THE SECRETARY OF TRANSPORTATION'S REPORT TO THE CONGRESS ON THE LONG TERM VIABILITY OF THE CHRYSLER CORPORATION'S INVOLVEMENT IN THE AUTOMOTIVE INDUSTRY

DECEMBER 1980

PREFACE

The Chrysler Corporation Loan Guarantee Act of 1979, under Sections 12.(a) and (d) of the Act, requires the Secretary of Transportation, after consulting with the Secretary of Energy and the Secretary of Labor, to conduct an assessment of the long-term viability of Chrysler's involvement in the automobile industry.

The study is to assess the impact of likely energy trends and events of the automobile industry. The assessment is to include long-term capital requirements, the rates of productivity growth and technological change, shifting market characteristics, and the capability of the industry as a whole to respond to the requirements of the 1980's. Additionally, the Secretary is responsible for evaluating the adequacy of the automotive industry's existing structure to make necessary technological and corporate adjustments. An examination is also required of Chrysler Corporation's capability to produce, for sale, an automobile similar to those vehicles developed under the Research Safety Vehicle Program of the National Highway Traffic Safety Administration.

This report is organized into two main parts: the first presents a discussion of the auto industry, as a whole, in transition, and the second addresses Chrysler viability specifically. A part of this report, that addressing the automotive industry market, was submitted to the Chrysler Loan Guarantee Board on April 29, 1980 as a preliminary analysis. Chrysler was continuously revising its product plans up to the end of April, and, as a result, no firm data were available until that time. Subsequently, Chrysler submitted a revised Operating Plan and a revised Financing Plan, both dated July 10, 1980 (the "July Operating Plan" and the "July Financing Plan", together the "July Plans").

This report is submitted in partial fulfillment of Section 12 of the Chrysler Corporation Loan Guarantee Act of 1979. Issues are highlighted for the Chrysler Corporation and the automobile industry as a whole. Recommendations relative to these issues will be presented in the annual comprehensive assessments of the state of the automobile industry required by Section 12(b) of the Act.

SECTION 12
OF
THE CHRYSLER CORPORATION LOAN GUARANTEE ACT OF 1979

LONG-TERM PLANNING STUDY

SEC. 12. (a) The Secretary of Transportation, after consultation with the Secretary of Energy and the Secretary of Labor, shall submit to the Board and to the Congress as soon as practicable, but not later than six months after the date of enactment of this Act, an assessment of the long-term viability of the Corporation's involvement in the automobile industry. The study shall assess the impact of likely energy trends and events on the automobile industry, including long-term capital requirements, productivity growth rate, rate of technological change, shifting market characteristics, the capability of the industry as a whole to respond to the requirements of the 1980's, and shall evaluate the adequacy of the industry's existing structure to make necessary technological and corporate adjustments. The study shall include an examination of the Corporation's capability to produce for sale an automobile similar to those vehicles developed under the research safety vehicle program of the National Highway Traffi Safety Administration. The study shall consider government procurement as one means of establishing a market for this automobile.

(b) The Secretary of Transportation shall prepare and transmit to the Congress annual comprehensive assessments of the state of the automobile industry and its interaction in an integrated economy. Each annual assessment shall include, but not be limited to, issues pertaining to personal mobility, capital and material requirements and availability, national and regional employment, productivity growth rate, trade and the balance of payments, the industry's competitive structure, and the effects of utilization of other modes of transportation.

(c) The Board shall take the results of the study and each annual assessment into account when examining and evaluating the Corporation's financing plan and operating plan.

(d) In the study and assessments required by subsection (a) and (b), the Secretary in consultation with appropriate agencies and departments shall identify any adverse effects on the economy of or on employment in the United States or any region thereof and shall make recommendations for dealing with the adverse economic and employment trends identified in such study and for proposed programs or structural or modifications of existing programs, as well as funding requirements, in such areas as economic development, community development, job retraining, and worker relocation. In addition, the Secretary may make any additional recommendations he deems appropriate to address the long term national and regional impact of reduced activity of the Corporation or of the automobile industry.

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EXECUTIVE SUMMARY

Over the past year, the domestic auto industry has experienced sharply reduced sales and profitability, large indefinite lay-offs, and increased market penetration by imports. The shift in consumer preferences towards smaller, more fuel-efficient passenger cars and light trucks, in large measure, appears to be permanent, and the industry will spend massive amounts of money to retool to produce the motor vehicles that the public now wants. The cash flow to pay for the transition to the new fuel-efficient cars and trucks will, however, have to come from sales of relatively fuel inefficient vehicles. At the same time, manufacturing facilities for the production of large cars and light trucks have been rendered prematurely obsolete; facilities are being scrapped rather than being kept in readiness in order to respond to an eventual upward swing in new motor vehicle sales.

The financial strain resulting from the changeover to small fuel economical cars and trucks is being made worse by other changes concurrently taking place in the domestic and international markets. There is a perception on the part of the motor vehicle buying public - right or wrong - that the domestically-produced passenger car is non-competitive in quality when compared to foreign - particularly Japanese - imports. The lack of domestic production capacity for small cars, in combination with the perceived lower quality of the domestic-built car compared to the foreign-built import, has caused foreign penetration to reach an all time high of nearly 30 percent. Finally, labor productivity in the Japanese industry is now comparable with and may soon surpass the labor productivity of the domestic industry; with Japanese wages below U.S. wages, they will have corresponding implications for motor vehicle manufactured cost and price.

In order to improve the overall future prospects for the domestic motor vehicle manufacturers, a quality and price competitive motor vehicle must be produced. If this is not

accomplished, the long term outlook for the industry is bleak, even without taking into account the size of capital investment needed for the transition to smaller, fuel economic motor vehicles.

There is general agreement that technology is available to permit the production of a U.S. passenger car fleet capable of giving 40 to 50 miles per gallon by the early 1990's. The major debate on the future 40 to 50 mile per gallon car pertains to economics and national security considerations, not technical feasibility. The nature of the post-1985 motor vehicle fleet will, in large part, be determined by the future rate of change of petroleum availability and price. If the availability and price of petroleum change at a moderate but continuous rate and there is no major intervention in the marketplace by government actions or other causal effects, a projection of new passenger car fleet fuel economy of 30 to 35 miles per gallon by the early 1990's would appear reasonable. On the other hand, a projected new passenger car fleet fuel economy of 40 to 50 miles per gallon, brought about by government actions and/or market response to more rapid or discontinuous changes in the availability and price of petroleum, is also a realistic possiblity that must be considered.

The capital spending required during the 1980 to 1985 time period by the domestic auto companies will necessitate sizeable external debt financing. The debt levels will put the domestic companies in a more weakened financial position, increasing their vulnerability to significant financial losses in a normal cyclical market downturn. It seems likely that the basic post-1985 finanical strategy of the domestic companies will be to reduce their debt structure to normal levels.

This should be possible under the moderate transition scenario (30 to 35 mpg by 1990). On the other hand, the rapid transition strategy (40 to 50 mpg by the early 1990's) would further challenge their already strained financial structures. If the companies were forced, due to external competition, market forces, or government actions to undertake

another accelerated spending period on top of an already heavy debt load, then some alternative to traditional financing methods may be necessary to maintain a competitive domestic auto industry.

The transition of the domestic auto industry during the 1980's will cause considerable domestic economic dislocations due to: (1) improvement in manufacturing labor productivity and (2) reduction in domestic motor vehicle manufacturing capacity.

Regardless of the economy or sales levels, by the late 1980's it seems quite realistic to project a prime domestic motor vehicle industry with a base manufacturing work force at a considerably lower level than the 800 to 850,000 manufacturing workers who were employed in late 1978.

Changes in the basic automobile will mean similar reductions in the material and component supplier work force as assembly and component facilities are consolidated and changed to the production of new products. Older, less efficient sheet steel mills will be closed as the demand for plain carbon sheet steel is reduced; iron foundries will be shut down corresponding to the use of smaller engines and substitution of cast aluminum for cast iron; there will be a further significant reduction in tire production as longer lasting radial tires are substituted for bias ply tires. These reductions may be offset by gains in employment in the replacement industries such as aluminum and plastics.

Overall, the transition to the more fuel efficient, front-wheel drive motor vehicles will cause domestic manufacturers to re-assess their existing facilities, and there will be signficant changes in the sourcing of componentry, parts, and materials. Those states and communities which will feel the greatest impacts are the ones with the greatest concentration of older facilities which have served the less fuel-efficient cars. These are located primarily in the midwest and northern industrial states.

Chrysler Corporation's operating plans are a striking illustration of the transition. The plans call for the company to undergo a five-year transition from being a full line, (2 to

2.5 million units/year) producer of rear-wheel drive passenger cars and light trucks to being a part line (1 to 1.5 million units/year), producer of front-wheel drive passenger cars and light trucks.

Chrysler Corporation
1978/1979 and 1984/1985 Operating Plans

	1978/1979	1984/1985
Product Mix	Full Line Producer Rear-Wheel Drive	Part Line Producer Front-Wheel Drive
Production Capacity	2 to 2.5 Million Units/Year	1 to 1.5 Million Units/Year

Chrysler has adopted the following product strategy to reach the 1984/1985 1.5 million unit/year front-wheel drive fleet: 1) concentrate on two basic front-wheel drive platforms for all car and truck lines and, thereby, obtain substantial commonality among products; 2) concentrate on in-house powertrain production of transaxles and four cylinder engines; 3) continue to produce a selected line of rear-wheel drive cars and light trucks at existing facilities as long as there is a market for the vehicles; and 4) shut down those facilities which are superfluous now and those which become superfluous in the future. In accordance with this strategy, Chrysler has already retooled some plants and designated others for future retooling. A number of facilities have been shut down, either temporarily or permanently, and still more are scheduled for shut down.

In late 1978 and early 1979, Chrysler Corporation had 50 manufacturing plants and a manufacturing work force of about 115,000 workers in the United States and Canada and a total auto-related work force of nearly 140,000. By 1984/1985, as a result of reduced production capacity and improved productivity, the new Chrysler may have only approximately 30 manufacturing plants, a manufacturing work force of about 60,000 and an auto-related work force of 75,000.

The Loan Board Base Case (Base Case II) projects the sale of 6.6 million Chrysler cars and trucks, including 838,000 captive imports, over the four-year period from 1980 through 1983. 1.9 million or nearly 28 percent of the projected motor vehicle sales will be conventional rear-wheel drive cars and trucks. Chrysler has projected the total variable margin from the sales of all vehicles to be $11 billion. (Variable margin is defined as sales price less variable costs or the amount available to cover fixed costs and profit, including debt servicing). The projected variable margin of $11 billion in combination with available external financing, including draw-down of part or all of the $1.5 billion government loan guarantee, is estimated by Chrysler to be sufficient to pay for changeover from a rear-wheel drive fleet to a front-wheel drive fleet, and to return Chrysler to profitability by 1984/1985.

A major uncertainty in the operating plan is Chrysler's ability to generate all of the projected $11 billion in variable margin revenues from motor vehicle sales over the 1980/1983 time period. Almost 35 percent or $3.9 billion of the projected $11 billion cash flow will be from the projected sales of 1.9 million conventional rear-wheel drive motor vehicles at an average variable margin of nearly $2000/unit. The rear-wheel drive motor vehicle market, particularly for large cars, trucks and vans, has significantly deteriorated over the past year. If the rear-wheel drive market remains at current low levels or deteriorates still further, Chrysler's ability to meet either its projected rear-wheel drive sales or projected rear-wheel drive unit margins is open to question. On the other hand, reduced rear-wheel drive unit margins may be counterbalanced by increased margins on the sale of the new K body front-wheel drive vehicles. Chrysler's financial plan provides for reserves to carry the corporation through a moderate reduction in revenue from rear-wheel drive vehicle sales. The results would be to stretch out the time to return to profitability to 1985 or beyond. A continued severe slump in the rear-wheel drive market might, however, create the need for additional external financing.

Given public acceptance of the new Chrysler front-wheel drive K-car offering, and a return to a normal economy with improved automobile sales, Chrysler's prospects for viability in the near term are favorable. In the longer term, however, the corporation is vulnerable to a future economic downturn or to a continuation of the present soft market for rear-wheel drive vehicles. These factors, plus the need for additional investment in fuel economy after 1985 could put the corporation under serious strain again.

Chrysler projects in the mid-1980's that the annual interest payments on its debt structure will be about $400 million or the equivalent of $300/motor vehicle (assuming 1.5 million unit annual sales) without the conversion of debt to equity permitted under Chrysler's agreement with its bank creditors. The recent decrease in interest rates has reduced the debt load somewhat, but because of this continuing burden and the possible need for further improvement in motor vehicle fuel economy, there is substantial risk with regard to Chrysler's long term prospects.

In view of the nature of the strong competition, Chrysler could consider a specialty niche in producing and marketing a vehicle where the emphasis is on safety as well as fuel economy. Experimental versions of such vehicles have been developed by the Department of Transportation, and the technology and related test data are available. At present, Chrysler has no plans to produce a specialty safety vehicle, and there has been minimal analysis of its potential market.

PART I

AUTO INDUSTRY IN TRANSITION
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PART I
AUTO INDUSTRY IN TRANSITION

1. INTRODUCTION

The purpose of Part I of the Report is to present an assessment of the current status of the domestic auto industry and its direction for the 1980's.

Chapters are presented on: (1) Present Circumstances; (2) On-Going Transition - 1980 to 1985; (3) Post-1985 Transition; and (4) Potential Employment and Community Dislocations in the 1980's.

2. PRESENT CIRCUMSTANCES

2.1 INTRODUCTION

Over the past year, the domestic auto industry has experienced sharply reduced sales and profitability, large indefinite lay-offs, and increased market penetration by imports. This reduction was caused initially by an energy shock which disrupted the supply of gasoline and then sharply increased its price. This shock has resulted in what appears to be a fundamental shift in consumer preferences towards smaller, more fuel efficient passenger cars and light trucks. The auto industry has acknowledged that this shift is permanent, and that they will be required to spend massive amounts of funds to retool to produce the motor vehicles that the public now wants. The industry estimates that retooling will cost between $70 and 80 billion from 1979 through 1984.

The shift in demand away from large passenger cars and light trucks - the segment which has traditionally provided the major source of profits - has significantly eroded the industry's ability to satisfy these huge capital requirements. Paradoxically, the industry would have anticipated selling large, relatively fuel inefficient passenger cars and light trucks in order to generate the cash flow to pay for the transition to the new fuel efficient cars and trucks.

The need of the domestic industry for massive new capital investments, in the face of a declining market for its traditional products, is occurring at the same time other major changes are taking place in the relationship of the domestic motor vehicle industry to the international auto industry.

- The domestic auto industry has a significant but falling fraction of world auto production.

- The United States is no longer the world's leading producer of passenger cars.

- The import of foreign cars (particularly from Japan) has reached an all-time high penetration level of nearly 30 percent.

- There is a perception on the part of the public - right or wrong - that the domestically-produced passenger car is non-competitive in quality compared to foreign - particularly Japanese - imports.

- The productivity growth rate of the domestic industry is behind that of the Japanese manufacturers; the Japanese auto manufacturing labor productivity is now comparable with and may soon surpass the labor productivity of the domestic industry.

This chapter will detail the circumstances in which the domestic motor vehicle manufacturers currently find themselves relative to their international competitors, and the following chapters will assess the nature of the intermediate term (1980 to 1985) and long term (1985 and beyond) transitions.

2.2 SIGNIFICANT (BUT FALLING) FRACTION OF WORLD PRODUCTION AND DEMAND

Profound long-term changes have occurred in the character of international motor vehicle production during the last four decades. Thirty years ago, motor vehicle manufacturing was centered in North America, where four-fifths of the world's motor vehicles were produced. Western European production accounted for most of the other twenty percent; the nascent Japanese motor vehicle industry produced a mere 0.3 percent of world production (see Table 2.2-1).

North American production has had limited net growth since the mid-1950s, and has been highly cyclical (see Table 2.2-2). On the other hand, Western European production increased steadily from less than one-fifth of North American production in 1950 to a level rivaling North American production in 1970. Since 1970, Western European production has become cyclical as well. Japanese production has been monotonically increasing since 1950, with the solitary exception of a small downturn in 1974. By 1980, Japan joined North America and Western Europe as the predominant manufacturers of motor vehicles. In the first quarter of 1980, North America produced 2.7 million vehicles, Japanese production was 2.6 million vehicles, and Western European manufacturing totalled 2.9 million vehicles.[1*]

The rest of the world, primarily comprised of the Eastern Block and Third World countries, has had, to date, a steady, but far slower, growth in production than Japan, increasing its share of world production from about 5 percent in 1950 to 13 percent in 1978.

In 1978, North America produced roughly 9 motor vehicles for each 100 North American vehicle registrations, just under

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*References for Part I, Chapter 2 are listed at the end of chapter narrative.

TABLE 2.2-1. WORLD MOTOR VEHICLE PRODUCTION SHARES (%) 1939-78

YEAR	1939	'50	'55	'60	'65	'70	'75	'78
North America	78	80	70	51	49	32	31	34
Western Europe	18	15	23	37	35	40	33	31
Japan	0	0*	1	3	8	18	21	22
Rest of World	4	5	6	9	8	10	15	13
Total World	100	100	100	100	100	100	100	100

*less than .5%
Source: Reference 2

TABLE 2.2-2. WORLD MOTOR VEHICLE PRODUCTION 1939-78
(In Millions)

YEAR	1939	'50	'55	'60	'65	'70	'75	'78
North America	3.8	8.4	9.6	8.3	12.0	9.4	10.4	14.7
Western Europe	.8	1.6	3.2	6.1	8.6	11.9	10.8	13.1
Japan	-	.03	.1	.5	1.9	5.3	6.9	9.3
Rest of World	.2	.6	.8	1.5	2.0	3.1	5.0	5.4
Total World	4.8	10.6	13.7	16.4	24.5	29.7	33.1	42.5

Source: Reference 2

TABLE 2.2-3. 1978 MOTOR VEHICLE MARKET

	Popula-tion (Million)[1]	Registra-tions-(million[2]	Share of World Registra-tions[2]	Produc-tion (Million)[2]	Share of World Produc-tion[2]	Production/ 100 Vehicles Registered	Popula-tion/ Motor Vehicle	Popula-tion/ Produc-tion
North America	242.1	156.1	43%	14.7	34%	9	1.55	16.5
Western Europe	343.2	106.7	29%	13.1	31%	12	3.22	26.2
Japan	114.9	32.0	9%	9.3	22%	29	3.59	12.4
Rest of World	1,279.0	67.8	19%	5.4	13%	8	18.9	236.9
Total World	1,979.2	362.6	100%	42.5	100%	12	5.5	46.6

Sources:

(1) Reference 3
(2) Reference 2

the rate needed by a pure replacement market** (see Table 2.2-3). (Since the North American Market is growing, albeit slowly, it must either increase its production or import to meet demand.) Western Europe produced 12 vehicles for each 100 domestic registrations. The rest of the world (other than Japan) produced 8 vehicles for each 100 of its vehicle registrations, a rate which is probably insufficient to maintain its fleet. However, Japan produced at a rate of 29 vehicles for each 100 domestic registrations, underscoring the role of Japan as a heavy exporter.

With the largest increment of increase in world motor vehicle demand projected to shift to the rest of the world by the year 2000, these countries can be expected to increase their production capacity, or face heavy import levels as the inescapable result of motor vehicle growth. North American and European manufacturers must export if they expect to increase their motor vehicle production over and above their limited projected national growth rates. Finally, Japan, which is a heavy net exporter of motor vehicles, can sustain the size of its industry only if it continues to export. Any increase in the production level of these countries beyond 1978 levels requires the development of new markets or deeper penetration into existing export markets.

As indicated in Tables 2.2-4 and 2.2-5, the historical pattern of declining share of passenger car demand for North America, Western Europe, and Japan is projected to continue, contrasting with a sharply increasing share of world demand in the rest of the world. The consensus is that the traditional growth markets in North America, Western Europe, and Japan have become quite mature, and that domestic vehicle demand in these nations will increase only slightly.

**The level at which every vehicle scrapped in a given calendar year is replaced by a new vehicle.

TABLE 2.2-4. WORLD REGISTRATIONS AND DEMAND (THOUSANDS)

	Actual*						
YEAR	1950[1]	55[1]	60[1]	65[1]	70[1]	75[1]	78[1]
North America	51,719	66,601	79,019	96,869	116,501	143,909	156,083
Western Europe	10,572	16,215	28,677	48,902	72,930	97,149	106,734
Japan	225	471	1,354	6,300	17,582	28,091	32,008
Rest of World	7,899	12,714	17,916	25,935	39,355	58,671	67,813
Total World	70,415	96,001	126,966	178,006	246,368	327,901	362,638
	Projected**						
YEAR	80[2]	81[2]	82[2]	83[2]	84[2]	90[3]	2000[4]
North America	11,545	11,852	12,113	12,119	12,734	(20,000)	13,500
Western Europe	10,440	10,298	10,876	11,210	11,339	(16,000)	14,900
Japan	3,332	3,369	3,455	3,588	3,605	(8,100)	4,400
Rest of World	6,601	7,227	7,909	8,590	9,478	(21,900)	24,200
Total World	31,918	32,746	34,353	35,579	37,156	(66,000)	57,000

*Based on motor vehicle registrations.
**Based on automobile sales, except 1990 projection which is based on motor vehicle sales.

Source: (1) Reference 2, (2) Reference 3
(3) Reference 4, (4) Reference 5

TABLE 2.2-5. WORLD DEMAND SHARES (%)

	ACTUAL*							PROJECTED**						
YEAR	1950[1]	55[1]	60[1]	65[1]	70[1]	75[1]	78[1]	80[2]	81[2]	82[2]	83[2]	84[2]	90[3]	2000[4]
North America	74	69	62	54	47	44	43	36	36	35	34	34	31	24
Western Europe	15	17	23	28	30	30	29	33	32	32	32	30	24	26
Japan	0	1	1	3	7	8	9	10	10	10	10	10	12	8
Rest of World	11	13	14	15	16	18	19	21	22	23	24	26	33	42
Total World	100	100	100	100	100	100	100	100	100	100	100	100	100	100

*Based on motor vehicle registrations.
**Based on automobile sales, except 1990 projection which is based on motor vehicle sales.

Source: (1) Reference 2, (2) Reference 3
(3) Reference 4, (4) Reference 5

2.3 INCREASING IMPORT PENETRATION

U.S. retail sales of imported automobiles have increased from 29,000 in 1952 to over 2.3 million units in 1979. During this period, the import share of the U.S. auto market has risen from 0.7 percent to 21.9 percent.[6] For the first four months of this year, the import penetration level has been 26.7 percent of total U.S. sales. In 1970, as shown in Table 2.3-1, nearly 60 percent of the imports were produced in West Germany. In 1980, on an annualized basis, only slightly more than 10 percent of the imports were produced in West Germany, compared to 80 percent from Japan. The major source of imports now, and for the foreseeable future, is clearly the Japanese auto industry.

The Japanese auto industry is believed to be expanding its capacity for the production of passenger cars and light trucks. A recent Trade Subcommittee Report of the House Ways and Means Committee analyzed the business plans of the Japanese auto manufacturers.[7] The report stated that:

"While most U.S. manufacturers are shutting down plants or mothballing plants, the Japanese manufacturers are increasing their motor vehicle capacity, mainly automobiles, by 10 percent this year. By the beginning of 1981, Japan will have an estimated capacity of over 11 million units with over one-half this figure targeted for export."[8]

As the Trade Subcommittee Report further indicates;

"There are plans for expansion in a number of countries -- and these plans often seem to count on the export market to absorb a great deal of the new capacity."[9]

The United States, in 1979, received nearly 50 percent of the total exports of Japan, and the Japanese auto manufacturers are expanding their efforts to increase their participation in the United States market. For example, Isuzu Motors, a Japanese car and truck manufacturer, recently announced plans to form an

TABLE 2.3-1. IMPORT AUTOMOBILE SALES BY COUNTRY OF ORIGIN AND TOTAL IMPORT SALES AS A PERCENTAGE OF TOTAL U.S. RETAIL SALES[10]
(IMPORT AND DOMESTIC) U.S. RETAIL SHARES, 1970-1981*

Year	Japan	West Germany	All other	Total	Percent total to U.S. Sales
1980**	80.6	12.0	7.4	100	26.7
1979	76.0	15.0	9.0	100	21.9
1978	67.8	21.8	10.4	100	17.7
1977	67.0	22.0	11.0	100	18.5
1976	62.8	23.8	13.4	100	14.8
1975	51.7	31.1	17.6	100	18.3
1974	41.1	42.2	16.7	100	16.1
1973	42.3	44.7	13.0	100	15.4
1972	38.1	46.6	15.3	100	14.8
1971	35.3	48.4	16.3	100	15.3
1970	24.4	57.4	18.2	100	15.2

*Canadian imports excluded.
**January-April only.

Source: Automobile News and Ward's Automotive.

American marketing firm to market a Japanese line of diesel powered car and trucks.[11] (See Table 2.3-2.)

An increasing number of nations desire to have their own auto assembly industries. A number of Third World Nations have announced plans for the assembly and export of cars. Plans on the part of Japan and the Third World to increase their production capacity for the export market pose an increasing threat to the United States auto industry, especially with respect to domestic sales, since these potential exports are effectively shut out of the car and truck markets of many countries through the use of a number of formal and informal trade barriers of the type indicated in Figure 2.3-1.

Even Japan, with its dependence on relatively free international automobile trade and its extremely competitive automobile industry, has been slow to eliminate policies that in effect penalize producers (foreign or domestic) that have low volume sales and/or whose vehicles are relatively large, powerful, or expensive. So, while Japan has no local content requirements, no quantitative restrictions, and no import duties, a new U.S.-made car which sells in the United States for $6,600 costs the consumer in Japan over $12,000.[12]

The reasons for such an almost prohibitively high cost for the U.S.-made car are: (1) Japan's 15-20 percent commodity tax based on engine size and car size; (2) substantial safety and emissions modifications that must be made; (3) high Japanese dealer markups; and (4) a high cost distribution system.[12] On May 15, 1980, Japan finally agreed to alleviate 12 of the 15 problems relating to costly modifications to meet Japanese safety and emission requirements and further pledged to work toward removing the remaining problems related to standards.[13] However, no progress was made in limiting the impacts of the high commodity tax, the annually imposed automobile tax based on engine size, and the distribution system since these apply to all vehicles irrespective of where they are produced.

