as well as a lot of other scientific endeavors that would never get off the ground.

A short time ago a person said to me while we were looking at an exhibit of old cars in a Shopping Mall, "They don't build them like those any more," and I answered by saying that they sure don't. The cars we were looking at would have required an oil change at least every 1,000 miles and in between times you would more than likely have to add a quart or two of oil, maybe more. A lubrication would have been required at the same time as the oil change.

The tires would have been lucky to get 5,000 to 10,000 miles, and even then you would have had any number of flats and maybe blowouts that could have resulted in a wreck. Most of the body construction was of wood that would soon dry rot. A new valve job and cleaning of carbon from the motor would also have been required at about the 10,000 mile mark. At about the same mileage new brakes would have been necessary, as there was a single rear brake. A Model T Ford's brakes would have been in the transmission and it was a constant job to keep them from chattering, and the replacement of the bands themselves would have been required.

There would have been no power steering, no power four-wheel brakes, and a single-beam headlight was bright sometimes, if you were lucky. The windshield wiper would have had to be worked by hand, if you even had one. You might have had to open the windshield to see out if it was raining real hard or was snowing or sleeting, as there was no such thing as a defroster. If it was able to run at 50,000 miles you had something far beyond the expectations of any of the manufacturers. Sure, there were exceptions, but they were few and far between.

The next remark of the one who was talking to me was, "Well, they are a lot shinier," and I had to remind this person that in those days the better cars, yes and even some of the less expensive, had required many coats of enamel and after each coat had to be baked for hours. If that was done today the price would be beyond reason, and none of the cars were rustproofed as they are today.

Another thing we would lose in the breakup of the Big Three would be the Standards of Engineering now established by the Central Engineering Staffs which in turn allow the use of some of the same parts on the smallest car to the largest. A thing of this nature would be impossible, for you could not have interchange of ideas between Divisions that you now have. If they were to be split I am sure this would not be allowed under the Anti-Trust Act, though I am no lawyer and for this I say Thank the Lord.

The lack of this type of interchange of parts would also cause a higher cost for the necessary replacement parts and it would also require separate warehouses and parts depots, all of which would add to the cost of replacement parts that would have to be passed on to the buying public.

I have yet to talk to any stockholder, big or small, that would like to see this type of breakup occur, and I do not think that even American Motors would be happy, for it would have to result in the Jeep Division being separated from it.

If such a thing was even likely to occur, my thinking would be that each and

every stockholder should be polled to see whether they are in favor, for they are the ones that have invested their money and, in thousands of cases, have scrimpted and saved to do so for an investment to take care of the penalty of getting old.

I only wish that I could have appeared in person so that you could have asked me questions and I could explain in more detail the why's and wherefores of my reasoning, for there are many hundreds of other examples I could use, such as the GM Institute, which has trained thousands of men and now women for positions of responsibility with no ties attached that they would have to stay with GM after graduation; the Chrysler Institute and many others far too numerous to mention in detail but which are essential for the well-being of the Country as a whole. I am sure that it would be interesting to hear from a few of the Dealer Organizations around the Country to see what they feel about such a move, for they cover a multitude of people and places and are good citizens in the community in which they live and do business, employing an awful lot of people, all of whom would be affected. Ask the small independent garage owner and get his reaction. These people have more at stake than any economist you might call to testify, for this is their livelihood.

I wish all of you might read the last book written by Allen Drury, "Come Nineveh, Come Tyre," and this is what I am afraid we might be leading into, not a Government of the People but a Government by elected persons who think they should decide what is best for all of us, even though they might have been elected by a majority of only a few votes.

I thank you and hope you will see fit not to have this type of law enacted for a lot of us who bought these stocks for dividends to make our old age a little more comfortable will surely be the ones that will have to suffer.

ADDENDA—COMPARISON OF EMPLOYEES AND STOCKHOLDERS TAKEN FROM 1973 ANNUAL REPORTS

	Employees	Stockholders
Chrysler	273,254	208,771
Ford	474,300	342,500
General Motors	810,920	1,305,998
Total	1,558,474	1,857,269

Exhibit 32.—Letter from R. F. Magill, GMC, in Response to Senator Hart's Letter of February 25, 1974

GENERAL MOTORS CORP.,
GENERAL MOTORS BUILDING,
Detroit, Mich., April 9, 1974.

Hon. PHILIP A. HART,
U.S. Senate,
Washington, D.C.

DEAR SENATOR HART: This is in response to the request contained in your February 25 letter to Mr. Edward N. Cole for information on components supplied to or obtained from competitive companies. The attached schedules show the following:

1. Value of purchases by competitors from GM by major products for the 1973 calendar year.
2. Value of sales by GM to competitors by major product for the 1972 and 1973 calendar years.

Information on the quantities of products purchased and sold to competitors has not been supplied since our records are not maintained in a manner which makes the data readily available. Quantities could be obtained only through a search of individual invoice records.

A survey of our divisions discloses that almost universally products are sold on purchase orders for a one-year requirement subject to periodic release.

Sincerely,

R. F. MAGILL,
Vice President.

Attachments (2).

ATTACHMENT 1.—GMC, 1973 CALENDAR YEAR, PURCHASES FROM COMPETITORS BY PRODUCT

[In millions of dollars]

	AMC	Chrysler	Ford	IHC
Governors and components		6.6		
Raw steel			6.5	1.3
Transmissions and components		36.3		.1
Miscellaneous		1.7	.2	.1
Total		44.6	6.7	1.5

ATTACHMENT 2.—GMC, 1972 AND 1973 CALENDAR YEAR, SALES TO COMPETITORS BY PRODUCT

[In millions of dollars]

	AMC		Chrysler		Ford		IHC	
	1972	1973	1972	1973	1972	1973	1972	1973
Air conditioners					19.2	22.4		
Castings	10.6	13.2	9.9	22.5	11.3	13.9		0.5
Diesel engines and components			2.7	5.1	30.2	36.2	58.8	47.8
Starting, lighting, and ignition parts	3.9	4.7	.4	.7	4.6	6.6	29.1	29.3
Steering gears and components	20.1	30.0	25.0	26.6	8.0	10.3	8.2	7.9
Transmissions	5.3	8.2	1.1	1.0	7.2	7.3	11.2	13.7
Miscellaneous	7.4	12.0	10.8	11.4	9.0	10.8	12.2	12.6
Total	47.3	68.1	49.9	67.3	89.5	107.5	119.5	111.8

THE INDUSTRIAL REORGANIZATION ACT (S. 1167)

(Ground Transportation Industries)

THURSDAY, APRIL 11, 1974

U.S. SENATE,
SUBCOMMITTEE ON ANTITRUST AND MONOPOLY
OF THE COMMITTEE ON THE JUDICIARY,
Washington, D.C.

The subcommittee met, pursuant to notice, at 10 a.m., in room 318, Russell Senate Office Building, Hon. Philip A. Hart (chairman of the subcommittee) presiding.

Present: Senator Hart.

Staff present: Howard E. O'Leary, Jr., staff director and chief counsel; Patricia Y. Bario, editorial director; Janice C. Williams, chief clerk; Peter N. Chumbris, chief counsel for minority; and Dr. Michael Granfield, economist for minority.

Senator HART. The subcommittee will be in order.

We welcome Mr. James W. Ford, chief economist of the Ford Motor Co.

The Senate is in session now and there will be interruptions because of votes on the floor. The only additional delay that we would anticipate is an obligation I have to offer and support an amendment to a bill that will be the subject of debate on the floor sometime during the day.

As of 10 minutes ago I couldn't find out exactly what time it might occur. I would like to apologize for the interruption.

Well, gentlemen, you proceed as you would like.

STATEMENT OF JAMES W. FORD, ASSISTANT CONTROLLER AND CHIEF ECONOMIST, FORD MOTOR CO., ACCOMPANIED BY JAMES M. MacNEE III, GENERAL COUNSEL'S OFFICE

Mr. FORD. Thank you, Mr. Chairman.

I should like to read our statement for the record, if I may.

With me this morning is James M. MacNee III, of the general counsel's office at Ford. We do appreciate the opportunity to appear this morning to present Ford Motor Co.'s views on the industrial reorganization bill as it applies to the automobile industry.

Our statement will deal with the substantive issues raised by the bill, and we should like to reserve our position on its organizational and procedural features.

In brief, we shall show that the record of automobile prices, profits, and product development indicates vigorous competition; that the only so-called barrier to entry is the superior competitive performance of present domestic and foreign manufacturers; and that breaking up U.S. automobile companies probably would result

in higher costs and reduced competition, possibly including the exclusion of foreign manufacturers in order to protect the smaller U.S. companies.

We shall discuss, first, the economic issues underlying the bill and, second, the bill's relation to present antitrust law.

ECONOMIC ISSUES

The industrial reorganization bill is based on the economic doctrine of market concentration. In essence, this doctrine holds that where there are few sellers in a market, competition is, at best, weak, prices are high relative to costs, and the companies are generally unresponsive to consumer preferences and other market forces.

Consequently, it is held, market concentration leads to price inflexibility, monopoly profits, inbation, underproduction, unemployment, inefficiency, and technological stagnation.

The older economic evidence on the relation of concentration to monopoly power—and we would like to give principal attention to that issue—was mixed.

Newer evidence, which has been summarized for the subcommittee by Prof. Harold Demsetz, tends to refute the contention that concentrated industries are monopolistic.

Our purpose here, however, is not to discuss the statistical evidence on markets in general. We shall deal with the applicability of the concentration doctrine to the U.S. market for new passenger cars and trucks.

We wish to emphasize that the relevant issues are the facts of performance, not speculative logic based on presumptions about how companies must behave and market prices must be set.

With respect to the U.S. automobile market, four central questions are suggested by the industrial reorganization bill:

First, is competition among automobile manufacturers a strong constraint on their prices?

Second, are profits out of line with those of other businesses?

Third, are there barriers that prevent the entry of new competitors?

Fourth, has there been technological progress and product improvement?

We shall discuss each of these issues and then comment on related economic matters before turning to questions of antitrust law.

1. Is competition among automobile manufacturers a strong constraint on their prices?

We wish to make clear, first of all, the distinction between an industry, which usually means manufacturers of a generic product located in a given country—the U.S. automobile industry—and a market, in which producers from other countries may compete. Companies in the automobile industries from several of other countries compete in the U.S. car market.

The market is more important to the consumer, in terms of prices and availability of a broad choice, than is the industry.

Because of the way the statistics are sometimes compiled, industry concentration ratios can be seriously misleading as indicators of concentration in a given market—this is importantly true of concentration ratios for the U.S. automobile industry.

In recent years, foreign manufacturers have accounted for up to 16 percent of total car sales in the United States, and one manu-

facturer, Volkswagen, had a market share higher than American Motors from 1965 until very recently. The successful entry of foreign manufacturers has been an important aspect of competition in the U.S. automobile market.

Automobile manufacturers compete in the establishment of model-year wholesale prices and in the offering of price reductions, from time to time, through sales contests and incentives. The effective wholesale price is the result, of course, of both kinds of pricing action. In explaining how we arrive at pricing decisions, however, it is convenient to treat the two actions separately.

Except in periods of Government price control, the prices set at the beginning of a model year rarely have been changed during the year. In deciding on prices at Ford, we consider the anticipated changes from the present model year in the costs of labor, materials, and purchased services; cost changes associated with Government product standards and other product changes; the relationship of Ford's prices and product features to the competition; changes in fixed costs per unit at our sales planning volumes; expected demand for different products; and efficiencies we expect to realize in producing the new models.

Our objective is to arrive at a price that will maximize profits over the long term, given the constraints of the market. If our prices are too high, we shall lose sales and profits. This is where competition restrains—and powerfully.

The same motivation and the same restraint determine the offering of sales incentives. These are, ineffect, discounts from posted prices on certain cars, usually for limited periods, and usually requiring that a dealer or salesman sell a certain volume or meet certain other conditions in order to qualify for the discount.

The following table shows some examples of representative programs offered by various companies during the 1973 model year.

U.S. AUTOMOBILE MANUFACTURERS, EXAMPLES OF SALES INCENTIVES AND SPECIAL VALUE PROGRAMS, 1973 MODEL YEAR

	Period	Estimated price reduction per average vehicle
Special value programs:		
American Motors	February–April	$113–$152
Plymouth Fury	Entire model year	35–106
Plymouth Valiant	do	148–154
Do	June–September	50
Maverick	December–March	69
Pinto	do	72–97
Chevrolet Vega	March–April	58–76
Pontiac Ventura	December–March	28–48
Oldsmobile	February–April	106
Ford Truck	January–June	66–190
Chevrolet Truck	March–May	72–171
Sales and incentive programs:		
American Motors [1]	January–April	15
Plymouth Fury	January–March	40
Do	June–September	106
Dodge Polara	April–May	25
Chrysler	June–September	106
Chevrolet Chevelle	March–April	14
Do	August–September	58
Buick	do	60
Ford and Maverick	December–February	17
Mercury and Montego	July–September	37

[1] Trip contest.

Source: Trade announcements; unit price reductions of American Motors, Chrysler, and GM partially estimated.

Mr. FORD. The discounts offered to dealers on particular models, through special value programs and sales contests, ranged up to nearly $200 per unit, and they often represented sizable discounts from wholesale prices.

Before reviewing the results of price competition among passenger-car manufacturers, we should like to comment briefly on two supposed indications of noncompetitiveness—"price leadership" and "price administration."

It is not clear at all what phenomenon the term "price leadership" is supposed to describe. It is not true that we and other manufacturers always wait for General Motors to price first or always match GM's prices when it does announce before we do. In the 1974 model year, for example, there have been two general increases in car and truck prices; in both instances, Ford priced before GM.

Neither is it true that GM is the volume leader throughout the new-car market. As shown in the table below, several companies are now challenging for leadership in the sale of small cars—subcompacts and compacts.

UNITED STATES, INDUSTRY CAR RETAIL DELIVERIES BY MARKET SEGMENT AND MANUFACTURER, 1973 CALENDAR YEAR

	Units	Share of segment (percent)
Subcompact and imported cars:		
Ford	594,568	21.2
General Motors	528,026	18.9
Volkswagen	437,915	15.6
Toyota	277,040	10.0
Datsun	235,449	8.4
American Motors	133,156	4.8
Chrysler	40,342	1.4
Other Japanese	194,846	7.0
Other foreign	355,267	12.7
Total	2,796,609	100.0
Compact:		
Chrysler	598,222	37.4
General Motors	498,121	31.1
Ford	364,403	22.8
American Motors	140,014	8.7
Total	1,600,760	100.0
Small specialty:		
Ford	191,431	45.5
General Motors	160,563	38.2
Chrysler	42,191	10.0
American Motors	26,308	6.3
Total	420,493	100.0
Small bus:		
Chrysler	46,391	36.0
Volkswagen	42,141	32.7
Ford	21,238	16.5
General Motors	19,024	14.8
Total	128,794	100.0
Intermediate:		
General Motors	1,653,401	62.8
Ford	586,520	22.3
Chrysler	338,458	12.8
American Motors	55,957	2.1
Total	2,634,336	100.0

UNITED STATES, INDUSTRY CAR RETAIL DELIVERIES BY MARKET SEGMENT AND MANUFACTURER, 1973 CALENDAR YEAR- Continued

	Units	Share of segment (percent)
Standard:		
General Motors	862,004	47.8
Ford	685,064	38.0
Chrysler	215,486	12.0
American Motors	40,396	2.2
Total	1,802,950	100.0
Medium and medium specialty:		
General Motors	1,131,324	69.3
Chrysler	274,773	16.9
Ford	225,724	13.8
Total	1,631,821	100.0
Luxury:		
General Motors	289,233	68.8
Ford	117,974	28.1
Chrysler	13,019	3.1
Total	420,226	100.0
Total industry	11,435,989	

Source: Domestic—press releases; foreign—press releases, Ward's Automotive Reports, and Ford estimate for small manufacturers.

Mr. FORD. Volkswagen, Chrysler, Toyota, Nissan, which produces Datsun products and American Motors are major competitors, and their prices have more influence than GM's on our pricing in many instances. In the subcompact segment during 1973, Ford was the volume leader. Chrysler was first in the compacts, and Ford was first in the small specialty segment. The concept of a single leader in the new-car market simply is not valid.

Sometimes both price leadership and price administration refer to the fact that automobile manufacturers take account of their competitors' prices. There is no question that for us, as for most businesses, pricing is a decision—in contrast to the relatively few situations in which a seller's prices are set through organized trading or other kinds of truly impersonal competition. Automobile companies guess at and take account of, the anticipated reaction of specific "rivals," as do most businesses, large and small—clothing manufacturers, the corner druggist, meat packers, appliance dealers, and dry cleaners, as well as automobile manufacturers.

The real issue is not so-called price administration or price rivalry or oligopoly, but whether price behavior and profitability are out of line with those in markets in which there is less concentration.

Price competition among automotive manufacturers reflects intense competition at the retail level. Perhaps the best illustration of the degree of price competition among dealers is newspaper advertising. Regardless of whether the dealer is promoting new or used cars, most of his promotional emphasis is on price. Dealers know, through years of experience, that price is one of the most important competitive factors because it is so easily compared and changed. It is the appeal of price to the consumer that causes both the dealer and the manufacturer to offer special price promotion programs.

such as a free automatic transmission or a vinyl top, a Ford "white sale," a Chevrolet "garage sale" or "Spirit of America" sale.

The automobile market is one of the last consumer markets where horsetrading is still a common practice. The used car trade-in, which is involved in most new-car sales transactions, provides a basis for price competition which is virtually unique. The dealer and the customer bargain not only for the purchase price of the new car, but also for the selling price of the used car.

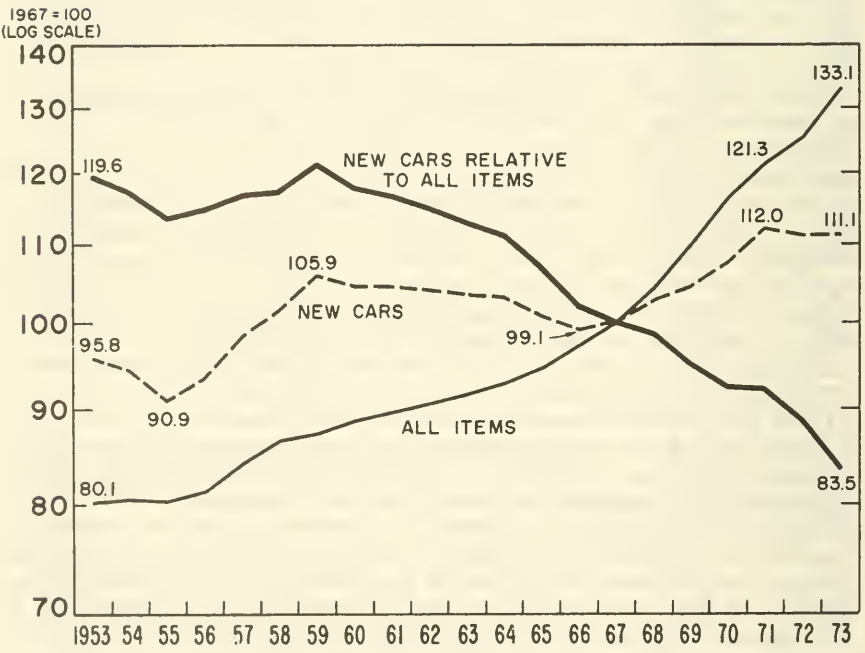
The dealer is in the front-line of new-car price competition. He first experiences changing demands for various products, and his response in pricing and in ordering leads to changes in manufacturers' prices, through incentive programs and changes in model-year wholesale prices.

The chart below shows the behavior of the Consumer Price Index for new cars compared with the Consumer Price Index for all items.

UNITED STATES

CONSUMER PRICE INDEX–
ALL ITEMS AND NEW CARS

1953 – 1973



SOURCE: BUREAU OF LABOR STATISTICS

Mr. Ford. The Consumer Price Index for new cars is compiled by the Bureau of Labor Statistics using monthly surveys of actual new car prices offered to BLS shoppers—a shopping survey. Each year BLS adjusts the price index numbers for the new models for quality changes by deducting from the shoppers' prices an allowance for added product quality in the new models. Some examples of added product quality on the 1974 models were the seatbelt interlock, and, on Ford cars, improvements made in paint, suspensions, and ignition systems.

Reflecting competition among dealers and manufacturers, the Consumer Price Index for New Cars increased only 19 percent from the second quarter of 1953, just after Korean War price controls on new cars were removed, to the second quarter of 1971, just before the recent controls and removal of the 7 percent excise tax on new cars. During the same period, the overall Consumer Price Index increased 5 percent—2⅔ times as much. As a result, new-car prices fell 27 percent relative to the general level of prices.

From 1953 to 1959, car prices rose 11 percent, relecting inflation and cost increases. From 1959 to 1966, car prices fell 6 percent. The decline reflected the additional features and other quality improvements added to cars without commensurate price increases, as well as a reduction in the new-car excise tax in 1965.

From 1966 to 1971, car prices rose 13 percent, as the result of accelerated increases in the cost of labor and materials. New-car prices, however, rose 12 percentage points less than the overall Consumer Price Index during this period.

In short, the relative price of new cars has fallen for essentially the entire postwar period, while the demand for new cars has been rising strongly, unit costs have been increasing faster than nominal prices, and manufacturers' profit margins have been shrinking. This behavior of prices, sustained over such a long period, is striking evidence of strong competition in automotive manufacturing.

It might be argued that this record, although impressive, is not conclusive evidence of competition among automobile manufacturers. Conceivably, car prices and profits might have been at monopolistic levels 20 years ago. In fact, that was not the case. The profit margins and returns of U.S. automobile manufacturers were generally in line with profits in other industries, as shown in the following section. Moreover, the returns and margins of automobile manufacturers have declined relative to the profitability of other businesses.

2. Are profits out of line with those of other businesses?

The crucial point, then, is that the profit returns earned by U.S. automobile manufacturers have been, and are, in line with returns in markets where there are many more sellers.

Even if this were not the case, higher-than-average profitability is not, by itself, an indication that competition is weak or absent.

There are many reasons other than monopoly power why a company, or even a group of companies, may be more profitable than business in general.

An individual company may earn higher profits than its competitors for the same reason that an exceptionally able lawyer, writer, promoter, physician, investor, or salesman may earn an exceptional income. The ability to do more with available resources does not indicate that there are restraints on competition.

The "Report of the White House Task Force on Antitrust Policy" —the Neal report—submitted to President Johnson in 1968, included an unequivocal statement that high profit rates in a single firm, or even a single industry, are fully consistent with competition in the market.

[The statement referred to follows:]

[Excerpt from "Report of the White House Task Force on Antitrust Policy," 1968]

PROFITS OF INDIVIDUAL FIRMS ARE NOT AN INDICATOR OF MONOPOLY OR COMPETITION

High profit rates in individual firms or even in particular industries are of course consistent with competition. They may reflect innovation, exceptional efficiency, or growth in demand outrunning the expansion of supply. Above-average profits in a particular industry signal the need and provide the incentive for additional resources and expanded output in the industry, which in due time should return profits to a normal level. It is the persistence of high profits over extended time periods and over whole industries, rather than in individual firms, that suggests artificial restraints on output and the absence of fully effective competition.

Mr. FORD. On the whole, this report was critical of market concentration.

Yet the authors clearly recognized that profitability by itself is not a meaningful test of monopoly power.

As general perspective for comparisons of profit rates among companies we should like to make clear the small share that after-tax profit has in total business results.