In 1979, the United States exported less than 15,000 passenger vehicles to Japan, while importing 1,642,323.[14] To those in

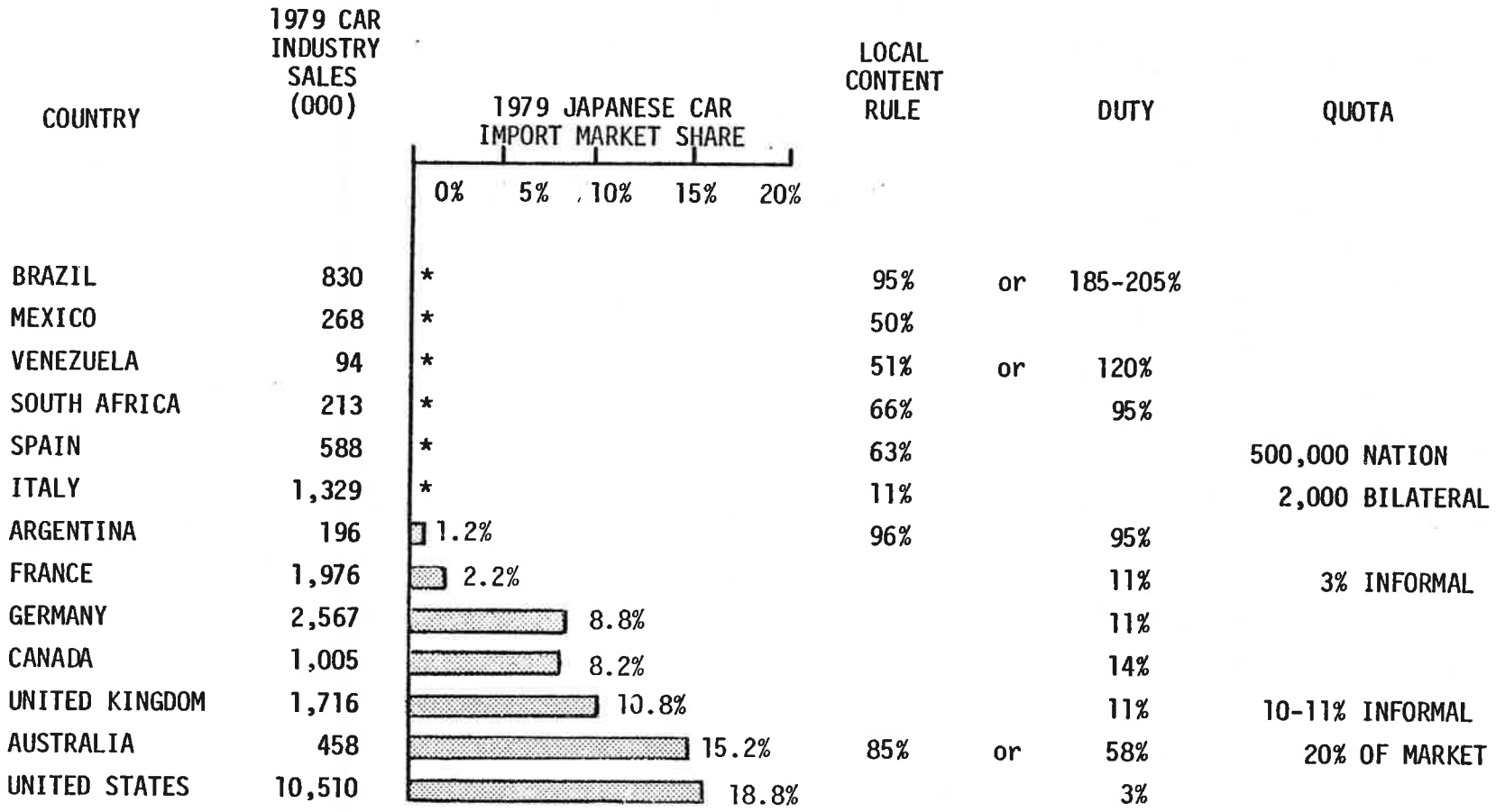
TABLE 2.3-2. JAPANESE AUTO MAKERS BUSINESS PLANS FOR 1980[15]

Maker	Production	Domestic Sales	Exports
Toyota Motor	3,220,000 80,000	1,700,000	1,520,000 8,000
Nissan Motor	2,559,000 186,000	1,325,000	1,234,000 186,000
Toyo Kogyo	1,070,000 80,000	440,000	630,000 80,000
Mitsubishi Motors	1,035,000 65,000	600,000	435,000 65,000
Honda Motor	946,000 4,000	320,000	626,000 4,000
Isuzu Motors	465,000	223,000	252,000
Daihatsu-Motor	412,000	312,000	100,000
Suzuki Motor	380,000	325,000	54,000
Fuji Heavy Industries	372,000 13,000	185,000	187,000 13,000
Hino Motors	74,500	51,500	23,000
Nissan Diesel Motor	41,700	28,000	13,700
Total	10,575,000 428,000	5,510,000	5,065,000 428,000

Note: Upper Figures - assembled cars; lower figures - knocked-down sets. Estimated figures are included in the column for Suzuki.

Source: Japan Economic Journal, Feb. 5, 1980.[15]

the United States automobile industry, such an imbalance in vehicle trade indicates the need for some forceful action to increase U.S. exports or reduce U.S. imports of Japanese automobiles.



*LESS THAN 0.1%

INDUSTRY DATA - STILL BEING VERIFIED

FIGURE 2.3-1. NATIONS WITH MAJOR DOMESTIC AUTO PRODUCTION (EXCLUDING JAPAN)

2.4 GROWING PERCEPTION OF NON-COMPETITIVE PRODUCT QUALITY

The domestic auto industry is making massive capital investments to increase its production capacity for the new, smaller, fuel efficient motor vehicles. Underlying this investment, is the implicit assumption that the newly designed cars will sell and reduce the Japanese import penetration.

During the auto hearings held earlier this year by the Subcommittee on Trade of the House Ways and Means Committee, Mr. F. Secrest, executive vice president of Ford Motor Company, stated:

"Today, in small-sporty and compact market segments, the fuel economy of U.S. cars is already competitive with the Japanese -- we're not competitive in the booming subcompact class, but in a few months Ford will resolve this problem -- rather dramatically -- with our all-new, front-wheel drive Escort and Lynx models,"[16]

The question, however, remains - will Ford and the rest of the U.S. industry solve the problem of Japanese imports? Will U.S. customers switch back to a U.S. auto after owning an imported auto? Will U.S. auto makers be able to overcome the image in the minds of many consumers that U.S. autos are not quality autos?

The people who bought Japanese cars in 1979 or 1980 probably will not be back until 1983 or later to buy another car. There will be a number of buyers in 1981 who were confirmed U.S. large car buyers, but who are now interested in a compact or subcompact vehicle. If U.S. manufacturers have the supply, they may be able to hold many of them.

Today there is a perception that Japanese-manufactured products are of higher quality than otherwise comparable U.S. manufactures.

There used to be an image of Japan as a producer of cheap goods that did not last. In the late 1960s and the 1970s, however, Japanese cameras, sound equipment, and TVs turned that image around. Studies of the takeover by the Japanese in the

U.S. color television receiver (CTR) market conclude that "the most significant factor in the competitive ability of the United States vis-a-vis Japan appears to be the quality and reliability of CTRs produced by both countries."[17] Quality control experts (such as J. M. Juran, author of "Japanese and Western Quality -- A Contrast," 1978) have indicated that even in U.S. plants taken over by the Japanese, such as Motorola (Now Quasar), the defect rate per 100 TV sets fell from 150-180 to 3-4, and even the latter is above the rate in Japan.[17] The Comptroller General's recent study on the major U.S. trade deficit with Japan ($11.8 billion in 1978) concluded: "The record of quality manufacture is disparate in the two economies. The defect ratio in product after product is lower in Japan than in the United States."[17]

A 1979 Rogers survey asked U.S. buyers of new subcompact cars how they choose a new car by having them grade 20 factors on a scale of 1 to 10.[18] "Mileage" scored highest (9.0), "Value for Money" (8.36) second, "Cost of Maintenance" (7.94) third, and "Quality of Workmanship" (7.81) fourth. Three of these top four attributes are quality attributes, suggesting that in the sector most heavily penetrated by imports and most closely representing the central market of the future, quality will be an extremely strong competitive factor.

This survey data on consumer interest in quality has been borne out by the numerous complaints that NHTSA, the industry, and Congress have received on U.S. automobile products.[19]

1979 data shows United States car buyers are happier with foreign car purchases than U.S. purchases in all size classes. (See Table 2.4-1, "Owner Satisfaction".)[18]

1979 data also shows that foreign cars are delivered to the customer in better condition than United States made vehicles. (See Table 2.4-1, "Condition of Car At Delivery".) Even United States manufacturers are publicly praising the comparative quality of foreign makes. Lee Iacocca, President of Chrysler, recently

TABLE 2.4-1. QUALITY COMPARISONS OF FOREIGN AND DOMESTIC AUTOMOBILES - 1979

AUTOMOTIVE CLASS	CONDITION OF CAR* AT DELIVERY (Scale of 1-10, 10 is Excellent)				OWNER SATISFACTION* (Would Buy Again, %)			
	Total Ave.	Domestic Make (Ave.)	Domestic Captive (Ave.)	Imports Ave.	Total Ave.	Domestic Make (Ave.)	Domestic Captive (Ave.)	Import Ave.
Subcompacts - Lt. Wt. - Heavier Wt.	7.15	6.55	7.15	7.94	82.9	76.6 83.0 71.0	83.9 -- --	91.0 -- --
Small Specialties	6.55	6.33	7.02	7.80	79.9	77.6	85.6	92.5
Compacts	6.30	6.20	--	7.65	72.4	72.2(1) 77.4(2)	--	91.4
Mid-Size	6.63	6.51	--	8.05	76.9	75.3	--	94.5
Standard	6.75	6.75	--	--	81.8	81.8	--	--
Luxury	7.21	7.12	--	8.47	87.2	86.6	--	94.6

*SOURCE: Rogers National Research, Buyer Profiles, 1979.[18] (Data aggregated from proprietary data.)

(1) Low price domestic compacts.

(2) High price domestic compacts

noted, "The Japanese have earned their reputation for quality."[20] And GM Vice President Robert Semple notes "You have to be impressed when parts like rubber door seals are in the right place, and the glue is under the rubber where it belongs."[20] Indeed, a poll by Wards Auto World found that almost 50 percent of Detroit engineers feel that the Japanese have the "highest quality."[20] The popular press echoes this sentiment:

- "The Japanese have a hard-to-beat reputation for economy and quality of workmanship."[21]
- "Americans are sold on the idea that foreign cars, principally Japanese makes and Volkswagen, are superior to comparable American models --- if both were priced the same, the Japanese would be able to maintain their market share."[22]

In some important respects, especially crashworthiness, United States motor vehicles still have quality characteristics superior to foreign, and especially Japanese, vehicles. Recent NHTSA crash test results showed that many United States vehicles (i.e., Omni/Horizon, Citation, etc.) did much better in standardized crash tests then foreign made vehicles of similar weight and wheelbase.[23] In areas of importance to the long term quality of the vehicle, such as rust protection, United States vehicles have also had generally better records.

Part of the quality difference may stem from the fact that for many years, small U.S. cars, unlike small Japanese cars, were the bottom of the lines, made to compete with the (then) cheap inports. In addition, the U.S. system of producing to orders, rather than running a long line of identical cars (as the Japanese do for export) made quality control more difficult. Nevertheless, it is clear that improvement is essential.

Improvements in quality must combine design, management concern, labor participation and satisfaction, and investment.

- Design - Functionability and style are seldom at odds in durable goods, and this appears more and more true as

consumers become more sophisticated about the strengths and weaknesses of technology.

- Management - Japan and Sweden have shown how management can use group and/or team incentives to improve the quality of output. Systems that reward only the rate of output ("Never stop the line!") have not fared as well in automobile quality control as systems that emphasize quality of product ("Stop the line wherever there is an important defect").

- Labor Participation and Satisfaction - The quality of one's job is increasingly important to workers with reasonable wages. A better product is easier to identify with, especially if the relationship of one's effort to the improvement in the product's quality is real, evident to all concerned, and rewarded in tangible ways. Pride in workmanship is a real and growing part of the equation in international product competitiveness. Concepts that promote worker participation in product and process, such as Japan's Quality Circles, not only lower labor turnover and absenteeism, but produce better quality products.

As a result of the quality issue, both perceived and real, even if U.S. manufacturers have the capacity by 1985 to meet the U.S. public demand for newly designed fuel efficient autos, there will still be an image problem vis-a-vis the Japanese. The Subcommittee on Trade[24] succinctly summarized the situation:

"The subcommittee hopes that the Nation's autoworkers and manufacturers can redouble their efforts to work together to make a quality product. We suspect that a return of the reputation of American auto quality would do more to reduce the unemployment and profit problems created by imports, than would any action by this subcommittee.

Unless there is a restoration of the reputation for quality, the American industry may be in permanent trouble."

2.5 FALLING PRODUCTIVITY GROWTH RATE RELATIVE TO OTHER AUTO MANUFACTURERS

Apart from product quality, a major factor in establishing the competitiveness of the domestic auto production industry with those of Japan and Western Europe and with the growing Third World auto industries is the relative labor cost of producing a quality product. The comparative unit cost is related to labor productivity, labor compensation and the relative exchange rate between the two competing countries. To illustrate, the Department of Commerce has estimated,[25] assuming equal United States and Japanese labor productivities of 125 hours/compact vehicle, and a Japanese wage rate of $6.85/hr compared to $13.72/hour in the United States (1979), that the Japanese spend $860 less for a vehicle on labor than does the United States. If the value of the yen increases with respect to the dollar, this differential will, of course, decrease, and if the yen falls, it will increase.

In the absence of sound contradictory data, and in the face of massive influx of Japanese imports, this sizeable unit labor cost differential has generated a consensus that U.S. motor vehicle productivity must be drastically improved. While it is generally realized that the production factor costs of the Japanese and the United States differ - the Japanese may spend $300 more on a shipment from their factories to the United States consumer and the United States may spend several hundred more on steel, on transport of components to the assembly place and inventory -- a cost differential of the magnitude of $860 is certainly going to be very important as the United States and Japan compete directly in an increasingly less product differentiated market.

Although it is agreed that high absolute and high relative growth rates relative to our competitors are essential, there is substantial debate as to whether the United States can obtain the requisite productivity growth rates.

2.5.1 Trends in U.S. Productivity

Overall U.S. productivity growth is slowing. From 1948 to 1965, annual U.S. labor productivity grew at an average rate of 2.6 percent. From 1965 to 1973, the annual productivity growth rate was at 2.0 percent. Since 1973, the annual productivity growth rate has been at 0.8 percent.[26]

Reasons for the relatively low U.S. growth (see Table 2.5-1) are not fully understood, but the two most common explanations for higher growth in industrialized countries outside the United States are: (1) their relatively higher rates of investment (and savings): for example, Japan, with an average productivity growth rate at 7.5 percent, more than four times that of the United States, invests twice as much as a percentage of output; and (2) their relatively low levels of capital and productivity at the end of World War II: for example, Japan's Gross Domestic Product per employee was only 18 percent of U.S. GNP per employee. Studies have reached somewhat different conclusions about the relative importance of general factors influencing overall U.S. productivity (see Table 2.5-2).

In a 1979 study by E. Dennison, Accounting for Slower Economic Growth,[27,28] two dozen causes of a decline in U.S. productivity were examined (including government imposed paperwork, environmental regulation, fall off in R&D, effect of high tax rates on incentives to save and invest, effects of inflation, and age-sex composition and education of labor, etc.) but together they are not able to explain the total drop. Furthermore, no one factor was singled out as being of overwhelming importance.

Twenty-five years ago U.S. automotive factories put out five times the vehicles per employee as the Japanese. In March 1980 the U.S. Department of Commerce testified[25] "productivity (labor) in the United States and Japanese auto industries may be roughly equal." The testimony also noted that "By some accounts the U.S. auto industry is behind Japanese competition in manufacturing technology, particularly in vehicle assembly."

TABLE 2.5-1. PRODUCTIVITY AND CAPITAL INVESTMENT

	Productivity Growth (ave. annual % change)		Capital Investment as Percent of Output (all industries) 1960-1976 average)	Real GDP Civilian 1977 Index U.S. = 100
	Manufacturing 1960-76	All Industries 1960-76		
United States	2.8	1.7	14.8	100
United Kingdom	2.9	2.2	17.0	---
Canada	4.0	2.1	19.7	92
Germany	5.4	4.2	19.6	85
France	5.5	4.3	19.3	92
Italy	5.9	4.9	16.3	63
Japan	8.2	7.5	28.3	69

Source: Reference 26, Tables 2 and 3

TABLE 2.5-2. RELATIVE IMPORTANCE OF GENERAL FACTORS INFLUENCING U.S. PRODUCTIVITY

Study	% INFLUENCE ESTIMATED		
	Technology & "Other"	Labor Quality	Capital
1. Accounting for United States Economic Growth, Edward F. Dennison, 1929-1969	62%	18%	20%
2. Postwar Productivity Trends In U.S., John W. Kendrick	72%	10%	18%
3. An International Comparison of Growth In Productivity, 1947-1973, L. Christensen, D. Cummings, D.W. Jorgenson	44%	14%	42%

Source: Reference 27, pp. 62-63.

2.5.2 Trends in U.S. Motor Vehicle Industry Productivity

There is general agreement that the current high levels of investment in domestic motor vehicle plant and equipment will greatly enhance the productivity of the domestic auto industry. However, Japanese motor vehicle production capability will also continue to grow and our productivity relative to the Japanese and growing Third World Motor Vehicle assembly facilities is not clear, being highly dependent on sales as well as the efficiency of the plants.

2.6 ENERGY TRENDS AND EVENTS

Energy analysis is complicated because there are many variables to be considered (climate, wealth, technology, culture, and economic structure are a few). This is especially true of international comparisons. Thus, economic analyses that compare the impact of price on energy use in different nations have stirred controversy and differed significantly in their precise numerical results (i.e., energy demand elasticities)[29]. Nevertheless, the intuitive and statistical evidence for a high positive correlation between energy price and the efficiency with which energy is used is overwhelmingly obvious. In those countries where energy is relatively very expensive, there is substantially less energy consumed per unit of typical output than in countries were energy is relatively very inexpensive.

The residential and automotive sectors are two areas where the basic link between energy prices and energy usage are quite apparent through international comparisons. Figure 2.6-1 shows the real price index for energy (all prices in constant dollar terms and relative to a price of 1.0 in the United States in 1970). The energy prices vary considerably, with energy prices in West Germany (the highest) about three times as high as in Canada (the lowest). Figure 2.6-2 shows per capita energy consumption in the residential sectors for each of the five countries. Canada has higher energy use than the Netherlands, W. Germany, and France but not as high as the United States where energy prices are not as high. (Per capita income variations also determine demand levels).[29,30]

The automobile example has recently been investigated under a DOT contract with MIT.[31] Janet Lee McCleary-Jones found in her study, "Factors Affecting Fuel Economy of Western European and Japanese Automobiles" (June, 1980) that "economic factors such as taxes, income, and wealth are important predictors of recent automotive fuel economy performance in major developed countries. Higher and progressive taxes, lower incomes, and higher fuel prices have caused the Europeans and Japanese to

produce and buy smaller, more fuel economical cars than in the U.S."[32] She found that "gasoline price divided by per capita gross domestic product" explained a large measure of the observed variance of the national average fuel economy of vehicles purchased in the nations during 1978 (NAFE) (R^2 = 0.54). And, as Table 2.6-1 below suggests, there is a positive correlation between gasoline prices and NAFE.

TABLE 2.6-1. GASOLINE PRICE & NATIONAL AVERAGE FUEL ECONOMY

COUNTRY	NAFE, 1978	REGULAR GRADE GASOLINE PRICES ($)		
		1970	1974	1978
U.S.	19.6	.36	.56	.67
W. Germany	24.6	.58	1.27	1.70
Sweden	24.7	.62	1.14	1.62
U.K.	24.7	.62	1.14	1.62
France	28.1	.72	1.25	2.15
Italy	28.9	.79	1.44	2.00

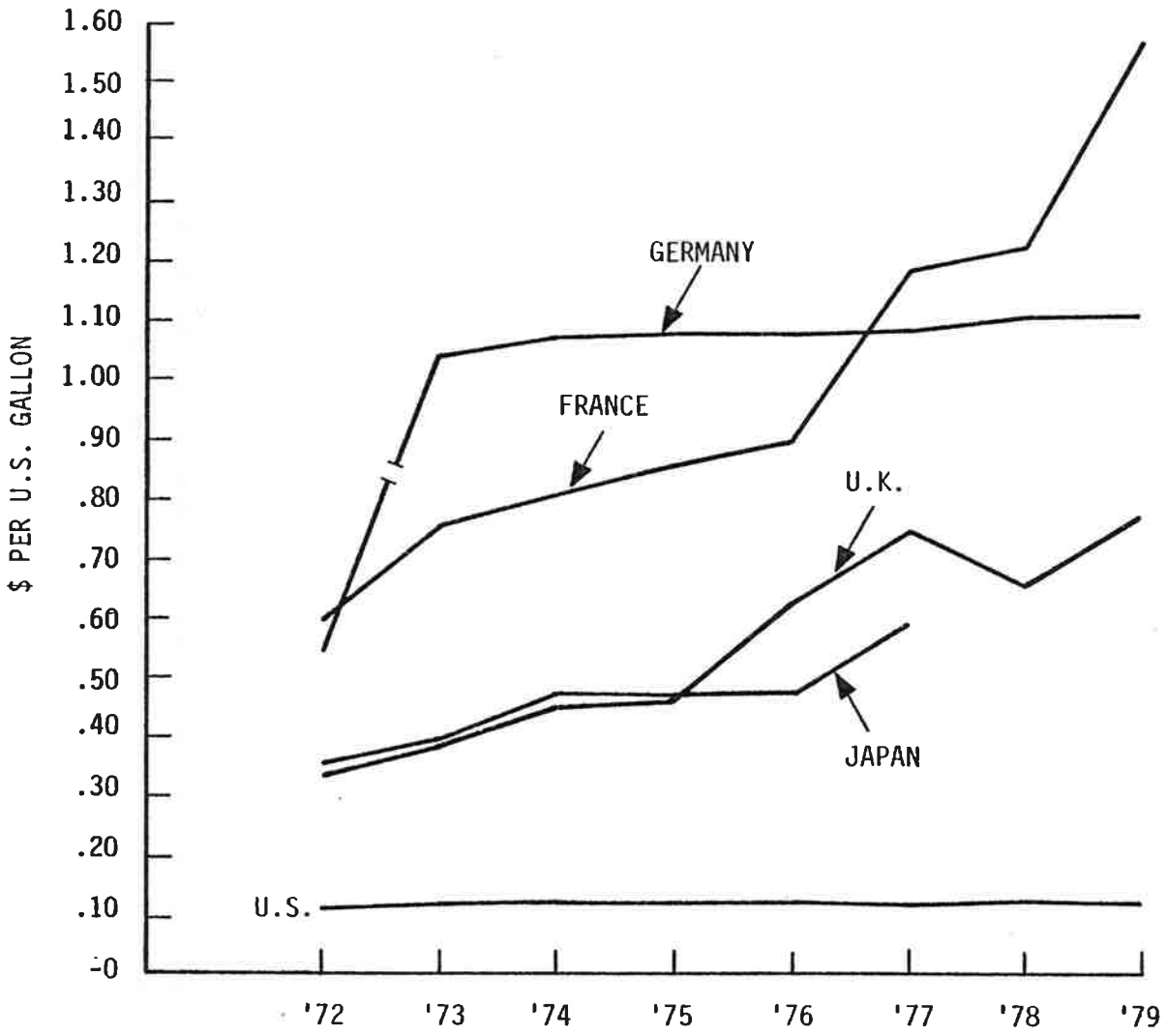
Source: Reference 32.

2.6.1 Recent Domestic Energy Situation and Its Relationship to Vehicle Demand Patterns

The international energy picture is not only a product of "natural" supply and demand forces. Other major industrialized countries have chosen explicit policies of higher gasoline taxation. (See Figure 2.6-3.) These policies communicate significant information to the energy and related vehicle markets which have importance for the nature of vehicle demand and production in each country.

For example, the European nations and Japan communicated market signals that gasoline was an expensive commodity, while the market communications in the United States signalled significantly cheaper gasoline. In combination with other forces, such as demographics and terrain, this can be thought of as a powerful instigator of the vehicle mix in each country.

The pricing power in relation to energy demand and vehicle demand arises primarily from the magnitude of energy consumption as an economic factor in our economy. Over the long term, the



Source: Reference 33

FIGURE 2.6-3. GASOLINE TAXES PER GALLON IN MAJOR AUTO PRODUCING COUNTRIES

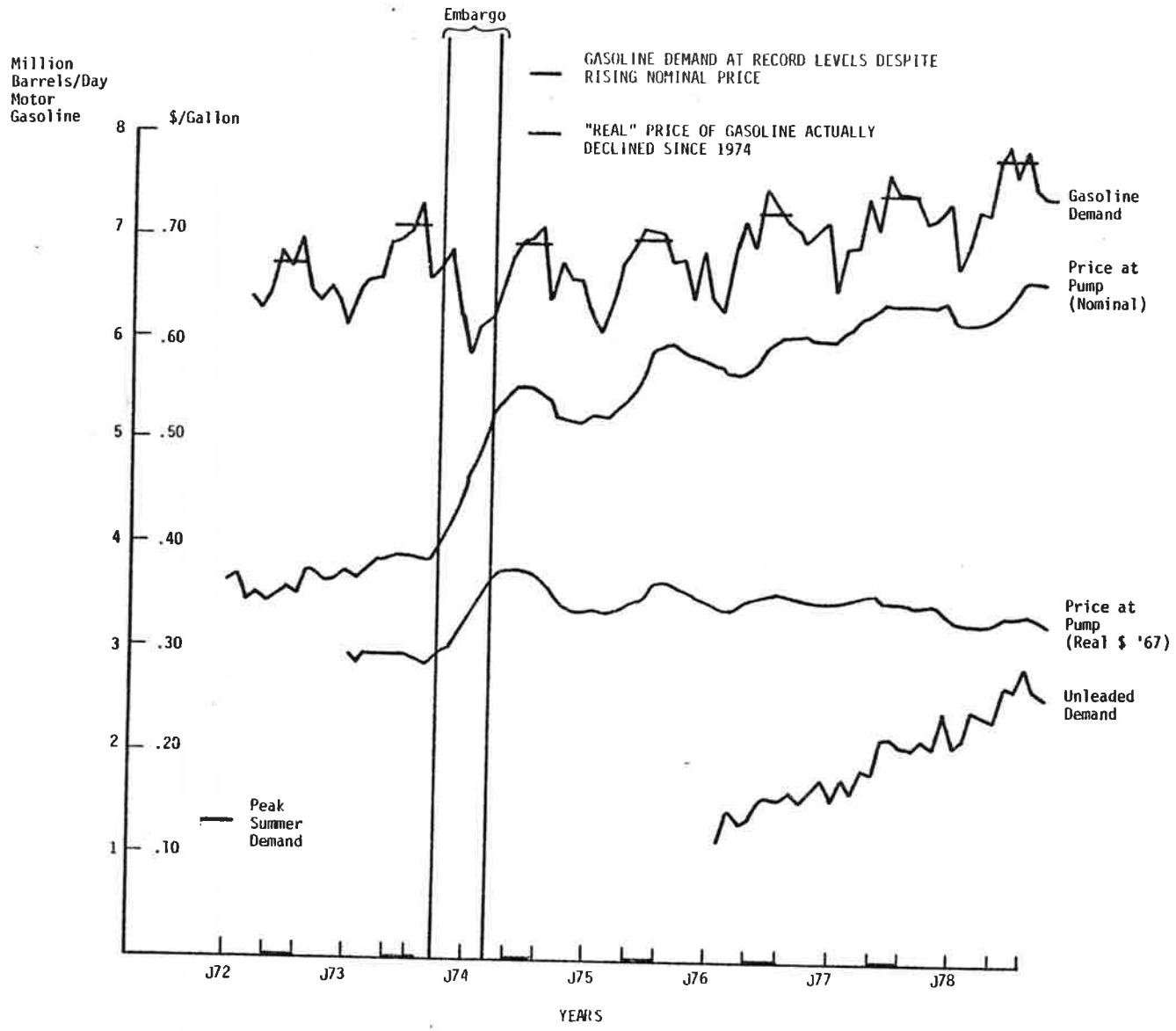
United States has tended to consume about 100 billion gallons of gasoline a year. Small percentage changes in gasoline price can, therefore, be seen to be a significant economic force. Cheaper gasoline can signal greater consumption and vehicle purchasing behavior in line with the cost of gasoline compared to other economic commodities. More expensive gasoline is a powerful stimulant to different behavior.