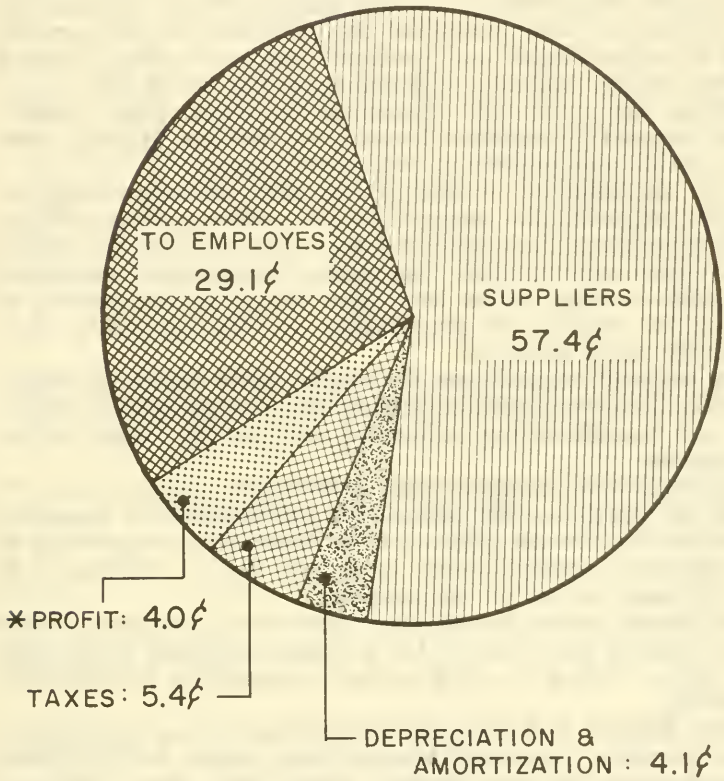
At Ford in 1973, profit was 4 cents for each dollar of sales and other income, compared with 5.4 cents for taxes, 4.1 cents for depreciation, 29 cents for payrolls, and 57 cents for purchases from suppliers.

The return to capital is a small part, indeed, of the price of an automobile. Of the 4 cents profit, 1.4 cents went to stockholders as dividends, and only 2.6 cents was left for investment in programs to increase efficiency, to expand capacity for small cars or other products in growing demand, and to develop new products and components to meet consumer demand and Government standards.

[The chart referred to follows:]

FORD MOTOR COMPANY

DISTRIBUTION OF EACH $1 OF 1973 SALES AND OTHER INCOME



* PROFIT (INCOME BEFORE MINORITY INTERESTS) INCLUDES 2.5¢ OF RETAINED EARNINGS, 1.4¢ IN DIVIDENDS, AND 0.1¢ IN MINORITY INTERESTS.

Profit is a residual, as well as small, share of the sales dollar. Unlike the returns to others who provide essential inputs to a business operation, the stockholders' share is not protected by contractual arrangements—it is exposed to the total business risk. Investors' evaluations of the riskiness of a given company or industry, therefore, have a major influence on its ability to attract and retain capital. Automobile manufacturing has always been specially exposed to risk because of the large investments and long lead-times required to introduce new products or product changes, and because of the magnitude of cyclical fluctuations in demand for cars and trucks. In recent years, the degree of risk has been greatly increased by uncertainties and problems connected with changing Government safety, emission, and damageability standards.

In addition, the automobile companies, like other large, "visible" firms, are exposed to selective Government actions in such areas as price control and balance-of-payments control.

Certainly, the behavior of stock prices does not suggest that investors have regarded the automobile companies as outstandingly profitable or insulated from market forces. The prices of automobile stocks have been more variable than those of comparable companies, and the price-earnings ratios have been lower. In the context of competition for capital, the profitability of U.S. automobile companies hardly seems excessive.

Turning to profit comparisons, the exhibit below shows the return on assets for U.S. automobile companies and for two broad business averages—all manufacturing companies and the 500 largest industrial companies.

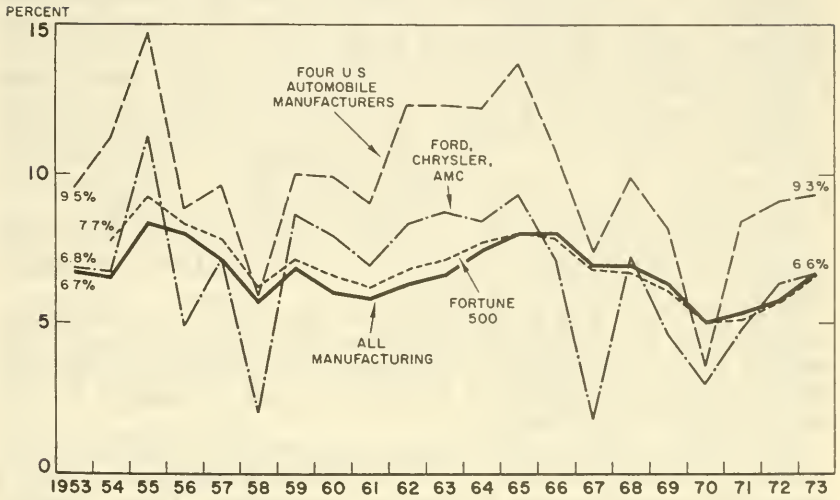
The return on total assets is more relevant, we believe, than the return on net worth—or net assets—for the question of monopoly versus competition because differences in financial leverage—that is, the ratio of debt to equity—among firms have little or nothing to do with the strength of market competition.

General Motors' return is well above the overall averages; Ford's return has usually been close to the averages, although it was consistently higher during the long cyclical recovery in the first half of the 1960's.

American Motors' and Chrysler's returns have been consistently below the averages. American Motors' high return for the 1959–65 period reflected two exceptionally strong sales years, 1959 and 1960. Since the mid-1960's, the returns of all the automobile companies have declined relative to the returns for other businesses.

The presence of automobile companies that continue to earn average or below-average returns is highly significant for the question of monopoly power. If there were restraints on competition in the automobile market, one would expect that all the U.S. automobile companies would do relatively well. In fact, this has not been the case. The profitability of the individual companies reflects the existence of a highly competitive market, in which the fortunes of individual companies have differed widely and the more successful firms have achieved both better profit results and higher market shares.

U. S. MANUFACTURING COMPANIES
AFTER-TAX RETURN ON ASSETS*



	After-Tax Return on Assets - Period Averages		
	1953 - 1958	1959 - 1965	1966 - 1973
American Motors	(0.5)%**	10.8%	(0.4)%
Chrysler	4.2	4.9	4.0
Ford	8.4	9.5	6.3
General Motors	12.5	13.7	11.3
All Manufacturing	7.1	6.7	6.3
Fortune 500	7.8***	7.1	6.2

- - - - -

*All Manufacturing and Fortune 500 estimated for 1973
**1955-1958
***1954-1958

Sources: SEC-FTC, Fortune, and the U.S. automobile companies' annual reports

This is consistent with the general evidence, presented earlier in these hearings by Professor Demsetz, that patterns of profitability in concentrated industries are consistent with competition and efficient performance.

Why, then, is the U.S. automobile industry so often singled out as extraordinarily profitable? We think there are two reasons for this. Too often, absolute dollar profits are cited as evidence of high profitability. The aggregate profits of automobile manufacturers are large, because the companies themselves are large—their total employment, payrolls, assets, and sales all are large magnitudes. Profitability, however, is only meaningful in relation to the size of sales or the size of investment, just as the level of employee compensation is measured on the basis of compensation per man, not total payroll. The fact that Ford's labor costs in 1973 were over $7 billion does not mean that our employees were overpaid.

The second reason is that weighted averages of the individual company's profit margins or returns are often used as a convenient summary—as we used them earlier.

General Motors is so much larger than any other U.S. auto manufacturer that its profitability dominates the industry average. The average creates a misleading impression that profitability throughout the industry is uniformly high. This is not so—though we certainly wish it were true.

In summary, the record of prices and profits in the automobile industry is inconsistent with the contention that competition among automobile manufacturers is weak or nonexistent. Taken together with the expansion of output and the acknowledged efficiency in automobile manufacturing, the record bespeaks a strongly competitive industry, not one in which companies have succeeded in protecting an easy and profitable existence by curbing competition.

3. Are there barriers to entry?

The first observation on this subject is that new competitors—foreign manufacturers—have entered the market, with increasing success in the last 10 years. The first growth of foreign car sales in the United States came in the late 1950's, as Volkswagen, especially, began to make inroads. Following the introduction of U.S. compacts in 1959, foreign car sales declined. VW's sales, however, continued to increase. The failure of some other foreign cars to compete successfully apparently reflected problems with parts and service availability and some product deficiencies under U.S. conditions. Beginning in the mid-1960's, however, import sales revived, as Volkswagen continued to grow and the sales of Japanese cars rose rapidly.

Notwithstanding this performance, it is not easy to enter the U.S. automobile market. The capital requirements are high, reflecting the capital-intensive nature of the business. Capital requirements and other miscalled "barriers to entry," however, are widely misinterpreted and sometimes, unfortunately, have been misrepresented.

The support barriers are not patent protection or tariffs or government licensure requirements or lack of the required resources,

including capital. The U.S. capital market each year supplies many times the funds that would be required to set up an automobile company with a capacity of half a million or a million cars a year. People with the required skills and experience, and businessmen to become dealers, could be found in other occupations or attracted from existing automobile companies if necessary.

The real barrier is the difficulty and risk entailed in developing, manufacturing, merchandising, and servicing products good enough to sell in adequate volume against the existing products. The barrier, in short, is nothing other than the proven performance of the existing companies. Obviously, this does not shelter companies from competition—the barrier is only as high as superior competiitve performance in the industry makes it.

True barriers to entry are illustrated well by the prohibitively high tariffs, discriminatory internal taxes, and local content regulations in some other countries. In such situations, importation of vehicles is effectively prohibited, and low-volume local manufacture or assembly is necessary. In these markets, costs and prices are substantially higher than in the United States, because of the high costs of vehicles, components, and materials produced in low volume, high tariffs on the small amount of imported materials and components, and because many major components are available only from a single supplier.

Some examples of car prices in such cases are shown in the table below:

FORD MOTOR CO., PRICE COMPARISONS OF FORD PRODUCTS IN THE UNITED STATES AND OVERSEAS WHERE ENTRY IS CONTROLLED

	Suggested retail list prices	
	United States	Overseas [1]
1973 model:		
Mustang (2-door hardtop)	$2,760	$5,076 (Mexico).
Ford LTD Brougham (4-door hardtop)	4,157	8,909 (Venezuela).
F-100 Pickup Truck	2,779	4,538 (Australia)
F-250 Truck	3,115	5,376 (South Africa)
F-700 Truck	5,687	8,319 (Argentina)

[1] Prices are net of sales taxes and import duties on components.

Note: Base vehicle prices; in most instances, the product content or value is higher for the U.S. model.

These are cases of true, artificial barriers to entry, which reflect extraneous, noneconomic obstacles. In terms of consumer welfare, they are at the opposite pole from the miscalled barriers in the U.S. market, which are the direct result of the open competition that has allowed the best firms to survive and grow to the limit of their ability to provide superior performance.

4. Has there been technological progress and product improvement?

The development of automotive technology has been governed by the efforts of manufacturers to increase automobile usage and broaden the market for their products.

The goals of product development, therefore, have been mainly market determined. They include principally improvements in: original cost and operating cost; ease of operation, service, and repair; reliability, durability, and safety; comfort and convenience; road performance; and appearance.

In addition to the goals that reflect consumer demand, Government requirements have added others in recent years, principally emission control and occupant and vehicle protection.

Like other consumer-oriented products, automobiles have been designed for mass production and mass use under a wide variety of operating conditions. Unlike the development and production of such products as aircraft, spacecraft, military electronics, and heavy weapons, for which the Government pays a large share of the costs, automotive R. & D. and manufacturing investments are determined by the prospects of earning a return in the marketplace.

Over the last 20 years, advances in automotive technology have continued to yield major functional and economic improvements in cars and trucks, and the variety of products has increased enormously.

A few examples of the changes in cars are shown in the table below:

UNITED STATES REPRESENTATIVE TECHNOLOGICAL AND ECONOMIC IMPROVEMENTS IN PASSENGER CARS

	1974	1954
Months of income required to buy a car	4.2 months	7.9 months.
Cost of Ford Motor Co. air conditioning unit (in 1954 dollars)	$244	$575.
Percent of new cars sold with air conditioning	69.8	0.1.
Maintenance improvements on Ford Cars:		
Chassis lubrication interval	36,000 miles	1,000 miles
Major engine tuning	24,000 miles	5,000 miles.
Oil change interval	6,000 miles	2,000 miles.
Innovations	Anti-skid brakes	Not available.
	Alternator	Do.
	Electronic ignition	Do.
	Radial-ply tires	Do.

Sources: Ford Motor Co., Ward's Automotive Reports, and U.S. Department of Commerce.

Reliability has increased greatly. Despite the addition of new features and general increases in product complexity, in-service data for the Ford car show no increase during the last 10 years in repair rates—repairs per 100 cars—or the average cost of repairs as measured in constant dollars.

Along with improvements in base vehicles and the development of more optional equipment, United States and foreign manufacturers have offered a wider range of vehicle types. As income rose and the cost of a car relative to earning power came down, markets began to develop for more specialized cars. Small cars became increasingly popular as the family car for single people and young families, and as a second car for others. Sporty cars, station wagons, and, in recent years, a wide variety of trucks have been developed to meet the demand for more specialized vehicles.

[The following table was received for the record:]

Ford Motor Co. new vehicles introduced since 1960

Vehicle	*Model year of introduction*
Falcon and Comet (compacts)	1960
Econoline (pickup and van) [1]	1961
Fairlane and Meteor (intermediates)	1962
Mustang (compact)	1964½
Econoline Supervan [1]	1965
Bronco [1]	1966
Cougar (compact)	1967
Mark III (luxury)	1968½
Maverick and Comet (compacts)	[2] 1969½
Motor home chassis [1]	1970
Capri (subcompact)	1970½
Pinto (subcompact)	1971
Econoline Camper Special Cutaway [1]	1972
Courier (compact pickup) [1]	1972
Mustang II (subcompact)	1974

[1] Truck
[2] Comet introduced in 1971 model year.

Mr. Ford. The development, launching, and production of an increasingly complex lineup of vehicles has been an expensive, difficult, and risky undertaking. Expanding the market by offering wider consumer choice has been one of the most important competitive responses of automobile manufacturers to market opportunities.

A restrictive oligopoly would have found a way to divide up a more limited market, enabling all of the companies to live an easier life.

In today's circumstances, it may seem that absence of an improvement in gasoline mileage is a telling exception to a record of general product advance. In fact, gas mileage on the Ford car increased slightly from the early 1950's to 1970, despite increases in weight, engine performance, and use of power for auxiliary equipment.

During this period, fuel economy was not a major consumer demand—and, therefore, not a primary design objective—simply because gasoline was cheap. From 1957 to 1970, the price of gasoline rose less than 5 cents, from 31 cents a gallon to 35.7 cents a gallon. This was an increase of only 15 percent in 13 years or less than half the 38-percent increase in the general price level. Most consumers, therefore, were willing to forego improvements in gas mileage to get easier operation—power brakes and steering; comfort—air-conditioning; convenience—power windows, power seats, and more performance.

Consumers always had a choice between amenities and gas mileage. Smaller cars—including imports—low-powered engines, standard transmissions, and, in general, cars with lower fuel consumption have always been available—and the market share of small cars, of course, has been increasing since the mid-1960's.

The fact that consumers did not choose more strongly in favor of gas mileage may seem wrong in today's circumstances. Such a conclusion, however, requires more than 20–20 hindsight; it requires bias against popular choice, as such, and a nonsensical projection of today's conditions backward into the past.

Fuel economy deteriorated sharply after 1970 as emissions standards were tightened. At the same time, safety and damageability requirements increased car weight, and the demand for larger-displacement engines increased as buyers sought to offset deteriorating performance. As a result of increased consumer interest in fuel economy, it became a high priority engineering objective. Our programs now in progress or under consideration are expected to achieve cost-effective gains in fuel economy, despite the greater difficulties caused by emissions control requirements.

Projections of small-car demand have been a central issue in our long-range forecasting studies for a number of years. In response to basic market trends, we have introduced four new U.S.-built small cars—Maverick in 1969, Comet and Pinto in 1971, and Mustang II in 1973. Other actions to meet rising demand for small cars have included a major import program—the Capri, modified to meet U.S. emissions, safety, and damageability standards—large increases in production capacity for small-car components and assembly; and the planned introduction of the new Granada and Monarch this fall.

As small-car demand surged in the spring and summer of last year, we started quick conversion of two large-car assembly plants to the production of small- and intermediate-size cars. After the beginning of the oil embargo late last year, we initiated other assembly actions to add to small-car capacity.

By the start of 1975-model production, we shall be able to produce 2 million small cars for sale in North America, double our 1973-model small-car production.

Technological competition among U.S. automobile manufacturers includes work on fundamental alternatives to present technology. Ford holds a number of patents on stratified charge engines, and we have done research on this technology for 15 years. Chrysler field tested passenger-car turbine engines in the 1960's. General Motors reportedly is planning to produce some 1975-model cars with rotary engines. In even more unconventional technology, Ford had a major electric-car program in the 1960's, including work on a radically different power source, a sodium-sulfur battery. This did not prove successful, and we are working now on the external-combustion Stirling engine and passenger-car turbines based on ceramic technology, both as possible power plants for the 1980's.

In a sense, however, the question whether U.S. automobile manufacturers are technologically advanced is irrelevant to the issue of market concentration. The simple fact is that any novel technology available anywhere in the world is, and always has been, potentially available to U.S. consumers through the efforts of either domestic or foreign manufacturers. A U.S. automobile company has no power to exclude technological changes, either by its action or its inaction. A U.S. company has every incentive, on the other hand, to develop and introduce any advances that appear likely to be economic.

To summarize this discussion of the market concentration doctrine, prices, profits, entry, product improvement, and technological progress in the U.S. automobile industry are, in our opinion, strongly indicative of economic efficiency and vigorous competition. Concentration of new car sales among relatively few sellers has not "* * * contributed to unemployment, inflation, inefficiency, and underutilization of economic capacity, and the decline of exports * * *" to quote the preamble of the industrial reorganization bill.

On the contrary, as demand for cars and trucks has increased, U.S. and foreign manufacturers have supplied a rising volume of better and more varied products, at prices that have declined relative to the general price level. The Bureau of Labor Statistics index of productivity in U.S. automobile manufacturing has risen faster than the index for all manufacturing; employment and wages have increased; and profits have reflected efficient performance, not restraint of competition. All this indicates a highly efficient industry.

We believe legislation that would make concentration the basis for a "presumption" of unlawful monopoly in the automobile industry would be economically harmful.

The results of such legislation, as we shall show in the next section, would be costly to automobile buyers and fundamentally anticompetitive.

ECONOMIES OF SCALE

It is inconsistent for those who say that large capital requirements are an anticompetitive barrier to entry into automobile manufacturing to assert, at the same time, that there are not substantial economies of scale in the industry. If there were not economies of scale, there would be no large capital "requirement" to enter the industry.

The significant economies of scale in the automobile industry result from the nature of the total business of planning, engineering, designing, manufacturing, and merchandising products to a standard that establishes and maintains a company's overall product and service reputation or brand name. These economies of scale are not to be found only or primarily in manufacturing processes and, even less, in differences in the size of individual plants. Economies of scale available within individual assembly and manufacturing plants are probably exploited to a large extent by plants of the size now being utilized, in most cases, by all of the automobile manufacturers.

Further economies might be available to smaller manufacturers through greater specialization of manufacturing processes, but, in any case, these are not the major opportunities to reduce costs at a larger scale of operations.

It is difficult to quantify the magnitude and extent of scale economies in such areas as engineering and research, design, marketing, and administration, yet our centralization at Ford yields clear economic advantages compared with a set of decentralized organizations. Obviously, we seek the degree of centralizing or management and functional responsibilities that will achieve the most efficient operating pattern and best overall results. We have centralized to a high degree our product planning, engineering, research, design,

and staff functions. This is done at different organizational levels for different functions. For example, each of our manufacturing divisions—an example would be our metal stamping division—has an engineering office. Total-vehicle engineering for all products, however, is centralized for our entire North American automotive operations.

In part, of course, centralized organizations in such areas as finance and administration are required, not for themselves, but to permit centralized corporate management. In part, however, these organizations permit the use of highly skilled specialists. In both respects—centralization of corporate control and centralization of specialized services—there are important economies of scale.

Management and specialization that are economic only at high volume may yield their value not through literal cost reduction, but by making possible a better product—in effect, lower costs for a given level of product quality. As one illustration of this, one of the major advantages we achieve through centralizing total-vehicle engineering control in our North American product development group is simply better engineered products.

In other areas of the business, the cost reduction associated with larger size can be quantified. The following table shows the relationship of administrative and selling cost per vehicle to volume among three of our marketing organizations.

	Indexes of cost and volume at three sales divisions			
	Total administrative and selling costs	Vehicle sales	Administrative and selling costs per vehicle	Approximate annual vehicle sales (thousands)
Division A	100	100	100	3,000
Division B	27	20	136	600
Division C	13	9	145	270

At an annual sales volume of 3 million vehicles, unit selling costs—that is, administrative and selling cost per vehicle—are about one-fourth lower than at a volume of 600,000 and one-third lower than at a volume of about 300,000 cars per year.

A statistical indication of the existence of overall economies of scale in the automobile industry is provided by the relationship of aggregate unit costs to size among the U.S. automobile companies. The simplest way to compare aggregate unit costs would be to use the ratio of total costs to sales for each company—which would be the same as comparing the profit margins, the ratios of profit to sales. The cost-sales ratios differ among the four automobile companies, however, partly because of differences in the degree of integration. To take the extreme example, American Motors has integrated much less of its final product than General Motors. American Motors, therefore, has less capital per dollar of sales, and this is one reason its profit margin is lower than GM's.

To abstract from the effects of different degrees of integration, therefore, we have used the ratio of internal costs to value added as the measure of aggregate unit costs, and value added as the measure of company size.

The table below shows data on value added and on the ratio of internal costs to value added in each of the four major U.S. automobile manufacturers.

U.S. AUTOMOBILE MANUFACTURERS COST AND VALUE ADDED RELATIONSHIPS, 1972

	General Motors	Ford	Chrysler	American Motors
Value added (millions of dollars)	16,301	8,287	3,686	421
Internal cost (millions of dollars)[1]	12,078	6,624	3,276	389
Internal cost as a percent of value added	74	80	89	92

[1] Labor cost, depreciation, and taxes other than income taxes.

Source: Company annual reports.

In interpreting these data, one should keep in mind that the four companies generally charge similar prices for similar products.

The largest firm, General Motors, had the lowest cost as a percentage of value added, 74 percent; Ford, second largest, was next with 80 percent; Chrysler and American Motors followed in order at 89 percent and 92 percent. This relationship between firm size and internal cost-value ratios has held consistently year after year. There have been partial exceptions in a few years—for example, American Motors experienced extraordinarily strong demand for its products in 1973, and its cost ratio was below Chrysler's in that year.

These data indicate the existence of substantial economies of scale in the auto industry over the size range of the present four firms.

There is a further important advantage of size in the automobile industry—size reduces risk. Not only are American Motors' cost ratios worse than GM's, they are also much more variable. That variability reflects something of the risk of being small in the automobile industry.

A company the size of American Motors cannot profitably participate in many segments of the auto market in the same way that General Motors or Ford can. Small companies must specialize in a limited product line. With specialization in one or a few product lines, misjudgment in styling or product features or a sudden shift in consumer preferences can mean bankruptcy—and did in some cases in earlier days. Consider what the fate of American Motors might have been in the recent market if it had been a specialist in the luxury segment rather than the economy segment of the market.

Even some of the critics of the present industry structure recognize that product diversification is, in effect, an economy of scale. Prof. Lawrence J. White, for example, discusses this point at length in his book on the industry. He points out that a major cause of risk in the size of the investments required for product change and the long leadtimes required to bring a new or changed product to market. This, of course, makes investments highly vulnerable to market changes and to all uncertainties affecting market forecasting.

Senator HART. Mr. Ford, at this point, let me ask for a recess in order to call the chairman of the Judiciary Committee, Mr. Eastland, who is chasing me.

[A brief recess was taken.]

Senator HART. Thank you, we will resume.

Mr. FORD. Yes, Mr. Chairman. I shall resume reading our statement at the top of page 20, and we are talking here about the consequences that we would expect to result from breaking up the automobile companies.

In addition to raising costs and prices, we believe that the plans for breaking up the automobile manufacturers into 8, or 32, or 150 companies would have drastic anticompetitive consequences, which would lead, in the end, to further prices increases. Exposed to much greater market risk some of the new, smaller companies probably would fail, but others presumably would find their sales growth limited by law. Consider, then, the situation of an automobile manufacturer limited to a sales volume below the demand for his products. The "competitive" response of the company would be to raise prices. The only way to avoid this outcome would be to regulate the prices charged by such a company as though it were a public uility. No other outcomes are possible—and what would happen to competition and the consumer in either case?

An equally difficult dilemma would be created on the international side. It is unlikely that U.S. automobile manufacturers, limited by law to small size, could maintain their initial market shares in competition with the large foreign manufacturers. Fiat, Volkswagen, Toyota, and Nissan all now have sales of about 2 million units a year. In the long run, the growing volume advantage enjoyed by foreign manufacturers probably would leave room for, at best, only a few marginal U.S. automobile manufacturers—unless, of course, high tariffs or import quotas were imposed. As a practical matter, that is exactly what would be likely to happen. Again, what would the consumer gain from the whole chain of consequences that would result from breaking up the U.S. automobile companies in the name of "competition"?

In all this, we fail to see how American consumers, the employees of the automobile companies, or the companies' stockholders have anything to gain. It is clear that there would be higher prices, lower production, lower employment in the industry—and here, I refer to U.S. industry—and all this after a period of dislocation and adjustment that would take years and involve severe hardship for many people. The painful adjustment process, however, would not be the main damage. The continuing deadweight excess cost to consumers of automobiles ultimately would be the greater loss.

SUMMARY OF LEGAL ISSUES

The bill does not define the term "monopoly power," nor does it specify what, if any, defenses are available to refute such a charge. Thus, a company would be placed in the untenable position of having to defend itself against an undefined offense.

Failure to define the term "monopoly power" also means that the three allegedly "rebuttable" presumptions, for all practical purposes, become conclusive presumptions of monopoly power. So viewed, the presumptions would violate principles of due process and equal protection of the law because the legislature would be denying

a defendant an opportunity to prove that his success was attributable to other factors—for example, a superior product, business acumen, or historic accident. As a result, the bill could penalize a corporation for no better reason than that it was successful.

Whether viewed as rebuttable or conclusive, we believe the three presumptions are based on speculation rather than probabilities:

1. To take the first, by condemning profits beyond a specified level—in this case, 15 percent net worth—as prima facie evidence of monopoly power, the bill adopts a totally arbitrary test of illegality that finds no support in previous antitrust cases. Although the purpose of this particular presumption is asserted to be to focus on "the issue * * * why such consistently high profits have not attracted new entrants"—and I quote that phrase from the section-by-section analysis of the bill—it is clear that the U.S. automobile market has attracted new entrants—the foreign manufacturers—despite the absence of high profit rates by most companies in the industry.

2. The confusion caused by the absence in the bill of a definition of the term "monopoly power" is compounded by the failure to define the critical words in the second presumption; that is, that the undefined offense may be presumed "if there has been no substantial price competition." The purposes of this presumption are asserted to be "to focus attention on parallel or administered pricing" and "to focus upon those situations where prices do not respond to fluctuations in supply and demand."

As discussed earlier, charging similar prices for similar products is as consistent with competition as with monopoly. Administered pricing—the practice of making pricing decisions that may or may not be accepted in the market—is common in most businesses, regardless of the degree of concentration. Furthermore, we have shown that our industry is very responsive to changes in supply and demand. These facts, combined with the vagueness inherent in the term "price competition," provide no legal or economic basis for presuming the existence of monopoly power.

3. The third presumption, that unlawful "monopoly power" may be presumed from the fact that four or fewer corporations account for 50 percent or more of sales in any line of commerce in any section of the country in any year, represents an attempt to equate legality with a concept of size. This contravenes more than 50 years of case law to the contrary. As former Assistant Attorney General in Charge of Antitrust, Professor Turner has told you this presumption "is not supportable."

In the second and third presumptions, the terms "any line of commerce" and "any section of the country" are used. These terms have acquired meanings under section 7 of the Clayton Act which, if applied to cases under this bill, could produce ludicrous results. For example, if four foreign or domestic automobile companies were found to account for 51 percent of sales of "subcompact" automobiles in a single county in the United States for a single year, the bill would authorize the Industrial Reorganization Court to enter an order of reorganization against the entire industry—theoretically on an annual basis.

The bill purports to authorize the Industrial Reorganization Court to take possession of any corporation or its assets "wherever located." It seems quite clear, however, that from a practical point of view, the powers of the Commission and the Court would be considerably less comprehensive with respect to nationals of foreign sovereigns than to domestic corporations. In these circumstances, the reduced ability of "reorganized" domestic manufacturers, over which the court admittedly would have complete jurisdiction, to compete against foreign industrials, over which the court would have only limited jurisdiction, should be the source of considerable concern to this subcommittee.

All competitors in the U.S. market should be subject to the same sanctions in the same circumstances. This bill, however, could place domestic automobile manufacturers—reorganized into a large number of relatively small companies—at a serious competitive disadvantage vis-a-vis a number of formidable foreign manufacturers.

This is of particular concern because, according to Professor Weston's testimony, the growth rates of foreign firms during the past 5 years have been roughly double the growth rates of the largest U.S. firms. Discriminatory action against U.S. companies would have a serious impact on U.S. employment.

As previously noted, the bill does not define the offense of "monopoly power" and fails to specify what, if any, defenses are available to a defendant faced with such a charge. Yet it does provide that once a corporation is found to possess monopoly power it shall not be required to divest if such power is due "solely" to valid patents lawfully acquired and used or if such divestiture would result in a loss of "substantial economies." The bill does not define what is meant by "substantial economies." You noted, Mr. Chairman, that the same language is used in the Public Utilities Act of 1935. The Securities and Exchange Commission, with Supreme Court approbation, has held that the term must be strictly construed and that possible increases in the cost of operation are relevant only if they threaten the very survival of a utility. As a result, adoption of this approach would represent a deliberate choice on the part of Congress to sacrifice economies.

It is difficult to reconcile such a choice with objectives of the Sherman and Clayton Acts to create and maintain the fruits of competition.

We believe there is no valid case for creating a new district court in the form of the Industrial Reorganization Court. If, however, such a court were established, its actions should be subject to review by the appropriate court of appeals or to a thorough review by the Supreme Court. The superficial Supreme Court review provided for in the bill—that is, that the Court "proceed correctly" and its findings are supported by "substantial evidence"—is unsound as a matter of law and of logic. Measures conceded to be aimed at fundamental overhaul of the Nation's economy should not be litigated in summary fashion.

Existing antitrust laws have not been shown to be inadequate to deal with the problem of monopoly power, and, in our opinion, the testimony to date has not established the need for new antitrust legislation.

SUMMARY AND CONCLUSIONS

To summarize our testimony, the weight of evidence on the U.S. automotive industry, in our judgment, is against the conclusion that concentration is anticompetitive. There is vigorous competition among existing sellers, and there are no barriers of the entry of new firms that have a reasonable prospect of success in the highly competitive environment.

The loss of economies of scale, if one or more U.S. automobile manufacturers were broken up and a minimum number of competitors were maintained by law, would raise costs and limit the ability of the more successful firms to expand and increase their efficiency.

Existing antitrust law provides sufficient safeguards for the maintenance of competition in the new-car market.

For these reasons, we believe that enactment of the industrial reorganization bill or any legislation limiting market concentration per se would be contrary to the public interest. We urge the Antitrust and Monopoly Subcommittee, therefore, to reject the bill.

We thank the subcommittee for the opportunity to express our views on this legislation. We should be happy to answer your questions.

Senator HART. Thanks very much, Mr. Ford.

In your statement you explained that the Reorganization Act does not define the term "monopoly power," and you further state that the failure to define the term means that the three rebuttable presumptions, for all practical purposes, become conclusive presumptions of monopoly power.

Continuing, you say that the presumptions would violate the presumptions of due process and equal protection of the law because the legislature would be denying a defendant an opportunity to prove that his success was attributable to other factors; for example, a superior product, business acumen, or historic accident.

Now, perhaps I am not going to ask a question, but to try to make some legislative history, we will clarify, at least, our purpose.

First, I am not sure that I agree completely with the scope of that statement. Couldn't a legislature pass a law declaring that the public structure of this industry or another industry was not in the public interest and ordering a reorganization of the firms in that industry.

In short, isn't that what Congress did in the Public Utilities Holding Company Act? And that act didn't provide, I am told, any findings to whether the holding company was good or bad, or provide for the security of the product or anything else. It simply said that the company should be reorganized.

Mr. FORD. Mr. MacNee will respond to that, Senator Hart.

Mr. MACNEE. I don't profess to be an expert in constitutional law, Senator, but I certainly would be inclined to agree with you that Congress could do what you have described.

Our concern here is, basically, that the presumptions—as presumptions in any case—are appropriate only when they reflect sound predictions of noncompetitive behavior.

And in this particular case, referring to S. 1167, we don't believe that they in fact are sound predictions of noncompetitive behavior.

Now, as far as the Public Utility Act of 1935 is concerned, as I understand it, really all that bill did was to dissolve the holding company. It left untouched the operating companies. And we have some concern here that, if implemented, you would touch the operating companies.

Senator HART. Well, again, confessing that I am flying semiblind as to what we really did here in Congress in the 1930's in the Utility Holding Company Act, as I understand it the Congress said to holding companies that the gas and the electric shall be divested; you will separate those two functions and at least in the case of the Public Utilities Holding Company Act, the Supreme Court did find that the actual act of Congress, whether wise or unwise, was constitutional.

Mr. MACNEE. I agree with that, sir, and part of the reason for the statement is Judge Neville's testimony along the same line, that we might well run into constitutional problems if faced with the presumptions that now appear in S. 1167.

Senator HART. Now, with regard to the criticism or the comment that we do not define monopoly power, I have probed in the material in the introduction of the bill, and we have made it clear that we were relying on the case law definition of monopoly power under section 2 of the Sherman Act, the power to control prices or to exclude competition. The Government has to get past a motion to direct a verdict, then it is up to the defendant to persuade the court that even though he may fall within the presumption, he doesn't possess the power to control price or exclude competition.

Now, as we went over the section-by-section analysis of the company production, we find we devoted only two sections to that, and perhaps we should make more explicit what our purpose was.

I suppose now we will go to the questions that are more economic than legal.

You know that yesterday certain questions were addressed to Dr. Duncombe, and on those same points we welcome having your opinion.

Earlier this week, Dr. Demsetz and Professor Manne testified to the effect that the Sherman Act should be repealed and that specific collusive agreements should continue to be illegal.

Are you, Mr. Ford, satisfied with the present reach of the Sherman Act, sections 1 and 2, or do you feel that they should be cut back?

Mr. FORD. Well, Mr. MacNee would caution me to say that I must preface my answer by saying, as an economist, because otherwise he would feel that I was commenting on legislation and law and so on, and he wouldn't like that.

But, as an economist, yes, I am. Yes, I believe that the Sherman Act, as we have testified, does provide adequate and appropriate safeguards for competition. Mr. MacNee suggests that I add that we would be opposed to its repeal. As an economist, I thought that was implicit.

Senator HART. How do you lawyers feel about that?

Mr. MACNEE. I have been with Ford Motor Co., Senator, for about 8 years now, and from my experiences dealing with the many clients

that we have, the client regards the Sherman Act as we do; it is as good business as it is good law. Perhaps it is good law because it is good business.

Senator HART. We have also received testimony from Professor Manne to the effect that reciprocity—that you buy from me and I buy from you—does not exist.

In your experience, do you believe that reciprocity does on occasion exist; and if it does, do you feel it should be illegal?

Mr. CHUMBRIS. Mr. Chairman, are you referring it does not exist in the automobile industry, or just generally?

Senator HART. I would not expect him to identify instances in the auto industry, but I will make the question clearer.

Mr. CHUMBRIS. The reason why I brought that up is because I think that Professor Manne was referring only to the automobile industry when he made his point, and not generally in other areas.

I have the citation here—I was reading it yesterday when you asked the question of Professor Duncombe.

Senator HART. Well, maybe we can reach an agreement that it exists in industries other than the automobiles.

Mr. CHUMBRIS. Well, he was relating as he saw.

Senator HART. Is that the way you want us to read it?

Mr. CHUMBRIS. I was trying to phrase the colloquy with Professor Manne, and the record will speak for itself on the issue.

But I think he was pointing out that as he saw the automobile industry that they felt that reciprocity was not needed.

The automobile industry was in such a way that reciprocity was not an issue. We know that there have been issues in other cases because the courts have acted upon issues of reciprocity, and we have discussed those cases in our earlier hearings, Mr. Chairman.

Senator HART. Well, let us at this point get from Mr. Ford his own opinion, yet not ask him whether there is or isn't in a specific industry. As an economist is it a desirable or an undesirable practice from the public interest point of view.

Mr. FORD. If I may be allowed to state first that it is a firm policy of Ford Motor Co. not to allow reciprocity as a criterion of purchasing, as an economist, I believe reciprocity could exist only where there is monopoly power—the powers to set market prices or exclude competition. And, therefore, I would regard this as an aspect of monopoly that ought to be—and I believe is—within the reach of existing antitrust laws.

Senator HART. Thank you.

Dr. Demsetz and Professor Manne indicated satisfaction with mergers that have been prevented as a result of the Celler-Kefauver Act of 1950.

Is it your view that the Celler-Kefauver Act as presently interpreted is satisfactory, or is Ford of the view that a different set of standards for mergers should be involved?

Mr. FORD. If I may, Mr. Chairman, I would like to ask Mr. MacNee to answer that question. He and I have discussed it, so he can answer for both of us.

Mr. MACNEE. Well, certainly the Celler-Kefauver amendment made eminent good sense in the sense of closing the loopholes, particularly the assets—stock loophole.

You ask a somewhat biased, if not burned, victim of the application of section 7 as amended.

Senator HART. You are now talking about the auto industry?

Mr. MACNEE. Yes, *United States* v. *Ford*. We acquired a part of the assets of the former Electro Autolight Co.

Now the rationale on our part was that, particularly in the case of the sparkplug market, you had two companies who accounted for the majority of sales—General Motors and Champion.

As a result of our acquisition, we injected into that market a third viable competitor, much more viable than had existed before.

Suffice it to say that Judge Freeman along with the Supreme Court disagreed with us. I don't know if that answers your question.

Senator HART. It does by implication.

Mr. MACNEE. I certainly wouldn't criticize every Supreme Court decision on section 7 cases, although Justice Potter Stewart noted that the one thing he could discern from all of the 30 or 40 Supreme Court merger cases he has participated in was that the Government never lost.

Now, just a week or 2 ago, the Government did lose one. Whether or not that indicates a trend remains to be seen.

Senator HART. The testimony of Professor Manne and Dr. Demsetz questioned whether monopoly power really could exist at all unless there was some governmental regulation that constituted a barrier to entry.

Dr. Demsetz indicated that he did not see a monopoly or shared monopoly profit with respect to the industry specifically enumerated in the bill you are talking about.

And Professor Manne indicated that except where organized crime might have moved in, monopoly really couldn't be maintained through purely private means absent of Government-imposed restraint or discipline.

Monopoly really couldn't be maintained for very long, at least through purely private means. Now, of course, the bill that we are discussing is based on the premise that we do have a problem with the monopoly and shared monopoly.

You make very clear that in your judgment the automobile industry is extremely competitive, but do you see a problem with respect to other sectors of the economy?

Mr. FORD. I hesitate in answering that question, Mr. Chairman, because I am not sure that I am fully qualified by a sufficient knowledge of other industries—certainly not of all other industries—to answer.

And, of course, the question, I take it, refers to concentrated industries, that is, the issue being addressed, where there are a relatively few sellers.

To the best of my knowledge, I believe that concentration has not, in any industry, led to monopoly. I would not push that answer so far as to say that I could not believe that there might not be a case—I have no knowledge of any such facts—in which there was indeed explicit collusion among a number of companies, related, perhaps, in a given hypothetical industry, to fewness of numbers.

But as to the existence of concentration itself, Mr. Chairman, as you note, it is our view that the evidence on the point is increasingly coming to establish that concentration does not lead to monopoly.

Senator HART. Assume concentration has not produced a monopoly. If the definition of monpoly is the ability to fix a price or to exclude competition, shouldn't our concern be simply with whether or not that in fact exists, and not be involved in the endless litigation that we are now in, in determining whether it developed by osmosis or conspiracy?

Mr. FORD. It will answer that if I may again as an economist, and say that I would answer yes, that it would be the existence of the power to set a market price or to exclude competition that would indicate to me as an economist the existence of monopoly.

Mr. MACNEE. May I annotate that remark for a moment, Senator?

Senator HART. Yes.

Mr. MACNEE. I would have concern. I agree with what Mr. Ford just said, but if monopoly power is defined to mean the power to fix market prices or to exclude competition without more, without the traditional abuse, deliberativeness, and intent elements that the cases had used, you run into two problems, at least, that I could perceive.

One is, the Commission could draft a complaint called, styled, "Industrial Reorganization Commission v. * * *"—in the case of our industry, I believe there are 20 companies selling cars in the country—and it would name each of the 20 as defendants.

Well, I assume that between 20 of them they would have the power to fix prices or exclude competition, or both, and it doesn't seem to me to be fair, equitable, or sensible to structure a law in such a way that the prosecutor couldn't lose.

The second problem I have with your question is in the nature of a hypothetical. As counsel for Ford Motor Co., I am asked to comment on proposed market plans sometimes, and let me pose a hypothetical of a gentleman coming into my office and asking me to take a look at a proposal for a new car: A car that has an engine that is absolutely emission free, with zero emissions of any pollutant; it has safety characteristics that exceed anything that the NHTSA has ever thought about; beautiful styling; just about everything you can think of and 40 miles per gallon in the way of gasoline consumption.

I consider that car and that program in terms of the Sherman Act, Clayton Act, the Robinson-Patman Act, and I can't find anything wrong with it. But if I say, "Yes, go ahead," we would walk right into a reorganization order. I can't believe you would want me to tell that man, don't go forward with the program.

Senator HART. We certainly don't—or, I certainly don't. And you would feel that you defined something far more than economy of scale?

Mr. MACNEE. That is right. I have got a superior product that bids fair to take over the market.

Senator HART. The product you describe, assuming the price was a benefit-cost relationship, would take over the market?

Mr. MACNEE. That is right, at least until competition caught up with me. Should I be penalized because I am successful?

Senator HART. My answer is no, that product ought not be to prevented from developing.

Mr. MACNEE. But it would be if you adopted this plain monopoly test of the power to fix prices or exclude competition.

Senator HART. Well, we will measure the bill against that prospect, and if it would, in fact, prevent the development of that kind of product, then we surely want to make a change.

Mr. CHUMBRIS. Mr. Chairman, earlier in the record Professor Manne was discussing the advisability of your bill. When he comes to the completion of his statement, he says:

Now, with a fearful sense that there may in fact be no one left to listen or to act, I would still urge this committee to forcefully reject any new regulatory gimmicks and to get down to the much more serious task of freeing American competition from its single most serious opponent, the U.S. Government. Thank you.

Senator HART. Thank you very much. You held no punches. I am grateful for it. You say that except for organized criminal musclemen who have moved in, private firms are incapable of perpetuating a monopoly or cartel by private means.

Well, then, do we need any antitrust laws?

Mr. MANNE. Well, to follow the response of that question by Professor Demsets, there certainly may be cases in which temporary monopoly and illicit gains may be made as a result of collusive efforts.

We don't find much evidence, as I suggested, however, that these collusions persist for any long period of time.

Now, that is not to justify them and I think that some degree of warning in the form of something like the Sherman Antitrust Act certainly has a place in our spectrum of legislation.

Senator HART. You would agree that it would be better to have Government include rather than wait, for what you describe as the natural course, the collapse of the monopoly?

Mr. MANNE. Well, it is a tough question for me. I am not completely certain in my own mind.

I think that the evidence to date of how the courts and the Antitrust Division and the Federal Trade Commission have behaved in the relation to our existing antitrust laws is not reassuring.

If I were completely convinced that that legislation would proceed to be enforced in the future then I would probably have to answer your question that I believe we would be better off with no antitrust laws rather than that kind of enforcement of laws that might otherwise be justified.

So what he is in effect saying is that if we are going to have this kind of interpretation by our agencies, we would be better off not having it at all, and let competition go on and do its business. The colloquy continues:

Senator HART. If you were to name one conspicuous example of—I forget the word you have used—inappropriate Trade Commission or Justice Department or court application of antitrust what are those at the top of the list?

Mr. MANNE. Well, I think that we have certainly gone much, much too far on almost any defensible theory in our attack on mergers.

And then he goes on, and you pose the question:

Well, what about reciprocity?

Mr. MANNE. I can't find any strong reason for believing that there is a significant monopoly problem with reciprocity.

Senator HART. Is there a problem with reciprocity?

Mr. MANNE. Not that I can see.

Senator HART. What if you were a guy trying to sell a product?

Mr. MANNE. One of the peculiar questions is why industry finds, in some instances, that a resort to barter rather than utilization of more direct and simple contractual forms, using money as the medium of exchange occurs.

I don't know of any good theories about that. I would suggest in some cases it may be as I have suggested in my statement, that regulatory impacts on certain kinds of contracts may make these arrangements the cheaper way for corporations to behave.

And he again goes back to say that because of the regulatory makeup he comes to this conclusion. I did not see in his statement that he was an advocate of the abolition of antitrust laws or the Sherman Act.

We have had witnesses way back who came and specifically asked to testify that they believed that the antitrust laws should be just abolished completely. But that was not the way I saw Dr. Manne's statement when he gave it 2 days ago.

Senator HART. We will be reviewing that.

Mr. O'LEARY. I missed some of your colloquy with Mr. MacNee with respect to the emission-free car. Would that not be the situation where that would be precisely the evidence you would use to rebut the presumption?

Mr. MACNEE. I don't know. I read your bill, and I find——

Senator HART. But if the only rebuttal to the existence of that kind of market dominance is efficiency of scale, I am not at all sure that what you have described is what the courts or the economists call efficiency of scale.

Mr. MACNEE. That is precisely——

Senator HART. Let me see if I understand. I reacted to this description, a company—as the witness has spoken before—produces a perfect car that improves the air, it is safer than a rocking chair, and it is cheap, and it gobbles up the market.