Such long term energy costs helped induce the market and production systems into making smaller vehicles in other nations and the larger vehicles in the United States. The recent radical change in energy economics in the United States is a principle reason our market has suddenly been exposed to the traditionally smaller cars from around the world.

Price is not the only significant force relating energy to vehicle demand. Supply limitations, whether actual or widely perceived, have produced great shifts in vehicle demand patterns over the past decade. Some data suggest that supply interruptions may have even greater power than pricing in short term demand changes. The evidence is inconclusive on the issues of supply versus price, but historical demand behavior surely suggests the power of both.

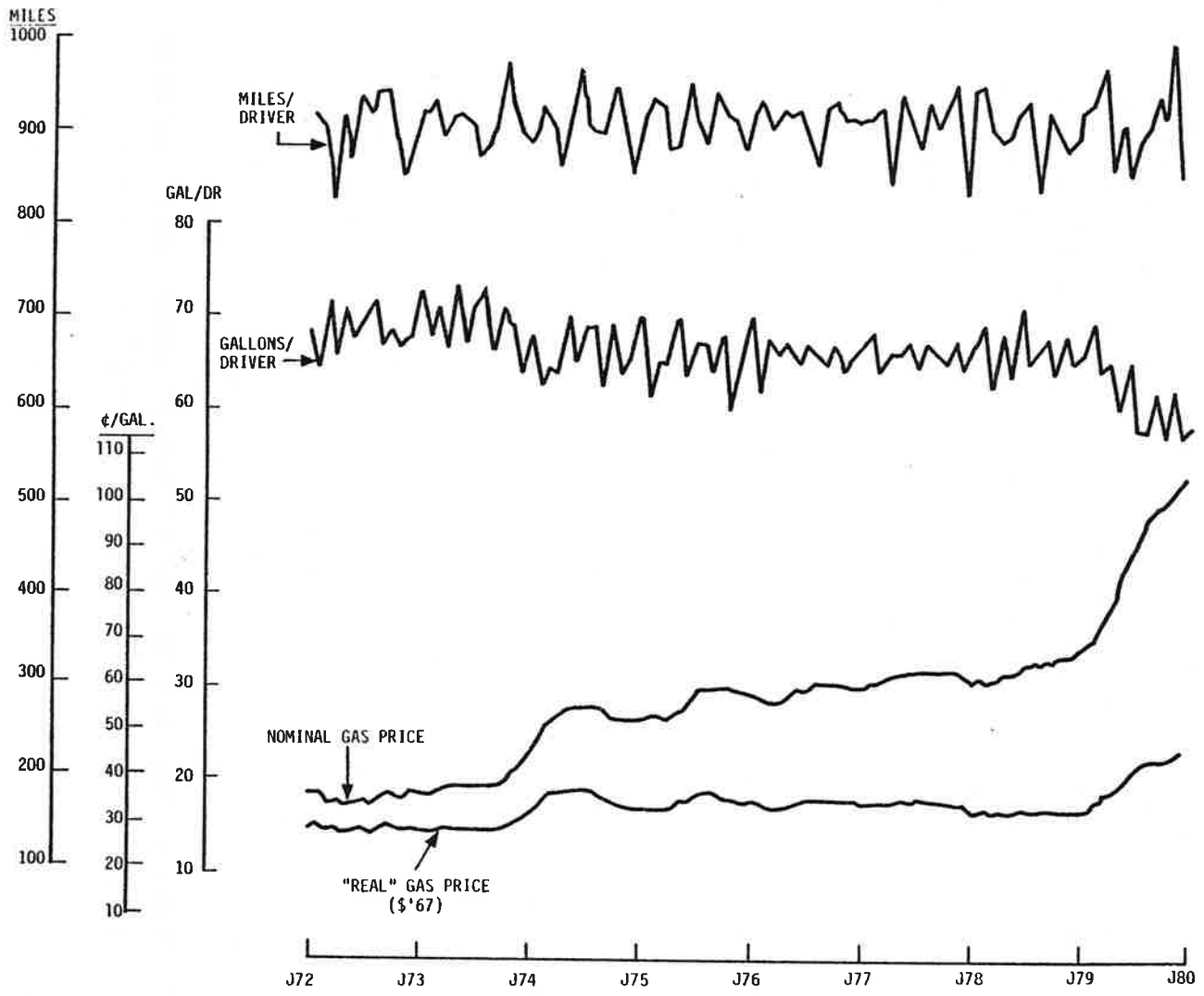
2.6.2 Chronology of Energy and Vehicle Demand Changes in the United States

Just before the energy events of 1973-74, gasoline consumption in the United States was on a long term growth trend. Peak gasoline consumption occurred in the summer driving period of 1973, along with the peak in vehicle demand to that point in history. For several years, predictions of pending energy shortages seemed to have little influence on energy consumption and vehicle demand. During the peak driving season in summer 1973, gasoline consumption reached approximately 7 million barrels per day - up from about 6.6 million barrels per day (MBD) the previous year - despite a slight rise in gasoline price to about $.38 per gallon in 1973. (See Figures 2.6-4. and 2.6-5.)



Source: Department of Energy and American Petroleum Institute

FIGURE 2.6-4. COMPARISON OF GASOLINE PRICE AND CONSUMER DEMAND



Source: Department of Energy and American Petroleum Institute

FIGURE 2.6-5. MONTHLY LONG TERM ENERGY/AUTO DATA

The energy/petroleum problems actually started in the winter of 1972-73. During that period, regional heating oil problems appeared which required reallocation of refinery capacity. By the Spring of 1973, gas station limitations had already begun. Several companies announced supply cutbacks and localized station closings had begun. Publicity was fairly widespread on the gasoline problem by summer. Although these changes did induce some travel changes, it appeared most Americans adapted well to the situation. By the end of the summer, however, conditions intensified. OPEC began taking serious action on price increases, and by the Fall of 1973, the embargo of oil to the United States began. This marked a drastic turning point in vehicle demand and consumption patterns. Within several months, larger car demand shifted from about 65 percent of the market to about 45 percent. Small car demand shifted correspondingly upward.

This demand shift left the domestic auto makers in a difficult situation, as they had just completed a model year introduction which was based on a different mix. The output of small cars had been increased in the Fall of 1973, but not nearly enough to anticipate the sudden shock of the mix shift. In response to this shift, the auto makers performed a rapid "second model year changeover" during the winter months. Larger car plants were shut down in the middle of the model year and converted to produce a greater proportion of smaller cars.

It is very important to note that the production shift to smaller size classes was much easier in that period than in 1979, primarily because of the engine and driveline commonality between the size classes of cars. The model shift could be largely accomplished by sheet metal alterations, while, at present, the conversion is from rear drive cars to totally different front drive vehicles with no powertrain commonality. The small cars of 1973 were also not as small as the small cars of today.

The production switch allowed the car makers to come on market in late winter 1974 with a product mix more closely aligned to market demand, although the problem of discounting the

previously produced large cars still existed. Large cars were being discounted heavily, while some price increases were allowed by the market on the highly demanded smaller cars.

However, by the summer of 1974, conditions changed rapidly again. Once the embargo came off in late winter and oil supplies returned, gasoline consumption, which had fallen in step with supply, began to increase once again. By summer 1974, consumption had rebounded from approximately 5.8 MBD during the embargo to about 6.5 MBD after supplies returned. This was lower than the peak consumption of 1973, but was about on a par with the summer consumption of 1972.

Changes in gasoline price paralleled changes in supply and consumption. While nominal prices had rapidly escalated from about $.38 per gallon in mid 1973 to almost $.55 by the spring of 1974, they dropped to less than $.50 during the later portion of 1974.

In line with these conditions, car demand patterns also shifted quite quickly into reverse. The small car market share fell from about 55 percent to 45 percent during 1974, while larger cars shifted from about 45 percent to about 55 percent.

This confronted the car makers with a double problem. They were now, for the second time in one year, faced with an inappropriate car mix, and they were in the midst of the most severe recession in recent history. Small cars began to pile up in inventory where large cars had gathered less than one year earlier. Supplies of larger cars were inadequate until general recession conditions pushed car demand very low. By the beginning of 1975, the disparity in mix and demand forced the manufacturers to clean inventories of small cars by placing rebates and discounts on them, similar to the ones which had been previously placed on larger cars. Rebates of $200-$500 were offered at that time on cars like the Vega and Monza subcompacts. This reversal of energy and vehicle demand conditions started a growing trend from late 1974 right up to the recent mix shift at the beginning of 1979.

During this period, even though nominal gasoline prices increased gradully from about $.50 per gallon to about $.65 per gallon in late 1978, the real price of gasoline, compared to general inflation, actually stabilized and declined. Measured against general levels of inflation (CPI), gasoline prices declined about 8 percent in real terms over the period. This meant that in the large compendium of consumer costs, gasoline was certainly no more expensive, and might have been felt to be somewhat of a bargain. Such possibilities were certainly reflected in the consumer demand patterns for vehicles, which returned to pre-1973 patterns.

While full size cars never fully regained their market share during the 1974-78 period, great numbers of consumers switched from the large car market to the even larger light truck vehicles. This prompted a powerful growth market in light trucks for personal use. Prior to the 1973 energy shock, full size cars were about 30 percent of the market. After the 1973 shock, they rebounded from lower levels, but never returned to the 30 percent level. However, the light truck share of the total vehicle market grew from about 15 percent to about 25 percent as consumers shifted into this growing segment.

Light trucks had even lower fuel economy than the larger cars, which seemed no deterrent to the consumer in the face of the above-mentioned cheaper real gasoline prices. In addition, light trucks, because they were not subject to the 1975 pollution controls on cars, were faster, more driveable, and could use regular gasoline instead of the unleaded fuel required in catalyzed cars.

Such strong demand growth at the large vehicle end of the market corresponded with consumer's willingness to pay higher prices for these vehicles, and to load these vehicles with comfort and convenience options. The effect of this was to produce larger variable profit margins (price minus direct labor and material) on these vehicles, so the manufacturers geared production during these years towards the most profitable segments. While variable

margins on the small cars were estimated to range only up to $1000 per vehicle, margins on the larger cars and light trucks were estimated to be often double this or more.

This "up-size" concentration was not only limited to the domestic vehicle manufacturers. While imported vehicles were generally more fuel efficient, import makers took advantage of this period to introduce larger numbers of the comparatively larger cars in their mix, again with full complements of luxury options. Volumes on cars like the Datsun 240-Z and the Toyota Celica, which got substantially lower fuel economy than other imported cars, began to grow in line with gasoline price stability and changing consumer demand. By 1979, even less efficient more luxurious versions of these vehicles with high profit margins and prices were important portions of the imported car fleets.

A substantial amount of small car demand still existed in the 1974-78 period, as marked by a generally higher import share than the last decade, and by a domestic small car share of about 5 percent to 10 percent greater than the pre-1973 mix. However, the volume of demand and the generally lower margins in these segments did not justify significant immediate investment in assets to produce for these demand volumes. This did not mean that all attention was focussed away from the small car end of the market. Decisions made during the 1973 period were implemented at several stages up through 1979, and products currently being introduced were in the design stages during the middle part of the decade. These product actions were in response to both the shock experienced in 1973 and to the new government fuel economy standards legislated in the middle of the decade.

GM made plans in the early seventies to produce the Chevette in the United States starting in 1975. Lead times for this introduction were estimated to be three years. In addition, the X-body front drive project, introduced in 1979, was under design in the 1974-75 period. GM downsized the B-body large cars in late 1976 and the A-body intermediates about one year later.

Ford completed design work on the "Fox" platform, now carry-

ing the Mustang, Capri, Fairmont, Zephyr, Thunderbird, and Cougar nameplates in the 1975-76 period, and introduced these new lighter cars in the 1978-79 period. The downsized Ford, Mercury, and Lincoln lines were also being designed during this period for launch in the 1979-80 model years.

Chrysler designed the small front drive Omni and Horizon models before 1975 for introduction in early 1978, and the about-to-be-introduced K-cars were in design stages for the past four years.

These smaller car products were being designed at a time of cheaper gasoline and high demand for large, V-8 powered vehicles, so the basic product concept was, at that time, a gradual transition to 1980-85 fuel economy levels, in line with consumer demand trends apparent then. Such plans were severely crippled by the unprecedented energy shock of 1979.

At the end of 1978, larger cars were running at full capacity in the plants, and fuel consumptive options were in high demand. Four cylinder penetrations had increased, but the bulk of demand was for V-8 powered vehicles. Import shares were relatively low compared to some earlier periods, and the import fleets contained large numbers of cars with relatively low fuel economy. For example, during the later part of 1978, almost half of Toyota's imports were of the larger Celica, Cressida, Corona models, which got approximately 19 to 23 mpg (EPA city) compared to the Corolla models which got 26-28 mpg.

Imports had more than 120 days' supply of inventory sitting unsold, compared to the estimated 40 to 50 day's supplies which were to follow a few months later after the mix shift, and the historic 50-80 days' in previous years. Some importers had in excess of 180 days' supply at that time. In contrast, domestic makers selling larger cars had inventories of only 40 to 60 days' supply, with the exception of Chrysler, which had been losing share on some models.

Vehicle demand paralled general energy consumption patterns.

By the middle of 1978, gasoline consumption had reached a new record level of approximately 7.5 MBD. Consumers appeared to be reflecting cheaper energy price and ample supply conditions in vehicle purchasing and driving habits.

It was in this context that carmakers were contesting the "front loaded" CAFE schedule, which, at that time, appeared to be in excess of consumer demand. Three months later, the situation was totally reversed. OPEC price increases and other influences caused gasoline prices to rise from about $.65 per gallon at the end of 1978 to more than $1.00 per gallon in many areas five months later. In addition, the Iranian situation and other conditions caused highly publicized regional gas lines and supply difficulties once again.

These conditions prompted an even more radical shift in vehicle mix demand than that produced in 1973, and the carmakers' trend line projection of product changes were totally outdated within several months. The light truck market, previously so strong, dropped from an annualized rate of about 2.5 million vehicles in late 1978 to about 1.6 million vehicles in mid 1979. Import inventory surplusses were cleaned out within three months, and long lines of orders piled up at dealers.

Price conditions on small and large cars reversed dramatically, with many consumers suddenly willing to pay price premiums on the most desired small cars. Margins on larger cars dropped precipitously as the makers had to discount heavily to clean inventories built up during the spring of 1979.

It is clear from the volatile energy-related demand shifts in the 1970's that the vehicle market is quite readily influenced by supply and price conditions in the gasoline market. It is also reasonable to expect that this set of factors will remain a strong influence on demand during the transition phase in the vehicle markets over the next several years. While other product attributes remain significant demand influences, they will have to be planned in the overall energy context. It is also clear

that government policies, even those indirectly influencing energy, will have effects upon vehicle demand. This includes not only domestic markets, but the world markets which will be increasingly supporting "world car" developments during the decade.

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3. ON GOING TRANSITION - 1980 to 1985

3.1 INTRODUCTION

In 1979, the domestic auto-industry had a production capacity for 15 million conventional rear-wheel drive passenger cars and light trucks primarily powered by eight-cylinder engines. In response to uncertainty about fuel availability and price, the demand for conventional rear-wheel drive passenger cars is fast drying-up, and by the mid-1980's may be nearly non-existent. By 1985, if they are to retain their current share of the domestic market, the domestic auto producers will have to almost completely restructure their auto facilities to the production of smaller fuel efficient vehicles with front-wheel drive transmissions and smaller six- and four-cylinder engines. Many of their existing facilities for the production of rear-wheel drive transmissions and eight-cylinder engines will be rendered obsolete and written off far before their anticipated lifetimes. The domestic auto industry has been caught in a major shift in market demand from large cars to small cars for which it was inadequately prepared.

The purpose of this chapter is to briefly describe the technical differences between the 1980 and 1985 auto fleets, and indicate the magnitude of the required capital expenditures and the projected effects of the changeover on the domestic industry.

3.2 COMPARISON OF 1978/1979 AND PROJECTED MID-1980's DOMESTIC MOTOR VEHICLES

The basic changes in vehicle components and vehicle package between the 1979/1980 and the projected mid 1980's domestic motor vehicle are shown in Figures 3.2-1 and 3.2-2.

- The standard domestic motor vehicle of the mid-1980's will be powered by a six-cylinder engine, or more likely a four-cylinder engine, rather than an eight-cylinder. The eight-cylinder engine will essentially disappear.

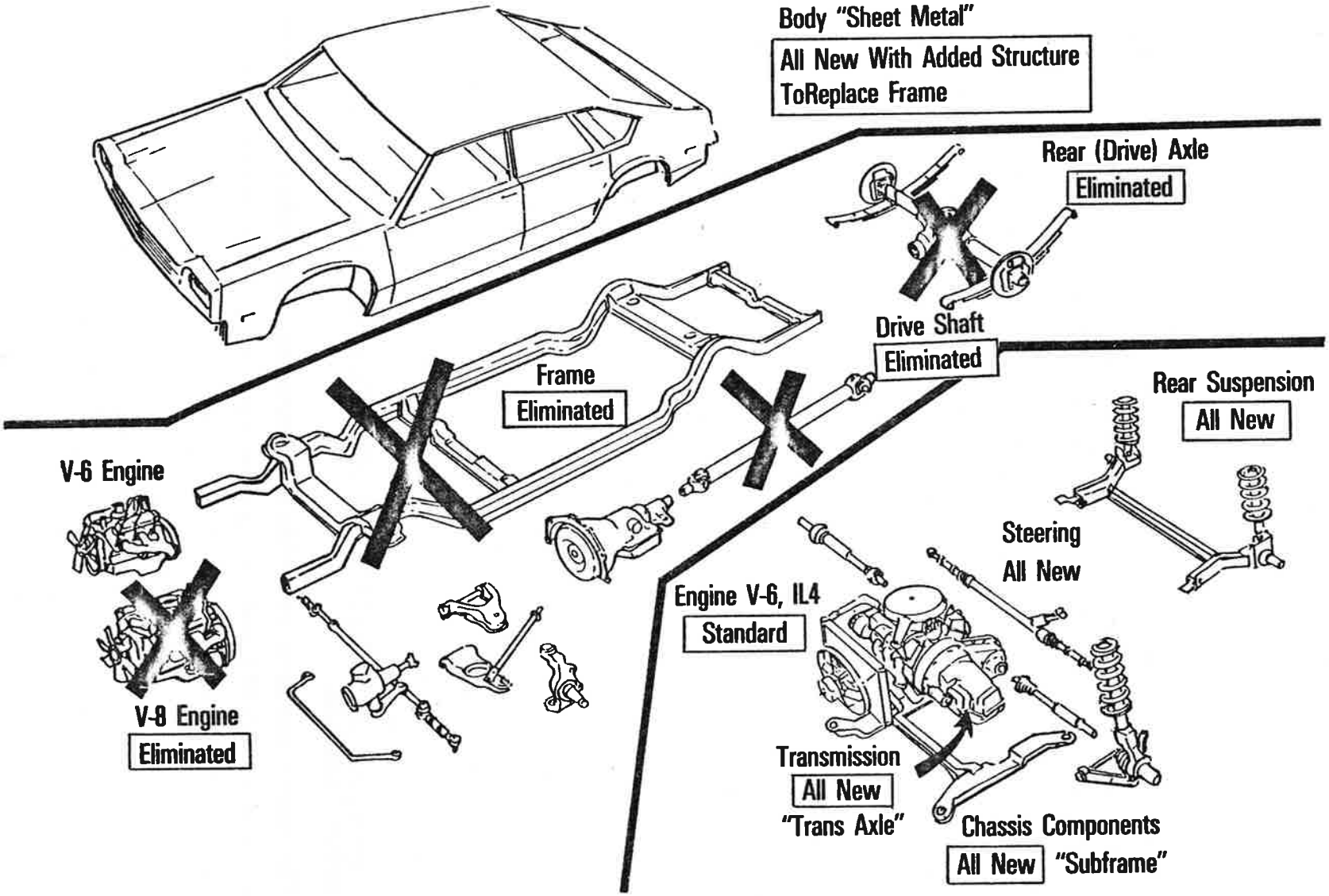

FIGURE 3.2-1. THE ONGOING TRANSITION, CHANGES TO THE VEHICLE PACKAGE

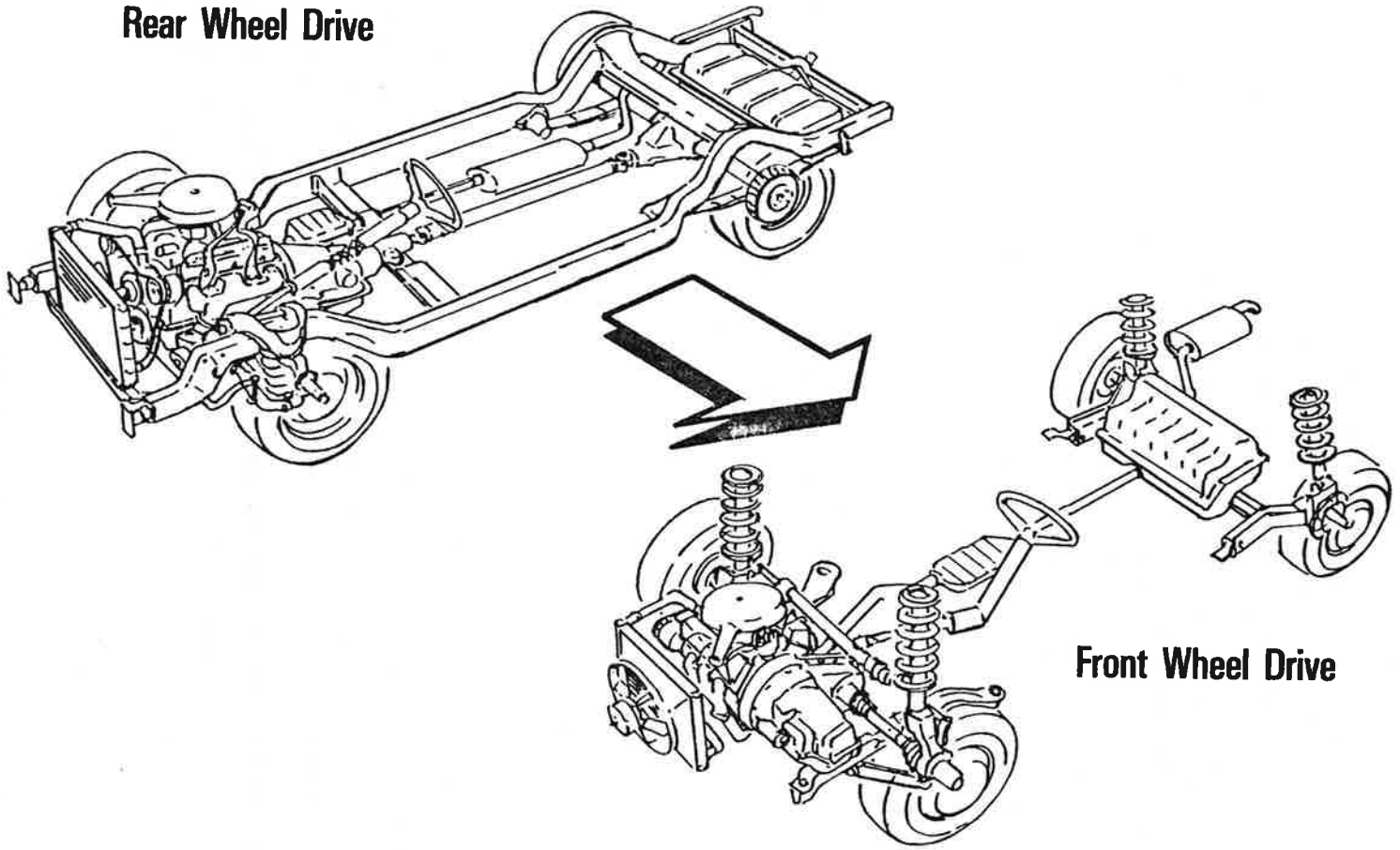

FIGURE 3.2-2. THE ONGOING TRANSITION, COMPONENT CHANGE

- The rear wheel drive shaft, drive axle, and transmission will be replaced by an all new transaxle.

- The conventional frame will be eliminated and be replaced by an all new sub-frame. The vehicle will have all new front suspension and steering components.

- The standard vehicle will have radial tires rather than bias ply tires.

- The vehicle will contain less cast iron and carbon sheet steel and more light weight low alloy steels, aluminum and plastics than the conventional motor vehicle of the late 1970's.

- There will be increasing use of on-board micro-processors, and sophisticated engine air and fuel control systems to minimize fuel consumption.