Now, that is what you were describing.

Mr. MACNEE. That is what I intended to postulate.

Mr. O'LEARY. Well, one may litigate the issue of whether or not it fails within the presumption, but let us assume in your hypothetical, they clearly do.

You develop this product and you have captured a large, large share of the market. I believe that our intent was that one could still litigate to the court and say that it appears that they possess monopoly power because they have captured a large share of the market, but in fact, the market share was reflected by this new car.

They have faced competition in the past, and they can expect to have competitors catch up with them, even—and I believe this is where your hypothetical would fit in—to the extent that that car was protected by patents.

A third line would exist which would say, "I have got it; I've had it. I can be expected to keep it, but I have got it by virtue of a patent."

Mr. MACNEE. But it might or might not be covered by patents.

Mr. O'LEARY. I understand that, and my question is that the patent defense and the economy of scale defense are designed to come in after one has been judged possssor of the power.

Because I think the bill recognizes that in some situations it may exist and it may cost more than it is worth to get rid of it.

I am asking whether or not your hypothetical really sits in the middle of the fence; namely, "It looks like I have got it.

"I have faced competition in the past; I can expect to face it in the future; I have only got it because I have come up with this new superior product."

Mr. MacNee. As the master of my own hypothetical, if I may, I have got it, I have monopolized the market, if you will. And I have done so by virtue of a superior product, business acumen, and nothing more. Now, I don't see anything in the bill that would protect me, because in my hypothetical, it is not economies of scale, and it is not patents.

You can counter by telling me I can defend after I have been adjudged to be made possessor of monopoly power, and I would counter with saying that is unfair.

I ought not to be so labeled, and I would go on to say that if you are going to permit me to show that my success is attributable to a superior product and business acumen that I should not have to be so labeled.

And I would also point out that we would be coming full circle. We would be back to the tests traditionally applied in cases under section 2 of the Sherman Act.

Senator Hart. I would not share your discomfort or voice your criticism about being labeled. My concern is that we not develop legislation——

Mr. MacNee. That would discourage.

Senator Hart. That would in fact prevent the development of that kind of superior product and which, after being labeled, there was no defense.

You resent the label. I am less worried about the label, which is why I say that this kind of discussion is useful, first to clarify what is intended in the bill, to identify limits which may be undesirable and conceivably unworkable.

Mr. O'Leary. Mr. Chairman, if I may briefly dissent from both you and Mr. MacNee.

Senator Hart. That is the purpose of the hearing.

Mr. O'Leary. I would suggest that the entire thrust of the bill is to improve upon an existing situation, and I can't believe that either a prosecutor or a court is going to walk into a situation that judges somebody guilty, in Mr. MacNee's hypothetical, first break the case and then penalize the rest of society if he has persuaded that he has not been proven in the existing situation.

Mr. MacNee. I don't mean to impugn the motives of any member of this committee or its staff. I am commenting only on what could happen as the bill is drafted.

Senator Hart. It is a useful discussion.

Mr. Granfield. Mr. Chairman, may I add, I think this particular perception of the bill was extremely widespread. In talking with other people who have read your bill I would just like to add that.

And anything we can do here today to straighten out this perception will be extremely helpful, but I think it is a common perception of the bill.

Senator Hart. Well, it is useful to try and clarify whether we gain or lose support. The process is less important if we can show the motives, what is intended.

So as not to slight you, Mr. Ford, there was one other question I asked of the General Motors witnesses yesterday that I should ask you.

That is that quote from Gailbraith—it is a long one. He is testifying before a small business committee of the Senate in 1967. It goes this way:

> Where firms are few and large, they can without overt collusion establish and maintain a price that is generally satisfactory to all participants.
>
> Nor is this an especially difficult calculation, this exercise of power. This is what we economists with our genius for the neat phrase have come to call our "oligopolistic rationality," and this market power is legally immune, or very nearly so.

I believe at that point he mentions autos as an example. I am not sure of that. But if there are 20 or 30 or more significant firms in the industry, this kind of tacit pricing, this calculation as to what is mutually advantageous, but without overt communication, becomes more difficult—maybe very difficult.

The same result can only be achieved by having a meeting or by exchanging information price and cost intentions, but this is illegal. What the big firm in the concentrated industry can accomplish legally and effortlessly because of its size, the small firm or the unconcentrated industry does under civil or even criminal prosecution.

Assuming this situation does not apply in your industry, would you agree that in some situations there are sufficiently few competitors that the same result can be accomplished without resorting to a collusive agreement?

And shouldn't the law try to reach that situation?

Mr. Ford. If I may answer that, Mr. Chairman, first, by saying that the main purpose of our testimony was to describe the evidence we believe that indicates that such a situation does not exist in the automobile industry.

That is one of the major points we wanted to make here—that contrary to statements such as Professor Gailbraith's although we did not have him specifically in mind in our testimony, the alleged joint power to set prices simply as a matter of the facts of the case does not exist.

Moreover, in answering your question as to other industries, I would rely on the evidence that has been summarized by Professor Demsetz.

I believe his evidence and other evidence that has been added in recent years is coming very strongly to show that this has not happened in industries in general; that what would be evidence of collusivelike results in concentrated industries does not exist.

I would say no, sir.

Senator Hart. Now, let me go over with you what we understand to have been the sequence of events in the pricing of the 1971 models.

Ford announced its prices first, in mid-September. A few days later GM came out with Chevrolet prices—price increases significantly higher than the Ford products.

Ford immediately raised its prices to match several others. Then, GM took a long strike. After the strike, GM raised its prices another $25.

Ford didn't have a strike, and Ford's labor contract hadn't changed. But Ford raised its prices by an average of $25 to meet GM's competition.

Now, is that what an economist means by meeting price competition?

Mr. FORD. In circumstances in which the result of the GM contract negotiation resulted in higher labor costs than we had incorrectly foreseen before, yes indeed, yes, sir.

Senator HART. But did the Ford's labor contract at that point change?

Mr. FORD. The Ford labor contract in 1971—I will have to check on the facts of the case—our labor contract was not signed, I believe, until after the GM settlement. I would have to check on that, but I think that was the case.

Senator HART. Well, if you would for the record.

Mr. FORD. I would be happy to submit an answer that for the record; yes, sir.

Senator HART. Identify what, if any, effect on your labor rates the GM settlement had.

Mr. FORD. I would be happy to do that.

[For the information requested, see exhibit 6 at the end of Mr. Ford's oral testimony.]

Senator HART. Do you have any reaction to the earlier event, the fact that Ford announced in mid-September its prices, and then a few days later, GM came out with higher prices, and immediately Ford's prices went up?

Mr. FORD. I do have a reaction to that, which is to state that when we set prices we make judgment as to the market conditions.

The market conditions include the prices of competitive products, and when we find that our judgment in that respect was wrong, whether that judgment is that the prices of competitive products are higher than we had anticipated or lower, we always reconsider, and sometimes change, our prices.

Senator HART. Well, I will wind up by reading some recommendations that were made to the subcommittee in earlier hearings; I should caution you, much earlier hearings.

And I think you will sense the identity of the witnesses as I go through, but I will hold that until the end.

Now, I am taking portions of this testimony, but clearly, the full passage should be printed at some appropriate point, either before my question or after Mr. Ford's answer.

Here is what he told the committee:

> I propose a new approach to the question of competitive economic power in the automobile industry, to promote competition, economic progress, individual opportunity, and to enlarge benefits to consumers, generally.
>
> Economic power in the automobile industry should be limited and divided to achieve the desired ends.
>
> The antitrust laws should provide when any one firm in a basic industry—and note I am only talking about basic industry, such as the automobile—exceeds a specific percentage of total industry sales over a specified period of time, it shall be required by law to propose to an administrative agency a plan of divestiture that will bring its percentage of sales below the specified level.
>
> This proposed amendment to the antitrust laws would have a number of advantages.

One, it would promote and preserve adequate competition. One of our problems in this country is when these industries arrive at the point where they ought to be most productive, that we begin to lack, then, an adequate number of firms to provide the competitive effort that is needed for economic progress.

Second, the companies affected—not the Government—would have the opportunity to originate the method of compliance.

If the company didn't originate it, why obviously the Government ought to step in and take such steps as would be necessary.

Third, achievement of the sales percentage required a split-off would become evidence of economic success.

Fourth, competitive effort and growth would be encouraged, not restrained.

What I mean by this is, if you take GM, for example, and GM becomes the sire of more than one company then those companies can grow and expand, and the net result is that GM winds up being an effective, bigger, and more beneficial part of our economy than if they stay in a single lump.

It has to be concerned about whether it is going to bet too big or not.

Again, I go back to Standard Oil. It became 34 companies. These companies today are many, even larger, companies and are making tremendous contributions to the economic well-being of America.

That was a tremendous thing we have done. It should be recognized as such, and we should remove this stigma from growing to a point where you can become two instead of one.

We ought to recognize that we need births in these industries. Then instead of making mere size itself a defense, the test under the law ould ration the size of a company in relation to that of its competitors.

In big industries, there would be big companies.

Now, that testimony was given the subcommittee in 1958 by George Romney, and it sounds to me a little more radical than the bill we have been talking about.

[For the full testimony referred to see exhibit 1 at the end of Mr. Ford's statement.]

Senator HART. How do you react to that?

Mr. FORD. First of all, Mr. Chairman, I guessed that that was probably Governor Romney, as you were reading the quotation.

I should disagree with the fundamental premise that there is undesirable economic power—monopoly power—in the automobile industry now.

I think that the economic power, if you want to call it that, that exists is the power to grow through proven superior performance.

I think that the results of this "power" have been demonstrated—I think that we can see the good things that have come from it.

Governor Romney's suggestion in effect says there is a way to improve on GM, and that is to break it up, and let us have some more GM's.

Well, we think there is a way to improve on GM, too, and we are trying very hard to do it. And I think that is the effective way.

I think—and I can't stress this too strongly—that it would be fundamentally anticompetitive—it would have very serious impact on the competitive performance of our industry, and certainly other industries as well—to limit growth by any such test as market concentration.

Mr. CHUMBRIS. Mr. Chairman, Mr. Ford is too much of a gentleman to make the statement, but someone may say that the politician in Romney was beginning to come out when he made that suggestion.

[Laughter.]

Mr. FORD. I was about to defend politicians.

Senator HART. Even when I disagreed with him, and there have been occasions, I have never doubted the depth of his conviction, but certainly it was one of his own positions, and I am sure whether it was an inherent populism speaking or the long experience he had in the automobile business, that is exactly what he thought should have been done.

My hunch is it didn't have a thing to do with politics.

Mr. O'Leary.

Mr. O'LEARY. Mr. Ford, in your response to the questions contained in the letter of invitation, you discussed Ford's development in the market with the "people movers."

For the benefit of the record, would you give us a broader description?

[For the response referred to see exhibit 2 at the end of Mr. Ford's testimony.]

Mr. FORD. My description will have to be very broad, Mr. O'Leary. We would be glad, if you would like us to, to submit a more complete description of activities in people movers, in 1972 Ford established a business division to market a product that we had developed in another activity within the company, and we are actively seeking sales of that system now.

I won't attempt to describe it. It is a "people mover" that is a form of public or mass transportation for application in limited areas, where we feel there is a strong economic advantage in such transportation.

If you would like more details than that on what we have done, why we should be happy to submit a more complete answer for the record.

Mr. O'LEARY. That is fine. I guess I was curious with respect to the system at Hartford. Do you know the distance? Does that go from the airport to downtown?

Mr. FORD. I had better get an answer for you to that because I believe the answer is that it does not. It is a circulation system within the area of the airport—and, again, I believe this is a characteristic of the system that we have developed—it is intended for us in what are called "activity centers," which implies an airport, a shopping center, or something similar, of limited extent.

I would be very happy to give you an appropriate answer. Mr. MacNee says the Ford Motor Co. annual report says that the system is at Bradley Airport, but we will confirm that.

[For the information requested, see exhibit 6 at the end of Mr. Ford's oral testimony.]

Mr. O'LEARY. It is not, then, I take it, comparable or in competition with motor transportation, which takes the ordinary person to and from work, such as subway or electrified mass transit, or the Metro here in Washington?

Mr. FORD. Well, the second application is a system being built now between El Paso, Tex., and Juarez, Mexico, and I believe a major element of business for that system is anticipated to be, precisely, bringing people to work.

Mr. O'LEARY. Unless I am mistaken you described that as a distance of 1½ miles. Is it anticipated that that system is going to go out into whatever other areas you have in those two towns?

Mr. Ford. I can't answer that. It is designed for this particular application. Whether it is potentially expandable to a wider use, I don't know.

Mr. O'Leary. Has the Ford Motor Co. bid on any subsystems such as the Metro? Do you envision this as a market you would enter in the future?

Mr. Ford. Yes. I am sure that we have not bid on the systems management of a metropolitan system such as Metro.

However, Philco-Ford was a supplier or subcontractor, I believe for vehicle controls, on the BART system in San Francisco.

Mr. O'Leary. At our first set of hearings, I am sure you are aware that Mayor Alioto came down rather hard on this concept of the automobile companies diversifiying into electrified mass transit along the lines of the Metro, BART, et cetera.

I would quote him. He says:

> I would have to come down on the view that neither Ford, nor Chrysler, nor General Motors ought to be manufacturing what is essentially the rival commodity.
>
> I think they would have a tendency to plan their development of the rival commodity and according to how it serves the interest of their most profitable commodity which yet remains the automobile.

I would like to have your reaction to that view.

Mr. Ford. Well, I would react to it by saying that I think any such suggestion as Mayor Alioto's is only going a very small part of the way.

If he is really concerned about our withholding new developments because of the effect on our existing business, he ought to tell us not to bring out Mustang II's.

That is a case in which we brought out a new product which was right on top of our major existing products. We do such things—and the same is true of our diversification into other lines of business—because we do believe that Ford can profitably extend its activities. This might include a new product or a totally new line of business. It seems to me Mayor Alioto's logic would say don't ever let them bring out a new car.

Mr. O'Leary. During Senator Benson's hearings in Detroit, Leonard Woodcock characterized the efforts, certainly not just Ford, but of all of the automobile industry and mass transit as "too little, too late."

Do you think there was any merit or justification in that criticism?

Mr. Ford. Well, I should draw on my previous answer and say that our venture into mass transit was, to the best of our judgment, well-timed to make use of our capabilities in the development of this market, and our purpose in entering was nothing other than I have just indicated—to find profitable new business for Ford Motor Co.

Mr. O'Leary. As I am sure you know, yesterday General Motors testified that its share of the bus market was 43 percent.

According to our figures, which are from the Department of Transportation, its share of the city bus market is approximately 65 percent; its share of locomotives, approximately 80 percent; and bus engines, 90 percent.

As an economist do you feel those market shares are areas of legitimate concern?

Mr. FORD. I do not feel those market shares by themselves indicate that there is any undesirable economic power; no, sir.

Mr. O'LEARY. They are not, in your view, legitimate in their share of monopoly power?

Mr. FORD. No, sir; not in themselves. And I would simply refer here again to the position we have presented, specifically with respect to the automobile industry, on market concentration in its relation to monopoly.

Mr. O'LEARY. Does General Motors' presence in either buses or bus engines inhibit you or enter into your decisionmaking process, and do you consider assembling buses?

Mr. FORD. Yes, sir; we have considered reentering the bus business. Our answers to Senator Hart's questions in his letter of invitation indicate that we had once been in the bus business, and we have periodically reconsidered entry into the bus business.

Mr. O'LEARY. I guess my question is to what extent is their presence and their market share a factor in your decisionmaking process?

Mr. FORD. It would have no greater weight than conditions in any other market, involving any other business firm, which we might enter.

The question would be, Could we compete effectively in that market?

Mr. O'LEARY. There is no feeling of, well, why bother?

Mr. FORD. Absolutely not.

Mr. CHUMBRIS. Mr. O'Leary, will you yield a moment?

Mr. O'LEARY. Certainly.

Mr. CHUMBRIS. Do you know if American Motors is in the business of manufacturing buses?

Mr. FORD. Yes, they are. "American General," I believe the subsidiary is called.

Mr. CHUMBRIS. And I believe that the new Metro buses that we see on the streets in Washington are manufactured by American Motors.

Mr. FORD. I think that is correct, Mr. Chumbris, although I am not sure about the facts. They are in the business of manufacturing transit buses.

Mr. CHUMBRIS. So there is the possibility, if it is profitable, for not only American Motors to do so, but for other automobile manufacturers or manufacturers of vehicles to enter this market.

Mr. FORD. Speaking for Ford Motor Co., that is certainly our view of it. Yes, sir.

Mr. CHUMBRIS. Would you say that the reason that all of the vehicle manufacturers are not in the market is because of the profitability factor that would have a person move into that particular market?

Mr. Ford. Well, for us it is a question of the allocation of corporate resources—capital resources, management resources, and so on.

Whether or not we feel that any opportunity, any business, is attractive—no matter how related it is to what our competitors are doing, or no matter how related to our existing business—is a matter of judgment of our capabilities in that market.

Mr. CHUMBRIS. You mentioned resources. Dr. White, in his book, referred to the fact that in order to have excellent profitability you have to have excellent management plus the excellent use of whatever resources you have. And if you feel that your resources can be used in other vehicle areas rather than buses, that would be a decision that your company would have to make, wouldn't it?

Mr. FORD. Yes, sir.

Mr. CHUMBRIS. Thank you very much, Mr. O'Leary.

Thank you, Mr. Ford.

Mr. O'LEARY. Mr. Ford, I note in your tables that Ford purchased $25 million worth of diesel engines and related parts for certain heavy trucks from GM.

If you were to enter the bus field, would they be your most likely source of supply for diesel bus engines?

Mr. FORD. I could not answer that at all, Mr. O'Leary. I have no knowledge on which to answer to it. I think the general fact is that we purchased last year, it would be a matter of the engine that best suited the application.

There are, of course, other manufacturers of diesel engines in the world, and we might or might not choose to buy from General Motors.

The question would be looked at, I am sure, in terms of the best purchase for the business we had in mind.

Mr. MACNEE. We do, today, purchase diesel engines from companies other than General Motors.

Mr. FORD. From Perkins and others.

Mr. O'LEARY. I understand that there are other suppliers of diesel engines, but I take it that you are not really willing to speculate as to whether or not, for bus purposes, your engines would be from GM or somebody else.

Mr. FORD. Well, if I may say so, I think there would be no purpose served by any such speculation because the answer in the end would depend on the specific fact as to what those buses were required to do and what the alternative power sources available to us would be.

And, therefore, it would, in the end, be a question of facts that we don't know here and now.

Mr. O'LEARY. Doctor, referring to your table, your sales incentives are basic examples of the price competition in automobiles; is that correct?

Mr. FORD. They are examples of one form of price competition in automobiles; yes, sir.

Mr. O'LEARY. I know that your dealers are independent businessmen, but do you think that the consumer is really aware of this type of price competition, with the sort of advertising the dealers constantly throw at the public?

Mr. FORD. I think that consumers are aware of this through the behavior of dealers. I think that, just as with other forms of price competition, manufacturers' actions are translated into, and indeed are, one of the bases of retail price competition.

It was for the purpose of emphasizing this, I might add, that we spoke about retail price competition in our prepared testimony.

Mr. O'Leary. Don't many of the sales incentive plans take the form of prizes and trips for the dealers and salesmen?

Mr. Ford. Some of the sales incentive programs do; yes, sir.

Mr. O'Leary. And when there is a monitoring setup, doesn't it come into play only after the dealer or salesman has already sold a certain number of units?

Mr. Ford. Not necessarily, no. There are conditions of qualification which might include sales above an established objective, or which might include qualification in other ways.

Sometimes, as a matter of fact, the incentive, the price reduction is available throughout a model year without qualification.

Mr. O'Leary. My question is how significant is this discount for the consumer, compared to some other sales discounts for durable goods.

Even furniture manufacturers sometimes give 20 percent off during their sales. What is the percentage of these discounts.

I think the largest one you have listed here is for Ford truck, $66 to $190. What is the percentage of the purchase price?

Mr. Ford. In percentage terms that would amount to 3 to 6 percent. The American Motors special value program that we list there at the top amounted to a 5- to 6-percent discount in the 1973 model year.

That was about the magnitude. In other years the percentages have been higher than that.

Mr. O'Leary. That is not necessarily passed on to the consumer, though, is it? That is up to the dealer, isn't it?

Mr. Ford. That is right. These are incentives to the dealer, and it is competition at the retail level that results in the effect of these incentives on the retail buyer.

Mr. O'Leary. The dealer may choose to pass on that reduction, or the extent to which he was to charge a higher price, he may profit that; isn't that right?

Mr. Ford. That is true. And, of course, the same thing is true with respect to established prices, whether or not there is a sales incentive in effect.

It is competition among the dealers that determines what the dealer charges on any given sale. This, again, is one of the points that we wanted to emphasize in our discussion of retail price competition.

Mr. O'Leary. So it may or may not be price competition for the consumer.

Mr. Ford. It may or may not; yes, sir.

Mr. O'Leary. Mr. Ford, I would like to get your reaction to a portion of an article which appeared Sunday, April 7, in the "Imported Automobile Show" section of the New York Times.

The first page says: "The Energy Crisis Spurs Demand for Small Cars." And at the top of the article they make reference to what appears to be a heading: "Detroit Responds With Big Car Prices."

The first paragraph:

> A flood of new made-in-Detroit smaller cars will pour from the factories next fall, but they will be small cars with a catch.
>
> And the catch is they will not be low priced cars. Instead automobile manufacturers in Detroit have concluded that they can get big-car prices for their smaller models.

Then he goes on, in the inside page, to discuss the two new compacts for next fall: the Granada for the Ford Division, and the Monarch for the Mercury.

The new models will have interior elegance.

In a succeeding paragraph:

The word "elegance" is hardly ever used in Detroit for anything under $3,500, which probably means that Ford expects to get $3,500 or $4,500 for the new compacts, about as much as the company now gets for an intermediate or full-size Ford.

How accurately, if at all, does that describe your strategy with respect to the conversion to small cars?

Mr. FORD. Well, of course, it would not be appropriate or helpful for me to speculate on what might happen in the 1975 model year as far as Ford's own actions are concerned or as far as any other manufacturer is concerned.

But, certainly, comments of that kind could apply equally to the situation in the market as it exists today. It is certainly true that there is, with respect to any size car, a wide range of choice as to how much optional equipment, trim, and features, and that choice includes models that have relatively little of these things.

Mr. O'LEARY. With respect to those two models that he mentioned, is it fair to say that you are designing those cars to take a shot at the luxury market, making a luxury small car for which you will charge correspondingly high prices?

Mr. FORD. I cannot comment on our specific plans for those cars at this point. I think you will understand why.

Mr. O'LEARY. Mr. Chairman, I suggest that we make these articles part of the record.

Senator HART. They will be received.

[The articles referred to appear at the end of Mr. Ford's testimony as exhibit 3.]

Mr. O'LEARY. Mr. Ford, in your discussion of entry barriers, you left out one which has been widely discussed by economists outside the industry; the dealer franchise system.

It is obviously not enough for an entrant to get the capital to manufacture cars. He also has to have some means of distributing them.

Your dealers are all independent businessmen, but suppose a Ford dealer decides to carry some Chevrolets or Plymouths. Does the company have any policy with respect to that?

Mr. FORD. Yes, Mr. O'Leary. May I ask Mr. MacNee to comment on that. It is a question that goes to the nature of our sales agreement with the dealers, and Mr. MacNee is better qualified to comment on that than I am.

Mr. MACNEE. Nothing in the sales agreement between ourselves and the dealers prohibits them in any way from carrying competitive models.

By the same token, we do expect and establish for them sales targets, and if they do not meet those targets, we reserve the right to terminate.

There are a number of dealers, Ford dealers, Lincoln-Mercury dealers, who carry second lines, non-Ford products, if you will.

Mr. O'Leary. To your knowledge, Mr. MacNee, are there any that carry, say, Chevrolets or Plymouths out of the same facility?

Mr. MacNee. I would be surprised if there were, but I do not know.

Mr. Granfield. Mr. O'Leary, if I can interject, Jim Moran, the courtesy man in Chicago, sells almost as many Chevrolets as he does Fords, and he is a Ford dealer.

Mr. MacNee. Thank you.

Senator Hart. Does Chevrolet regard him as a Chevrolet dealer?

Mr. Granfield. Chevrolet regards him very kindly.

Senator Hart. But he is not a Chevrolet dealer?

Mr. Granfield. He is not a franchise Chevrolet dealer. He also sells Cadillacs, Lincolns, Mercurys, and other cars the consumer wishes to buy.

Mr. O'Leary. Well, Mr. MacNee, could you supply us for the record the instances in which the Ford Motor Car Co. is aware of this kind of situation—a Ford dealer, who out of the same facilities, sells Chevrolets and new Plymouths and makes of the other domestic manufacturers?

Mr. MacNee. Yes.

[For the information requested, see exhibit 6 at the end of Mr. Ford's testimony.]

Senator Hart. Just out of instinct—with this Detroit background—I would think that you would know the names of those fellows on the tips of your fingers.

Mr. MacNee. Well, I will tell you my problem, and I should apologize to you. I am not in the distribution end of the business in our office.

My title is "Counsel—Emissions and Safety," believe it or not. However, I happen to have a fairly extensive antitrust background. But I am not in the distribution end of the company's operations and do not know the answer, whereas, others would.

Senator Hart. I should not have said what I said. I didn't mean to suggest that you knew and weren't telling or that there was any secret.

I was just reacting out of surprise.

Mr. MacNee. You are quite right. I should have known the answer.

Mr. O'Leary. Doctor, in your testimony you state that whether U.S. automobile manufacturers are technologically advanced is irrelevant to the issue of market concentration.

Your statement also lists certain innovations. Is it your position that the smaller sized firms are not as innovative as the larger domestic manufacturer?

Mr. Ford. No, sir.

Mr. O'Leary. I have a copy of a patent filed in November of 1927 on the stratified engine charge by Mr. F. M. Jobes. I understand that this patent has been sitting in the patent office for years.

You indicate that Ford has been working on this concept for the past 15 years. How is it that Honda has managed to outstrip the "Big Three" with respect to the stratified engines charge?

[The patent referred to appears as exhibit 4 at the end of Mr. Ford's testimony.]

Mr. FORD. Well, of course, there are a number of possibilities of designing an engine on the principles of controlled combustion.

We have been working on a number of them. Honda has. I am sure other manufacturers have, as well. I don't know what comparisons one ought to make to support the premise in your question that Honda's engine is more advanced than work that we may be doing.

Certainly, without greater knowledge of what comparisons are relevant I wouldn't want to concede that that is the case. However, it is certainly true that with respect to any technological development or any product, one automobile manufacturer may out do another. But I don't wish to concede that is the fact in this case.

Mr. O'LEARY. I understand. Recently, I think I read somewhere that you have entered into an agreement—purchased the license agreement—to distribute the Honda stratified engine in this country.

Am I right or wrong.

Mr. MACNEE. We have a license agreement with Honda relative to the so-called CVCC.

Mr. FORD. I think neither Mr. MacNee nor I know the details of the agreement that Ford has with Honda, Mr. O'Leary.

But we would be glad to submit those for the record, if we may.

Mr. O'LEARY. Thank you.

Mr. MACNEE. May I ask, Mr. O'Leary, what was your last question?

Mr. O'LEARY. I believe I read somewhere that Ford had entered into an agreement or purchased a license from Honda to distribute the stratified engine in this country.

Mr. MACNEE. The engine——

Mr. O'LEARY. To use it, distribute it, put it in Ford cars, whatever.

Mr. MACNEE. I think we can answer that question.

We do have a license with Honda enabling us to gain access to their know-how, to the patented information to Honda's so-called CVCC engine, so that we can apply it or try to apply it to our own automobiles.

But so far as I know, there is no marketing arrangement between us, insofar as Japan exports to the United States are concerned.

Mr. O'LEARY. You purchased access to their technology with respect to this engine.

Mr. MACNEE. That is correct, as we have with practically every manufacturer or owner of patents on any kind of an engine that would result in lower emissions.

Mr. O'LEARY. Doctor, I have an article here which appeared in the Wall Street Journal, Monday, January 28, 1974, entitled, "Ford Is Closing Additional Plants, in Big Car Cuts."

[For the article referred to, see exhibit 5 at the end of Mr. Ford's testimony.]

Mr. O'LEARY. It makes reference to a closing of the plants in Mahwah, N.J., and Los Angeles, Calif.

Then it goes on to indicate that, in addition, Ford will close its plant at Dearborn that makes frames for big cars, will cut production for 2 weeks in its Lima, Ohio, engine plant.

It makes reference to cutting back Ford's Nashville, Tenn., glass plant and its Buffalo, N.Y., stamping plant, and Livonia, Mich., transmission plant.

Do the plants named in those articles supply the main components to the assembly plants in Los Angeles and New Jersey?

Mr. FORD. The manufacturing plants included there, that is the glass plant in Nashville, the frame plant in Dearborn—what were the others? I am sorry.

Mr. O'LEARY. Lima, Ohio, engines; Buffalo, N.Y., stamping; and Livonia, Mich., transmissions.

Mr. FORD. I don't know specifically whether or not components from those manufacturing plants are supplied to the assembly plants named. I should think that the answer is "Yes," because we are talking about plants that assemble larger Ford cars and also plants that manufacture components for the larger cars.

So I think I am very safe to answer "Yes."

Mr. O'LEARY. And your component manufacturers are not necessarily located geographically to reduce the cost of transportation to your assembly plants.

Mr. FORD. Discussions on the location of manufacturing plants consider the cost of shipping their output to assembly plants. We also consider, of course, the inbound-freight cost of getting materials to the plant. Plant location decisions consider many other factors, such as the availability of labor in an area. Certainly freight cost is one of the primary considerations; yes.

Mr. O'LEARY. Thank you. I have no further questions.

Senator HART. Mr. Chumbris?

Mr. CHUMBRIS. Thank you very much, Mr. Chairman.

I would just like to make one clarification on my remark about Mr. Romney because I am very fond of Mr. Romney, and I was sitting in this chair when he testified that day in 1958.

I was really trying to lead to the fact that not only was he concerned about the problem because his company was the smallest of the four manufacturers, and that it made sense that he would be in a better position to compete if General Motors, Ford and Chrysler were not quite as large as they were—a situation which did develop over the many years going back to the 1905–07 era. I was pointing out that without realizing it he was saying something of note that 5 or 6 years later proved he was a politician. And I use "politician" in a healthy sense because I have lived among politicians for over a 25-year period, and I wasn't saying it in a derogatory sense.

And now I leave you to my colleague, Mike Granfield, who will have a few questions to ask.

Mr. GRANFIELD. Mr. Ford, is the Ford Motor Co., to your knowledge, in favor of import quotas on automobiles?

Mr. FORD. No, sir. Executives at Ford Motor Co. have been on record for a considerable number of years in favor of free trade in automobiles, in the United States and elsewhere.

Mr. GRANFIELD. As an economist, would you agree with the assessment that some economists have made that quotas could be interpreted as partial monopolies or at least restricting some form of competition?

Mr. FORD. Yes, I should agree with that.

Mr. GRANFIELD. Would you also agree with the contention that if the automobile industry was, indeed, a successful collusive monopolist that they would probably be seen here in Washington lobbying for import quotas?

At least it is not inconsistent with their being a collusive monopolist.

Mr. FORD. On the contrary. It would be consistent with it. Whether their behavior would extend to that or not, of course, I wouldn't know.

Senator HART. Does the answer stand whether you have production facilities outside the continental limits or not?

Mr. FORD. Yes, sir; it does. I think the position of Henry Ford II concerning free trade reflects what he regards as desirable economic conditions in the manufacture and sale of automobile without regard to Ford Motor Co.'s situation.

Mr. GRANFIELD. Recently Professor Demsetz told us that if, indeed, there was a successful collusive monopolist or contract, be it tacit or explicit in an industry, with particular reference to a concentrated industry, he would expect the small firms in that industry, as well as the larger firms, to be earning above normal rates of return.

Do you see that existing in the automobile industry?

Mr. FORD. No; to the contrary we made reference to his position precisely because we regard this as a really significant fact about profitability in the automobile industry.

Mr. GRANFIELD. Is it a correct interpretation of your evidence presented here today on rates of return that, at best, only one firm can be unequivocally stated to be earning a higher than normal rate of return; and that is General Motors?

Mr. FORD. Yes, sir; with the additional proviso that the definition of a normal rate of return is not necessarily the average for a number of businesses. That is normal in no sense other than it is a pervasive average. It is, of course, normal for an extraordinarily successful corporation to earn high profit.

Mr. GRANFIELD. Has Ford Motor Co. operated at a 15-percent rate of return in 5 of the last 7 years, net return to net worth?

Mr. FORD. Well, I am confident the answer is "No," but I would check that.

Mr. GRANFIELD. Has the Chrysler Motor Corporation earned higher than a 15-percent rate of return in 5 of the last 7 years?

Mr. FORD. In 5 of the last 7 years, again based on recollection, I would answer no.

Mr. GRANFIELD. American Motors?

Mr. FORD. No, sir.

Mr. GRANFIELD. Then at least, again, three of the four firms in this industry do not meet one of the particular criterions of this particular act?

Mr. FORD. That is correct.

Mr. GRANFIELD. Now, the average, as you state, will differ between each model. Would it be a correct interpretation to say that if indeed you were successfully colluding that all models would exhibit returns above normal?

Mr. FORD. That all of the companies would?

Mr. GRANFIELD. No: all the models within the company, why would there be any particular model that would earn a lower normal rate of return, if you were successfully colluding? Would we expect that to occur?

Mr. FORD. I am hesitating in answering your question because the data that we have presented, of course, represent the returns earned by the companies in the total business.

Mr. GRANFIELD. But that does vary from model to model; this is an average. There is quite a bit of dispersion.

Mr. FORD. Yes, you are correct, of course. This in effect is an average of the returns earned on specific products including specific models.

In answer to the question, yes, I should expect, as an economist, that if a monopoly existed for collusion, let us say—in an industry, that all or most of the products would earn extraordinary high rates of return.

Mr. GRANFIELD. Let me deal now with the question of what exactly is a monopolist. As an economist would you agree that what a monopolist does is not fix the price, but rather, restricts output, and thereby sets a higher than competitive price. In other words, the key to a monopoly is to restrict output below the competitive level of output, and this is what produces the higher price rather than the reverse?

Mr. FORD. I would agree with that; yes, sir.

Mr. GRANFIELD. Would you then agree that if there were a successful collusive agreement in your industry there must be serious attempts at somehow restricting output.

In other words, it must go far beyond setting a fixed price. In other words, setting a fixed price is not sufficient enough to guarantee monopoly returns?

Mr. FORD. Yes. In fact, I believe that in order for a fixed price—if a monopolistic price—to be maintained there would have to be a restriction on output.

Mr. GRANFIELD. And that restriction on output would really have to cover all the various models you product. It couldn't simply be all company output, or could it?

In other words, to really make it effective would you not have to agree to restrict output along each model lines: for example, LTD versus Pintos?

Mr. FORD. It is hard for me to think in this frame of reference. I guess.

Mr. GRANFIELD. It must be comforting to you.

Mr. FORD. Well, it is a fact.

Mr. GRANFIELD. Well, it means you haven't had any practice at it: Let us leave that.

Without making you conclude on that, you would agree at least that the firms must agree to restrict output as well as fixing price?

Mr. FORD. Yes, indeed.

Mr. GRANFIELD. I asked this question yesterday, and Mr. Duncombe didn't really feel he had enough knowledge. In your knowledge of the history of collusive agreements have they relied on fixing

price, or have they been more likely to restrict output, and restrict output in the sense of dividing up the market geographically, for example.

Have they not all included at least a very strong provision of how they would divide up the market?

Mr. FORD. The classic economic "concept of what is more generally called "collusion" is, of course, the cartel, which is explicitly a device for restricting output in total and dividing up a market. Although I would not claim to be able to cite historical evidence that would support the generalization, I feel pretty confident that collusion has typically taken this form; yes.

Mr. GRANFIELD. Do you sell in all markets in this country?

Mr. FORD. Yes, we do.

Mr. GRANFIELD. Do your sales remain relatively constant in this market or do they fluctuate?

Mr. FORD. That is our market share in different geographical regions of the country?

Mr. GRANFIELD. Correct.

Mr. FORD. Well, it differs markedly among regions, and changes sometimes radically over time.

Mr. GRANFIELD. Could you supply that evidence to this committee?

Mr. FORD. Yes, we would be happy to do that.

Mr. GRANFIELD. Thank you. So, at least according to the textbook——

Mr. MACNEE. Can we pin that down a little bit better?

Mr. GRANFIELD. I would like to see any kind of evidence you could present on distribution sales of Ford Motor Co. and how they fluctuated over time.

Would you agree, at least in terms of sort of the classic textbook version of a collusive agreement, that if indeed your sales are fluctuating in all regions—and you refer to them as fluctuating widely and geographically—that this is at least strong confirmatory evidence that there is some kind of to divide the market geographically?

[For the information requested, see exhibit 6 at the end of Mr. Ford's testimony.]

Mr. FORD. On the contrary. I would say that it is evidence not only of the absence of any such agreement, but the absence of any such result, there not being an agreement.

Mr. GRANFIELD. If you could somehow devise a successful collusive agreement to set prices at competitive levels and to restrict the ouput simultaneously, what would you expect to happen in the absence of legal barriers to entry?

Mr. FORD. I would expect that other producers not participants in the agreement would make strenuous attempts to sell in this market.

Mr. GRANFIELD. Would you regard the small European imports as evidence that you were colluding into a small-car market?

Mr. FORD. No, sir.

Mr. GRANFIELD. How would you explain this entrance?

Mr. FORD. I would explain it as a normal competitive opportunity open to a business firm with respect to a market, any market.

I don't think that for entry into a market to be attractive implies the existence of collusion in that market.

Of course, if I may refer again back here to the answers to several of Mr. O'Leary's questions, in our own consideration as to whether or not there is another line of business we wish to enter, one of the leading sets of considerations is simply our own capabilities.

And I think it constitutes no evidence at all that collusion existed in small cars to find that the foreign manufacturers had entered this market.

They had very strong capabilities for doing so.

Mr. GRANFIELD. Actually, in point of fact, they entered it before you did, so it is hard to collude on it. But that hase been cited as evidence that you were colluding in the small-car market.

It always mistified me since they entered before you——

Mr. FORD. Not "you" in the generic sense. That is, there were American producers of small cars way back, but I guess nobody would claim that Crosley was colluding to monopolize the U.S. small-car market.

Mr. GRANFIELD. I would like to deal very briefly with the situation of American Motors. We have heard a lot of testimony with respect to the benefits of high economies of scale in terms of large scale production.

Would you regard the kind of success that American Motors is having as due to its success in producing large quantities and its charging low prices for small cars, or is it due to something else?

Mr. FORD. I think their success—the current sales increase and market share increase of American Motors—is attributable to its ability to meet a very strongly rising segment of demands in the automobile industry at a competitive price.

Mr. GRANFIELD. So success in even the automobile market is really a combination of your ability to produce a car at a competitive price as well as producing a car that can sell; that is, it meets consumer demand?

Mr. FORD. Yes.

Mr. GRANFIELD. Just producing a car at a low price is not sufficient, and your economies of scale are more the result of your success in meeting market demand than rather the cause of it?

Mr. FORD. I think that economies of scale are the ability to lower cost as well as the ability to offer attractive products. Both are ingredients.

I would not call either one the cause of the other.

Mr. GRANFIELD. How do you explain the fact that European cars seem to have—at least in the medium size range, I am talking about Volvo, Audi, Saab—seem to have a comparative advantage in small engines and high performance with these relatively small horsepower engines, whereas American manufacturers seem to have a comparative advantage in the production of optional equipment, such as air conditioning, automatic transmission, power steering, power brakes?

Mr. FORD. Well again, without quoting comparisons that would support your premise, I think that it is evident that in the worldwide automobile market there has been specialization of products to

conditions under which those products are expected to be sold in the highest volumes.

The nature of many things—geography, income level, income distribution, and such things as the cost of fuel, and national policies of fuel taxation—have led to specialization in car design among countries. One manifestation of that has been specialization in relatively larger cars in the United States.

Mr. GRANFIELD. In your tables, you indicate what Ford sells for, and the costs in other countries. What would you speculate would be the demand response, or the consumer response, to Ford if in fact it faced these kinds of tariff barriers?

Mr. FORD. I am sorry. Would you repeat the question?

Mr. GRANFIELD. I would like to know what would you speculate would be the demand response to Ford cars if you did not face the kind of tariff barriers you currently face overseas, either in terms of quotas or add-on tariff taxes.

Mr. FORD. Well, I believe that it is reasonable to conclude from the nature of the circumstances that lead to these relatively high costs that, absent such barriers, production would be in larger volume, cost would be lower, and prices would be lower in those markets.

And as a consequence of that. sales would be higher.

Mr. GRANFIELD. Could you present us with data on the model-by-model basis as to what Ford Motor cars would sell for in these countries if they faced the same kind of barriers that the foreign competition faces here?

For example, we know what a Datsun sells for here; what would a Ford Pinto sell for comparatively equipped in Japan with the same tariff barrier that Datsun faces in the United States; could you supply us with those figures?

Mr. FORD. Yes, we could, in the case of that particular example.

Mr. GRANFIELD. Well, as extensive as you can. I would like to know some comparison about the relative level of price of a Pinto versus a Datsun facing an identical tariff structure.

Mr. FORD. Tariff and tax structure in the country of sale?

Mr. GRANFIELD. Correct.

Mr. FORD. Yes.

[For the information requested, see exhibit 6 at the end of Mr. Ford's oral testimony.]

Mr. GRANFIELD. Now, we heard something about the exploitation of monopoly power here, and I would like to use an example.

Specifically, you are extremely successful in the production of the Mustang. If you don't have the figures today with you, I would like them to be given to me.

The Mustang, in my recollection, when it came out did not have a competitor in the form of a similar kind of what has now been called the "pony car" for at least 2 to 2½ years; is that correct, at least 2 years?

Mr. FORD. Yes, I think that is correct.

Mr. GRANFIELD. In that period of time, are you aware of what the percentage of increase in the price of the Mustang was from the day of introduction to the day when the competition was actually experienced?

Mr. FORD. I do not know that, but we can supply that for the record.

[For the information requested, see exhibit 6 at the end of Mr. Ford's oral testimony.]

Mr. GRANFIELD. The point I am trying to bring out is you had clearly a car with what was alleged to be monopoly power in the market. There was nothing in the American market, or even that could be imported, that closely resembled the Mustang.

And it was my recollection the Mustang rose less than 15 percent in price during that time, because I would argue the potential effects of competitive entry, and that this is what the restriction on your ability to raise price to an exorbitant level.

That is the kind of evidence I am looking for, that even when faced with an obvious product monopoly, Ford did not exercise what one might regard as the full extent of its product monopoly because potential competition was facing them.

Mr. FORD. We can certainly supply prices that I believe would support that contention, yes.

[For the information requested, see exhibit 6 at the end of Mr. Ford's oral testimony.]

Mr. GRANFIELD. One last question. I would like you to interpret what you think is the difference, Mr. MacNee, between the Sherman Act and the Industrial Reorganization Act as you see it as a test or analysis of monopoly power.

Mr. MACNEE. Well, I suppose the single biggest difference would be the elimination—if I understand the section-by-section analysis—of the "something else," the intent, deliberateness, abuse, the absence—well, let me put it a different way. The Sherman Act today, and I guess all of the antitrust laws, are directed at the behavioral conduct.

The Industrial Reorganization Act, on the other hand, would exclude behavior for the most part and focus exclusively on structure.

Mr. GRANFIELD. Is it your interpretation that you could not have a successful collusive agreement without the behavior attribute; that is, to restrict output to divide the market. Either one of you can answer that.

Mr. MACNEE. I think that that question has been asked and answered several times.

Mr. FORD. As far as taking the question as going to the issue of concentration, does the fact that concentration——

Mr. GRANFIELD. No, I asked another question.

Do you feel that this industry could successfully and tacitly collude without some behavior attribute which also would be detected?

Mr. MACNEE. No.

Mr. GRANFIELD. Thank you.

Thank you, Mr. Chairman.

Senator HART. Thanks.

Before you leave, given that area of exchange, I welcome the chance to put in the record that the inclusion of the automobile industry in this list of seven—or six—was not to suggest that concentration levels in those industries are the consequence of collusion.

I am delighted to salute the skill and abilities of all you have achieved in your position. It may not have anything to do with it, but there are two reasons for putting them down.

They have some basic impact on all of us; and that being the case, the second purpose is that we weigh objectively to develop an answer as to whether great as they are, they may not be great in terms of public service, financial interest, to give that kind of answer.

I think just to structure and restructure in the courts in the matter of antitrust procedures are required, and the bill seeks to do that, too.

So, at least for this period, we conclude the hearings as they relate to the automobile industry, and I want to express to the Ford witnesses our appreciation for their welcome presentation.

I am tempted to suggest how unreal this period of 4 days has been. If 20 years ago it had been suggested that we would be going through this kind of a discussion—I didn't grow up in Michigan, but I got there early enough to learn and have always been aware that in days past at home, the car agent or whoever was running one of those companies could do no wrong. Either you worked for them or you tried to sell to them, because you might need them.

And in any event, look at the success of the industry. It was America's pride, and I share it.

We used to laugh at those crazy little European cars, that wouldn't sell, and just think of the events that have occurred that have changed it—the attitudes, including Ford's own attitude of itself, which is good.

My hunch is that Ford more than any other has understood that change.

Mr. MacNee. Thank you, sir.

Mr. Ford. Thank you.

Senator Hart. We are adjourned subject to the call of the Chair.

[Whereupon, at 12:40p.m., the subcommittee adjourned, to reconvene on June 20, 1974, on the "Industrial Reorganization Act—S. 1167 (the Communications Industry)".]

[The following was received for the record.]

MATERIAL RELATING TO THE TESTIMONY OF JAMES W. FORD

Exhibit 1.—Excerpts From Testimony of George Romney Before Subcommittee on Antitrust and Monopoly, February 7, 1958

Mr. Romney. This brings us to a fundamental question. Are the antitrust laws adequate to provide for the minimum number of companies to produce needed competition in the automobile business?

The existing provisions in the Sherman Antitrust Act against monopoly are not adequate for two reasons.

In the first place, Sherman Act procedures are too slow. It took exactly 20 years in the courts to terminate the proceedings against the Aluminum Company of America.

It took 14 years between the filing and conclusion of the cases against General Motors Acceptance Corp.

It took more than 10 years in the courts to try and settle the problems of monopoly in the motion-picture industry, In the meantime the advent of television had completely changed industry patterns.