The implications of these projected changes on the nature and structure of the domestic auto industry and its related supplier industries will be profound. Further, the domestic auto industry will be trying to raise the resources to pay for this transistion in the face of strong competition from the Japanese motor vehicle industry.

3.3 CAPITAL REQUIREMENTS FOR THE DOMESTIC AUTO INDUSTRY

In 1978/1979, the North American motor vehicle industry, as indicated previously, had domestic production capacity for 15 to 16 million conventional rear-wheel drive passenger cars and light trucks.

In order to estimate the required transition program expenditures, it is assumed that by 1985 the domestic auto industry will require a production capacity for about 12 million front wheel drive passenger cars and mini-trucks and vans. It is assumed that the additional potential demand of 4 million vehicles, assuming a total market of 16 million passenger car and light truck motor vehicles, will be filled by imports and conventional rear-wheel drive light trucks, vans and large cars.

A comparison of the extant 1979/1980 facilities and the projected 1989/1986 forward wheel drive and conventional motor vehicle facilities is shown in Table 3.3-1.

- The 1979 domestic engine capacity was about 16 million units or 40 'equivalent' lines* each having an annual capacity of 400,000 units/year. Out of the 40 'equivalent' lines, 28 lines were for the production of 8 cylinder engines. By 1985/1986 it is projected that there will only be four lines producing 8 cylinder engines compared to the 28 lines at present; however, there will be 30 lines producing 4 cylinder engines compared to the 4 lines which were producing these engines in 1979. The capital cost of a 4 cylinder line ($1979) is $220M/line; the total cost of the 26 new 4 cylinder lines will be $5.7B (26 lines at $220M/line). The total projected cost for engine changes is $6.7 Billion.

- The domestic 1979 transmission capacity is about 15 million units/year or 25 equivalent lines each having a capacity of 600,000 units/year. By the mid-1980's, 19 new transaxle lines will be required at a unit cost/line of $350 million or a total cost for new transaxle production facilities of $6.7 Billion.

- In 1979 the total assembly plant capacity was about 16 million motor vehicles/year (for purpose of discussion, 80 'equivalent' assembly lines at 200,000 units/line/year). In 1979, 75 equivalent lines produced rear-wheel drive platforms and only 5 produced front-wheel drive platforms. By 1985, there will be a need for 65 'equivalent' front-wheel drive assembly lines (at $200M/line), at a total cost of $13 Billion.

- Finally, 12 new component and stamping complexes are required, each having a capacity of about 1 million car sets/year. The total cost of the 12 new stamping complexes at $275M/complex is $3.3 Billion and the cost of the 12 new component complexes at $750M/complex is $9 Billion.

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*Equivalent line -- a line with a capacity equal to minimum economic scale for that type of production facility.

TABLE 3.3-1. MAJOR NEW CAPITAL EXPENDITURES ARE NEEDED THROUGH 1985

COMPARISON OF EXTANT 1979/80 FACILITIES AND PROJECTED 1985/86 FACILITIES FOR FWD VEHICLES

Production Facility	1979/80	1985/86	Number of New Lines	Cost/Line	Total Cost*
Engine Lines (400,000 units/year)					
4-cylinder	4	30	26	$220M/Line	$ 5.7B
6-cylinder (L-6)	6	-	-	-	-
6-cylinder (V-6)	2	6	4	$260M/Line	$ 1.0B
8-cylinder (V-8)	28	4	-		
Total	40	40	30		$ 6.7B
Transmission Lines (600,000 units/year)	1979/80	1985/86			
Rear-Wheel (3 speed)	22	-	-		
Rear-Wheel (4 speed)	2	5	-		
Front-Wheel	1	20	19	$350M/Line	
Total	25	25	19		$ 6.7B
Platform Assembly Lines** (200,000 car sets/year)	1979/80	1985/86			
Assembly (Rear-Wheel)	75	10	-		
Assembly (Front-Wheel)	5	70	65	$200M/Line	$13.0B
Component Complex (1,000,000 car sets/year)					
Stamping			12	$275M/Complex	$ 3.3B
Components			12	$750M/Complex	$ 9.0B
					$38.7B
To this must be added 30% for R&D, engineering, preproduction, and launch costs.					x 1.30
					$50.3B

**Includes stamping, dies, and tooling.

* 79$

An approximate total capital cost for changeover is nearly $40B, to which must be added the $12B costs for research and development, preproduction, and launch. These project-related costs have been assumed, on the basis of historical data, to be about 30 percent of the total capital costs.

The total program costs for the 1979/1985 transition of the domestic auto industry manufacturing facilities from the production of rear-wheel drive vehicles to the production of front-wheel drive vehicles is thus about $50B.

This projected costs is, of course, only a projection, but the cost will stretch considerably the financial resources of the domestic auto industry.

4. POST-1985 TRANSITION

4.1 INTRODUCTION

The nature of the post-1985 motor vehicle fleet will, in large part, be determined by the future rate of change of petroleum availability and price. If the availability and price of petroleum change at a moderate but continuous rate, and there is no major intervention in the marketplace by government actions or other causal effects, a projection of new passenger car fleet fuel economy of 30 to 35 miles per gallon by the early 1990's would appear reasonable. On the other hand, a projected new passenger car fleet fuel economy of 40 to 50 miles per gallon, brought about by government actions and/or market response to more rapid or discontinuous changes in the availability and price of petroleum, is also a realistic possibility that must be considered. The purpose of this chapter is to anticipate the probable technologies and effects on the future auto industry resulting from these scenarios.

4.2 POST-1985 MOTOR VEHICLE TECHNOLOGY

There is general agreement that a new passenger car fleet average fuel economy of 40 to 50 miles per gallon by the early 1990's is technically feasible. Passenger cars having a fuel economy greater than 40 miles per gallon are currently being sold commercially. The major debate on the future 40 to 50 miles per gallon car pertains to its functional utility and marketability, and the economics of its production, not to its technical practicability. For example, what reduction in level of acceleration degradation or change in vehicle utility, if any, are required to achieve another significant increase or even doubling of the post-1985 fuel economy?; what will it cost to produce?; and how will it be paid for? Within the present state of knowledge, the answer to these questions are not clear; however, it is possible to project technology trends for the alternative fuel price and availability scenarios. It is also possible that these more rapid transition rates may be in the best interest of the auto industry and the nation.

Questions are being addressed relative to the environmental impact of increased penetration of diesel engines into the fleet to achieve greater fuel economy. The National Research Council of the National Academy of Science has formed a Committee on Motor Vehicle Emissions (Diesel Impact Study Committee) to assess the impacts of this issue.

In addition, diesel related health effect research programs are being sponsored by the Department of Energy and the Environmental Protection Agency.

4.2.1 Moderate Transition by Approximately 1990 (30 to 35 MPG)

In the moderate transition case, the passenger car fleet of the early 1990's is projected to have a fuel economy of 30 to 35 miles per gallon. (It should be noted that General Motors in a press release of June 9, 1980, announced a fuel economy potential of 31 miles per gallon in 1985.) The transition of the passenger

car fleet to one having all front-wheel drive platforms, 4 cylinder engines, and transaxles will be complete. The predominant power plant will still be the internal combustion engine utilizing gasoline or diesel fuel. The vehicle mix, in terms of 4, 5 and 6 passenger cars, will not be too different than that predicted by the manufacturers for 1985. The projected fleet average increase of about 1/2 to 1 mile/gal/year - required to meet the early 1990's possibilities of 30 to 35 miles per gallon - will be obtained primarily through advances in power plant and light-weight structure technology rather than sacrifices in vehicle performance or vehicle utility.

4.2.2 Rapid Transition (40 to 50 MPG or Higher by the Early 1990's)

In the rapid transition case, the passenger car fleet of the early 1990's is projected to have a fuel economy of 40 to 50 miles per gallon or higher. The projected fleet in terms of passenger capacity and acceleration performance will be quite different from that projected for 1985. There will be increased penetration of two and four passenger cars compared to the mix projected for the moderate transition scenario. In order to obtain the projected annual fuel economy increase of 2 to 3 miles/gal/year, there will be some vehicle acceleration performance degradation, increased penetration of three and even two cylinder internal combustion engines and electric power plants - if the appropriate energy storage technology becomes available - major material substitution of high strength low alloy steel and plastics for sheet steel, and light-weight cast aluminum for cast iron.

The two scenarios, as will be discussed in the following section, have significantly different implications for the future of the domestic auto industry.

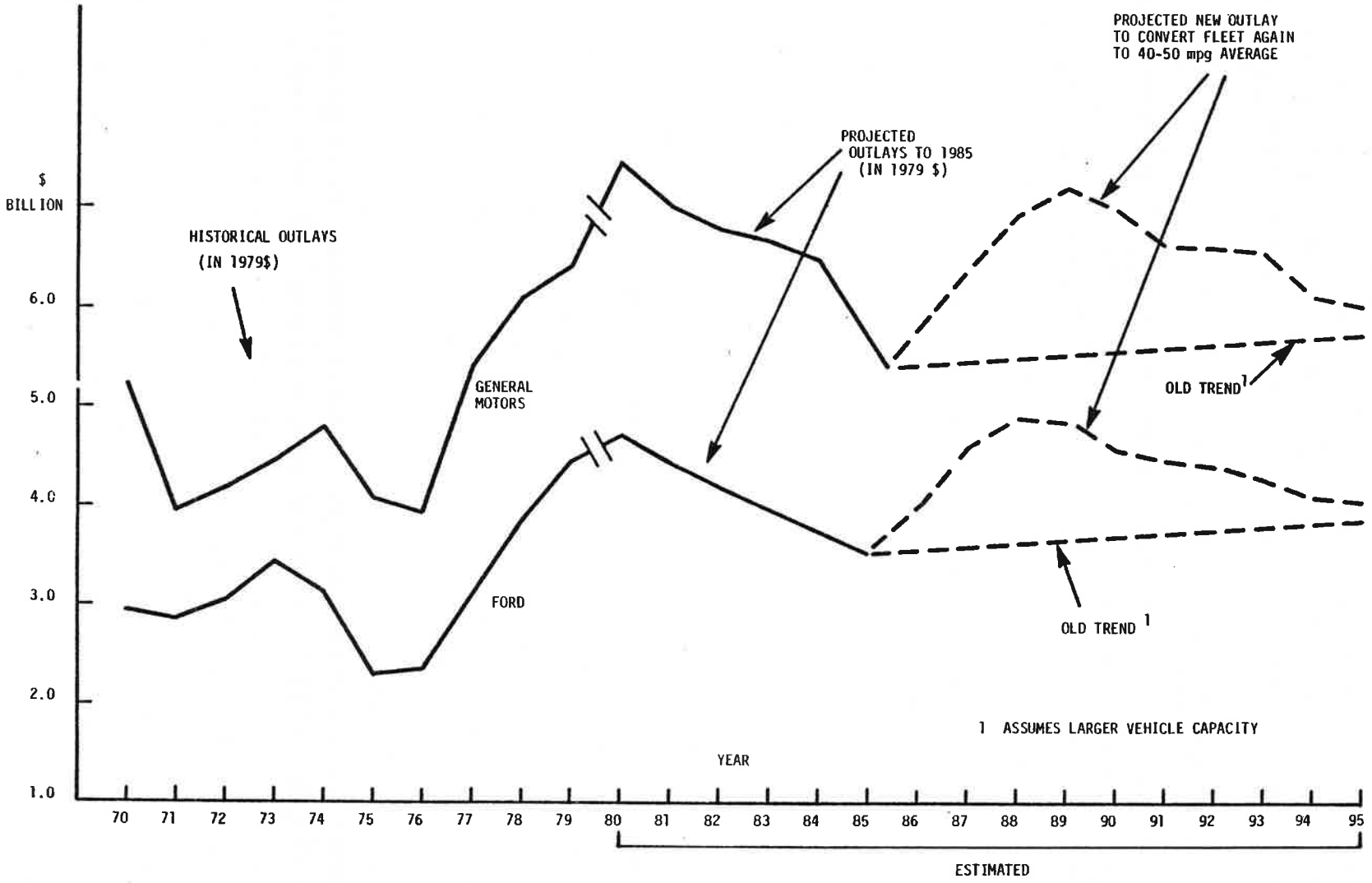
4.3 OUTLOOK FOR THE POST-1985 DOMESTIC AUTO INDUSTRY

Vastly different rates of domestic auto industry post-1985 capital spending are projected for each of the fuel availability/ price scenarios. As indicated in Figure 4.3-1, in the case of the moderate (30 to 35 mpg) transition the world-wide capital spending plans of Ford and General Motors are projected to return to normal in the post-1985 time period; in the case of the rapid (40 to 50 mpg or higher) transition the post-1985 world-wide capital spending plans of Ford and General Motors are projected to peak again as they did in the 1980 to 1985 time period. To a first approximation, the total industry costs of a post-1985 transition to a 40 to 50 mile per gallon or higher fleet would be about $100 billion. The domestic industry would be again forced to external rather than internal financing, as in the current situation.

The overall outlook for the post-1985 domestic auto industry can be summarized as follows:

- During the 1980 to 1985 time period the domestic auto companies will have incurred major pressures on their capital structures. The debt levels which will have been incurred by 1985 will put the domestic companies in a weakened financial position, susceptible to significant financial losses in a 'normal' cyclical market downturn. The basic post-1985 financial strategy of the domestic companies will be to reduce their debt structures to normal levels.

- The moderate transition scenario (30 to 35 mpg by the early 1990's) would be in line with the domestic auto companies' planned post-1985 financial strategy. On the other hand, the rapid transition strategy (40 to 50 mpg by early 1990's) would further challenge the already strained financial structures. If the companies were forced to undertake another accelerated spending period similar to the current one, on top of an already heavy debt load, then some alternative to traditional financing methods may be necessary to maintain a competitive domestic auto industry.



Note: Reference Part II, Chapter 4 for the Chrysler Financial Analysis

FIGURE 4.3.1. CAPITAL SPENDING HISTORY AND PROJECTIONS IN CONSTANT 1979 DOLLARS

It is particularly significant to note that there are many factors which can force the auto companies into the rapid transition strategy which are not under the control of government policy.

4.3.1 Lower Demand for Motor Vehicle

From econometric projections, which assume, on the basis of historical data, that disposable income is a major factor in motor vehicle sales, one obtains forecasts of continued growth of the United States and world market for motor vehicles. These forecasts may, however, be in error, at least as far as the United States is concerned. It is indeed possible that the U.S. market for new motor vehicles and particularly vehicle miles is saturated, or even declining. The vehicle miles traveled in the spring of 1980, when there were no gasoline lines, were actually less than the vehicle miles traveled in the spring of 1979 when there were gasoline lines.[1*]

Also, the United States land use is changing away from detached one-unit structures towards attached one-unit structures, mobile homes, and multi-unit structures.[2] Thus, land use is changing towards housing densities that traditionally have implied lower motor vehicle ownership and usage.

It is possible that these trends may signal a decline in the demand for motor vehicles and motor vehicle travel.

4.3.2 Two-Seater Impact

If there is a decline in motor vehicle travel, it is possible that this decline will be combined with a demand for very small vehicles, i.e., two seaters. In the expected heavy competition between domestic and foreign manufacturers in the small FWD motor vehicle market, it is possible that the foreign manufacturers (Japan) will turn to two seaters in order to maintain their market shares. If these vehicles are a market success, they may generate

*References for Part I, Chapter 4 are listed at the end of the chapter narrative.

another round of downsizing and force the domestic manufacturers into the rapid transition strategy.

4.3.3 Oil Embargos

Future foreign oil embargos are certainly not beyond the realm of possibility. However, in future years, these embargos may be less effective as the United States becomes more self reliant. Still, such an embargo may further accelerate the decline of the motor vehicle market if the postulate of a saturated motor vehicle market is correct.

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5. POTENTIAL EMPLOYMENT AND COMMUNITY DISLOCATIONS IN THE 1980'S

5.1 INTRODUCTION

The transition of the auto industry from the production of rear-wheel drive motor vehicles, powered by eight cylinder engines, to the production of newly designed front-wheel drive motor vehicles will cause considerable economic changes during the 1980's. The economic changes will come about for three basic reasons:

- Improvement in manufacturing productivity: Manufacturing labor productivity must improve if the domestic industry is to remain internationally competitive. In a mature domestic market (i.e., constant or slight annual sales growth) improved labor productivity through automation and other manufacturing process improvements results in a reduced motor vehicle manufacturing workforce.
- Reduction in domestic manufacturing capacity: In the face of intense international competition and a growing tide of imports, both Chrysler and Ford, in order to remain financially viable, have chosen to reduce their domestic production capacity. If the market share which Chrysler and Ford have chosen to abandon is not picked up through the utilization of General Motors' or other domestic production facilities, this action on the part of Ford and Chrysler will result in a permanent job loss.
- New motor vehicle designs: The newly designed motor vehicles will require different materials and components than the previous motor vehicle designs, and there will be resulting job and community dislocations.

The purpose of this chapter is to present an overview of the potential auto-related community and employment dislocations in the 1980's.

5.2 AUTO AND SUPPLIER INDUSTRY EMPLOYMENT

The 1978/1979 distribution of auto industry employment is shown in Table 5-2.1.

- The domestic auto manufacturers operate about 300 plants and facilities in the United States and Canada and employ about 900,000 manufacturing workers;

- 367,000 Michigan workers are employed directly by the prime auto manufacturers; there are an additional 532,000 Michigan workers in the auto-related supply sector. Nearly 75 percent of the Michigan manufacturing employment is auto-related.

- 165,000 Ohio workers are employed directly by the prime manufacturer; there are an additional 225,000 Ohio workers in the auto-related supply sector. Nearly 30 percent of the Ohio manufacturing employment is auto-related.

- The major concentration of direct auto and auto-related supplier industry employment is in Michigan, Ohio, Indiana, New York and Missouri.

- There are 800,000 people employed in the automobile dealer network. These jobs are, however, relatively evenly distributed throughout the country.

TABLE 5.2-1. DISTRIBUTION OF EMPLOYMENT AND FACILITIES

10 LARGEST STATES (1979)

	NUMBER OF FACILITIES	MOTOR VEHICLE EMPLOYMENT	MOTOR VEHICLE AS A PERCENT OF TOTAL EMPLOYMENT	MOTOR VEHICLE AS A PERCENT OF MANUFACTURING EMPLOYMENT
MICHIGAN	129	367,500	10.4%	34.7%
OHIO	48	165,300	3.7	12.2
INDIANA	29	86,900	3.9	11.9
NEW YORK	14	62,600	0.9	4.2
MISSOURI	6	29,800	1.5	6.6
WISCONSIN	10	20,600	1.1	3.5
NEW JERSEY	6	19,800	0.6	2.5
ILLINOIS	5	18,700	0.4	1.5
CALIFORNIA	6	18,000	0.2	0.9
GEORGIA	5	13,200	0.7	2.6

5.3 DOMESTIC AUTO INDUSTRY EMPLOYMENT

5.3.1 Productivity Improvements

The domestic auto industry (1978/1979) directly employed about 850,000 manufacturing workers in the United States and produced about 12 million passenger cars and light trucks. About 75,000 manufacturing workers (labor years) have historically been required to produce 1 million cars and light trucks.

Table 5.3-1 shows recent estimates comparing assembly plant productivity for current and projected motor vehicle plants.

The labor required for the assembly of 10 million conventional passenger cars and light trucks is about 250,000 labor years (10 million units at 40 cars/labor year). The labor requirement for assembly of 10 million newly designed front-wheel drive cars and trucks in an advanced assembly plant will be about 125,000 labor years based on an increase of 80 cars per labor year. At constant domestic output of 10 million units, introduction of advanced, automated, assembly plants is projected to decrease permanently the motor industry manufacturing work force by 125,000 workers out of an 850,000 base. Similar productivity improvements can be anticipated in auto component fabrication.

5.3.2 Increased Import Penetration

Domestic import sales of passenger cars and light trucks are currently running at an annualized level of about 2.5 million units. This represents 200,000 direct auto-related workers, and does not include workers in auto-related supply industries. Any increase in foreign-made imports over the current 2.5 million unit/year level will, of course, further erode auto-related manufacturing employment. Based on historical trends, the erosion rate will be about 75,000 direct manufacturing workers for each 1 million imported cars and trucks.

TABLE 5.3-1. COMPARISON OF ASSEMBLY PLANT PRODUCTIVITY

Plant	Labor Productivity
Conventional Rear-Wheel Drive	40 cars/labor year
Newly-Designed Front-Wheel Drive	60 cars/labor year
Advanced Assembly Plant	80 cars/labor year

5.3.3 New Motor Vehicle Designs

The new small front-wheel drive motor vehicles will be inherently simpler and carry less parts than the traditional rear-wheel drive motor vehicles. The employment of manufacturing workers will be reduced not just because of improvements in manufacturing productivity, but also because of simplifications in motor vehicle design.

5.3.4 Employment Outlook Summary

By the late 1980's, assuming that the domestic industry does not become a major exporter of domestically-made autos, it is quite realistic to project a domestic industry with a base manufacturing work force at a considerably lower level than the 800 to 850,000 manufacturing workers who were employed in late 1978. The situation has best been summed up by Irving Bluestone, retiring UAW vice president, and Douglas Fraser:

> "What's happening has a kind of permanence to it," says Irving Bluestone, a retiring UAW vice president. He says that because small cars are generally simpler, often require fewer parts and carry less gadgetry, their manufacture requires fewer workers. In addition, Detroit's overhaul of its factories is introducing new automation faster than expected, further reducing the size of the work force. And over the long term, demand for new cars in the U.S. simply isn't expected to grow as fast as it did from the 1950s through the 1970s. "Employment will never get back to where it was," Mr. Fraser says."*

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* Robert L. Simison, "UAW Changing Tactics," Wall Street Journal, May 30, 1980.

5.4 OUTLOOK FOR DOMESTIC AUTO-RELATED SUPPLIER INDUSTRIES

A summary of the basic auto-related supplier industries and their employment output ratios is presented in Table 5.4-1.

During the next decade there will be major changes in the type and amount of materials and components utilized by the auto industry. A summary of the outlook is shown in Table 5.4-2.

- There will be an overall reduction in auto production workers, and consolidation of assembly and component facilities.

- There will be a reduction in hot- and cold-rolled sheet steel corresponding to general vehicle downsizing and material substitution. Older, less efficient steel mills which traditionally supplied sheet steel to the auto industry will be closed.

- As 4 cylinder engines are substituted for 8 cylinder engines and aluminum castings are substituted for iron castings there will be a consolidation of iron foundries, and many of the older, smaller foundries will be shut down.

- The demand for primary aluminum will increase but, due to ever increasing domestic energy prices, it may be supplied from outside the country.

- New aluminum foundries will be required; they will be probably located in different locations than the cast iron foundries.

- The requirement for plastic resins and plastic processing will increase. The plastic resin facilities will be located in the south, west, and midwest, but most likely in the regions of the country where resins have traditionally been produced i.e., regions which have ready access to petroleum byproducts.

- There will be a significant reduction in tire production and shut down of the older facilities corresponding to the substitution of radial for bias ply tires.

TABLE 5.4-1. SUPPLIER INDUSTRY EMPLOYMENT/OUTPUT RATIOS

Industry	% Output to Automotive	Jobs per Output		Total Employment
Steel	21%	550	100,000 Tons	450,000
Ferrous Castings	30%	1250	100,000 Tons	230,000
Plastic Materials & Resins	8%	150	50,000 Tons	57,000
Synthetic Rubber	60%	200	50,000 Tons	11,000
Tires & Inner Tubes	90%	500	1 Million Tires	105,000
Primary Aluminum	22%	700	100,000 Tons	34,000
Aluminum Products	12%	125	10,000 Tons	88,000
Electronic Systems & Components	2%	2000	$100 Million of shipments ('79)	773,000
Machine Tools	20%	2000	$100 Million of shipments ('79)	94,000
Glass Products	10%	1000	$100 Million of shipments ('79)	21,000

TABLE 5.4-2. OVERALL REGIONAL TRANSITIONS 1979-1995*

INDUSTRY	EMPLOYMENT IMPACTS	REGIONAL IMPLICATIONS
MOTOR VEHICLE MANUFACTURERS	DOWN	o SIGNIFIGANT (200,000) JOB LOSSES IN INDUSTRIAL URBAN CENTERS OF EAST NORTH CENTRAL STATES OFFSET BY GROWTH IN OTHER NON-URBAN AREAS IN OTHER REGIONS OF COUNTRY AND OUTSIDE U.S.
STEEL	DOWN	o OLDER STEEL MILLS LOCATED IN IN, OH, PA AREA COULD BE IMPACTED IF NO INCREASE IN STEEL DEMAND FROM OTHER SECTORS.
IRON FOUNDRIES	DOWN	o SIGNIFICANT REDUCTION IN CAST IRON DEMAND WHICH COULD IMPACT APPROXIMATELY 150 IRON FOUNDRIES - 20,000-25,000 JOBS - IN THE MIDWEST AND EASTERN STATES.
PRIMARY ALUMINUM	UP	o THE EQUIVALENT OF 11 SMELTERS - 11,000 JOBS - WOULD HAVE TO BE BUILT TO SATISFY ALUMINUM REQUIREMENTS. LOCATED IN SOUTH, PACIFIC NORTH WEST, NORTH EASTERN, CANADIAN REGIONS AND OVERSEAS
ALUMINUM FOUNDRIES	UP	o THE EQUIVALENT OF 15 FOUNDRIES - 4,600 JOBS - WOULD BE REQUIRED. LOCATED IN MIDWEST, EASTERN, AND MID-ATLANTIC STATES AND CANADA.
PLASTIC RESIN	UP	o THE EQUIVALENT OF 20 RESIN FACILITIES - 14,200 JOBS - REQUIRED. LOCATED IN SOUTH, WEST AND MIDWEST.
PLASTIC PROCESSING	UP	o THE EQUIVALENT OF 78 PROCESSING FACILITIES - 31,000 JOBS - REQUIRED OFFSET BY SIGNIFICANT LOSSES IN METAL STAMPING INDUSTRY. LOCATED IN MIDWEST AND SOUTH.
TIRES	DOWN	o SIGNIFICANT REDUCTION IN TIRE PRODUCTION EXPECTED. MOST OLDER MIDWEST TIRE FACILITIES ALREADY CLOSED. GROWTH IN SOUTH AND LESS LABOR INTENSIVE.

* INCLUDES EFFECTS OF CURRENT (PRE-1985) VEHICLE CHANGES.

The impact of auto-related supplier trends requires continuing analysis. Suppliers of electronic components, diesel engine components, and turbochargers may likely expand their production and employment. The shifts in regional demand for labor will be dependent upon the varying supplier industry trends.

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PART II
CHRYSLER VIABILITY

1. INTRODUCTION

The purpose of this section is to present an analysis of the Chrysler Corporation and its ability to again become a viable corporation without the necessity for Government support. This analysis covers the period through the 1983 model year, since this is the extent of the firm data provided by Chrysler in their submittal to the Loan Guarantee Board. The analysis concentrates on the projected market for Chrysler vehicles, Chrysler's production plans, and the sensitivity of the variable margin to variations in the market.

Several alternative prospects are evaluated with respect to regional and employment effects.

This part concludes with an analysis of the producibility and marketing of a Research Safety Vehicle by Chrysler.

It should be noted that Chrysler in its April 28, 1980 Operating Plan and subsequent product plans (July 10, 1980) cites a number of significant actions necessary to achieve a reasonable and viable business environment. There are, however, normal market and economic risks associated with the motor vehicle industry. Risks from the economy and slumping market are common to all manufacturers. Chrysler cannot be insulated from these risks. The management consulting firm of Booz, Allen and Hamilton, Inc. in a letter dated July 31, 1980 to Mr. Lee A. Iacocca, Chairman, Chrysler Corporation, summarizing the results of their review of the revised Chrysler Operating Plan dated July 10, 1980 stated, in part:

"In summary, assuming a recovery in the market and in Chrysler's penetration, the present Operating Plan could give the Company a reasonable prospect of viability. There are obvious risks that industry sales and Chrysler market share in 1980 and

1981 might not recover. To take account of these risks, the Company is engaged in a continued restructuring of its operations. In our judgment, it is feasible that the restructuring plan be in place and ready to implement by September 1. We are informed that Chrysler will reflect appropriate contingency actions in its September 1 submission of the Operating Plan. We will be in a position to comment more specifically on the restructuring plan when more details are available."

2. MARKET DESCRIPTION AND PROJECTION

2.1 INTRODUCTION

A critical, if not the critical factor, in Chrysler's both near- and long-term viability is the number of motor vehicles Chrysler will sell. This will depend, in part, on both the overall strength of demand for motor vehicles, and on Chrysler's ability to respond to that demand with appropriate products. It should be noted that motor vehicle sales are tempered, not only for Chrysler, but the motor vehicle industry as a whole, by a number of factors including recession and inflation. An example of this impact may be evidencing itself in the weakening demand for Chrysler Omni/Horizon vehicles.

At the present time, the light-duty passenger car and truck fleet can be categorized into two segments: (1) conventional, domestically-built, rear-wheel drive, motor vehicles such as the General Motors Chevrolet Impala, Chrysler Le Baron, Ford Granada, etc.; and (2) light-weight structure, fuel efficient, front- and rear-wheel drive vehicles such as the Toyota Corola, Nissan Datsun 210, General Motors X-Body, etc. The conventional structure, RWD segment, is in limited demand, highly price competitive, and, at this time, a buyer's market; the light-weight structure, fuel efficient segment is in limited supply and represents, at this time, a seller's market.

Table 2.1-1 shows the four-year Base Case projection of Chrysler 1980/1983 motor vehicle sales as developed by the Staff of the Loan Guarantee Board.[1*]

Chrysler captive imports were projected to be about 838 thousand units (13%); fuel-economical, front-wheel drive cars, about 3.9 million units (59%); and conventional rear-wheel drive motor vehicles about 1.9 million units (28%). A deterioration of

*References for Part II, Chapter 2 are listed at end of chapter narrative.

Chrysler rear-wheel drive sales to a level below 1.9 million units would result in significant Chrysler financial exposure, and such declines could have a significant adverse effect on Chrysler's projected earnings during the 1980/1983 period.[2]

TABLE 2.1-1. FOUR-YEAR BASE CASE PROJECTION OF CHRYSLER 1980/1983 MOTOR VEHICLE SALES*

MOTOR VEHICLE TYPE	VOLUME (000'S) YEAR					
	1980	1981	1982	1983	Total	%
Import	190	218	224	206	838	12.6
FWD Cars and Trucks	455	935	1135	1415	3940	59.4
RWD Cars and Trucks	512	553	538	255	1858	28.0

*Loan Guarantee Board Staff Projections. Treasury Adjusted Base Case[1] (Base Case II). Report of the Chrysler Corporation Loan Guarantee Board, July 15, 1980. Page 79 of the Committee Report.

2.2 CHARACTERIZATION OF 1979/1980 DOMESTIC MOTOR VEHICLE MARKET[3]

The passenger car and light-truck markets can be subdivided into two categories:

a) light-weight structure; and

b) conventional structure

The light-weight structure category includes those vehicles which are relatively small and lightweight for their carrying capacities compared with the conventional structure vehicles. The conventional structure category includes the larger and heavier, more traditionally-designed vehicles. The results of segmenting the market into the two vehicle structural categories, i.e., light-weight and conventional, is shown in Table 2.2-1.

Each of the two vehicle structural categories includes, or is projected to include, passenger cars in each of the traditional market segments - i.e., mini/sub-compact, compact, etc. For example, the Ford Pinto and the General Motors Monza have conventional structures and are in the sub-compact market segments; the Chrysler Omni/Horizon and the Ford Fiesta have light-weight structures and are also in the sub-compact segment. The domestic motor vehicle industry is currently projecting that passenger cars in the middle and standard market segments will be designed with the light-weight structures; for example, the General Motors front-wheel drive B-bodies.

Referring to Table 2.2-1, in general, the conventional passenger car auto structures have rear-wheel-drive powertrains, and the light-weight auto structures have front-wheel drive powertrains. The General Motors Chevette is the only rear-wheel-drive domestically-built exception; the Chevette has a light-weight structure, but with some reduction in interior volume compared to the traditional sub-compact. The Japanese sub-compact imports from Toyota and Nissan are in the same category as the Chevette; they have rear-wheel-drive powertrains but have light-weight

TABLE 2.2-1. MARKET CLASSES - PASSENGER CARS

MARKET SEGMENT	STRUCTURAL CATEGORIES	
	LIGHT WEIGHT	CONVENTIONAL
MINI/SUB-COMPACT	CHEVETTE (GM) OMNI/HORIZON (CHRYSLER) FIESTA, ESCORT, LYNX (FORD) TOYOTA, HONDA, ETC.	PINTO (FORD) MONZA (GM)
COMPACT	X-BODY (GM) K-BODY (CHRYSLER)	ASPEN/VOLARE (CHRYSLER) FAIRMONT (FORD)
MIDDLE		DIPLOMAT (CHRYSLER) GRANADA (FORD)
STANDARD	*B-BODY (GM)	LTD (FORD) IMPALA (GM) ST. REGIS (CHRYSLER)

*PROJECTED

structure. As indicated previously, however, the conventional passenger car structures, as defined in Table 2.2-1, typically have rear-wheel-drive powertrains, and the domestically built light-weight passenger car structures will have front-wheel-drive powertrains. A light-weight, front-wheel-drive auto, providing essentially the same functional capabilities (e.g., passenger and baggage capacity) as a conventional rear-wheel drive vehicle, is either currently positioned or projected to be positioned in each of the traditional market segments.

Light trucks are currently being sold which have the following structural configurations:

a) light-weight (mini); and

b) conventional.

As indicated in Table 2.2-2, both the light-weight (mini) and conventional structural categories contain the same basic market segmentation:

a) pick-up trucks;

b) passenger and commercial van, and

c) utility.

In general, the conventional light-truck structures have rear-wheel-drive powertrains; the light-weight or mini-trucks have both front- and rear-wheel-drive. The light-weight (or mini) trucks have a lower weight and bulk load capacity than conventional trucks - i.e., the mini-van has a smaller bulk load capacity than the conventional van even though both vehicles are in the same market segment. The recent combined strong sale of light-weight structure trucks and vans suggests that the light-weight structure truck and van might provide many of the functional requirements previously provided by the conventional structure truck and van.

Conventional passengers cars and light trucks are currently selling domestically at about 50 percent of North American production capacity; light-weight structure passenger cars are selling

TABLE 2.2-2. MARKET CLASSES - TRUCKS

MARKET SEGMENT	STRUCTURAL CLASSES	
	LIGHT WEIGHT	CONVENTIONAL
PICKUP	MINI-PICKUP (DATSUN) COURIER (FORD) LUR (GM) ETC.	DODGE D300 (CHRYSLER) F250 (FORD) ETC.
VAN		ECONOLINE (FORD) DODGE SPORTSMAN (CHRYSLER) ETC.
UTILITY	MINI-UTILITY (TOYOTA) ETC.	CHEVROLET BLAZER (GM) DODGE RAMCHARGER (CHRYSLER) ETC.

at 100 percent of domestic production capacity; in addition, well over 50 percent of domestic light-weight passenger cars and light trucks are imported. No mini-trucks are currently produced domestically. The characteristics of the two market semgents are summarized in Table 2.2-3.

Conventional motor vehicles are currently in limited demand and the contingency should be considered wherein the long-term demand outlook is poor. The industry is operating at less than 50 percent capacity, and price competition is intense. General Motors, the industry price leader, can be expected to continue to actively price-discount conventional passenger cars and trucks, and this will result in significant pressure on industry variable margins.

Light-weight motor vehicles are currently supply-limited, and will probably be supply-limited for the next two or three years, barring a complete collapse of the total domestic passenger car and light-truck market. Due to lack of domestic light-weight motor vehicle capacity, the market can absorb all foreseeable imports. Increased availability of the newly-designed small cars will, however, make it increasingly difficult to sell conventional passenger cars and light trucks.

Price competition in the supply limited market segment is expected to remain modest through 1982. Thus, it can be anticipated that the variable margins for light-weight, front-wheel-drive vehicles, will remain strong and may even increase if fuel costs continue to rise. This should partially offset lost revenues from the conventional structure cars. However, there is the possibility that brand identification with the imports will help them retain a significant share of the market when competition (the result of excess supply) returns to the small car market. This will put pressure on the variable margin of the domestic manufacturers. This subject is further discussed in Part I, Chapter 2, Section 2.4, "Growing Perception of Non-Competitive Product Quality."

TABLE 2.2-3. MARKET CHARACTERISTICS OF DOMESTIC PASSENGER CAR AND LIGHT TRUCK FLEET

CHARACTERISTIC	CONVENTIONAL STRUCTURE	LIGHT WEIGHT STRUCTURE
MARKET	LIMITED-DEMAND	LIMITED-SUPPLY
SALES FORECAST	DECLINING	STRONG GROWTH
PRICE COMPETITION	STRONG-INTENSE	MODEST
VARIABLE MARGIN	POOR	STRONG

2.3 PROJECTION OF 1980-1983 DOMESTIC MOTOR VEHICLE MARKET

The most recent econometric forecasts of 1980/1983 annual domestic passenger car and light truck sales are presented in Table 2.3-1.[4]

On the basis of the results presented in the preceding section, the future 1980/1983 motor vehicle market is assumed to be sub-divided into two categories: a) conventional structure and b) light-weight structure. Sales of light-weight structure vehicles were assumed to be capacity-constrained throughout the period. The estimated capacity for newly-designed, fuel-efficient cars during the 1980/1983 time period is shown in Table 2.3-2.

Projections of the 1980/1983 North American domestic production capacity for conventional structure, rear-wheel drive passenger cars and light trucks, obtained from an analysis of the domestic manufacturers' current production plans, are shown in Table 2.3-3. Plans have been made to reduce domestic conventional structure passenger car production capacity from a 1980 level of about 10 million units/year to a 1983 level of about 7 million units/year. Conventional structure light truck capacity is scheduled to remain constant at about 3.5 million units/year. If the market for conventional passenger cars and light trucks continues to deteriorate, this domestic capacity will, of course, be further reduced.

Table 2.3-4 presents estimates of the domestic vehicle market relative to the econometric projections of total passenger car and light trucks sales from Table 2.3-1. The potential RWD market is assumed to be the difference between the econometric forecasts and the domestic capacity for the production of fuel economical motor vehicles, plus imports.

The projected domestic market for conventional passenger cars and light trucks is, of course, quite sensitive to the total passenger car and light truck sales projections. It seems reasonable to assume that a shortfall in actual total sales,

TABLE 2.3-1. ECONOMETRIC FORECASTS OF 1980/1983 DOMESTIC MOTOR VEHICLE MARKET*

	1980	1981	1982	1983
		(Millions of Units)		
PASSENGER CARS				
DRI	8.9	9.4	10.8	11.2
LIGHT TRUCKS				
DRI	2.2	2.7	3.2	3.4

*DRI: U.S. Long Term Review - Summer 1980 p. 1. 40 (Forecast: Trend Long 0680)

TABLE 2.3-2. ESTIMATED CAPACITY FOR NEWLY-DESIGNED, FUEL-EFFICIENT PASSENGER CARS AND LIGHT TRUCKS

	1980	1981	1982	1983
		(Millions of Units)		
PASSENGER CARS				
Domestic	1.8	3.0	3.7	6.0
Imports	2.0	2.0	2.0	2.0
Total	3.8	5.0	5.7	8.0
LIGHT TRUCKS				
Domestic	----	----	0.25	0.50
Imports	0.50	0.50	0.50	0.50
Total	0.50	0.50	0.75	1.00

TABLE 2.3-3. PROJECTED DOMESTIC PRODUCTION CAPACITY FOR CONVENTIONAL RWD PASSENGER CARS AND LIGHT TRUCKS

	1980	1981 (Millions of Units)	1982	1983
Passenger Cars	10.2	9.3	8.9	6.8
Light Trucks	3.6	3.6	3.6	3.4

TABLE 2.3-4. PROJECTED DOMESTIC VEHICLE MARKET FOR CONVENTIONAL RWD PASSENGER CARS AND LIGHT TRUCKS

	1980	1981 (Millions of Units)	1982	1983
Passenger Cars	5.2	4.4	5.1	3.2
Light Trucks	1.7	2.2	2.5	2.4

below the values shown in Table 2.3-1, will be absorbed in the conventional RWD portion of the market, rather than in the limited-supply, fuel-economical, front-wheel drive segment. Conventional RWD light trucks and vans are currently selling at an annualized rate of 2 million units; it is not clear that this market will come back to the extent implied by the light truck econometric forecasts. Comparison of the projected domestic capacity for RWD conventional structure vehicles, Table 2.3-3 and the projected RWD market, Table 2.3-4, strongly suggests a buyer's market for RWD vehicles over the three year period from 1981/1983. Each of the domestic manufacturers will be under intense pressure to retain market share in a steadily deteriorating RWD conventional market. As a result, it is reasonable to anticipate that there will be intense price competition, and increasing difficulty in maintaining unit variable margins.

The major uncertainty with regard to passenger car and light truck projections in the 1980/1983 period pertains to the ability of the industry to sell RWD conventional structure passenger cars and light trucks in the face of possible increase in imports, uncertain gasoline supplies, and ever-increasing gasoline prices. If the changes in these factors, i.e., gasoline availability, price and imports, are relatively slow, then the industry, based on recent experience, should be able to sell RWD passenger cars at the 5 to 6 million units/year level and perhaps even increase the sale of conventional RWD light trucks and vans from the current 2 million unit/year level to the 2.5 to 3 million unit/year level. See Table 2.3-4. On the other hand, based on experience during the 1973 and 1979 oil impacts, rapid changes in these factors could result in a further significant drop in conventional structure RWD passenger car and light truck sales with a resulting increase in domestic industry financial exposure.[5]

2.4 CHARACTERIZATION OF 1979/1980 CHRYSLER DOMESTIC MOTOR VEHICLE MARKET

Table 2.4-1 shows annualized three-month running averages of domestic passenger sales for the four basic 1979/1980 Chrysler conventional structure, rear-wheel drive passenger cars. These are: (1) Compact F-body (Aspen/Volare); (2) Basic Middle M-body (Diplomat/LeBaron); (3) Middle Specialty J-body (Cordoba/Mirada); and (4) Basic Large R-body (St. Regis, Newport, New Yorker).[6]

The RWD Compact F-body is being phased out in Model Year 1980. Production has been terminated at the Newark, Delaware Assembly Plant and it is being converted to the production of FWD K-body passenger cars. The Basic Middle M-body is being produced at St. Louis Assembly, the Middle Specialty J-body is being produced at Windsor, Ontario Assembly and the Basic Large R-body at Lynch Road, Detroit. Total annualized Chrysler RWD passenger car sales are currently running (late Spring 1980) at an annualized rate of about 400,000 units/year, or 8 percent of the current annualized total domestic RWD passenger car sales of 5 million units/year. (Total RWD passenger car sales do not include the General Motors Chevette, which is considered to be a light structure, fuel-efficient vehicle.)

At current sales rates, in Model Year 1981, Chrysler RWD passenger car sales will be about 250,000 units, i.e., M-body (Diplomat/LeBaron) 120,000 units; J-body (Cordoba/Mirada) 80,000 units; R-body (St. Regis/Chrysler) 50,000 units. This excludes the F-body (Aspen/Volare) which is being replaced by the K-body.

The standard pickup is being produced at Warren Main Assembly Plant at Warren, Michigan and passenger/cargo vans at Missouri Assembly, St. Louis, Missouri, and Pillette Road Assembly, Windsor, Ontario. (See Table 2.4-2.) Total annualized RWD light truck and van sales are currently running at a rate of

TABLE 2.4-1. CHRYSLER CONVENTIONAL-STRUCTURE PASSENGER CAR SALES

R-Body
St. Regis/Chrysler
Basic Large
Lynch Road
Capacity - 240,000/year

MONTH ENDING	ANNUALIZED SALES
June 1980	50,000
May 1980	58,000
Apr. 1980	58,000
Mar. 1980	62,000
Feb. 1980	56,000
Jan. 1980	54,000
Dec. 1979	60,000
Nov. 1979	101,000
Oct. 1979	137,000
Sept. 1979	148,000

M-Body
Diplomat/LeBaron
Basic Middle
St. Louis Assembly
Capacity 240,000/year

MONTH ENDING	ANNUALIZED SALES
June 1980	89,000
May 1980	111,000
Apr. 1980	118,000
Mar. 1980	112,000
Feb. 1980	100,000
Jan. 1980	100,000
Dec. 1979	109,000
Nov. 1979	148,000
Oct. 1979	176,000
Sept. 1979	175,000

J-Body
Cordoba/Mirada
Middle Specialty
Windsor
Capacity - 260,000/year

MONTH ENDING	ANNUALIZED SALES
June 1980	66,000
May 1980	82,000
Apr. 1980	81,000
Mar. 1980	88,000
Feb. 1980	83,000
Jan. 1980	94,000
Dec. 1979	91,000
Nov. 1979	113,000
Oct. 1979	119,000
Sept. 1979	113,000

F-Body
Aspen/Volare
Compact
Newark
Capacity - 240,000/year

MONTH ENDING	ANNUALIZED SALES
June 1980	145,000
May 1980	162,000
Apr. 1980	163,000
Mar. 1980	166,000
Feb. 1980	168,000
Jan. 1980	176,000
Dec. 1979	193,000
Nov. 1979	257,000
Oct. 1979	319,000
Sept. 1979	341,000

Note: Capacity calculated on the basis of 4000 hours of operation per year, or two eight hour shifts, 250 days per year. Unlike the total capacity figures used for projecting sales, these do not take into account shutdowns for conversion to new products.

TABLE 2.4-2. CHRYSLER CONVENTIONAL STRUCTURE LIGHT TRUCK SALES

Std. Pick-Up
Warren Main

Capacity - 220,000/year

MONTH ENDING	ANNUALIZED SALES
June 1980	78,000
May 1980	88,000
Apr. 1980	91,000
Mar. 1980	92,000
Feb. 1980	91,000
Jan. 1980	88,000
Dec. 1979	115,000
Nov. 1979	154,000
Oct. 1979	182,000
Sept. 1979	166,000

Std/Pass./Cargo Vans
Missouri Assembly/
Pillette Road

Capacity - 270,000/year

MONTH ENDING	ANNUALIZED SALES
June 1980	100,000
May 1980	114,000
Apr. 1980	115,000
Mar. 1980	110,000
Feb. 1980	98,000
Jan. 1980	98,000
Dec. 1979	125,000
Nov. 1979	157,000
Oct. 1979	178,000
Sept. 1979	166,000

Note: Capacity calculated on the basis of 4000 hours of operating per year. Unlike the aggregate capacity figures used for projecting sales, these do not take into account shutdown for conversion to new products.

200,000 units/year which is about 10 percent of the current annualized RWD light truck and van sales of about 2 million units/year.

At current sales rates in Model Year 1981, light truck and van sales are projected to be about 200,000 units, i.e., RWD passenger/cargo vans 110,000 units, and RWD light trucks 90,000 units.

The staff of the Loan Guarantee Board projected Chrysler model year 1981 RWD sales at 553,000 units/year (Table 2.1-1); current (MY 1980) depressed sales levels are at a rate of 400,000 units/year (excluding the F-bodies).

2.5 PROJECTION OF 1980/1983 CHRYSLER MOTOR VEHICLES SALES

The projections of the 1980/1983 Chrysler motor vehicle sales were developed using the two tier concept of market segmentation.

Sales of limited-supply, light weight structure, fuel-efficient vehicles, such as the FWD L-body and K-body were assumed to be limited only by available supply; the projected sales of FWD vehicles were assumed to be equal to the sum of available domestic capacity and the availability of light-weight imports. The Loan Board capacity-limited sales projections for Chrysler FWD motor vehicles are presented in Table 2.5-1.[1]

Two additional sales projections were made for the limited-demand conventional RWD passenger cars and light trucks and compared to the RWD Base Case prepared by the Loan Board Staff. The results are shown in Table 2.5-2.

The moderate RWD transition scenario (Alternative #2) assumes much the same product phasing schedule as the Treasury Base Case II but takes a more conservative view of the impact of that product phasing schedule. Specifically, no increase in rear drive truck sales is assumed for 1981-82 (over 1980), and the phase-out of the rear drive M-body in the 1982 model year is assumed to have a more visible impact on total sales.

The rapid RWD transition scenario (Alternative #3) assumes a shut-down of the large car during Model Year 1981, and a subsequent consolidation of the RWD passenger car and light truck fleets to a 200,000 unit/year level in response to a deteriorating market with all rear drive car production ending in the 1982 model year and rear wheel drive light truck production ending in the 1983 model year.

TABLE 2.5-1. CAPACITY-LIMITED SALES PROJECTION OF CHRYSLER LIGHT-WEIGHT STRUCTURE MOTOR VEHICLE SALES (BASE CASE II)*

Volume (000's)

Type	1980	1981	1982	1983	Total
Import	190	218	224	206	838
FWD Cars and Trucks	455	935	1135	1415	3940

*Loan Guarantee Board Staff Projections[1]

TABLE 2.5-2. DEMAND-LIMITED PROJECTIONS OF CHRYSLER CONVENTIONAL RWD MOTOR VEHICLE SALES

Volume (000's)

Sales Projections	Description	1980	1981	1982	1983	Total
Alt. #1	Base Case II*	512	553	538	255	1858
Alt. #2	Moderate RWD Transition	512	450	330	225	1517
Alt. #3	Rapid RWD Transition	512	400	200	150	1262

*Loan Guarantee Board Staff Projections[1]

The moderate and rapid transition cases are due to a number of possible factors --- e.g., market forces; international competition; energy emergencies; etc.

The effect of these two alternative projections on Chrysler is assessed in the following chapters.

REFERENCES FOR CHAPTER 2

1. Office of Chrysler Finance, U.S. Treasury Department, July 15, 1980. Summary Report On Review of Chrysler Corporations July 10, 1980 Operating Plan, page 10.

2. Attachment #3, Report on Review of Chrysler Corporation's April 28, 1980 Operating Plan, Introduction, pg. iii, "An event which represents a significant risk for Chrysler is the continued deterioration of rear wheel drive vehicle sales and the need to utilize special monetary incentives in order to market these vehicles. ... Chrysler has a significant exposure during the Plan Period (1980/1983) to decline in rear wheel-drive sales, and such declines could have a material effect on Chrysler's projected earnings and financial position during the period."

3. Attachment #2, Automotive Industry and Price Evaluation, Department of Transportation Analysis of Chrysler Sales Forecasts, op. cit.

4. Data Resources Inc., "U.S. Long Term Review, Summer 1980, pg.1.40 (Forecast: Trend Long 0680).

5. Office of Chrysler Finance, U.S. Treasury Department, May 8, 1980 Board Determination of Findings, Attachment #3, op. cit. pp. 1-41: "Rear wheel drive vehicles have had poor customer acceptance in 1980 with all U.S. automotive manufacturers experiencing substantial sales declines. Whether RWD sales will regain some lost popularity, stabilize at current sales rates, or decline further is an unknown but highly important matter for Chrysler and the other U.S. manufacturers."

6. Ward's Weekly Automotive Report.

3. PRODUCT STRATEGY AND PRODUCTION PLANS

3.1 INTRODUCTION

The previous chapter presented a description of three alternative demand scenarios for Chrysler cars and trucks in the 1980/1983 time period. Each demand scenario utilized the Loan Board Base Case projection for the sale of imports and front-wheel-drive motor vehicles. (See Table 2.1-1.) The Base Case II projection assumes that sales of the Chrysler K-car are limited by production capacity while sales of Chrysler's L-body (Omni/Horizon) are held somewhat below capacity by a weakening in demands.[1]* Three alternative demand projections were assumed for the 1980/1983 sale of rear-wheel drive motor vehicles; Alternative #1 - Loan Board Base Case (1.9 million units); Alternative #2 - Moderate Rear-Wheel Drive Transition (1.5 million units); Alternative #3 - Rapid Rear-Wheel Drive Transition (1.3 million units). The sale of conventional rear-wheel drive vehicles was projected to be nearly 400,000 units less than the Loan Board Base Case for the moderate transition and nearly 600,000 units less for the rapid transition.

Over the past six months, in response to a rapidly deteriorating market for conventional rear-wheel drive motor vehicles and a resulting deteriorating financial position, Chrysler has adopted the following product and production strategy.

- Concentrate on two basic forward-wheel drive vehicle platforms for all car and truck lines, and thereby obtain substantial commonality among products.[2]

- Concentrate on in-house powertrain production of transaxles and four-cylinder engines, with some external sourcing.

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* References for Part II, Chapter 3 are listed at the end of chapter narrative.

- Produce and sell as many conventional rear-wheel drive motor vehicles as possible during the transition to all forward-wheel drive products. (If the sale of rear-wheel drive cars becomes unprofitable, Chrysler is ready, however, with a contingency plan to shut down and consolidate rear-wheel drive production facilities.)

- Plan elimination of all rear-wheel drive products by 1985.[2]

- Shut down or consolidate all facilities not essential to the product schedule.