Senator Kefauver. Do you mean by that some fellow who is trying to be able to compete by virtue of the antitrust laws, if he has to wait 8, 10, 12, 16 years for a decision, he is gone and forgotten about by that time?

Mr. Romney. He just isn't there.

Senator Kefauver. I think that is a very justified criticism of the government of the antitrust laws. Justice so long delayed is justice denied.

Mr. Romney. That is correct.

Senator Wiley. He just told us it would take us 15 years before we could get a new change in other things.

Mr. Romney. Fundamentally.

The second difficulty with existing antimonopoly procedures is that they are conducted in the atmosphere of a criminal trial. Questions of morality and ethics rather than economic and social policy have often determined court decisions in this field. With very few exceptions, the Government has been unsuccessful in curbing economic monopoly unless it could show that the defendant has been motivated by evil or predatory intent.

In other words, where the company has grown without violating the provisions of the law, and where it has not conspired on done anything of that character to indicate an intent to exclude, it can grow as big as it can as long as it does not do the two things: develop the intent to exclude as well as the size.

Even the most advanced definition of monopoly requires proof not only that the defendant has the power to exclude his competitors from the industry but also that he has the desire or intent to use this power.

And it is that proving of desire and intent that makes it so difficult to apply the present antitrust laws.

And this intent is provable only by demonstrating that he has, in fact, used exclusionary practices to obtain and maintain his position.

Incidentally, there is a distinction between the Sherman Act and the Clayton Act in this case, and the Clayton Act applies to acquisitions, and this is why in the Du Pont case, which involved acquisition, it was not necessary to prove any intent.

Under the Sherman Act you have to prove intent, and that is the primary law we are dealing with except in the case of acquisition.

Senator KEFAUVER. You have to prove intent until monopolization gets up to the point apparently where there is practically nobody else left.

Mr. ROMNEY. Senator, even in the Aluminum Co. case where they were doing 100 percent of the business it took them 20 years to decide that the Aluminum Co. was a monopoly.

Senator KEFAUVER. Everybody knew they had all the business.

Mr. ROMNEY. Sure, everybody knew it, and as I recall the case, it hinged on the fact that the Aluminum Co. had used the pricing process to keep low prices on things that apparently it wanted to keep people out of from the standpoint of production and higher prices on those where they were willing to have people in, you see, which was purely an internal affair and it involved no conspiracy or anything else.

Overall, the Aluminum Co. was a good monopoly. They did not make much on invested capital. They made about 6 percent on invested capital in the years I was with them, so it was not very much.

Senator KEFAUVER. Regardless of how the competition started, it is a healthy thing that other companies are in the aluminum industry now, in your opinion?

Mr. ROMNEY. It has been a great thing for the aluminum industry and the consumers and the people, and that competition is what protects the people and increases the application of the metal and product in ways that consumers want to use it.

Senator KEFAUVER. It also keeps the aluminum companies on the ball, too.

Mr. ROMNEY. Yes, it certainly does.

A private monopoly can become very lethargic and bureaucratic just as other monopolies can.

I propose a new approach to the question of competitive economic power in the automobile industry.

To promote competition, economic progress, individual opportunity and to enlarge benefits to consumers generally, economic power in the automobile industry should be limited and divided.

Limitations should be placed on firms whose size, integration, and financial strength make possible the domination of a national market.

It is also desirable to maintain a sufficient number of firms in each basic industry to have adequate competition, to encourage cooperation on common problems in the areas permitted by law and to prevent the development of an excessive imbalance of economic power.

To achieve the desired ends, the antitrust laws should provide that when any one firm in a basic industry, and note I am only talking about basic industries, such as the automobile business, exceeds a specific percentage of total industry sales over a specified period of time, it shall be required by law to propose to an administrative agency a plan of divestiture that will bring its percentage of sales below the specified level. Where a firm is engaged in more than one basic industry, the maximum percentage of total industry sales

should be fixed by law at a point lower than the percentage to be fixed for companies operating in only a single basic industry.

Where a company is engaged in more than one basic industry, its competitive position is strengthened and it is able to dominate a single market with a lower percentage in any given industry.

This results from its ability to concentrate its resources on a single industry or product at any time and to expand its market position by relying on earnings from its other activities.

This proposed amendment of the antitrust laws would have a number of advantages:

1. It would promote and preserve adequate competition.

One of our problems in this country is when these industries arrive at the point of adulthood where they ought to be most productive, that we begin to lack then an adequate number of firms to provide the competitive effort that is needed for economic progress.

2. The companies affected, not the Government, would have the opportunity to originate the method of compliance.

If the company did not originate it, why obviously the Government ought to step in and take such steps as would be necessary.

3. Achievement of the sales percentage requiring a split-off or "birth" would become evidence of economic success.

I think it is a birth, and I develop that a little further and would like to comment on it.

Senator KEFAUVER. Yes, will you do so, Mr. Romney?

Mr. ROMNEY. A little further on I will expand on that.

4. Competitive effort and growth would be encouraged, not restrained.

What I mean by that is if you take General Motors, for example, and General Motors becomes the sire of more than one company, then those companies can grow and expand and the net result is that General Motors winds up being in effect a bigger and more beneficial part of our economy than if they stay in a single lump that has to be concerned about whether it is going to get too big or not. Again I go back to Standard Oil. Standard Oil became 34 companies.

These companies today are many of them large companies making a tremendous contribution to the economic well-being of America.

That was a tremendous thing to have done and should be recognized as such, and we should remove this stigma from growing to the point where you can became 2 instead of 1, and we ought to recognize that we need births in these industries.

5. Instead of making mere size itself an offense, the test under the law would be based on the size of a company in relation to that of its competitors. In big industries there would be big companies.

(Page 2890).

My proposal is not an effort to eliminate big business. In the automobile business you have to have big business as it is a big industry.

But this would simply relate the size of the companies to the size of the industry, and insure that we have an adequate number of companies in these big industries so that we would have adequate competition.

Why? To protect the customer, to protect the people, to enable the customer to continue to influence the product, policies, and positions of those companies.

Exhibit 2.—Reply of Ford Motor Co. to Letter From Senator Hart

ANSWERS OF FORD MOTOR CO. TO QUESTIONS IN SENATOR HART'S LETTER OF FEBRUARY 28, 1974

ECONOMICS OF SCALE

Our views requested on the relationship of technical efficiency to size and the aspects of production processes that account for economies of scale are set forth in the testimony to which these answers are attached.

VERTICAL INTEGRATION

1. Which components do you manufacture and which do you purchase? What is the basis for these decisions?

Answer. In general, we manufacture all or a major portion of the principal components of our passenger cars and lights trucks—engines, transmissions, and other drive-line components, body stampings, chassis parts, and interiors. We

purchase a number of these components for heavy trucks. We purchase our requirements for many electrical components and a number of other parts and materials. A listing of our make/buy sourcing pattern for major items and a list of components and materials we buy entirely from outside suppliers are attached (Attachments I and II).

The principal factor affecting make/buy decisions is the cost advantages obtained by manufacturing certain components within the Company. These advantages generally result from our uniques knowledge of the product (and, therefore, knoweldge of component performance requirements), our ability to react more quickly to rapidly changing market demands and governmental regulations (both of which often require component redesign), and from efficiencies in the supply and distribution of the components. Other factors that influence the decision to manufacture certain components included the critical nature of a component (because of its importance in design, safety, or overall performance) and the needs to protect availability of the component in sufficient quantities to maintain production schedules. If we cannot produce a component more economically or efficiently than a supplier can, we purchase that component from sources outside the Company. Over the years, suppliers have made valuable contributions to the Company in technical support, manufacturing efficiencies, and supply performance.

2. Do you supply automotive components to competitors? Do you purchase automotive components from competitors? Please supply a description of the nature, quantity, and terms on which you obtained from or supplied to General Motors, Chrysler, and American Motors during the 1973–model year.

Answer. Lists of vehicle components purchased from or sold to General Motors, Chrysler, and American Motors during the 1973–model years are included as Attachments III and IV. Our purchases of these components represented only about 1% of the Company's total payments to all U.S. suppliers for purchased products and services during 1973.

OTHER TRANSPORTATION BUSINESS

1. Why did you withdraw from the manufacture of buses? Have you considered entering again?

Answer. Ford played a minor role in the transit (as opposed to inter-city) bus business before World War II, merchandising first the Model 70 and, subsequently, the Metroliner buses. After World War II, Ford manufactured the Metroliner chassis until the late 1940's, when the business was sold to the Marmoh-Herrington Automotive Company. Our reasons for leaving the transit bus business included low industry volume with limited growth potential and our desire to discontinue product lines with high assembly labor content and limited profit potential. Since then, Ford periodically has considered re-entering the transit bus business. To date, our studies have not indicated a volume potential sufficient to justify the required investment in engineering, tooling, and facilites. In view of the anticipated continued energy problems and their potential effect on transit patterns, Ford will continue to reassess this decision.

2. What consideration have you given to entering any other ground transportation markets, including electrified mass transit equipment?

Answer. In 1972, we established a Transportation Systems Operations activity to engage in the development and marketing of automatically controlled transportation systems (People-Movers). Ford's system consists of driverless, computer-controlled electrically-powered vehicles operating on exclusive guideways.

Our activity in this market began at the Government-sponsored TRANSPO Exposition at Dulles International Airport in May 1974, where a system designed and built under a Department of Transportation contract was demonstrated. Over 25,000 passengers rode on the Ford system during the week-long exposition. A test track was completed earlier this year near Ypsilanti, Michigan. It is being used to develop advanced system concepts and to test vehicles and control systems prior to installation for public service. We are presently constructing our first commercial system at Bradley International Airport, near Hartford, Connecticut, and a People-Mover system is also being installed in Dearborn in the Fairlane Development, a project of the Ford Motor Land Development Corporation. Both the Bradley and Fairlane systems are expected to be operational in late 1975. Ford was recently selected as the supplier of a 1½ mile system connecting the central business districts of El Paso, Texas and Juarez, Mexico, scheduled to open in 1976. It is planned to continue to seek

new applications for automated transportation systems in airports, activity centers, central business districts, and medium-density corridors.

Another transportation concept we have developed is the Ford "Dial-A-Ride" system which uses small, 10- to 12- passenger buses that are linked by radio to a central dispatcher and are routed in response to demands of patrons. The system has application in areas where densities and transportation demands are not adequate to support conventional transit buses. We have done considerable work in designing the system for 19 cities and in conducting an extensive field test in the city of Ann Arbor, Michigan.

Our Scientific Research Staff is working on the development of tracked magnetic levitated vehicles—a new technology potentially applicable to inter-city trips of 300–500 miles. The concept employs magnetic forces that enable a vehicle to travel about one foot above a metal guideway at speeds of 300 miles per hour. Theoretical research at Company expense in 1968 and 1969 resulted in the award of a contract by the Federal Railroad Administration of the Department of Transportation in 1971. Under this and subsequent contracts, Ford has conducted experiments with models which confirm the theoretical research.

ENERGY CRISIS

1. What is your view of the energy crisis, and what effect will it have on the automobile industry?

Answer. In their letter to stockholders accompanying the Ford Motor Company Annual Report for 1973, Mr. Henry Ford II and Mr. Lee A. Iacocca made the following comments on the energy crisis:

"Late in [1973], the Mid-East war and the Arab oil embargo transformed what had been a worsening petroleum shortage into an immediate energy crisis. The energy crisis, in turn, transformed what had been a steady trend toward small cars into a sudden rush.

"Small cars—compacts and below, including imports—accounted for 38% of U.S. industry sales in 1972 and 42% in 1973. Since late November, the small-car share has been more than 50% of the U.S. market, and it could be even higher if more small cars were available.

"For the short run, the energy crisis represents a serious problem for your Company, as it does for other manufacturers. Even before the energy shortage reached critical proportions, industry sales were declining because of the overall slowing of economic growth resulting from the government's anti-inflationary policies. The impact of restrictive economic policies on car sales has been worsened by shortages and rapidly rising prices of gasoline, consumer uncertainty and the inability of producers to keep up with the sudden increase in demand for small cars. With sales down and costs continuing to rise sharply, Ford's earnings will be under severe pressure in 1974.

"We are responding to the short-run problem by undertaking stringent measures to reduce costs and by accelerating programs to convert North American assembly capacity from larger cars that are in weak demand to smaller cars that are selling well. By the start of 1975–model production, we will have the capacity to assemble nearly two million small cars annually in North America—about twice as many as were produced in the 1973 model year. Because of facility programs planned several years ago, we already have small-car component manufacturing capacity to support an increase of this magnitude.

"For the long run, we regard the energy crisis not as a catastrophe, but rather as a challenge and an opportunity. We believe the automobile industry has, and will continue to have, a vigorous future. And we believe Ford is in a unique position to respond to changes in automotive demand that have been stimulated and reinforced by energy shortages.

"The long-range outlook for the automobile industry clearly depends on the outlook for petroleum supplies. The petroleum shortage is real. Even if the Arab nations had not restricted production and embargoed shipments to the United States, petroleum would be in short supply today. The principal cause of the underlying shortage is not the depletion of crude oil reserves, but the fact that demand has been rising much more rapidly than the petroleum industry's investments in capacity expansion.

"Recent sharp increases in the prices of petroleum and petroleum products have caused severe hardships. Higher petroleum prices are bitter medicine in a world that has become increasingly dependent on petroleum to meet its growing energy requirements. But higher prices are also the quickest and surest

way to bring supply and demand back into balance. In spite of the hardships, it is better to have enough petroleum at higher prices than to have continuing shortages at lower prices.

"Within a few years, if prices provide adequate incentive, supplies should be markedly increased through the construction of new refining capacity and the discovery and development of substantial new petroleum reserves. More petroleum will also be available for motor vehicle users because other users will be encouraged to switch to less expensive energy sources. In the long run, higher prices will make it economically feasible to manufacture petroleum products from enormous reserves of oil shale and coal. In short, we believe that the world will continue for the indefinite future to have enough liquid fuel to support a growing motor vehicle industry.

"We recognize that higher gasoline prices will exert some downward pressure on vehicle sales and usage. There will probably be some shift from car travel to rail and other public transit. Even a small shift, incidentally, means a substantial growth in the market for public transit systems and equipment. Ford is participating in this market and now is planning three installations of its Automatically Controlled Transportation (ACT) system: one at Bradley International Airport in Connecticut, another at the Fairlane development in Dearborn, Michigan, and a third between El Paso, Texas and Juarez, Mexico.

"The Company also has pioneered in the design and development of Dial-A-Ride bus transit systems, and is prepared to take advantage of whatever new market opportunities this emerging form of public transportation might provide.

"On the other hand, we know from experience in other countries that the principal effect of gasoline price increases will not be to shift people out of cars, but to shift them into smaller cars with superior fuel economy.

"We are convinced that the switch to smaller cars is not a passing phenomenon, but a permanent feature of the North American car market. It began many years ago as a result of changing consumer attitudes, the growth of multiple-car families and inflationary pressures on consumer income. In recent years, the trend toward smaller, more economical cars has been accelerated by substantial increases in car prices to cover the cost of new safety, damageability and emission control equipment mandated by Federal law. We expect that this trend will continue to be reinforced by higher gasoline prices.

"Your management is responding in many ways to the challenge and the opportunity presented by this shift in the market. In addition to expanding small-car capacity, we are expanding our small-car lines. During the past five years, Ford has introduced five new small-car lines in the North American market—Maverick, Comet, Capri, Pinto, and Mustang II—and each has been highly successful.

"This fall, we will introduce two additional small cars, the Ford Granada and the Mercury Monarch. Like the Mustang II in the specialty car market, these new cars will represent a new concept in the family sedan market—a concept that combines a high level of comfort, ride, and elegance with modest exterior dimensions and good fuel economy.

"We are also working intensively to achieve major fuel economy improvements in all our vehicles. By the start of 1975–model production, all of our cars will have steel-belted radial-ply tires as standard equipment because they offer less rolling resistance as well as greater durability. We are preparing to follow as fast as development and tooling time permits with a variety of additional component changes to provide better gas mileage.

"We are making good progress in developing highly promising new approaches to fuel induction and ignition systems and combustion-chamber design. If the statutory Federal emission standard for oxides of nitrogen (NOx) is amended by Congress to a more realistic long-term level, we believe that these new approaches will make it possible to build reciprocating internal combustion engines that will meet the Federal emission requirements for future models and at the same time will provide better fuel economy.

"In our judgment, two alternative engine concepts show promise for application in the 1980's—the high-temperature gas turbine based on ceramic technology and the Stirling cycle engine. Our experience in seeking to develop electric vehicles has led us to the conclusion that electric power has little potential for general motor vehicle use.

"Other efforts to improve fuel economy across-the-board include increased usage of lighter-weight materials—plastics, aluminum, and high strength steel—and improved aerodynamics.

"In spite of the strong trend toward small cars, we believe there will continue to be a substantial North American market for larger cars. Economy is not necessarily an overriding factor in the choice of a family or personal car, but fuel economy will be a more important consideration for big-car buyers as well as for small-car buyers. The basic goal of all our future product programs is, therefore, to maximize interior room, comfort, handling and ride within the limits set by smaller exterior dimensions, lighter total weght and better gas mileage. As we take action to improve the fuel economy of our vehicles, we have no intention of neglecting our continuing efforts to improve their comfort, durability, reliability, serviceability and quality."

2. How much of your capacity will be converted to the production of small cars?

Answer. At the beginning of 1975-model production, approximately 60% of Ford's North American passenger car production capabilities will have been converted to small cars: Pinto, Mustang II, Maverick, Comet, Granada, and Monarch. This excludes the Capri, which is imported. If overseas capacity dedicated to North America is included, our small-car capacity will increase to 62% of total capacity.

3. To what extent do you anticipate increasing imports from your foreign subsidiaries to meet any increase in demand for small cars?

Answer. Our present plans do not include an increase in imports of completed vehicles from our foreign subsidiaries. We do plan to continue importing the Capri (imported from our German subsidiary) at about the same rate as we have in recent years. In addition, we will continue to import components as necessary to support our domestic small-car capacity.

Attachment I

FORD MOTOR CO. MAJOR ITEMS SOURCING PATTERN

Item	Passenger cars	Light truck	Heavy truck
Iron castings	Make and purchase	Make and purchase	Make and purchase.
Aluminum castings	do	do	do
Forgings	do	do	Purchase.
Glass	Make	do	Make.
Vinyl	Make and purchase	do	Make and purchase.
Engines	Make	Make	Do.
Body stampings	Make and purchase	Make and purchase	Purchase.
Cab stampings		do	Do.
Trnasmissions	Make and purchase	do	Do.
Axles	Make	Make	Do.
Frames	Make and purchase	Purchase	Do.
Wheels	do	do	Do.
Steering columns	Make	Make	Make.
Steering gears	Make and purchase	Make and purchase	Purchase.
Front suspension	Make	do	Do.
Starters and alternators	do	do	Do.
Trim sets	Make and purchase	do	Make and purchase.
Radios	do	Make	Make.
Air conditioners	Make	do	Make and purchase.
Air conditioner compressors	Purchase	Purchase	Purchase.
Engine electrical wiring	do	do	Do.
Wiring harnesses	do	do	Do.
Radiators	Make and purchase	Make and purchase	Do.
Drive shafts	do	do	Do.

Attachment II

FORD MOTOR CO, ITEMS THAT ARE SOURCED ENTIRELY TO OUTSIDE SUPPLIERS

Spark plugs, batteries, electrical wire, tires, turn signals, carpet, cloth, light bulbs, hose, hydraulic lines, fuel lines, brakes, mufflers, tail pipes, rubber products, wheel covers, exterior trim moldings, air conditioner compressors, and wiring harnesses.

Attachment III

FORD MOTOR CO., PURCHASES FROM GENERAL MOTORS, CHRYSLER, AND AMERICAN MOTORS FOR THE 1973 MODEL YEAR

Description of item	Principal reason for purchasing	Purchases[1] (millions)	Contract term
General motors:			
Diesel engines and related parts—certain heavy trucks	Specified by customer	$25.8	1973 model.
Castings—various cars and trucks	Critical shortage of mallable castings.	11.0	Do.
Air conditioner core assemblies—luxury, medium specialty, and intermediate cars.	Temporary internal manufacturing problems.	8.9	Do.
Air conditioner suction values—luxury, medium specialty, medium, standard, and intermediate cars.	Best design available to meet performance objectives.	8.5	Do.
Integral power steering gear assemblies—intermediate and small specialty cars and certain light trucks.	Most economical alternative studied to relieve internal manufacturing limitations.	6.9	1971–75 models.
Air conditioner compressor assemblies—luxury and medium specialty cars.	Best design available to meet performance objectives.	6.8	1973 model.
Automatic transmissions—certain heavy trucks	Specified by customer	3.8	Do.
Starter motor and drive assemblies—certain heavy trucks	do	3.5	Do.
Power steering pumps—luxury, medium specialty, medium and certain standard cars	Best design available to meet performance objectives.	2.7	Do.
Starter motor solenoid and plunger assemblies—luxury, medium specialty, and medium, standard, and intermediate cars.	do	1.9	Do.
Exhaust gas recirculation valves—luxury, medium specialty, and certain medium, standard, and intermediate cars.	Utilize available technology of all known producers at the time to meet emission standards.	1.6	1973–75 models.
Miscellaneous	Various	6.3	1973 models.
Total estimated purchases from General Motors		87.7	
Chrysler:			
Manual transmissions—certain 4-wheel drive light and medium trucks.	Specified by customer	8.5	Do.
Transfer cases—certain light trucks	Best price at the time	4.4	Do.
Manual transmissions—certain 2-wheel drive light trucks	do	4.2	Do.
Oil, fuel, and temperature senders—various cars and trucks.	Volume did not warrant expense in attempt to develop alternate.	1.3	Do.
Miscellaneous	Various	3.0	Do.
Total estimated purchases from Chrysler		21.4	
American motors:			
Interior plastic parts—various cars and trucks	Best price at the time	1.7	Do.

[1] At standard volume.

Attachment IV

FORD MOTOR CO., ESTIMATED SALES TO GENERAL MOTORS, CHRYSLER, AND AMERICAN MOTORS FOR THE 1973-MODEL YEAR

Description of item	Estimated sales (millions)
General motors:	
Leaf spring steel	$4.2
Hot rolled sheet steel	2.5
Knit vinyl	.6
Miscellaneous	.1
Total estimated sales to General Motors	7.4
Chrylser:	
Glass brackets	3.5
Sheet metal tooling	1.3
Steel slabs	1.1
Miscellaneous	.1
Total estimated sales to Chrylser	6.0
American Motors:	
Starter motors	5.5
Carburetors	3.6
Windshield wiper motors and governors	3.3
Crankshaft castings	1.9
Miscellaneous	.1
Total estimated sales to American Motors	14.4

Exhibit 3.—Excerpt From the New York Times, April 9, 1974, Re Demand for Small Cars and Price Increase

The Energy Crisis Spurs Demand for Small Cars * * *

By Jerry M. Flint

There has been an earthquake in the automobile world and the temples of the industry—from the Volkswagen lair in Wolfsburg, West Germany, to the giant factories in Detroit and Tokyo—are still trembling.

Smaller cars, slower cars, gasoline misers—the type of cars that Detroit disdained for decades—are in demand. And it does not matter if the oil is flowing again or that gasoline stations are open again—even on Sundays.

For the Arab oil embargo last October opened a great crevice in the automobile industry, and into that crevice fell the Pride of Detroit, the 4,500-pound, soft-riding, 10-miles-to-the-gallon big car.

Automobile sales in the United States are running 26 per cent behind last year's record pace, when Detroit produced 9.7 million cars. And big-car sales are falling the fastest.

The General Motors Corporation, which has emphasized big cars, reports that its sales have slumped by one-third so far this year. For the Ford Motor Company and the Chrysler Corporation, sales are down 20 per cent from last year. The only one of the Big Four domestic auto makers to show a gain this year is the American Motors Corporation, which has concentrated on small cars in recent years; its sales so far this year have increased by 14 per cent.

'NOT A PASSING PHENOMENON'

"We are convinced that the switch to smaller cars is not a passing phenomenon," says Henry Ford 2d. And Stuart Perkins, president of Volkswagen of America, says: "In another year and a half, they won't be using the definition 'small car.' They will be the standard car."

The low-priced import also fell into the crevice, a victim of inflation brought on in part by the oil embargo. Gone is the $2,000 car, gone in the $2,500 car and going is the $3,000 car—only a few of these models are left, and they are expected to disappear by this summer with the next price increase.

This means that the typical low-priced foreign car will soon cost at least $3,500. And importers are emphasizing even more costly models—$4,500 cars and $5,000 cars to lure customers who are used to buying medium-priced cars.

Commenting on the price increase, Norman Lean, vice president of American Toyota, said, "Inflation in Japan is pushing up the cost of materials at a 20 per cent-plus annual rate, and the labor unions are expected to demand a 30 per cent increase in their pay envelopes this year."

The shock waves set off by the energy crisis have also shaken environmentalist and Government safety officials who have been pushing for gasoline-guzzling antipollution adjustments to car engines, heavy bumpers that cost more than they saved buyers in insurance premiums, and electronic devices that forced drivers and front-seat passengers to buckle up before their new cars would start.

The environmentalists and safety officials are still pushing. Last month, for example, the Government proposed that air bags or other passive restraints be made mandatory in cars sold by the fall of 1976. But there is less sympathy today for such rules.

FOREIGN PROBLEMS, TOO

While the events of the last five months have shaken the big-car makers in Detroit, foreign car makers face problems of their own. Their domestic sales are slumping, too, despite their emphasis on small economy cars. The price of gasoline in the major auto-producing nations of Western Europe and Japan has risen sharply since last fall. And potential car buyers in those countries, like those in the United States, were frightened away by gasoline shortages—especially at the start of the energy crisis.

Even in the United States, the importers are finding it more difficult to sell their small economic models. Last year, nearly 1.8 million cars from Europe and Japan were sold in the United States. During the first two months of this year, import sales were off by 15 per cent.

One reason is that the price of cars used for trade-ins has slumped. That means potential buyers will hang on to their big cars rather than trade them in on smaller cars at a big loss.

"A 1973 Buick Electra tagged at $5,407 when it left Detroit now brings about $2,900 at auction," said Mr. Lean, the Toyota executive. His company's sales in the United States are 16 per cent below last year's.

"Our Capri has one up $1,000 in the last 13 months." said a Ford man in attempting to explain why sales of the German-made Ford this year were nearly half last year's.

The American car buyer panicked "far beyond the gasoline shortage," said C. R. Brown, vice president of American Mazda, whose rotary engine car has been threatened by the new emphasis on fuel economy. He says a Government report showing that Mazdas got only 10 to 11 miles to a gallon has cost his company $100-million in sales.

Other foreign car makers reporting sales setbacks in the United States this year are Volkswagen, Mercedes, British Motors and Volvo.

At Datsun, one of the few major importers showing strong early year sales, the car stockpile is only half what is needed, according to Robert Link, vice president of sales for Datson. Because of a shortage of ships in Japan, he said, cars are "sitting on a wharf in Tokyo." Adding to the uncertainty is the threat of a seamen's strike in Japan.

Fiat says it is not selling more cars here because labor disputes in Italy have slowed production of the special parts needed to clean up engine emissions and to bring their cars up to United States safety standards.

Some sellers of American-made cars are even having trouble selling smaller cars—because they are accustomed to selling big, accessory-loaded cars for $5,000 and now they want to sell small, accessory-laden cars for $5,000.

"I went to my Oldsmobile dealer," one New Yorker said last week, "and they wanted $5,200 for something called an Omega." An Omega is an Oldsmobile version of a rather plain-looking compact called the Nova when sold by Chevrolet dealers. "They'll give me a discount—to what, $4,400," the New Yorker added. "So today I'm still driving my '65 Olds."

The American companies are making their smaller cars "more and more luxurious and more and more expensive," just as they did in the past, said Mr. Perkins, the Volkswagen official.

Detroit will have to raise the price of its small cars, said Michael Sanyour, president of Subaru of America, because that is where its profits will come from in the future. "Even now, it's hard to get a stripped [without accessories] domestic subcompact," he added.

Did Detroit miss the boat by failing to see the trend toward small cars? Most importers do not think so.

"I don't think [American auto makers] were shoving big cars down people's throats," said Mr. Sanyour, whose company imports the Japanese-made Subaru. "Maybe they were fanning desires for big cars," he conceded. But he added: "They were brought up with the big-car point of view. How do you change your value systems?"

"It's a big country, open spaces, open ideas, and anything small or smaller didn't fit," Mr. Perkins said, referring to the United States and the thinking of Detroiters. "It had to be big to be better."

Moreover, there have been a few faint stirrings of hope in Detroit lately. Two weeks ago, General Motors canceled plans to lay off 27,000 workers. And now that the oil embargo has been lifted and the long lines at service stations have melted away, some auto executives say big-car sales are starting to pick up.

But the shift to small cars is expected to continue. Detroit will spend $1-billion this year and next in a massive effort to convert factories that once produced standard-size and large cars. Moreover, Detroit responded to the small-car demand faster than most importers expected.

"There'll be a lot of competition, said Mr. Link, the Datsun executive. He thinks the big effort from Detroit and the higher prices on imports will push the import market back to about 15 per cent of the total car sales in the United States. Import sales have been approaching 20 per cent.

The new Detroit cars include two compacts for Ford's fall introduction, four restyled compacts from General Motors, a version of Chevrolet's subcompact Vega for Pontiac and a new sporty version of the Vega for Chevrolet to battle Ford's Mustang II. American Motors is planning to introduce its Pacer by next February.

But none of the domestic cars—nor most of the cars planned by foreign auto makers—will be low-priced models. Indeed, Detroit likes to call its new cars "luxury" models, and likens them to Mercedes-Benz cars.

The importers are moving in the same direction. Volkswagen's new Dasher costs $4,500 and is like the cars that will come out of Detroit in a couple of years, Mr. Perkins says. There are $7,000 Volvos. And Toyota says its new Corona is designed "so that big-car owners have something to turn to."

The move to larger and more expensive smaller cars makes sense to auto men because—as they interpret the sales figures—new buyers have not swarmed into tiny cars. Instead, they have continued to buy smaller cars while turning away from big cars.

For example, last October, the kick-off month for the '74 model year and before the effect of the oil crisis was felt, 330,000 smaller cars (imports and American-made compacts and subcompacts) were sold. That figure climbed to 400,000 in November, but then was relatively steady at 339,000 in December, 350,000 in January and 334,000 in February. That five-month total, 1.75 million, was only 94,000 above the smaller car sales for a comparable period in the previous model year.

But the big cars, outselling the smaller cars almost 2-to-1 in October, fell to a 5-to-4 advantage in November and were matched by smaller car sales for December, January and February. And the five-month sales total for the bigger cars—2.19 million—trailed the total sales for a comparable period in the previous year by 750,000.

Most car makers believe they have a chance to win the medium-price car buyer when he buys again. Such customers are willing to pay $5,000, and most auto companies like that, but he wants a plush interior, automatic transmission and air-conditioning—which means that importers will push larger and more luxurious cars.

The last chance for a low-priced car may be the minicar, which is 12 feet long or less, has a low-horsepower motor, relatively low speed (65 miles an hour at most) and can get 40 miles to a gallon.

"It's time to think of the mini-car," said Michael Sanyour of Subaru, which sells a tiny mini called the Rex in Japan.

Mr. Perkins of Volkswagen said, "There isn't a single company today that isn't playing around with true mini-cars."

The mini-cars built today—mostly in Japan—are not exported to the United States because they fail to meet Federal safety standards.

But the importers might try eventually to sell such cars in the United States because American manufacturers are not likely to touch that market, Mr. Sanyour said. For decades, he noted, Detroit played down the market for compact cars.

* * * and Detroit Responds—With Big-Car Prices

A flood of new, made-in-Detroit smaller cars will pour from the factories next fall. But they will be smaller cars with a catch—and the catch is they will not be low-priced cars. Instead, automobile manufacturers in Detroit have concluded that they can get big-car prices for their smaller models—and the key is to make them "luxury" models.

To a Detroit auto manufacturers, luxury means thick carpets on the floor; colorful, imitation leather seats; plenty of power-assisted gadgets, such as power steering, power brakes, power windows and power seats, and even big V–8 engines. And Detroit's engineers already are hard at work stuffing bigger, fuel-gulping engines and power assists into next fall's small cars.

$1–BILLION TO REBUILD

The reason? The four major automobile manufacturers in the United States are spending $1–billion to rebuild their factories to pour out nearly two million more small cars—and they don't think they can get their money back by selling cars that retail for less than $3,000.

Detroit is not hiding its intentions. Describing the new compact-size cars that will be coming out this fall, Lee A. Iacocca, president of the Ford Motor Company, said "they will combine timeless styling and interior elegance" and would offer "luxury in a small size." He added that "there will be no compromise with comfort and convenience."

Not to be outdone, Richard C. Gerstenberg, chairman of the General Motors Corporation, said: "A few years ago, the public valued small cars as only basic transportation; now, customers are looking for the same luxury and convenience in a small car that are usually associated only with full-size cars. The future G.M. cars, now being designed and developed, are attuned to this shift in the public's preference, and we intend to take full advantage of the new sales opportunity it presents."

But Stuart Perkins, president of Volkswagen of America, the leading seller of economy cars here, says that what Detroit is designing is high profits.

"They have got to have their cars at current prices" to maintain the high profit, he says. "The over-all price of the Chevrolet Impala has to be duplicated in the small car." Indeed, that seems to be what Detroit plans with its 1975 models.

What the American car manufacturers will do, Mr. Perkins continued, is take the basic economy car and make it "more and more luxurious, more and more expensive." That happened a decade ago, he said, when the domestic manufacturers first produced low-priced compact cars, then built them up—adding size and weight and price—until they no longer were economy cars.

Certainly, of all the new small cars planned for 1975, there is not one at the low-priced end of the market. If the new American models have anything in common, it is that they are supposed to be the most luxurious group of smaller cars ever made here.

Ford, for example, will introduce two new compacts next fall—the Granada for the Ford Division and the Monarch for Mercury—and the company will continue to build its present compacts, Maverick and Comet. But the new models will have "interior elegance," according to Ford officials. Some of these officials say the new cars look much like the German Mercedes-Benz models. But non-Ford men who have seen the new compacts say they look more like old American compacts squared off without much streamlining.

The word "elegance" is hardly ever used in Detroit for anything under $3,500, however, which probably means that Ford expects to get $3,500 to $4,500 for the new compacts, or as much as the company now gets for an intermediate or full-sized Ford.

A.M.C.'S NEW PACER

In addition, Ford plans to put a V–8 engine in its small Mustang II's. This will add weight and lose some fuel economy. It will also add about $130 to the purchase price and enable the car to handle expensive power options, such as air-conditioning, which is $400 extra.

The American Motors Corporation's new model will be called the Pacer and will carry V–6 and V–8 engines (A.M.C. has no four-cylinder engine) and eventually a rotary engine, which will add power and performance, but probably cost several hundred dollars more. The Pacer is scheduled to be introduced after the first of the year and, like other new small cars, will probably retail at $3,500 plus.

From Chevrolet is expected a small sporty car, a modified Vega with a Porsche look, competition for Ford's Mustang II. This model was to have had a rotary engine, but will be offered initially with a V–8, with the rotary to come later in 1975, unless G.M. changes its plans, as it has done before.

Pontiac will have its version of the small Chevy Vega, possibly to be called the Astre—a dressed up, more expensive version of G.M.'s original economy car.

And G.M.'s Chevrolet, Pontiac, Oldsmobile and Buick Divisions will get new compacts to replace their Nova, Venture, Omega and Apollo models this fall. Also, there are reports that G.M. is pushing to get a smaller Cadillac on the market sometime in 1975.

The new small cars will not to be scarce—in the 1975 model year, the domestic auto manufacturers will be able to produce 5.2 million smaller models, compared with 3.4 million when the current model year began last fall. This is because many of their plants have been or are being converted into small-car production centers.

Mr. Iacocca of Ford said of the giant conversion, "We are in the midst of the greatest industrial conversion in history, at least in peacetime."

One Detroit official estimated that the cost of converting an assembly center and its allied parts-feeding plants at $150–million.

Eight assembly plants have undergone or are undergoing such changes. They are:

A General Motors assembly plant near Atlanta, where full-size cars were produced, has been converted into one that produces smaller intermediates. And a G.M. plant near Kansas City has been switched from full-size cars to compacts. The company will also convert its plant in Tarrytown, N.Y., from full-size cars to compacts, and another plant in Southgate, Calif., from full-size cars to subcompacts.

Ford has switched a plant in the Detroit area from full-size cars to compacts, and an assembly plant in Chicago from full-size models to the intermediate-size Torino. And the Ford plant in Mahwah, N.J., will switch from full-size cars to compacts next fall.

The Chrysler Corporation has converted its assembly plant in Newark, Del., to compact cars.

NEW PLANT ACQUIRED

In addition, American Motors is acquiring a new plant in Wisconsin to produce Pacer parts, and adding a second work shift at its plan in Kenosha, Wis., to increase the production of small cars. Ford is also adding a second shift at its plant in San Jose, Calif., to make more Pintos and Mustangs.

"I can't help but be impressed with the speed with which Detroit is virtually rebuilding its plants," Mr. Perkins of American Volkswagen said. "It's very impressive and shows the ability of the industry to react."

But the cars Detroit is rushing to turn out are not low-cost 30–miles-to-the-gallon commuter cars; those are still on the drawing board.

Instead, they are $3,500 to $4,500 compacts and subcompacts, getting 15 to 20 miles—or just a bit more—to the gallon. Detroit's bet is that the American car buyer will be willing to pay as much as he did for his large car—just as long as he gets the plush interiors and peppy performance he's accustomed to.

JERRY M. FLINT

Exhibit 4.—Copy of 1927 Internal Combustion Engine Patent

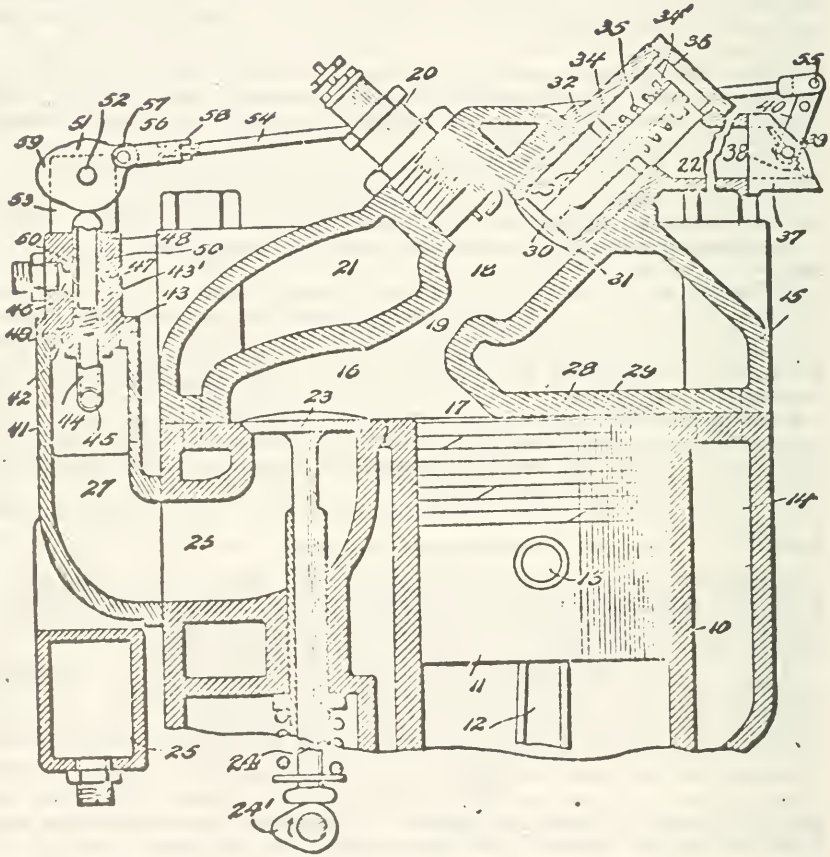
Nov. 15, 1927. 1,649,700

F. M. JOBES

INTERNAL COMBUSTION ENGINE

Filed April 23, 1924 3 Sheets-Sheet 1

FIG. 1.



Inventor

F. M. Jobes

By Watson, Cole, Grindle & Watson

Attorney

5, 1927. 1,649,700

F. M. JOBES

INTERNAL COMBUSTION ENGINE

Filed April 23, 1924 3 Sheets-Sheet 2

FIG. 2.

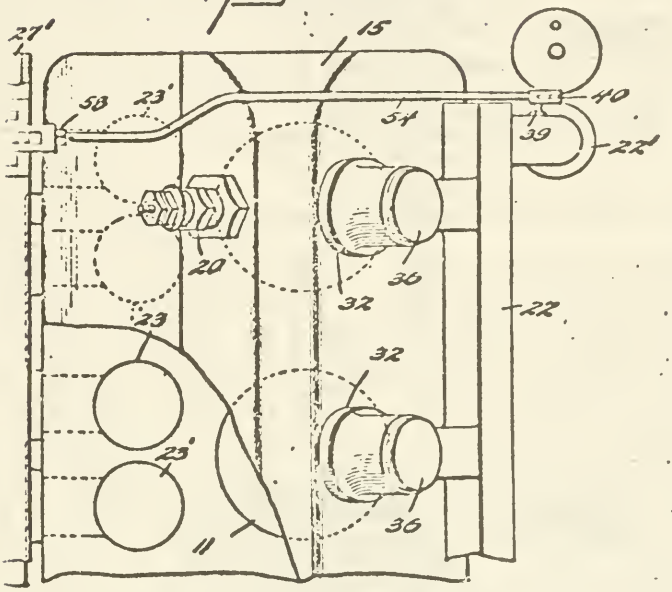
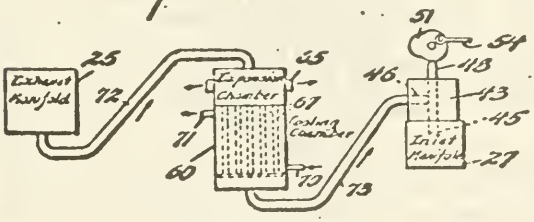


FIG. 3.



Inventor

Frank M. Jobes.

By Watson, Cole, Moser & Grindle,

Attorney

Nov. 15, 1927. **1,649,700**

F. M. JOBES

INTERNAL COMBUSTION ENGINE

Filed April 23, 1924 3 Sheets-Sheet 3

FIG. 4.

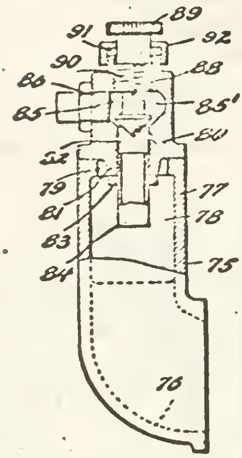
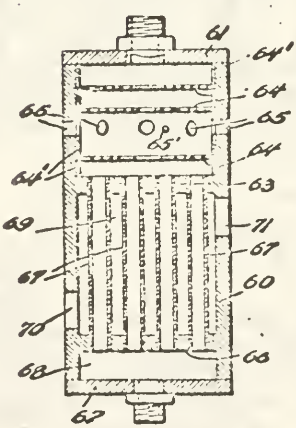


FIG. 5.



Inventor

F. M. Jobes

By Watson, Coit, Morse & Grindle

Attorney

[Patented Nov. 15, 1927, 1,649,700]

UNITED STATES PATENT OFFICE

FRANK M. JOBES, OF ANN ARBOR, MICHIGAN, INTERNAL-COMBUSTION ENGINE.
APPLICATION FILED APRIL 23 1924. SERIAL NO. 708,575.

This invention relates to internal combustion engines, and more particularly to internal combustion engines of the constant volume type adapted to be operated on gasoline or other light hydrocarbon fuels.

An object of this invention is to materially increase the thermal efficiency of such engines.

Another object of this invention is to maintain substantially the same efficiency throughout the full throttle range of an internal combustion engine.

A further object of this invention is to secure in a constant volume type of internal combustion engine a high maximum, mean effective pressure in the cylinder in order that the power output may be high in proportion to the piston displacement.

A still further object of this invention is to provide means to prevent detonation at all engine loads in an internal combustion engine having a higher than normal compression pressure.

It has long been known that the thermal efficiency of an internal combustion engine depends directly upon the expansion ratio, which is limited to a great extent, by the compression pressure of the engine. While this desirable theoretical condition of efficiency can be gained in practice to some degree, the expansion ratio is materially limited by the relatively low compression pressure under which the ordinary engine may work, for it has been determined that above the usual pressures, a peculiar condition of combustion develops especially when using an explosive mixture composed of light hydrocarbons or similar fuels mixed with air. When such a fuel is highly compressed and ignited a phenomenon known as detonation takes place in which the rate of combustion increases abnormally, making it substantially an instantaneous process, and producing a characteristic knock in the combustion chamber. Operation of a motor under these conditions results in rapid overheating to such an extent that it is impossible to operate it for any great length of time or with a high thermal efficiency. In order to secure a higher thermal efficiency, it becomes necessary to provide means for controlling this phenomenon, and much attention has been devoted in recent years to the solution of this problem, but in general the various solutions put forth have proved to be complicated or unreliable commercially.

Experimental work has demonstrated that the rate of combustion in the cylinder of an internal combustion engine may be materially decreased by adding to the combustible mixture a quantity of inert gases, an abundant supply of which is to be found in the products of combustion from such an engine. By providing means to properly proportion the diluent to the mixture, at the fuller throttle loads, it is possible to design an engine having a considerably higher compression ratio than is permissible when no detonation control is effected. The operation of such an engine is fully described in my copending application, Serial No. 669,173, filed Oct. 17, 1923.

It has also been demonstrated experimentally that when a small localized charge of combustible mixture having access to a large volume of pure air or excessively lean mixture is burned under pressures which ordinarily cause detonation, the effects of such detonation are absent, and it is therefore permissible to use in engines operating in this manner, a considerably higher compression ratio than is otherwise found permissible. Engines of this type have been built, but it has been determined that the maximum power output is unusually low owing to the difficulty of rapidly and completely intermingling the localized charge with the large volume of air, during the small period devoted to combustion, as is necessary in order to secure the complete burning of a mean near normal mixture for the production of a high maximum power output at full throttle loads. The operation of such an engine is fully described in my copending application, Serial No. 696,878, filed Mar. 4, 1924.

This invention includes a combination of the two above mentioned means for controlling detonation, the use of inert gases mixed with the combustible mixture being restricted to the fuller throttle loads, while at the minimum and intermediate loads, a localized charge of rich combustion mixture is burned with access to a large volume of pure air or lean mixture, with which it may intermingle during the process of combustion.