Based on the current trends in vehicle size and packaging, Chrysler's overall product strategy for the mid-1980's is to be positioned not as a full line motor vehicle producer, but to be able to compete in 70 percent to 80 percent of the projected market.[3]

In response to the rapidly changing market for rear-wheel drive motor vehicles, two product/production plans have been projected. The Base product/production plan responds to a moderate rate of transition to front-wheel drive motor vehicles (Alternative #1 - Loan Board Base Case and Alternative #2 - Moderate RWD Transition). The contingency product/production plan responds to a rapid rate of transition to front-wheel drive motor vehicles (Alternative #3 - Rapid RWD Transition).

Section 3.2 compares the Base and Contingency Product Plans.

Section 3.3 compares the Base and Contingency Production Plans.

The contingency rapid RWD phase out plan was made solely for the purpose of illustration, as a response to the rapid RWD transition (Alternative #3) market scenario, and is only intended as one of many possible product plan alternatives.

Because of Chrysler's rapidly changing financial situation, the projections made in this chapter are only intended to be indicative of general trends in Chrysler's product and production plans.

3.2 CHRYSLER PROJECTED PRODUCT PLANS

A base Chrysler product plan is shown in Table 3.2-1, and a contingency plan for rapid RWD phase-out is shown in Table 3.2-2.

Both the projected base Chrysler product plan and the projected contingency plan contain a rear-wheel drive and front-wheel drive passenger/light truck vehicle family. The difference in the two plans is the timing and rate of phase-out of the rear-wheel drive vehicle family.

3.2.1 Rear-Wheel Drive Vehicle Family

In model year 1980, Chrysler is producing large (R-Body), intermediate (M-Body), specialty (J/Y-Body), and compact (F-Body) conventional passenger car platforms, and both a van and pick-up truck platform.

R-Body - The R-Body (Newport/New Yorker) has been the basic platform for Chrysler's large passenger cars. In late 1979,[3] the product plan called for the continued production of the R-body until it could be replaced by a front-wheel drive platform. The R-body has not proven to be popular. As part of a rapid RWD phase-out plan, Chrysler is considering terminating R-body production during model year 1981, and permanently abandoning this segment of the market. Chrysler might attempt to retain part of this market segment by producing a special version of the X-body bearing the New Yorker nameplate.

M-Body - The M-Body (LeBaron/Diplomat) has been the basic platform for the Chrysler passenger cars in the intermediate market segment and was scheduled in late 1979 to be marketed through 1983. Current contingency plans anticipate the M-body being phased-out by model year 1982 and replaced by the K-body front-wheel drive platform.

J/Y-Body - The J-Body (Cordoba/Mirada) is the basic rear-wheel drive platform for the specialty intermediate segment. A Y-body (Imperial/luxury) platform will be derived from the J-body and produced in model year 1981. Current plans call for

TABLE 3.2-1. CHRYSLER BASE PRODUCT PLAN

REAR-WHEEL DRIVE VEHICLES				
	1980	1981	1982	1983
Passenger Car				
R-Body (Large)	X	X	X	X
M-Body (Intermediate)	X	X	X	Closed out
J/Y-Body (Specialty)	X	X	X	X
F-Body (Compact)	X	Closed out	Closed out	Closed out
Light Truck/Van				
Pick-Up (Conventional)	X	X	X	X
Van/Wagon (Conventional)	X	X	X	X

FRONT-WHEEL DRIVE VEHICLES				
	1980	1981	1982	1983
Passenger Car				
L-Body	X	X	X	X
K-Body	X	X	X	X
Mini-Truck				
Import	X	X	X	X
Pick-Up/Van	-	-	-	X

TABLE 3.2-2. PROJECTED CHRYSLER CONTINGENCY PRODUCT PLAN FOR RAPID REAR-WHEEL DRIVE PHASE-OUT*

REAR-WHEEL DRIVE VEHICLES				
	1980	1981	1982	1983
Passenger Car				
R-Body (Large)	X	Closed out	Closed out	Closed out
M-Body (Intermediate)	X	X	Closed out	Closed out
J/Y-Body (Specialty)	X	X	Closed out	Closed out
F-Body (Compact)	X	Closed out	Closed out	Closed out
Light-Truck/Van				
Pick-Up (Conventional)	X	X	X	Closed out
Van/Wagon (Conventional)	X	X	X	Closed out
FRONT-WHEEL DRIVE VEHICLES				
	1980	1981	1982	1983
Passenger Car				
L-Body	X	X	X	X
K-Body	X	X	X	X
Mini-Truck				
Import	X	X	X	X
Pick-Up/Van	-	-	-	X

*Within the framework of alternative analyses, this table is presented only as a pessimistic alternative and not as an actual product plan.

the J/Y-body to be produced through model year 1983, and then to be replaced by a derivative of the front-wheel drive K-body. Under the rapid phase-out contingency plan, the J/Y-body might be closed-out during model year 1982.

F-Body - The rear-wheel drive compact F-body (Aspen/Volare) will be phased-out during model year 1980, and replaced by the front-wheel drive K-body.

Conventional RWD Pick-UP Trucks, Vans, and Wagons - Current plans call for the conventional rear-wheel drive light truck to be produced through model year 1983, and to be replaced by front-wheel drive mini trucks in model years 1983/1984. In the rapid RWD phase-out plan, the conventional RWD trucks and vans would be consolidated and phased-out during model year 1983.

3.2.2 Front-Wheel Drive Vehicle Family

Chrysler's two basic front-wheel drive platforms are the L-Body (Omni/Horizon) and the K-Body. Present plans call for the mini-truck and mini-van to be derivatives of the front-wheel drive K-body.

L-Body - The sub-compact, L-body will be produced through model years 1983/1984. Chrysler is contemplating a light weight subcompact A-body as a replacement for the L-body in model year 1985. Unless, however, Chrysler can find collaborators in producing an A-body it may not be able to design and produce such a vehicle at competitive cost.

K-Body - The front-wheel drive K-body will be the basic platform for Chrysler vehicles in model years 1981 through 1984. All the K-body models will use basically the same set of power-train and chassis components. The K-body will replace existing compact (Aspen/Volare), and intermediate (LeBaron/Diplomat) rear-wheel drive motor vehicles.

The K-body program will eventually include replacements for virtually all of the car models Chrysler currently produces except for the large car market segment, and also will provide platforms for front-wheel drive mini-trucks and mini-vans.

3.2.3 Projected Product Plans for Standard Pick-Up Truck and Vans

Chrysler will introduce restyled and somewhat lighter pick-up trucks for the 1981 M.Y. These plans parallel similar programs at G.M. and at Ford. However, the redesign will be limited to sheet metal changes.

Truck production has traditionally relied on the availability of components designed and put in production for cars, especially engines and transmissions. Chrysler's rear-wheel drive trucks will have little in common with the light, front-wheel drive cars developed under the K-body program. Without the commonality, economies of scale become an important issue and the volume of Chrysler truck sales may not be sufficient to justify rear-wheel drive truck production indefinitely in the absence of rear-wheel drive car production. The end of rear drive car production can be expected to result in the end of rear drive truck production shortly thereafter.

3.2.4 Advanced Powertrain Technology

Some specific technologies can be considered important to Chrysler's competitiveness as a full-line manufacturer. Three are considered briefly here: diesels, turbocharging and transaxle lockup.

Chrysler, at present, does not offer diesels or turbocharged engines in any of its models. Although Chrysler was the first U.S. manufacturer to use a lockup torque converter with its automatic (RWD) transmissions, it does not currently use lockup on its automatic (FWD) transaxles. (Lockup refers to a feature of some automatic transmissions which provides a mechanical linkage in high gear, thus improving fuel economy at cruising speeds.)

Both G.M. and Ford offer turbocharging on at least one engine and G.M. offers diesel engines in several models. Ford has been widely reported to be seeking a source of diesel engines to offer in its cars, and G.M. is thought to be planning to expand the range of diesel engines it offers.

Chrysler, too, has been exploring the possibility of turbocharging one or more of its engines and also of either producing or buying diesel engines for its vehicles. Several schemes for obtaining diesel engines have been reported to be under consideration including low volume production of a turbocharged, diesel version of its 225 CID L-6 engine; production of a diesel version of its L-6 engine; and, purchase of either four or six cylinder diesels. A six cylinder, or even an eight cylinder, diesel might be produced or purchased specifically for its rear-wheel-drive light trucks, while a four cylinder diesel would seem more appropriate to its front-wheel-drive cars.

In the case of lockup, G.M. is not expected to use lockup with their front-wheel-drive transaxles before the 1982 M.Y. Ford's new transaxle, to be introduced with the Escort and Lynx models in the 1981 M.Y., utilizes a split-torque feature which achieves some of the advantages of the lockup clutch. Chrysler might reasonably expect to add lockup by the 1982 M.Y.

Finally, where turbocharging is concerned, aside from a turbocharged diesel L-6 engine, Chrysler might try to turbocharge its 2.2 liter L-4 engine. Introduction of a turbocharged L-4 engine with the K-body platform specialty car might be considered highly desirable since both the Ford Mustang and G.M. F-body (Camaro/Firebird) are offered with turbocharged engines.

3.3 PRODUCTION PLANS/MANUFACTURING PLANTS

Chrysler's automotive facilities can be divided into seven categories: (1) Vehicle Assembly; (2) Stamping and Trim; (3) Engine; (4) Forgings, Casting and Foundries; (5) Transmission Assembly; (6) General Manufacturing; and (7) Material Components and Other Facilities. The changeover from the production of rear-wheel drive to front-wheel drive passenger cars and light trucks will require major changes in these plants -- some plants will be closed while others will be expanded. The 50 Chrysler Corporation facilities which were operational in model year 1980 are analyzed. Due to the many considerations necessary to determine the future of a specific plant and the inability to accurately project either the market or the economy, no attempt has been made to determine which plants may remain open or be closed other than those already announced.

3.3.1 Chrysler Assembly

Chrysler Corporation currently has eleven motor vehicle final assembly plants. These plants and their locations are listed in Table 3.3-1.

A summary of projected assembly plant loadings is presented in Table 3.3-2

a) Passenger Car Assembly - The Belvidere, Jefferson Ave., and Newark assembly plants are scheduled for the production of front-wheel drive platforms in model year 1981. The future of the remaining three rear-wheel drive passenger car production plants is not clear, and is, of course, highly sensitive to the rear-wheel drive passenger car market and Chryslers' ability to generate funds for future plant changeover.

Chrysler has announced plans to 'mothball' Lynch Road. Recently, the plant received a reprieve into, at least, model year 1981. The most probable prospect is that only one of the

TABLE 3.3-1. CHRYSLER CORPORATION - NORTH AMERICAN PASSENGER CAR/LIGHT TRUCK ASSEMBLY PLANTS

Plant Name / Employment*	Location	'80 Products
Passenger Car Assembly		
Belvidere/5300	Belvidere, Ill	Omni/Horizon (L)
Jefferson Ave./3100	Detroit, Michigan	Light Truck (PU) (Changeover to K)
Newark/4600	Newark, Delaware	Aspen/Volare (F) (Changeover to K)
St. Louis/5100	St. Louis, Missouri	LeBaron/Diplomat (M)
Windsor/5400	Windsor, Ontario	Cordoba (J)
Lynch Rd./5100	Detroit, Michigan	Newport/New Yorker (R)
Hamtramck/5600	Detroit, Michigan	Closed
Light Truck Assembly		
Warren Main } 7500	Warren, Michigan	Light Trucks (PU)
Warren Compact }	Warren, Michigan	Recreation Vehicles
Missouri Truck/4100	St. Louis, Missouri	Vans
Pillette Rd./3000	Windsor, Ontario	Vans
Total 11/48,800		

*Employment statistics used in this section are the average employment for the first quarter of 1979. This figure represents employment at normal operating levels/capacities.

TABLE 3.3-2. ASSEMBLY PLANT CAPACITY

	MODEL YEAR			
	1980	1981	1982	1983
Passenger Cars				
Belvidere	L (300,000)	L (300,000)	L (300,000)	L (300,000)
Jefferson Ave.	(Pickup) Changeover	K (280,000)	K (280,000)	K (280,000)
Newark	F Changeover	K (280,000)	K (280,000)	K (280,000)
St. Louis	M (240,000)	M (240,000)	M (240,000)	M (240,000)
Windsor	J (260,000)	J/Y (260,000)	J/Y (260,000)	J/Y (260,000)
Lynch Road	R (200,000)	R (200,000)	R (200,000)	R (200,000)
Light Trucks				
Warren Main	Pick-Up (220,000)	Pick-Up (220,000)	Pick-Up (220,000)	Pick-Up (220,000)
Warren R.V.	Motor Homes (40,000)	Motor Homes (40,000)	Motor Homes (40,000)	Motor Homes (40,000)
Missouri Truck	Van (160,000)	Van (160,000)	Van (160,000)	Van (160,000)
Pillette Road	Van (110,000)	Van (110,000)	Van (110,000)	Van (110,000)

three plants will be converted from rear-wheel drive to front-wheel drive passenger cars by model year 1983.

b) Light Truck Assembly - Chrysler's future in the conventional rear-wheel drive truck and van market is not clear. In model year 1981, Chrysler will have two operational light truck and van plants-Warren Main and Pillette Rd. Chrysler has announced the permanent shutdown of Warren R.V., which produced recreational vehicles, and Missouri Truck which produced vans. The future of Warren Main and Pillette Road again depends on the conventional rear-wheel drive truck market. One of the truck plants or one of the unused car plants might be converted to accommodate production of new front-drive trucks derived from the K-body.

Table 3.3-3. compares the 1970/1980 Chrysler Corporation motor vehicle capacity with the most probable projected capacity for the 1984/1985 Chrysler Corporation.

By the mid-1980's, assuming Chrysler's financial survival and no merger, Chrysler Corporation is projected to have five front-wheel drive assembly plants compared to their 11 rear-wheel drive assembly plants in the late 1970's, and a production capacity of 1 to 1.5 million units compared to the 2 to 2.5 million units in the late 1970's.

3.3.2 Stamping and Trim Plants

In the late 1970's, Chrysler Corporation had five stamping plants and three trim plants. The plants are listed in Table 3.3-4. These plants had the capacity to produce all the body stampings and interior trim for an annual passenger car/truck capacity of nearly 2.5 million. The projected production plan, Table 3.3-3, projects a reduction in vehicle capacity from 2.5 million to 1.5 million units. This reduction in vehicle capacity combined with reduced product complexity will require considerably less total stamping press and interior trim capacity.

TABLE 3.3-3. DOT ESTIMATE OF CHRYSLER MOTOR VEHICLE PRODUCTION CAPACITY

	Assembly Plants		Annual Production Capacity*	
	1979/1980	1984/1985	1979/1980	1984/1985
Passenger Car	6	4	1.6-1.8	1 to 1.3
Light Trucks	5	1	0.4-0.7	0.2 to 0.3**
Total	11	5	2-2.5	1.2 to 1.5

*millions of units

**FWD vans/wagons

TABLE 3.3-4. CHRYSLER STAMPING AND TRIM PLANTS

Plant/Employment	Location
Stamping Plants	
Twinsburg, Stamping/3700	Twinsburg, Ohio
Sterling Stamping/3200	Sterling Heights, Michigan
Warren Stamping/3300	Warren, Michigan
Eight Mile & Outer Drive* Stamping/2,400	Detroit, Michigan
Mack* Stamping/4100	Detroit, Michigan
Trim Plants	
Lyons Trim/700*	Lyons, Michigan
Ajax Trim/1700	Ontario, Canada
Detroit Trim/1000	Detroit, Michigan
Total 8/20,100	

*closed

By the mid-1980's, Chrysler will probably consolidate its stamping operations into two or three plants, and the interior trim operations into one plant. Thus five or six of the nine trim and stamping plants that were operational in the late 1970's will probably be shut down.

3.3.3 Engine Plants

Chrysler, at present, has four major engine assembly plants as listed in Table 3.3-5.

These plants had, until quite recently, a production capacity of about 2.5 million L-6 and V-8 engines. The L-6 and V-8 engines are not compatible with either the L-body or K-body front-wheel drive platforms; these front-wheel drive platforms require either an L-4 or V-6 powerplant. In the late 1970's, Chrysler did not have any capacity for producing either L-4 or V-6 engines, and purchased the L-4 engines used in the Omni/Horizon front-wheel drive platform from VW, West Germany. By the mid-1980's, Chrysler will require between 1 and 1.5 million L-4 and V-6 engines for its front-wheel drive fleet. Due to financial limitations, Chrysler is planning to outsource the V-6 engines and some L-4 engines and produce only L-4 engines in-house. The changeover from the production of 2.5 million/year L-6 and V-8 engines to about 1.2 million/year L-4 engines will render much of Chrysler's existing engine production capacity obsolete, and require major engine facility conversion.

Current projections are that the L-4 engine production will be consolidated at the Trenton Ave. plant and the Saltillo plant in Mexico. The Windsor Engine plant has been shut down, and the remaining V-8 production will be consolidated at Mound Road, and phased-out as the demand for V-8 engines disappears. A capacity for L-6 engine production will be retained at the Trenton Engine plant. The Trenton Ave. plant will have a capacity of about 800,000 L-4 units/year; the Chrysler Mexican plant will have a capacity of about 250,000 engines/year.

TABLE 3.3-5. CHRYSLER ENGINE ASSEMBLY PLANTS

Engine Plant / Employment	Location	Product
Trenton Ave. Plant/3100	Trenton, Michigan	L-4 Cyl. and L-6 Cyl. Engines
Mound Rd. Plant/2900	Detroit, Michigan	V-8 Engines
Windsor * Engine Plant/2400	Windsor, Ontario	V-8 Engines
Saltillo Plant/0	Saltillo, Mexico	L-4 Engines
Total 4/8400		

*closed

In addition, Chrysler will purchase engines from Volkswagen, Mitsibishi, and Peugeot. These are projected to range from 250,000 to 450,000 engines per year.

3.3.4 Casting and Forging Plants

Chrysler had, in 1979, four grey iron casting plants, two forging plants, and two aluminum casting plants. (See Table 3.3-6.)

a) Grey Iron Casting - The total iron/steel casting capacity (tons/day) will be reduced because of: a) reduced engine production, i.e., 2.5 million engines/year to 1.2 million engines/year; b) reduction in the weight of the average engine block corresponding to the substitution of four-cylinder engines for six- and eight-cylinder engines; and c) substitution of aluminum for grey cast iron in inlet and exhaust manifolds and engine heads.

Due to the reduction in grey cast iron requirements, the Chrysler casting facilities will be consolidated. As part of the consolidation, the Fostoria Foundry has been shut down. Further consolidation may affect Huber Ave. or Indianapolis. The Winfield Foundry is a specialty camshaft foundry, employs about 200 people, and is part of the Huber Ave. complex.

b) Aluminum Casting - Chrysler has two aluminum casting facilities: (1) Kokomo Die Casting, and (2) Etobicoke. Kokomo Die Casting produces transmission cases and the inlet and manifolds that were previously produced in the Fostoria Foundry. Etobicoke produces engine pistons. By the mid-1980's, activity at Kokomo should expand due to increased production of aluminum inlet manifolds. Etobicoke may be expanded to permit some insourcing of aluminum cylinder heads.

c) Forging Plants - Chrysler has two forging plants: (1) Detroit Forge in Detroit, Michigan and (2) New Castle Forge in New Castle Indiana. The major forged parts are ring gears, drive pinions, connecting rods, and front suspension parts. Some consolidation of forge capacity may occur as production of front suspensions for rear drive vehicles is phased out.

TABLE 3.3-6. CASTING AND FORGING PLANTS

Plant/Employment	Location	Product
Grey Iron Casting		
Huber Ave. (Lynch Ave.)/2400	Detroit, Michigan	Engine Blocks and Heads Cast Crankshafts
Winfield Foundry (Lynch Ave.)/300	Detroit, Michigan	Camshafts
Indianapolis Foundry/1100	Indianapolis, Indiana	Engine Blocks and Heads
Fostoria** Foundry/650	Fostoria, Ohio	Inlet and Exhaust Manifolds
Total 4/4450		
Aluminum Casting		
Kokomo Die Casting/1000	Kokomo, Indiana	Aluminum Heads
Etobicoke Casting/400	Toronto, Canada	Pistons
Total 2/1400		
Forging Plants		
Detroit Forge/4400*	Detroit, Michigan	Ring Gears Drive Pinions Connecting Rods Steering Gears
New Castle Forge/1600	New Castle, Indiana	
Total 2/6000		

*Detroit Forge and Axle is included under General Manufacturing (Table 3.3-8).
**closed

3.3.5 Transmission Plants

Chrysler currently operates two transmission plants. One is located in Kokomo, Indiana, and produces rear-wheel drive transmissions and front-wheel drive transaxles; the other, New Process Gear, is located in Syracuse, New York, and produces rear-wheel drive manual transmissions and four-wheel drive transfer cases. (See Table 3.3-7.)

Kokomo will be the basic source for transaxles for the front-wheel drive platforms. Nearly 70 percent of the output of New Process Gear is sold by Chrysler to other manufacturers.

At the end of the 1970's, Kokomo Transmission had a capacity for nearly 2.5 million rear-wheel drive and 250 thousand transaxles. By the mid-1980's, the transaxle capacity will be increased to nearly 1.25 million, and the rear-wheel drive automatic transmission capacity will be phased-out at a rate to be established by the market for rear-wheel drive motor vehicles.

The future product mix at New Process Gear will, in large part, be determined by the nature of the rear-wheel drive market. New Process Gear is presently a major supplier of transfer cases for 4x4 rear-wheel drive vehicles. The plant is scheduled, however, to produce 300,000 manual transaxles. New Process Gear and Kokomo Transmission will, thus, by the mid-1980's, be able to supply all the front-wheel drive transaxle requirements - both manual and automatic - for the projected 1.5 million Chrysler front-wheel drive platforms.

3.3.6 General Manufacturing

Chrysler operates six general manufacturing plants which produce chassis and electromechanical components. (See Table 3.3-8.)

The Chrysler Corporation currently produces all of its own torque converters, alternators, distributors, six and eight cylinder engine starters, and rear-wheel drive front disc brakes. Chrysler also produces all of its car rear-drive axles and some

TABLE 3.3-7. TRANSMISSION PLANTS

Plant/Employment	Location	Product
Kokomo Transmission/5900	Kokomo, Indiana	RWD and FWD Auto-transmission
New Process Gear/3700	Syracuse, New York	RWD manual transmissions
Total 2/9600		

TABLE 3.3-8. GENERAL MANUFACTURING

Plant/Employment	Location	Product
Dayton Plant No. 1/1900	Dayton, Ohio	Heating and Air Conditioning Systems
Indianapolis Electric/1000	Indianapolis, Indiana	Alternators, Starters, Distributors
New Castle Machine and Forge/2600	New Castle, Indiana	Ball Joints, Suspension Parts
Toledo Machine/2400	Toledo, Ohio	Disk Brakes, Torque Converters
Eldon Axle/*	Detroit, Michigan	Rear Drive Axles
Detroit Universal/1100	Detroit, Michigan	Prop-Shafts U-Joints
total 6/9000		

*Total for Detroit Forge & Eldon Axle is 4400

truck rear drive axles, all of its rear-wheel drive car steering gears and torsion bar front suspensions.

The Chrysler Corporation currently purchases starters, front disc brakes, constant velocity joints, steering gears, and MacPhearson struts for its front-wheel drive L-body cars (Omni-Horizon), and also purchases some drive axles and steering gears for its trucks.

The Indianapolis Electrical Plant is being facilitized to produce a new 80 amp alternator with annual capacity of 2 million in M.Y. 1983.

The manufacturing plants listed in Table 3.3-8 have been dedicated to rear-wheel drive components. The mass production equipment used to produce these rear-wheel drive components is, for the most part, not flexible. New mass production manufacturing equipment will be required for the front-wheel drive components. The transition to front-wheel drive motor vehicles implies that many of the components which are at present produced in the general manufacturing plants will no longer be needed in the mid-1980's. Typical chassis components in rear-wheel drive and front-wheel drive vehicles are contrasted in Table 3.3-9.

Production of starters, disc brakes, steering systems and front suspensions for front drive vehicles would require conversions to new designs. Although Chrysler may build some individual parts of the brake and suspension systems, Chrysler, at present, relies primarily on independent suppliers for complete components.

Production of heating and air conditioning systems, torque converters, and alternators for the new vehicles will also require some modifications to produce new designs. Chrysler is expected to continue to produce these components.

TABLE 3.3-9. CHASSIS COMPONENTS IN RWD AND FWD VEHICLES*

Chassis Function	Rear-Wheel Drive Component	Front-Wheel Drive Component
Front Suspension	Torsion Bar	MacPhearson Strut
Drive Axle	Rear Axle	Transaxle
Drive Shaft	Prop Shaft and U-Joint	C.V. Joints
Power Steering	Recirculating Ball	Rack and Pinion
Front Brakes	Disc Brakes	FWD Disc Brakes

*See also Figures 3.2-1 and 3.2-2 of Part I

As a result of Chrysler's planned reduction of in-house sourcing and general reduction in vehicle production capacity, consolidation among the six component plants will probably result in closing between two and three of them and some reduction in the scope of operations at the remaining plants.

3.3.7 Materials and Components

Chrysler has a number of specialty material and component plants; the major plants are indicated in Table 3.3-10.

The products of each of the material and component activities will be required in the new FWD fleet.

3.3.8 Comparison of Chrysler-1978/1979 and Projected Chrysler 1984/1985 --- Summary

A comparison of the 1978/1979 Chrysler Corporation and the projected 1984/1985 Chrysler Corporation is presented in Table 3.3-11.

In 1978/1979, Chrysler Corporation had an annual production capacity of 2 to 2.5 million RWD passenger cars and light trucks; in 1984/1985 it is projected that Chrysler will be producing 1.5 million FWD motor vehicles.[4] The annual engine production capacity is projected to be reduced from 2.5 million L-6 and V-8 engines to 1.2 million L-4 engines, and correspondingly, there is a reduction in annual transmission capacity from 2.5 million units to 1.5 million units. The five-year transition from a 2.5 million unit/year RWD motor vehicle production capacity to a 1.5 million unit/year FWD motor vehicle production capacity is projected to have a major impact on Chrysler employment distribution.

Table 3.3-12 compares the 1978/1979 Chrysler employment distribution with that projected for the 1984/1985 Chrysler production plans.

TABLE 3.3-10. MATERIALS, COMPONENTS AND OTHER FACILITIES

Plants/Employment	Location	Output
Plant Materials		
McGraw Glass/800	Detroit, Michigan	Glass
Chrysler Plastic Products/350	Sandusky, Ohio	Interior Vinyl and Resins
Trenton Chemical/400	Trenton, Michigan	Chemical Products, Adhesives
Total 3/1550		
Plastic Parts		
Molded Products DW/300	Michigan City, Indiana	Molded Parts
Mechanical Parts		
Windsor Spring/500	Windsor, Ontario	Seat Springs
Auto Groups/ Electric Component		
Introl/1300	Ann Arbor, Michigan	Auto Gauges
Huntsville Electronics/1700	Huntsville, Alabama	Engine Electronics
Cape Canaveral/450	Cape Canaveral, Florida	Wiring Harnesses
Total 3/3450		
Powder Metal Parts		
Amplex Harper/800	Detroit, Michigan	Powder Metal Parts Extrusion, etc.
	Van Wert, Ohio	
Other Facilities		
Northern Steel/1300	Detroit, Michigan	
Vernor Tool and Die/50	Detroit, Michigan	
Clairpointe Pre-production/200	Detroit, Michigan	
Total 3/1550		

TABLE 3.3-11. COMPARISON OF 1978/1979 and 1984/1985 CHRYSLER CORPORATION

	Year	
	1978/1979	1984/1985
Product	RWD Passenger Cars and Light Trucks	FWD Passenger Cars and Light Trucks
Motor Vehicle Production Capacity	2 to 2.2 million units	1 to 1.5 million units
In-House Engine Production Capacity	2.5 million units L-6, V-8	1.2 million units L-4
In-House Transmission Production Capacity	2.2 million units RWD transmissions	1.5 million units Transaxles

TABLE 3.3-12. CHRYSLER 1978/1979 AND 1984/1985 EMPLOYEE DISTRIBUTIONS

Function	1978/1979 number/employment	1984/1985 number/employment
Assembly Plant	11/48,800	5/20,600
Stamping/Trim	8/20,100	4/11,700
Engines	3/8,400	1/4,400
Castings/Foundries/ Forges	7/7,450	3/2,800
Transmissions	2/9,600	2/8,900
General Manufacturing	6/13,500	4/6,100
Materials, Specialty Components and Other Facilities	13/8,150	12/7,650
Manufacturing Total	50/116,000	31/62,150
Central Office	13,700	8,300
Marketing/Distri-butions	7,400	5,200
Corporate Staff Total	21,100	13,500
Total	50/137,100	31/75,650

- An overall reduction of more than 50,000 is projected in manufacturing-related jobs, and an overall reduction of 60,000 jobs is projected in Chrysler auto-related employment.

- The major employment reductions are in the functional areas of assembly, stamping and general manufacturing.

- There are currently 36 Chrysler plants in the basic areas of auto assembly, powertrain assembly, stamping, casting and forging. It is projected that 16 of these plants may be shut down, sold, or "mothballed".

3.4 SAFETY VEHICLE PRODUCTION

Congress, in requiring preparation of this assessment of Chrysler's viability, directed that the capability of Chrysler to produce a car model incorporating the safe vehicle concepts demonstrated under the National Highway Traffic Safety Administration's Research Safety Vehicle program be assessed. A complete consideration of this possibility is included in Chapter 5. The purpose of this section is to indicate where in the outline of a Chrysler product plan a safety vehicle might be inserted.

Two research safety vehicles may be considered as representative options -- the Minicars small research safety vehicle (Minicars RSV), and the Calspan RSV.

The Minicars RSV, described in greater detail in Chapter 5, offers lifesaving protection in crashes up to 50 miles per hour. This is a level of protection far in excess of similar size compact and subcompact cars available today. The high level of occupant protection is provided primarily through the use of air bags and unique foam-filled, energy-absorbing structure.

The cage and glove structure of the Minicars RSV, with its foam-filled panels, makes this car radically different in design from the conventional steel sheet, unibody designs currently in production throughout the world. Production of this car would represent an all new car program for Chrysler and would, additionally, involve considerable new technology testing as well as some new assembly and stamping plant redesign.

The Minicars RSV concept could apply only where an all new car was contemplated and sufficient lead-time was available. Substitution of a Minicars RSV-concept vehicle for a conventional all new car would cause the least stress to Chrysler financially and operationally. Candidate all-new cars might include a delayed D-body, if a decision is made to postpone rather than cancel that program. Another possibility would be to use the Minicars RSV concepts in replacing the K-body models when that becomes necessary.

A delayed D-body RSV could probably be targeted for the 1986 M.Y. Such a car as an entrant in the large or luxury car segment of the market might by able to command a considerable premium in the market. Volume would be limited to one assembly plant (i.e., circa 300,000 units per year).

A K-body replacement RSV would have to be introduced later so as not to cut short the life of the K-body compacts. Less of a cost premium could be tolerated, because the K-body market segments demand modest prices. The volume would be higher, however. Replacement of the K-body can reasonably be expected to begin in the 1988 M.Y.

The second option to be considered is the Calspan RSV. The Calspan RSV is a modification of the Chrysler Simca incorporating a stronger structure, special bumpers and a number of hang-on devices. Since it involves a conventional structure, adoption of the Calspan concepts could be achieved by modifying an existing model or a contemplated design for a new model. In fact, Chrysler's L-body (Omni/Horizon) already incorporates some features of the Calspan Simca RSV. Further incorporation of these features when the L-body is replaced by the A-body in 1985 M.Y. would seem both feasible and desirable.

REFERENCES FOR CHAPTER 3

1. Office of Chrysler Finance, U.S. Treasury Department, July 15, 1980, Summary Report on Review of Chrysler Corporation's July 10, 1980 Operating Plan, page 11.

2. Chrysler Corporation, Application to the Loan Guarantee Board for a $1.5 Billion Commitment to Guarantee, April 25, 1980, Exhibit 5, Booz, Allen and Hamilton, Chrysler Consultants. Analysis of Chrysler Operating Plan, pg. 3:

   "Since our review of the Company's Operating Plan last October, Chrysler has made several major changes in its product strategy including:

   - Focus on two basic vehicle platforms.
   - Planned elimination of rear-wheel drive products by 1985."

3. Chrysler Loan Guarantee Application, Exhibit 5, Booz, Allen and Hamilton, Op. Cit., pg. 3.

   "Based on the current trend in vehicle size and packaging, with the present product plans, Chrysler should be positioned to compete in 70 percent to 80 percent of the projected market in 1980."

4. Chrysler Loan Guarantee Application, Exhibit 5, Op. Cit., Booz, Allen and Hamilton, pg. 4: "Chrysler's plan is directed at making the company profitable at combined car and truck volume sales of 1.5 million units."

4. 1980/1983 FINANCIAL ANALYSIS

The Loan Board Base Case II operating plan, shown in Table 4.1-1[1*] projects the sale of 6.6 million cars and trucks, including 838,000 captive imports over the period from 1980 through 1983. 1.9 million (or nearly 28 percent) of the projected motor vehicle sales will be conventional rear-wheel drive cars and trucks. The total variable margin from the sale of these vehicles is projected to be $11 billion. (Variable margin is defined as sales price less variable costs or the amount available to cover fixed costs and profit, including debt servicing.) This variable margin of $11 billion in combination with available external financing, including the draw-down of all or part of the $1.5 billion government loan guarantee, is estimated, by Chrysler, to be sufficient to both pay the transition cost of the changeover from a rear-wheel drive to a smaller, front-wheel drive fleet, and to return the Company to profitability by 1984/1985.

A major uncertainty in the operating plan is Chrysler's ability to generate all of $11 billion in variable margin revenues from motor vehicle sales over the 1980/1983 time period. Almost 35 percent (or 3.9 billion) of the projected $11 billion variable margin will be from the projected sale of 1.9 million conventional rear-wheel drive passenger cars and trucks.

The purpose of this chapter is to assess the sensitivity of Chrysler's projected financial results to a significant decline in rear-wheel drive passenger cars and light truck sales.

A summary of the unit variable margins for imports, front-wheel drive cars and trucks and rear-wheel drive cars and trucks is shown in Table 4.1-2.

The margins were developed by the staff of the Loan Guarantee Board and are shown in the "Going Concern Finding" submitted to the Congress in May 1980.

*References for Part II, Chapter 4 are listed at the end of chapter narrative.

TABLE 4.1-1. BASE CASE SALES AND TOTAL VARIABLE MARGIN

	1980	1981	1982	1983	TOTAL	PERCENT
Base Case II Sales:[1] Volume (000's)						
Imports	190	218	224	206	838	12.6
Small Cars & Trucks	455	935	1,135	1,415	3,940	59.4
RWD Cars & Trucks	512	553	538	255	1,858	28.0
TOTAL	1,157	1,706	1,897	1,876	6,636	100.0
Base Case Variable* Margins ($ Millions)*						
Small Cars and Small Trucks	$ 625	$1,431	$1,995	$2,663	$6,714	60.1
Imports	116	133	137	123	509	4.6
SUBTOTAL	741	1,564	2,132	2,786	7,223	64.7
RWD Cars	588	719	673	262	2,242	20.1
RWD Trucks	346	473	530	355	1,704	15.3
SUBTOTAL	934	1,192	1,203	617	3,946	35.3
TOTAL	$1,675	$2,756	$3,335	$3,403	$11,169	100.0
RWD Vehicle Variable Margin Percent	55.8%	43.3%	36.1%	18.1%	35.3%	

*Based on derived unit variable margins in May 8, 1980 Base Case (See Table 4.1-2.) (In 1980 economics.)

Tables 4.1-3 through 4.1-5 compare the variable margin forecasts for the moderate and rapid front-wheel drive transitions to the Base Case.

Estimated net cash inflows for the sale of rear-wheel drive cars and trucks for the three cases are compared in Table 4.1-6.

The sensitivity of total variable margin and net income to the rate of sales of rear-wheel drive passenger cars and light trucks represents a significant risk for Chrysler. Chrysler has a significant exposure during 1980/1983 to declines in rear-wheel drive sales, and such declines in sales can have a natural adverse effect on Chrysler's projected earnings and financial position. Large rear-wheel drive cars have had poor customer acceptance in 1980 with all U.S. automotive manufacturers experiencing substantial sales decline. There appear to be three phenomena at work simultaneously: (1) a market shift toward fuel economy; (2) a market slump due to the recession; and (3) apprehension about Chrysler's stability. The last two are expected to be short term effects and there is a market for some level of large cars and pickup trucks. Whether rear-wheel drive vehicles will regain some lost popularity, stabilize at current sales, or decline further is unknown, but it is a highly important matter for Chrysler and the other domestic manufacturers.[2]

The Office of Chrysler Finance, U.S. Treasury Department, in its July 15, 1980 Summary Report on Review of Chrysler Corporation's July 10, 1980 Operating Plan reflects this concern. On pages 23 and 24 of their review, the Office of Chrysler Finance stated:

> "Nonetheless, it should be emphasized that the margins available are narrow. Base Case II indicates that the period of greatest risk is the third and fourth quarters of 1980 while the company is incurring substantial expenditures to launch the new K-car and during which sales of its rear wheel drive vehicles are expected to continue to be weak. However, introduction of the K-car this fall should mean improved operating results for Chrysler at that time and thereafter. Another period of great risk is early 1981. The Section 8(b)

TABLE 4.1-2. DERIVED UNIT VARIABLE MARGIN - BASE CASE

Vehicle Class	1980	1981	1982	1983
Import	$608/unit	$610/unit	$612/unit	$597/unit
Small Car/ Truck	$1374/unit	$1531/unit	$1758/unit	$1882/unit
RWD Car/ Truck	$1824/unit	$2156/unit	$2237/unit	$2419/unit

TABLE 4.1-3. FORECAST TOTAL VARIABLE MARGINS, ALTERNATIVE NO.1. - BASE CASE
($ Million)

	1980	1981	1982	1983	Total	%
Imports	116	133	137	123	509	4.6
Small Cars and Trucks	625	1431	1995	2663	6714	60.1
RWD Cars and Trucks	934	1192	1203	617	3946	35.3

TABLE 4.1-4. FORECAST TOTAL VARIABLE MARGIN, ALTERNATIVE NO. 2 - MODERATE RWD TRANSITION
($ Million)

	1980	1981	1982	1983	TOTAL	%
Imports	116	133	137	123	509	4.9
Small Cars and Trucks	625	1431	1995	2663	6714	64.5
RWD Cars and Trucks	934	970	738	544	3186	30.6

TABLE 4.1-5. FORECAST TOTAL VARIABLE MARGIN, ALTERNATIVE NO. 3 - RAPID RWD TRANSITION
($ Million)

	1980	1981	1982	1983	TOTAL	%
Imports	116	133	137	123	509	5.2
Small Cars and Trucks	625	1431	1995	2663	6714	63
RWD Cars and Trucks	934	862	447	363	2606	26.5

TABLE 4.1-6. ESTIMATED VARIABLE MARGIN REVENUES FOR THE SALE OF RWD CARS AND TRUCKS
($ Million)

	1980	1981	1982	1983	TOTAL
Treasury Base Case II	934	1192	1203	617	3946
Moderate RWD Transition	934	970	738	544	3186
Rapid RWD Transition	934	862	447	363	2606

limitation could prove a contraint during the third quarter of 1980 and early 1981. Similarly, if substantively all of projected profitability for the remainder of 1980 and early 1981 is not achieved, available guaranteed loans and reserves may prove inadequate. It should also be recognized that the restructuring pledged by Chrysler's Chairman in his July 14, 1980, letter to the Board could make up for some portion of the cash needs that might arise from unexpectedly poor conditions in 1980 and 1981.

It should be recognized that risks beyond those assumed in the Base Case exist and could render Chrysler not viable. Most importantly, it is doubtful that Chrylser could survive within the authorized level of guaranteed loans if current depressed auto industry conditions persist through the plan period and perhaps beyond the early part of 1981. However, no independent forecaster has projected these to persist.

Accordingly, although Chrysler's situation has worsened since May 10, there is a rational basis on which the Board may conclude that the company still has a reasonable prospect of continuing as a going concern in the automobile business. The conclusion assumes that conditions in the industry will improve as generally forecast and that the company will take additional drastic actions to cut costs as required."

Chrysler's projected post-1985 debt structure is cause for some concern. Chrysler projects[3] in the mid-1980's that the annual interest payments on its debt structure will be about $400 million/year or the equivalent of $300/motor vehicle without conversion of debt to equity.

Chrysler's long term financial position has been summarized in an April 25, 1980 letter from Booz, Allen and Hamilton (Chrysler Consultants) to Mr. Lee Iacocca, Chairman Chrysler Corporation:

"Longer term, a substantial risk exists for Chrysler and other U.S. automotive companies. If a further major improvement in fuel economy is required either as a result of foreign competition or by mandate from the U.S. government, another round of further product changes would be necessary. If the industry has to make another massive investment to improve fuel economy in the latter part of the decade, Chrysler might be in a weak position financially to fund a major retooling."[4]

The Booz, Allen and Hamilton letter[5] of July 31, 1980 to Mr. Iacocca summarizes the results of their review of the revised Chrysler Operating Plan dated July 10, 1980. An excerpt from this letter was quoted in Chapter 1 - Introduction to Part II of this report.

REFERENCES FOR CHAPTER 4

1. Office of Chrysler Finances, U.S. Treasury Department, July 15, 1980, Summary Report on Review of Chrysler Corporation's July 10, 1980 Operating Plan, page 10.

2. Office of Chrysler Finance, U.S. Treasury Department, May 8, 1980 Board Determination of Findings, Attachment 3, Op. Cit., pp. 1-42, Table XXI - Chrysler's Reliance on Rear Wheel Drive Vehicles.

3. Chrysler Corporation 1980 to 1985 Financing Plan, July 10, 1980, pg. 14 - Projected Net Interest Expense:

   1980 - $334M; 1981 - $475M;
   1982 - $442M; 1983 - $473M.

4. Booz, Allen and Hamilton. Letter to Mr. Lee A. Iacocca, April 29, 1980, Exhibit 5 of Chrysler Corporation Application to Loan Gurantee Board.

5. Booz, Allen and Hamilton. Letter to Mr. Lee A. Iacocca, July 31, 1980.

5. THE RSV: ITS POTENTIAL FOR PRODUCIBILITY AND MARKETING BY CHRYSLER CORPORATION

5.1 INTRODUCTION

This chapter examines the Chrysler Corporation's capability to produce and sell an automobile similar to those vehicles developed under the Research Safety Vehicle (RSV) project administered by the National Highway Traffic Safety Administration (NHTSA). The RSV project is designed to demonstrate with current technology that substantially improved safety, fuel economy, damageability, and low exhaust emissions can be achieved in an attractive comfortable, affordable car.

Two vehicles were developed under the RSV project, a modified production vehicle (Calspan RSV) and an all-new vehicle of innovative design (Minicars RSV). Chrysler was the major subcontractor for the Calspan RSV which was based upon a redesign of the French Chrysler 1976 Simca. Many of the design techniques developed in this project were subsequently applied by Chrysler in the design and manufacture of the Omni and Horizon. The Horizon was recently named as one of the few high volume domestic cars in 1979 to pass five different dynamic crash tests conducted by NHTSA at 35 mph.[1*]

This chapter is divided into four parts:

- Features of RSV's
- Consumer demand for safe automobiles
- Production cost and lead time
- Conclusions.

5.2 FEATURES OF RSV's

*References for Part II, Chapter 5 are listed at the end of chapter narrative.

5.2.1 Background

It is estimated that motor vehicle crashes in this country cost society $50 billion each year in medical and rehabilitation costs, lost wages, welfare, and property damage.[2]

As the new smaller and lighter cars join the older, heavier cars already on the roads, more collisions between large and small vheicles will occur. Of the passenger car occupants killed in two-car collisions, deaths in subcompact cars accounted for 25 percent of the total in 1977, rose to 27 percent in 1978, and climbed to 30 percent in 1979.

A comparison of fatalities in two vehicle accidents among vehicles of different sizes is shown in Table 5.2-1. This data clearly shows that occupants of smaller vehicles are at much greater risk than occupants of the larger vehicles in a large car/small car collision.

Occupants of the smaller cars generally are at greater risk because:

- In collisions between vehicles of different weight, the forces imposed on occupants of lighter cars tend to be proportionately greater than the forces felt by occupants of heavier vehicles;
- The occupant's survival space is generally less in small cars (survival space, in simple terms, means enough room for the occupant to be held in the vehicle's restraint system without being smashed into injurious surfaces and enough room to prevent being crushed or hit by a collapsing surface); and
- Smaller and lighter vehicles generally have less physical structure available to absorb and manage crash energy and forces.

A major purpose of the RSV program is to demonstrate technology which will prevent a sacrifice of lives and to save fuel as consumers move to smaller cars.

TABLE 2.5-1. A COMPARISON OF FATALITIES IN TWO-VEHICLE ACCIDENTS AMONG VEHICLES OF DIFFERENT SIZES

Size of Smaller Vehicle in the Crash	Size of the Larger Vehicle in the Crash: Compact	Mid-Size	Full Size	Pick-up, Van, or MPV	Two Units Combination Truck
Subcompact	3.4	6.3	8.2	8.4	51.5
Compact		1.9	2.3	3.2	25.0
Mid-size			1.3	1.7	28.8
Full-size				1.5	25.9
Pick-up, Van, or MPV					20.3

This chart illustrates the relative probabilities of fatal injuries to occupants when vehicles of different sizes are involved in accidents. For example, in a collision of a subcompact and a full size car the occupants of the smaller car are 8.2 times more likely to be killed than are the occupants of the full size auto.

Source: 1979 Traffic Fatalities Preliminary Assessments, February 1980

5.2.2 Minicars RSV

The Minicars RSV is shown in Figure 5.2-1. This vehicle incorporates innovative design and styling offering significant advances in safety and damageability. Many of these features are shown in Figure 5.2-2. It is a two-door, four-passenger sedan with an interior occupant space as large as most mid-size cars. Acceleration is 0 to 60 mph in about 20 seconds. Fuel economy is projected at 32 mph on the EPA combined cycle at 1981-1985* emission levels, when powered by a recent model Honda four cylinder spark ignition engine.* Testing of this RSV for safety, fuel economy, and emissions will be completed during 1980.[3]

The frontal and side structures are made of lightweight sheet metal sections filled with stabilizing foam. This structure provides a high level of occupant protection at a weight consistent with that found in the conventional structures currently used in cars that offer much less protection. The soft, resilient foam front end of the vehicle is designed to reduce pedestrian injuries. The driver and front-seat passenger are protected by an advanced air bag system, which has been tested at barrier crash speeds up to 50 mph. Side protection for front-seat occupants in car-to-car crashes at closing speeds of 50 mph has been demonstrated. The rear-seat passengers are protected by advanced (force limited) safety belt systems in barrier crashes up to 40 mph.[4]

The RSV can be equipped with a number of optional engines and drivetrains. An alternative turbocharged diesel engine based upon the stock Volkswagen Rabbit engine** is being installed in the RSV. With this engine it is estimated that the RSV will achieve a fuel economy of 50 mpg with good acceleration.

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*1981-1985 emission levels are 0.41, 3.4, and 1.0 grams per mile for hydrocarbons (HC), carbon monoxide (CO) and oxides of nitrogen (NO_X), respectively.

**The Omni/ Horizon engine also could be adapted to the RSV.

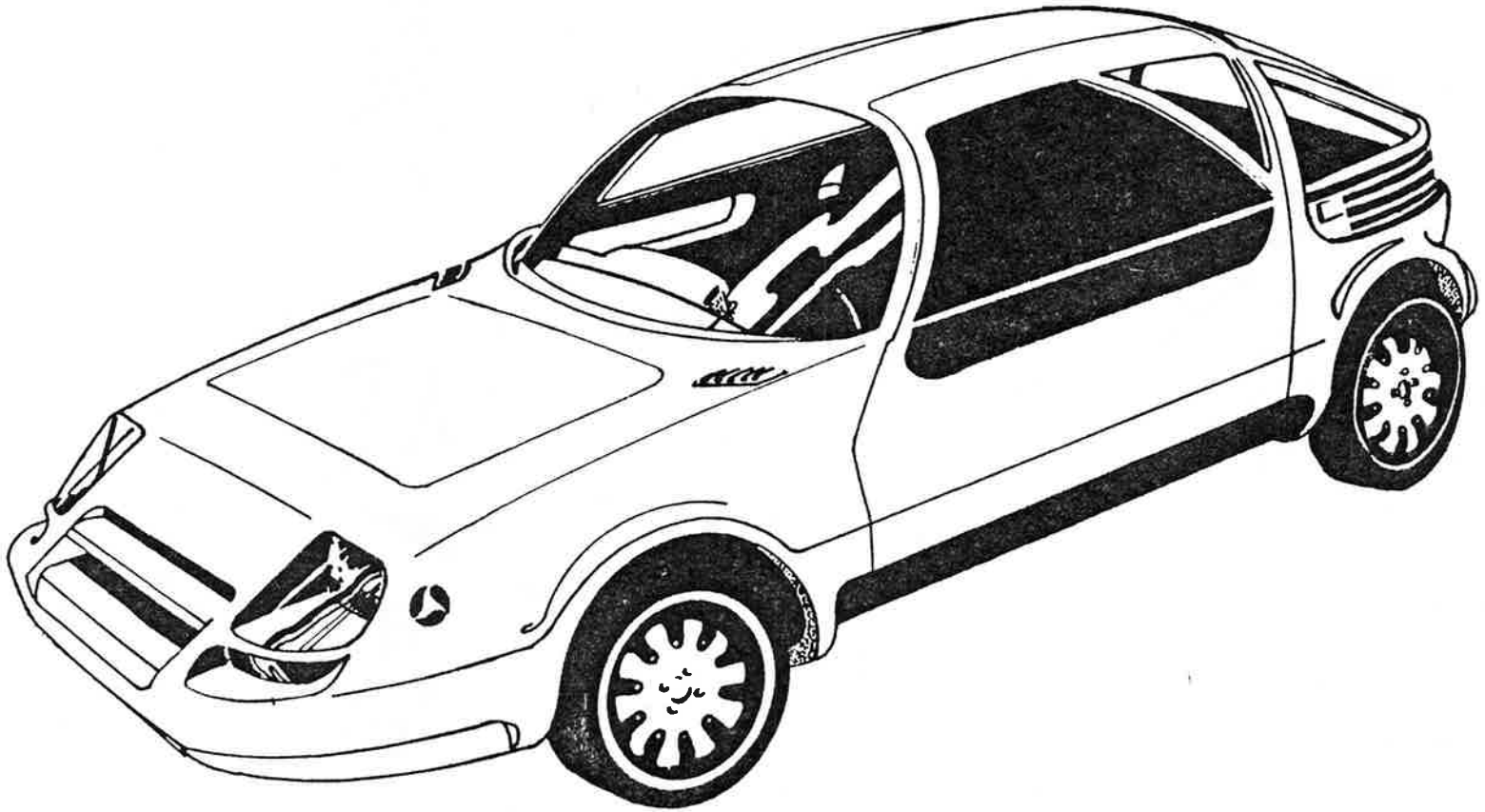

FIGURE 5.2-1. MINICARS RSV

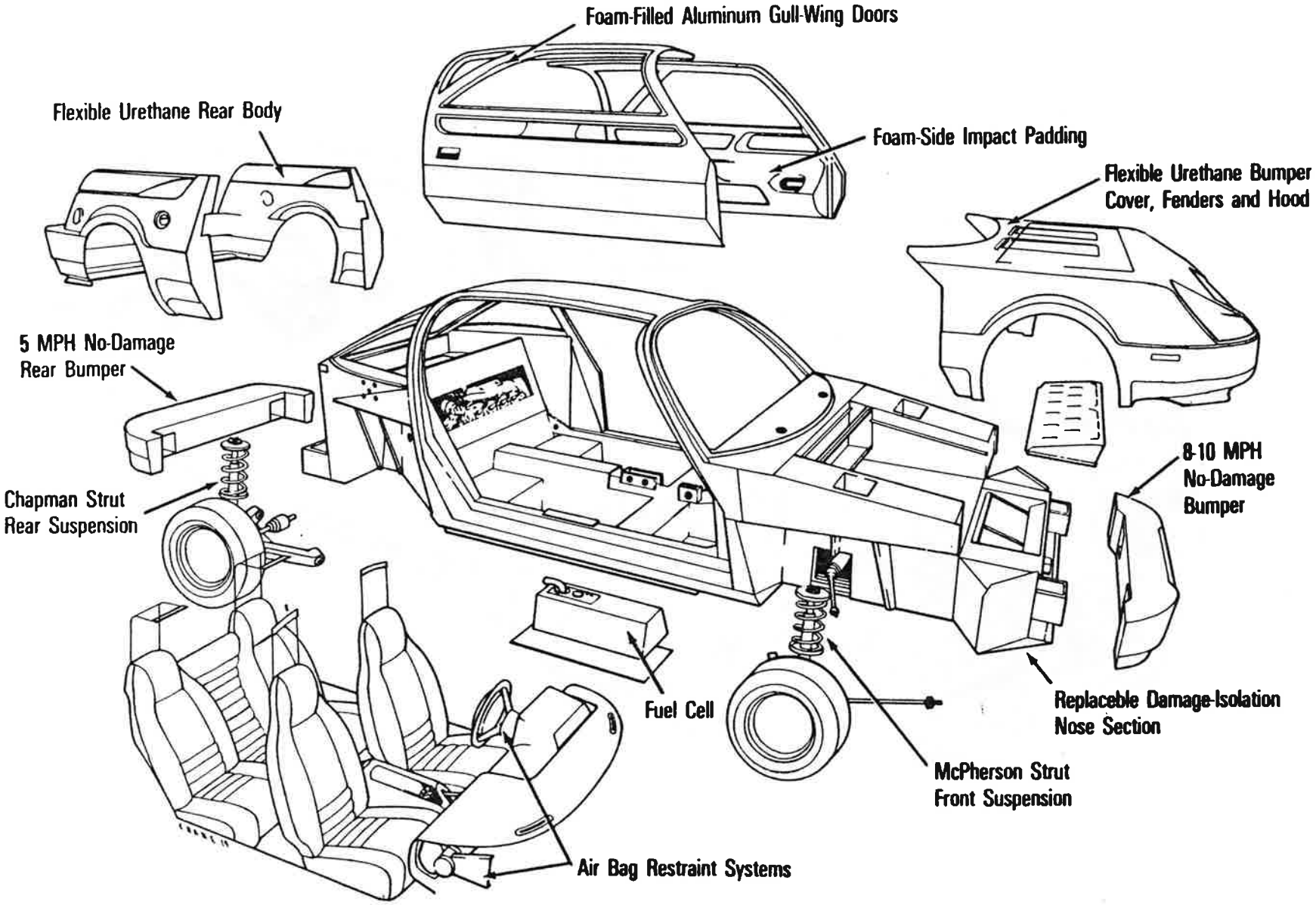

FIGURE 5.2-2. FEATURES OF MINICARS RSV

5.2.3 Calspan RSV

The design and styling of the Calspan vehicle utilizes a conservative, evolutionary approach based upon the modification of an existing European vehicle, the Simca 1308. The Simca 1308 was introduced by Chrysler France in 1975. It received strong consumer acceptance in Europe and was named the Car of the Year there in 1976. The General Motors X-Body, such as the Chevrolet Citation introduced in 1979, and the smaller Omni/Horizon vehicles introduced by Chrysler in 1978, have many of the characteristics of the Chrysler Simca 1308. Vehicles of this general design are highly fuel efficient and popular with consumers. The improved safety and damageability offered by the Calspan RSV would further enhance the marketability of this type of vehicle.