A highly satisfactory type of engine is provided by such a combination of control means, making it possible to design an engine having an unusually high compression ratio, which will operate without a trace of detonation, and in which there is also secured the valuable features of a constant compression ratio at all throttle loads, thus maintaining full efficiency throughout the throttle range. This latter feature is due to an arrangement which provides that only a small charge of combustible mixture is drawn into the compression chamber and retained in an isolated portion thereof, there being admitted a volume of pure air sufficient to fill the remainder of the compression chamber at substantially atmospheric pressure. Thus, even at reduced loads, the small combustible charge is compressed to the same pressure as the charge at full load, which pressure is materially higher than permissible in engines not including detonation control. There is also provided means for securing a high degree of turbulence of the pure air contained within the combustion chamber during the compression and expansion strokes, which is an effective solution of the problem of securing a high mean effective pressure in an engine which may be considered to belong to the partially localized charge type.

For a full understanding of this invention, reference should be had to the accompanying specification taken with the drawings in which:

Figure 1 is a transverse section through the upper structure of one cylinder of an internal combustion engine, constructed according to this invention:

Figure 2 is a partial plan view of the engine with parts broken away;

Figure 3 is a schematic diagram showing the path of the inert gases;

Figure 4 is a side elevation partly in section of a modified form of device for regulating the flow of inert gases to the cylinder; and

Figure 5 is a longitudinal section through the combined expansion chamber and cooling * * * for the inert gases.

In Figure 1, the usual cylinder 10 is shown fitted with a piston 11 of well-known form and connected to a crank shaft (not shown) by means of a connecting rod 12 and wrist pin 13. The cylinder is surrounded by a water jacket 14 for cooling purposes. The upper end of the cylinder is closed by means of a cylinder head 15 which includes the dome-shaped combustion chamber 16, offset from, but communicating restrictedly with, the upper end of the cylinder through the passage 17; the pocket 18 communicating restrictedly with the combustion chamber through the passageway 19; the spark plug or ignition device 20; the water jacket 21 and the combustible mixture inlet manifold 22.

Arranged beside each cylinder in the manner common to the usual type of L-head motor, is the inlet valve 23 and the exhaust valve 23'. These valves are retained on their seats by the usual valve springs 24 and opened in the well-known manner by cams such as 24' mounted on a cam shaft driven from the crank-shaft. These valves open into the combustion chamber 16, and the exhaust valve controls a passage leading to the usual exhaust manifold 25, while the inlet valve 23 controls a passage 26 leading to a manifold 27, which is open at one end to the atmosphere as shown at 27'.

The portion 28 of the cylinder head extending above the piston has merely sufficient clearance 29 at top dead center for safety, so that at the completion of a compression stroke, all the gas contained between the portion 28 and the piston head is violently projected into the combustion chamber 16 through the restricted opening 17, thereby causing a high degree of turbulence within the chamber.

The isolated pocket 18 is of comparatively small volume compared with the volume of the combustion chamber 16, and the passageway 19 is restricted, directed away from the piston and shaped somewhat as a Venturi tube in order that the products of combustion issuing therethrough may more readily intermingle with the air contained in the combustion chamber 16. The upper end of the pocket 18 is normally closed by a spring controlled valve 30 fitting upon a seat 31, which is integral with the valve cage 32. This cage is suitably inserted, preferably by threading, into the pocket 18 and contains a valve guide 33 mounted on the spider 34. Between it and the washer 34', on the end of the valve stem, there is a spring 35 normally tending to retain the valve 30 against the seat 31. The upper end of the valve cage is closed by means of a cap 36, while the manifold 22 communicates with the interior of the cage. A carburetor, 22' having an induction tube 37 is adapted to be attached to the manifold 22, and is provided with the usual butterfly throttle valve 38 mounted on a shaft 39 which is adapted to be rotated by means of the arm 40.

This carburetor may be of relatively small size compared with the size of the engine to which it is attached, and is normally adjusted to deliver an extremely rich combustible mixture to the pocket 18 of the engine.

* * * * * * *

Exhibit 5.—Excerpt From Wall Street Journal, January 28, 1974, Re Closing of Ford Plants

FORD IS CLOSING ADDITIONAL PLANTS, IN BIG-CAR CUTS

TWO ASSEMBLY FACILITIES AND FRAME UNIT INVOLVED; UNITED STATES AND FOREIGN LAYOFFS SET

Dearborn, Mich.—Ford Motor Co. said it is temporarily closing two more of its big-car assembly plants and curtailing production at several supply plants, idling 7,400 workers temporarily and 1,550 indefinitely in an action reflecting previously reported sharp cuts in first quarter schedules for big cars.

In addition, Ford said it will lay off for a week 3,500 workers at its Oakville, Ontario, assembly plant starting Feb. 4, and 4,450 workers over the next few weeks at its Cologne, West Germany, plant, because of a German sales drop of more than 40% in December, the British three-day workweek and reduced demand for parts by other Ford plants in Germany and Belgium.

The U.S. production cuts reported earlier this month chopped Ford's first quarter plans from already reduced schedules, but the No. 2 auto maker then only disclosed some of the employment cutbacks and plant closings that would be caused by the big-car cutbacks. Since the schedule cut, Ford has increased the number of small cars it plans to build this quarter.

The latest moves will close Ford's big Mahwah, N.J., assembly plant for two weeks, idling 3,400, and its Los Angeles assembly plant for a week, idling 2,200. Mahwah produces big Ford models; Los Angeles makes Ford and Thunderbird models. In addition, Ford will close for a week its plant at Dearborn that makes frames for big cars and will cut production for two weeks at its Lima, Ohio, engine plant. At Dearborn, 825 will be laid off; at Lima, 800 will be idled.

Ford's newly announced plans to lay off indefinitely 1,550 workers reflect production cutbacks at a variety of facilities. Among them, 150 workers will be furloughed at Ford's Nashville, Tenn., glass plant, 300 at its Buffalo, N.Y., stamping plant and 600 at its Livonia, Mich., transmission plant.

The plant closings involved in the latest announcement are to occur over the next three weeks. The Mahwah assembly plant will be down this week and the week of Feb. 11, Ford said. Los Angeles will be down the week of Feb. 4. Dearborn frame will be down this week and Lima engine for two weeks, starting Feb. 11.

Ford's moves are part of a continuing cutback within the industry in response to the sharp slump in sales of big cars, as buyers are shying away from big autos that don't get as economical gas mileage as smaller cars. The industry-wide cutbacks have resulted in the indefinite layoff by the "Big Three" auto makers of 60,000 workers in the U.S.

Ford's reduced production schedule for the first quarter is 550,000 cars, down 11% from the 620,000 target before Christmas and down 22% from the 702,823 cars it built in the year-earlier first quarter.

However, Ford's latest first quarter plans are slightly higher than the 520,000 it had been planning to build in the first quarter before adding to its small-car plans. Ford's 550,000-car schedule still reflects sharp cuts in big-car output.

Ford also disclosed over the weekend it's planning to convert still another assembly plant to production of small cars from large cars for the coming year. Ford wouldn't specify which plant will be changed over, but the move would boost Ford's small-car capacity in North America to about two million cars annually. The company, which built about 1.1 million small cars in North America last year, previously said it was considering moves that would boost small-car capacity to about 1.5 million units.

The planned increase to two million from 1.5 million would reflect not only the most recently announced plant conversion, but other moves, including the recently announced possible addition of an added workturn at Ford's San Jose, Calif., assembly plant, which produces Mustang II models.

Exhibit 6.—Information Received From Ford Motor Co. in Response to Requests of James W. Ford During His Appearance Before Committee

MATERIAL SUBMITTED FOR THE RECORD IN RESPONSE TO QUESTIONS AND REQUESTS DURING THE APPEARANCE OF JAMES W. FORD AND JAMES M. MACNEE III BEFORE THE SUBCOMMITTEE ON ANTITRUST AND MONOPOLY ON APRIL 11, 1974

1. Did Ford Motor Company's labor costs increase after the General Motors settlement in 1970?

Answer. Yes. In fact, Ford did not conclude a new labor agreement with the UAW in 1970 until December 7, after the General Motors settlement on November 11. On December 9, we announced a price increase on 1971 model cars and trucks because of the labor cost increases provided in the new contract.

2. Does the Ford people mover system at Bradley International Airport, Hartford, Connecticut connect the Airport with downtown Hartford?

Answer. No, the system operates only at the Airport.

3. Is it anticipated that the Ford people mover system that is to connect the central business districts of El Pasto, Texas and Juarez, Mexico will be extended to form a larger system?

Answer. Our contract is to supply only the 1½ mile line. As far as we are aware, there are no plans to expand the system.

4. Please supply the names of dealers who sell Ford Motor Company cars and the cars of other domestic manufacturers in the same premises.

Answer. A list of Lincoln-Mercury dealers who sell non-Ford vehicles is attached. A national list of Ford dealers has not been compiled, and it would require considerable time and expense to assemble such a list. Although we believe the list of Lincoln-Mercury dual dealerships illlustrates the point, we shall provide a similar list of Ford dealerships if the Subcommittee's staff believes that this information is needed for the record.

5. Does Ford's market share vary from one region of the country to another?

Answer. Our market share does differ among regions, and the regional shares change differently overtime. The following table shows the Company's share in the five regions. Much greater variations are manifested of course, in smaller geographical areas.

FORD MOTOR CO. SALES AS PERCENTAGE OF TOTAL NEW CAR SALES [1]

	Northeast	Southeast	Great Lakes	Central	West	National average
1969	23.1	25.2	24.4	25.1	24.8	24.4
1970	24.2	27.5	28.0	28.2	26.1	26.5
1971	21.9	24.6	24.5	25.2	24.9	24.0
1972	23.0	25.6	25.5	26.1	26.9	25.2
1973	22.2	25.6	24.3	25.9	26.2	24.6

[1] Excludes State and Federal Government.

6. Would you please supply data on a model-by-model basis showing what Ford Motor Company cars would sell for in overseas markets if they faced the same structure of tariffs and internal taxes that foreign cars face here?

Answer. Because model-by-model data would be so extensive, we have summarized, for an average Ford Motor Company U.S. car and extra-heavy truck, the differences between the U.S. and a number of other countries in the structure of tariffs and internal taxes. These data are shown in Attachment 2.

The differences in tariff duties reflect differences in statutory rates and differences in the basis on which duties are levied. The 3% United States duty on passenger cars and the 4% duty on trucks (cab and chassis) are levied on the price at overseas factory, which, of course, excludes inland freight (a minimum charge is dutiable where a freight charge is made mandatory by the manufacturer), ocean freight, and insurance. Foreign duties generally are levied on the higher CIF (cost, insurance, freight) price, which includes full inland freight, insurance, and ocean freight.

The differences in "Internal Taxes" reflect differences in the base on which internal taxes are levied. Because the internal taxes levied on automotive vehicles in most foreign countries are part of a general value-added tax or other general tax, the discrimination against exports consists only of the inclusion of duty, freight, and insurance in the tax base. Foreign excise taxes on imports are generally levied on a Duty Paid Value basis, which includes inland freight in the country of export, ocean freight, insurance, and duty. The taxable base for the U.S. 10% Federal excise tax on trucks includes a minimum formula destination charge, but it excludes the other costs.

7. What was the percentage increase in the price of the Mustang from the time of its introduction [April 1964] to the time that a competing car was introduced?

Answer. The suggested retail list price of the Mustang 2-door hardtop was $2,153 (excluding Federal excise tax) when it was introduced in April 1964. The price of the same model was $2,311 (again, excluding excise tax) in Septem-

ber 1966, when Chevrolet introduced the Camaro. The price increase during the two and one-half year period was $158 or 7.4% (The prices used exclude Federal excise tax because the tax was reduced from 10% to 7% in this period).

Lincoln-Mercury dealerships dualed with products of other manufacturers

District, dealer name, and location	*Manufacturer of "dualed" products*
Boston:	
B&J Lincoln-Mercury, Berlin, N.H	American Motors.
Bostley Motor Co., Greenfield, Mass	Do.
Moriarty Bros., Inc., Manchester, Conn	Do.
Park Motor Co., Auburn, Maine	Do.
Poirer Lincoln-Mercury, Fall River, Mass	Do.
Swearningen Motor Co., Portland, Maine	Do.
Tally's Auto Sales, Inc., Gloucester, Maine	American Motors, International Harvester.
New York:	
Dwan Lincoln-Mercury, Inc., Norwalk, Conn	American Motors.
McCormack Motor Sales, Bedford, Hills, N.Y	Do.
Merit Lincoln-Mercury, Lawrence, N.Y	Do.
Merriam Motors, Inc., Wallingford, Conn	American Motors, Saab.
Shakers, Inc., Waterbury, Conn	American Motors, British Leyland Motors.
Milton Weiss, Inc., Bridgeport, Conn	American Motors, Nissan.
Philadelphia:	
David Ertley L–M Sales, Kingston, Pa	American Motors, Daimler-Benz.
Mayo Motors, Trexlertown, Pa	Do.
Witmer Motors, Inc., Millersburg, Pa	Do.
Washington:	
Antietam Motors, Inc., Hagerstown, Md	Do.
Davenport Motors, Inc., Elizabeth City, N.C	American Motors, British Leyland Motors, General Motors (trucks).
Jim Eckels, Manassas, Va	American Motors.
Marlow Motor Co., Inc., Front Royal, Va	Do.
Patuxent Motor Sales, Inc., Lexington Park, Md	Do.
Smith-Waldrop Motors, Inc., Greenville, N.C	American Motors, General Motors (trucks).
Atlanta:	
Carroll Motors, Inc., Conway, S.C	Chrysler.
East End Motor Co., Orangeburg, S.C	American Motors.
Kingsport Motors, Kingsport, Tenn	Chrysler.
Pollock L–M, Gadsden, Ala	General Motors.
Wilson Motors, Inc., Columbia, S.C	American Motors.
Woods-Henshaw Motors, Sweetwater, Tenn	Chrysler, American Motors.
Dallas:	
Bayshore Motors, Inc., Baytown, Tex	American Motors.
Marstaller Motors, Inc., Waco, Tex	American Motors, Fiat.
C. O. Morgan L–M, Inc., Wichita Falls, Tex	American Motors.
Ken Nowell Lincoln-Mercury, Arlington, Tex	Do.
Pagan-Lewis Motors, Inc., Corpus Christi, Tex	American Motors, Open Road Motor Home.
University L–M, Stillwater, Okla	American Motors.
Van Burkleo Motors, Inc., McAllen, Tex	Do.
H. A. Wilson Motor Co., Taylor, Tex	Do.

Lincoln-Mercury dealerships dualed with products of other manufacturers—Continued

District, dealer name, and location	*Manufacturer of "dualed" products*
Jacksonville:	
Ed Cox Motor Co., Inc., Fort Walton Beach, Fla	Do.
Ocala Lincoln-Mercury, Ocala, Fla	Do.
Memphis:	
Baldwin Motors, Covington, La	Do.
Dick Barker, Houma, La	Do.
Benafield Motors, Stuttgart, Ark	Chrysler.
Carpenter-Hudnall, Natchez, Miss	American Motors.
Hugh Critz Motor Co., Greenwood, Miss	Do.
Diamond Lincoln-Mercury, Biloxi, Miss	American Motors, Volvo, British Leyland Motors.
Fletcher Motor Co., Columbus, Miss	American Motors, General Motors (trucks).
Hiveley Motor Co., Selmer, Tenn	Chrysler.
McCarty Motor Co., Inc., Jonesboro, Ark	American Motors, Fiat, Shasta Motor Home.
Quick L-M, Inc., Bowling Green, Ky	American Motors.
Gene Reeves L-M, Jasper, Ala	Chrysler, General Motors (trucks).
Thompson Motors, Inc., Forest, Miss	American Motors.
Buffalo:	
Fort Plain Motor Sales, Inc., Fort Plain, N.Y.	Do.
John C. Miller, Inc., Johnstown, N.Y.	American Motors, International Harvester.
Nemith Motor Co., Latham, N.Y.	American Motors.
Lyle W. Peebles, Titusville, N.Y.	Do.
John T. Roach, Inc., Batavia, N.Y.	Do.
Vetrone Motor Sales, Hancock, N.Y.	Do.
Cincinnati:	
Al Castrucci Lincoln-Mercury, Cincinnati, Ohio	American Motors, Winnebago Motor Home.
Federici Lincoln-Mercury, Chillicothe, Ohio	American Motors, Concord Motor Home.
Lenox Lincoln-Mercury, Lebanon, Ind	American Motors.
Bob Rigg Motors, London, Ohio	Chrysler.
Villers Motor Sales, Inc., Vienna, W. Va	American Motors.
Wallace Motor Service, Clarksburg, W. Va	Do.
Cleveland:	
Al Green L-M, East Liverpool, Ohio	Chrysler.
Jack Hockenberger, Zelienople, Pa	American Motors.
Martin Motor, Norwalk, Ohio	General Motors.
Moore's Motor Sales, Galion, Ohio	American Motors.
Ostrander Lincoln-Mercury, Mount Vernon, Ohio	Do.
Ramme's Lincoln-Mercury, Delaware, Ohio	Do.
Ravotti L-M Sales, Inc., Leachburg, Pa	Do.
Smith Road Auto Sales, Inc., Ashland, Ohio	Do.
Spitzer Motors of Elyria, Elyria, Ohio	Chrysler.
Paul H. Stegkamper, Inc., Ashtabula, Ohio	American Motors, Fiat.
Whitey's, Mansfield, Ohio	Chrysler, General Motors (truck).
Chicago: Terry's Lincoln-Mercury, Orland Park, Ill	Starcraft Mobile Home.

Lincoln-Mercury dealerships dualed with products of other manufacturers—Continued

District, dealer name, and location	*Manufacturer of "dualed" products*
Detroit:	
Bowling Green Motor Sales, Bowling Green, Ohio	American Motors.
Devon Lincoln-Mercury, Ann Arbor, Mich	Do.
Les Frank, Inc., Blissfield, Mich	Do.
Hanshumaker Motor Sales, Delphos, Ohio	Do.
Ray Hodgson, Inc., Sturgis, Mich	Do.
Kibsgard, Inc., Findlay, Ohio	American Motors, Nissan.
O'Keefe Motor Co., Inc., Kalamazoo, Mich	American Motors.
Peterson & Son, Lapeer, Mich	Do.
Reiber & Schwartz, Chesaning, Mich	Do.
Gene Smith Lincoln-Mercury, Mount Pleasant, Mich	American Motors, Fiat, Travel Equipment Corp. Motor Home.
Ralph Toupalik, Inc., Coldwater, Mich	American Motors.
St. Louis:	
Bluff City Motors, Inc., Council Bluffs, Iowa	Do.
Bryan Motor Co., Poplar Bluff, Mo	American Motors, General Motors (trucks).
Del Cornell & Son, Columbia, Mo	American Motors.
Harrison Motor Sales, Taylorville, Ill	Chrysler.
Metropolitan L–M, Inc., Omaha, Nebr	American Motors.
Molitor Motor Co., Colinsville, Ill	Do.
Hugh Palmer Motor Co., Lebanon, Mo	Do.
Polsky Motors, Inc., St. Joseph, Mo	Do.
Pruitt Lincoln-Mercury, Quincy, Ill	Do.
Town & Country Motor, Sedalia, Mo	Do.
Walker Motor Co., Inc., Jacksonville, Ill	Do.
Wichman Motor Co., Inc., Farmington, Mo	Do.
Twin Cities:	
Henco Motors, Fond du Lac, Wis	Chrysler.
Hendricks Bros. Auto Sales, Bruce, Wis	American Motors, International Harvester.
Low Motor Co., Inc., LaCrosse, Wis	American Motors.
Seitzer Lincoln-Mercury, St. Peter, Minn	Do.
Denver:	
Jerry Bartley Lincoln-Mercury, Jeep, Grand Junction, Colo	Do.
Baugh Motor Co., Logan, Utah	Do.
Don Richards Lincoln-Mercury, Inc., Salt Lake City, Utah	Do.
Watson Motor Co., Clovis, N. Mex	American Motors, Toyota.
Los Angeles:	
Bill Haden Lincoln-Mercury, Yuma, Ariz	American Motors.
Mangerich Lincoln-Mercury, Prescott, Ariz	Do.
Seattle:	
Edmark Motors, Caldwell, Idaho	General Motors.
Hannah Motor Co., Vancouver, Wash	American Motors.
Hotzgang Motors, Grants Pass, Oreg	Do.
Jackson Motor Co., Walla Walla, Wash	Do.
Rygmyr Lincoln-Mercury, Mount Vernon, Wash	Do.
Sutherland Lincoln-Mercury, Spokane, Wash	Do.
Thomas Lincoln-Mercury, Bremerton, Wash	Do.
Wentworth Motors, Inc., Albank, Oreg	Do.

REDUCTIONS IN FOREIGN TARIFFS AND INTERNAL TAXES ON FORD U.S.-MADE VEHICLES AT U.S. DUTY RATES AND TAXABLE BASES

	Duty and internal taxes per vehicle					
	Average U.S. car			Extra-heavy truck chassis		
	Foreign basis [1]	U.S. basis [2]	Total reduction	Foreign basis [1]	U.S. basis [2]	Total reduction
Austria:						
Duty	$767	$107	----------	$5,132	$679	----------
Turnover tax	488	377	----------	2,984	2,208	----------
Value added tax (16 percent)	737	569	----------	3,672	2,718	----------
Total	1,992	1,053	939	11,788	5,605	$6,183
Belgium:						
Duty	422	107	----------	3,920	679	----------
Value added tax (25 percent)	1,065	889	----------	3,913	3,058	----------
Total	1,487	996	491	7,833	3,737	4,096
Denmark:						
Duty	422	107	----------	3,920	679	----------
Value added tax (15 percent)	639	534	----------	3,261	2,548	----------
Total	1,061	641	420	7,181	3,227	3,954
France:						
Duty	422	107	----------	3,920	679	----------
Value added tax (33.3 percent)	1,418	1,184	----------	5,000	3,907	----------
Total	1,840	1,291	549	8,920	4,586	4,334
Germany:						
Duty	422	107	----------	3,920	679	----------
Value added tax (11 percent)	468	391	----------	2,391	1,869	----------
Total	890	498	392	6,311	2,548	3,763
Italy:						
Duty	422	107	----------	3,920	679	----------
Value added tax (18 percent)	766	640	----------	2,609	2,038	----------
Total	1,188	747	441	6,529	2,717	3,812
Luxembourg:						
Duty	422	107	----------	3,920	679	----------
Additional tax (10 percent)	426	356	----------	2,174	1,699	----------
Total	848	463	385	6,094	2,378	3,716
Netherlands:						
Duty	422	107	----------	3,920	679	----------
Additional tax (16 percent)	681	569	----------			
Consumption tax (16 percent)	681	569	----------	3,478	2,718	----------
Total:	1,784	1,245	539	7,398	3,397	4,001
Norway:						
Duty	307	107	----------	1,426	679	----------
Value added tax (18 percent)	829	711	----------	3,849	3,397	----------
Total	1,136	818	318	5,275	4,076	1,199
Sweden:						
Duty	384	107	----------	2,673	679	----------
Valued added tax (17.65 percent)	745	628	----------	3,617	2,998	----------
Total	1,129	735	394	6,290	3,677	2,613
Japan:						
Duty	262	107	----------	1,518	706	----------
Commodity tax	871	711	----------			
Total	1,133	818	315	1,518	706	812

[1] At duty rates and taxable based presently applicable in the indicated countries.
[2] At U.S. duty rates and dutiable base on vehicles, and base for Federal excise tax on imported trucks.

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