The Calspan RSV, shown in Figure 5.2-3, is a four-door, five-passenger sedan that incorporates front-wheel drive and employs a front transverse engine. The base engine is found in the 1978 Dodge Omni-Plymouth Horizon, which meets 1978-79 California emission control levels. Fuel economy on the combined EPA urban/highway cycle is 27.5 mpg. Acceleration performance is 0 to 60 mph in 17 seconds. An optional turbocharged gasoline engine has been developed which achieves 32 mpg fuel economy and 0 to 60 mpg in 12 seconds.[5] A turbocharged diesel developed by Volkswagen and tested by NHTSA and EPA has been demonstrated as an alternative. Both optional engines meet 1981-1985 Federal emission levels.[4]

Major safety improvements built into the RSV have been tested, and the results demonstrate automatic occupant protection in frontal car-to-car crashes at closing speeds of 80 mph* and up to 50 mph in side and 45 mph in rear impacts. The vehicle's plastic foam front significantly reduces potential impact injury to

*Approximately equivalent to a barrier crash at 40 mph.

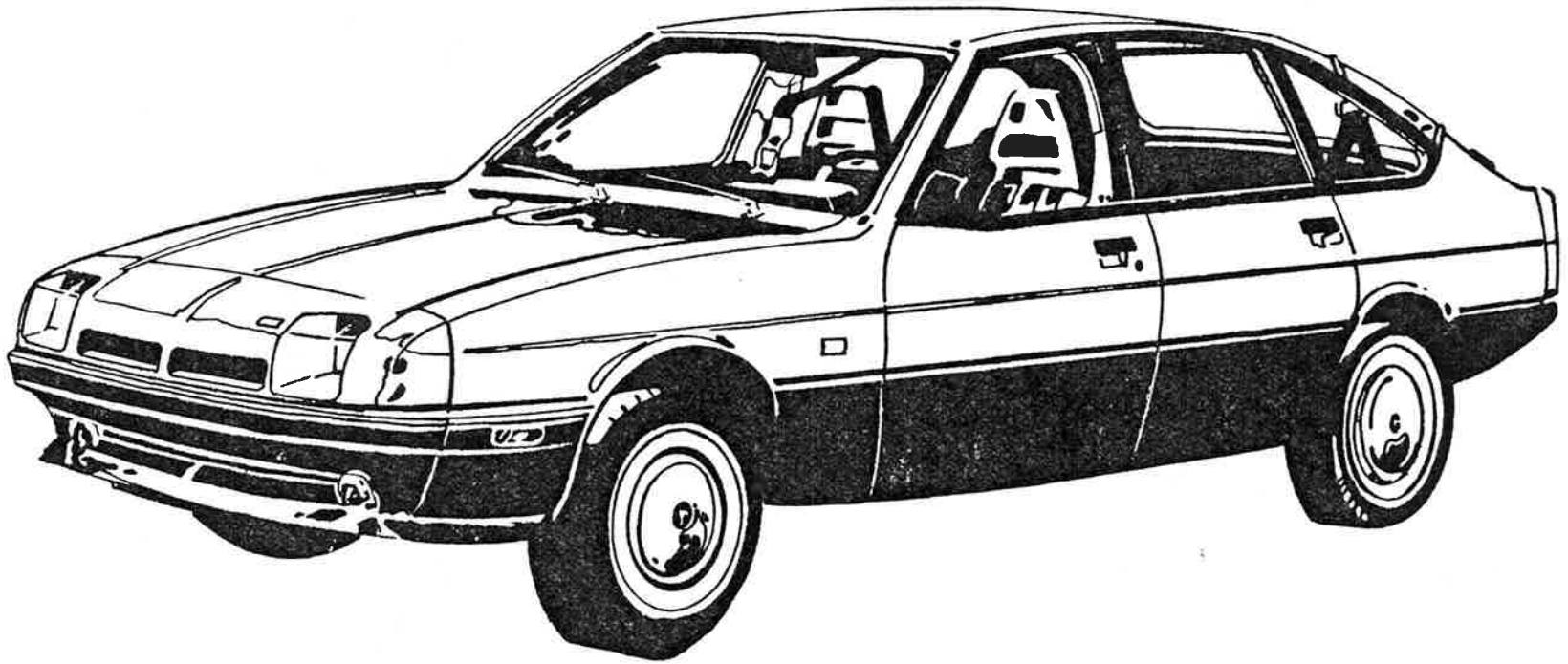

FIGURE 5.2-3. CALSPAN/CHRYSLER RSV

pedestrains at speeds up to 25 mph. The vehicle is equipped with soft face front and rear bumpers which remain undamaged in 7 mph frontal barrier and 5 mph rear impacts. These bumpers greatly reduce damage to other cars in a variety of low speed collisions.

5.3 CONSUMER DEMAND FOR SAFE AUTOMOBILES

A 1979 GM study showed that consumers are overwhelmingly in favor of some kind of occupant restraint system." A marketing study done by GM in 1978 on automatic restraints showed a strong willingness on the part of new car buyers to pay extra for very comfortable and convenient automatic belts or for air bags.

Adverse consumer reaction to vehicles that have been publicized as having severe safety problems is a matter of record. If consumers believe a vehicle is unsafe, the sales and the price of that vehicle decline. This has been demonstrated recently in the decline in sales of Ford Pintos after publicity concerning problems with their fuel tank systems in rear impact collisions.

Qualitative research on consumer attitudes conducted by NHTSA in 15 locations around the country in 1978 and 1979 indicated that two perceptions regarding vehicle safety were found to be widely held by consumers. First, safety is related to car size with large cars being considered safer than small cars. Second, except in well publicized cases such as the Ford Pinto, no difference in safety generally is perceived among vehicles in a given weight class.[6]

In the absence of knowledge regarding positive differences in the safety of small cars, consumers frequently indicate that they buy larger cars because they believe them to be safer. Consumers who purchased smaller cars for improved fuel economy generally recognized that they were sacrificing some crash protection in moving from a larger to a small car.[6]

The fuel economy ratings prepared by EPA have been most useful in distinguishing differences in fuel economy among automobiles and light trucks. The fuel economy ratings have become a major consumer consideration in purchasing a car.

As a first step toward a Federal New Car Crashworthiness Rating System, NHTSA recently released the results of crash tests of selected 1979 and 1980 models. The tests involved crashing cars into a fixed barrier in frontal tests and in moving barrier rear tests at speeds of 35 mpg -- five miles per hour above the existing standards. Only 4 cars out of 24 tested passed these higher level tests.[1] The Calspan and Minicars RSVs are designed to pass these tests at 40 and 50 mph, respectively.[4]

During April 1980, the NHTSA conducted a series of qualitative consumer discussion groups in six cities throughout the country designed to gain insight into the attitudes of the car buying public with respect to their acceptance of the RSV and its safety features.[7] The format of the discussion groups was to have the participants discuss their current automobile and their desires for features, attributes and capabilities in their next vehicle. A short film on small car/large car crash tests was then shown, followed by a film of the RSV in various crash test situations. Within this context, approximately a quarter of the discussion group participants expressed an interest in learning more about the RSV.

NHTSA has also displayed the Minicars RSV in numerous cities and communities throughout the United States and the public has responded favorably. Postcards returned by those who have seen the RSV exhibit posed three main questions: (1) Why hasn't Detroit developed such a car? (2) When will it appear on the market? (Where can I buy one?) and (3) How much does it cost.[8*]

NHTSA is continuing to assess the parameters of consumer preference and perceptions of improved automotive safety. However, further work by the manufacturer would be required to determine the characteristics and size of the market for the RSV, and how to position an RSV in the market.

*To date the sample size is 500 postcards. Since the respondents are voluntary, this survey does not claim to be representative of the population.

In the absence of market survey data on the specific RSV vehicles, a rough estimate of market potential was made. Based upon several assumptions dealing with current usage of safety related restraint systems, the overall size of the small car market, and 1979 market shift to compact and small cars, a total demand for small, fuel-efficient cars with advanced safety features of anywhere between 250,000 and 1,000,000 cars per year was projected. (Marketing data indicates that in 1979, approximately 6 million compact and smaller cars were sold. Of these, 2.5 million were sold to consumers who previously owned mid-size and full-size cars. Assuming that 9 percent of this 2.5 million consumers were seat belt wearers and, therefore, interested in higher levels of safety, there would be a market size of 225,000 in 1979. This market is increasing rapidly as owners of large cars shift to smaller cars. A second estimate of the potential market for safe automobiles could be based upon the 18 percent of the small car occupants who wear belts. Assuming the 18 percent of the 6,000,000 small car buyers are interested.) How many of these safety conscious consumers, and how many consumers from other groups would select the RSV would depend on price and other attributes of the vehicle.

Added to the consumer market potential is the annual purchases of passenger automobiles by the General Services Administration (GSA). The GSA maintains a fleet of approximately 95,000 passenger automobiles and purchases approximately 15,000 new automobiles each year for use in its civilian and military fleets. It is possible that a portion of the vehicles purchased by the GSA could include RSV-type cars even though initially, because of low volume production, they may carry a higher price tag than the less safe vehicles offered by competitors.

In summary, it appears that there is a public interest in safer automobiles in the United States. Consumers have traditionally equated automobile safety with size. The market shift to smaller cars may accelerate consumer demand for safe, small

cars. Rough estimates indicate that a market in the order of perhaps 250,000 to 1,000,000 cars per year may exist for small, safe vehicles. Additional market research is required to quantify this demand and to determine how to market the RSV. An impediment to marketing safety has been the inability of the consumer to distinguish exceptional levels of safety.

5.4 PRODUCTION COST AND LEAD TIME

5.4.1 Introduction

In order to evaluate the difference in cost and lead time for producing an RSV and a conventional car, it is necessary to examine the production development process for a conventional car. All discussion of this process will be followed by a description of two options:

(1) Produce the Minicars RSV,

(2) Produce a car similar to the Calspan RSV.

Finally, the possible production of these vehicles by Chrysler Corporation will be discussed.

5.4.2 Production of a New Automobile

An automobile is a complex system consisting of several thousand components. The components are manufactured with facilities and equipment used in the production of one part or a family of parts in order to take advantage of lower costs. A change to any component or group of components of the vehicle requires changes to the facilities and equipment for the manufacture of that component.

Generally, the activities required by a motor vehicle manufacturer to bring about product change can be categorized as follows:

- Corporate Planning (product conceptualization, market research, cost estimation, finance, etc.)
- Research and Development, Styling
- Advanced Engineering
- Product Production and Manufacturing Engineering
- Manufacture and Installation of Tooling, Facilities and Equipment
- Preproduction and Launch.

Each of these activities has its associated lead time and costs. In evaluating possible production strategies for product change, it is useful to use the lead time and cost of these activities as a basis for comparison.

The overall length of a production program for a model year vehicle depends on the magnitude and complexity of the changes from the previous model. A face lift may involve only changes to the front and rear exterior trim and to the interior, and this does not involve major change to assembly or stamping plants. A reskin involves changes to the exterior body contours but the basic body structure and drivetrain remain the same. A reskin, however, involves extensive design work and major changes to the assembly and stamping plants. An all-new-car requires extensive engineering, test, design and complete changeover of tooling in the assembly and stamping plants. An all-new drivetrain involves a long program for design, development and test of components and the changeover of engine, transmission, and other component plants.

Lead times for these changes vary. For example, to develop a new engine from experimental model to production hardware could take as long as ten years -- 6-7 years for development and testing of engine components and 3-4 years for production design, sourcing, and manufacture and installation of the production tooling and equipment. All-new-car programs which do not involve the development of all-new powertrain components typically take 3 to 3-1/2 years. A company can, of course, shorten this time frame if it chooses, although shorter lead time could increase costs and risk.

There are two major phases of the all-new-car production cycle -- the planning and design phase and the hardware phase. These phases are shown in Figure 5.4-1. The hardware phase commences when the vehicle is approved for production about two years before the first production car comes off the assembly line (JOB 1). At this time, the selection of tooling for vehicle assembly has begun. Transfer line machinery for manufacture of

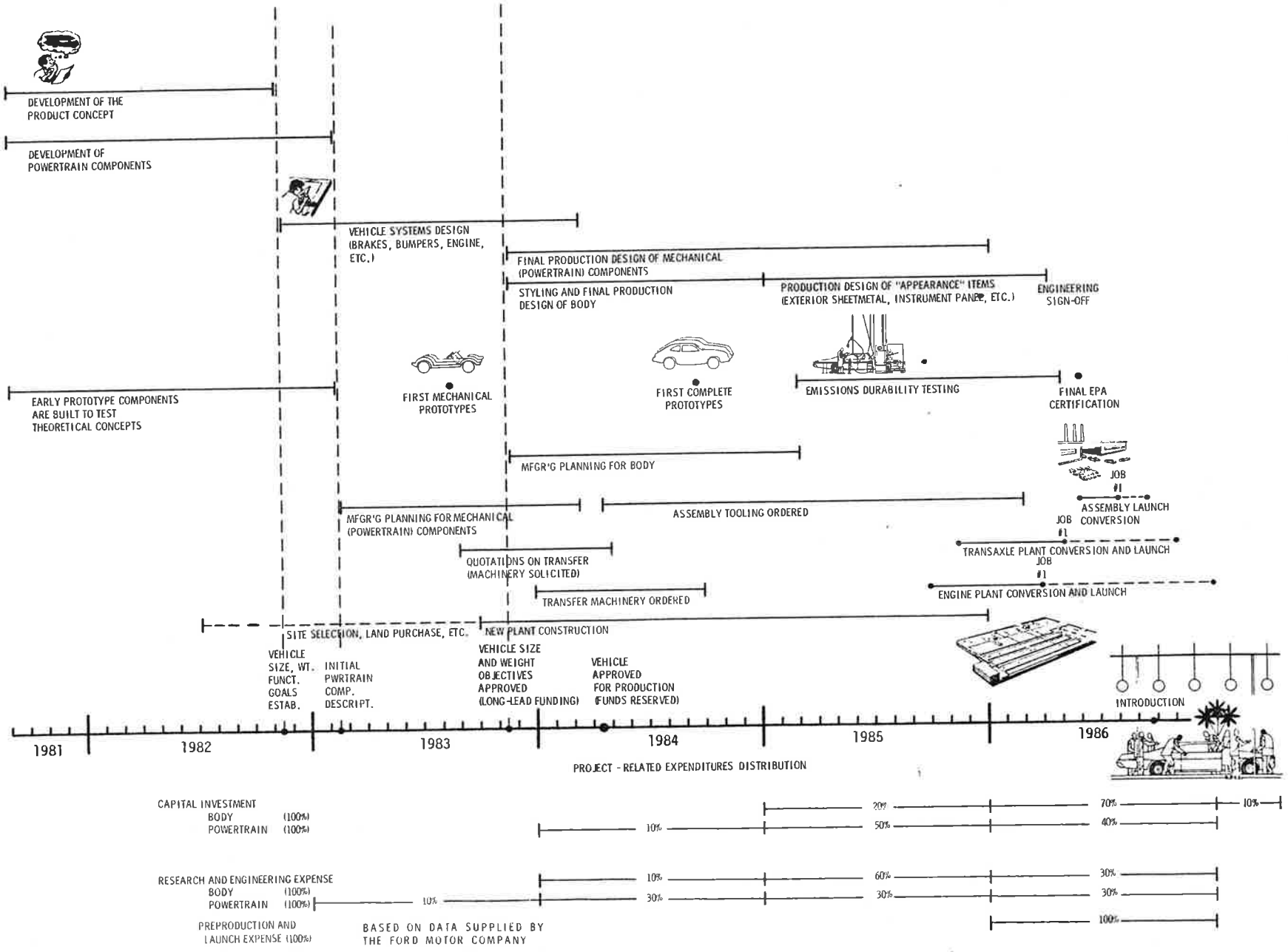

FIGURE 5.4-1. TYPICAL PROGRAM TIMING AND LEAD TIMES FOR AN ALL-NEW 1986 M.Y. VEHICLE

components, if required, may be ordered somewhat earlier. This hardware period of two years before JOB 1 cannot be compressed substantially, because it involves lead time for the manufacture of production tooling and equipment which are relatively constant for various types of machinery and equipment used by the automotive industry.

The length of the planning and design phase, on the other hand, can be as short as a year or as long as three depending on the magnitude of the task, the resources and priority committed to the job, the schedule of other product changes and the risk that the manufacturer is willing to take.

The decision on what product to make and when to introduce that product in the market involves risk for the manufacturer. Decisions based on market research made early in the program -- which determine product concept, styling, size and weight -- result in the investment of large sums of money several years later. Changes in the market after the production decision is made may result in producing the wrong product. In the current market, domestic manufacturers have not produced sufficient numbers of marketable subcompact cars to meet the competition of the Japanese manufacturers.

During the planning and design phase the manufacturer carries out extensive market research to determine the concept of the car and how to position it in the market. Clay models are constructed to evaluate styling features and prototype components are built to test engineering assumptions and calculations. At the end of this phase, product concept, vehicle size, weight and functional goals have been established. Initial powertrain components have been identified. The design of vehicle systems such as the engine, transmission, brakes, bumpers, electrical, etc., are completed. Mechanical prototype vehicles are constructed for testing. About 2-1/2 years before production, final production design of powertrain components, styling and final production design of the body, and manufacturing planning for building the body are begun.

At the beginning of the hardware phase, the vehicle is approved for production. Assembly tooling and machinery for manufacture of powertrain components are ordered as necessary. Funds are set aside for the purchase of production equipment which will be delivered over the succeeding two years. During this phase, the manufacturer is committing large resources to the program. About 80-90 percent of the total cost of the program will be expended during the succeeding two years.

In the last 18 months of the program, the final production design of the exterior sheet metal and trim and the interior trim and instrument panel are completed, emissions testing is begun, and drivetrain component plants are convertered to production. The first production drivetrain components are completed 4-6 months before the JOB 1.

The estimated expenses and capital costs for production of a new car are listed in Table 5.4-1.

In many cases, manufacturers are able to use existing engines and drivetrains and other parts on new models, and thereby substantially reduce the costs as well as the lead time. Table 5.4-1 shows two options -- one assuming an existing drivetrain is available or can be procured from a supplier, the other assuming a new drivetrain must be developed and produced. When a new drivetrain is required, substantially higher costs are involved, as shown in Table 5.4-1.

The costs for producing a new vehicle fall into two categories -- Expenses and Capital Costs. The Expenses include R&D, Styling, Advanced Engineering, Product/Manufacturing Engineering and Preproduction Launch Costs. These Expenses generally run between $110 to $140 million on a typical car using an existing drivetrain.

Table 5.4-1 also shows the capital costs which generally range from $280 to $340 million for a new vehicle which uses an existing drivetrain.

TABLE 5.4-1. TYPICAL EXPENSES AND CAPITAL COSTS FOR ALL-NEW-CAR PROGRAM FOR ONE CAR LINE

COST CATEGORY	COSTS IN MILLIONS OF DOLLARS	
EXPENSES	USING EXISTING DRIVETRAIN	NEW DRIVETRAINS
R&D, Styling Advanced Engineering Product/Manufacturing Engineering Pre-Production and Launch	110-140*	310-370*
CAPITAL COSTS		
Assembly Plant	60-80	60-80
Stamping Plant	120-140	120-140
Engine Plant	-------	200-240
Transmission Plant	-------	300-350
Component Plants	100-120	100-120
TOTAL	390-480	1090-1300

Note: Costs in 1980 dollars
Capital Costs include only tooling and equipment
Source: Automotive Manufacturing Capital Data Base, Transportation Systems Center
*Total for all expenses

The total costs of producing an all-new car are about $390 to $480 million using an existing drivetrain and are $1.09 to $1.3 billion using a new drivetrain.

5.4.3 Option 1 - Produce the Minicars RSV

The Minicars RSV, as described in 5.2.2, is a vehicle of innovative and unconventional design, having exceptional safety performance. The scope of the program in terms of budget and schedule is limited to the engineering development necessary to fabricate a minimum number of test vehicles to demonstrate that design performance can be achieved. The principal areas of engineering development remaining are the environmental and durability testing under operational conditions. Testing under rough road vibration conditions for extended periods at extremes of temperature and humidity, for example, exposes many design weaknesses undetected in the laboratory. Such testing requires several vehicles operating on a rigorous test course, redesign as necessary, and retesting to validate the design of an all new vehicle. In the case of a new structural concept such as the foam-filled sheet metal system of the Minicars RSV, this process would be carried to an advanced stage of completion prior to a production decision to avoid undue risk. This testing is normally conducted on the first mechanical prototypes which are generally available about three years from production (see Figure 5.4-1). A few RSV test vehicles could be made available to initiate this testing, and drawings of the test vehicles are available as the starting point for fabrication of additional test cars and upgrading the design as test results are obtained. In view of the innovative design of the Minicars RSV, it is estimated that a 12 to 24 month engineering test and development period will be required prior to production. However, much of this could be accomplished concurrently with production hardware development. The fact that prototype RSV's are available now for developmental testing could reduce the nominal five-year cycle shown in Figure 5.4-1 by 1 to 2 years providing priority is given to the program and testing of prototypes begins immediately.

Minicars RSV has significant features which will affect its manufacturability when compared to conventional domestic automotive design. The major areas of difference from conventional car design are as follows:

- Plastic and foam front and rear structure for reduced damageability and pedestrain protection.
- Flexible plastic fenders and exterior body surfaces.
- Frontal and side structures of lightweight sheet metal with stablizing foam.
- Automatic restraint systems.

Production tooling for the Minicars RSV must be designed and manufactured as in an all-new-car program. Although processes for manufacture of the foam-filled body panels have not been developed for the automotive industry, urethane foam parts have been manufactured in the refigerator and portable cooler industries for many years and similar processes could be utilized for automobiles. Flexible bumpers are state-of-the-art components and can be supplied by component suppliers such as Davidson Rubber. Flexible fenders and other body parts can also be produced by suppliers of the automotive industry. Air cushion restraint systems should be available in production by year 1982 as a result of the implementation of FMVSS 208 (automatic restraints).

The estimated expenses and capital costs for production of the Minicars RSV are as follows: The Research and Development and Styling expenses which are normally incurred by a new car development program have been reduced by an estimated $14 million as a result of the design and development work already completed by Minicars for the Department of Transportation. Therefore, total expenses should be in the $110 to $120 million range shown in Table 5.4-1. Capital costs are estimated as follows: $70 million for rearranging fixtures, modifying vendor tooling for trim, moldings and other parts, and installing the foaming system; $120 million for new dies and modifications to

the stamping plant; and $100 million for tooling for the automatic restraint system, no-damage bumpers, and molded plastic parts for front-end and fenders and other components. The total expenses and capital costs for the Minicars RSV program are estimated at $400 million. As shown in Table 5.4-1, the total costs for a typical new car program are normally in the range of $390 to $480 million dollars. The level of the cost for preparing to manufacture the RSV is typical of that of any new car program. It is assumed that components for a rear engine, rear drivetrain configuration are available in the manufacturer's inventory or can be purchased from another manufacturer. If not, additional capital costs (as shown in Table 5.4-1) would be needed to design, develop and manufacture tooling for these components.

The feasibility of mass producing an automobile like the Minicars RSV was studied by the Budd Company, under subcontract to Minicars, Inc. The objective of the work was to take the basic concept and structural design and develop it to produce a volume of 300,000 units per year with particular emphasis on the sheet metal body, and foam filling that body. The study was based on a comparison of the producibility of the Minicars RSV utilizing the Ford Pinto as a baseline.[9]

This study indicates that the Minicars RSV is mass producible in quantities of 300,000 per year with process changes for manufacture of the foam-filled body structure. The cost for tooling for the RSV with advanced systems was estimated by the Budd Company to be about $134 million compared with the baseline Pinto of $120 million in 1980 dollars. This estimate compares reasonably well with the typical capital costs cited in Table 5.4-1 when the Budd estimate is adjusted on the assumption that no changes are required in assembly plants other than for foam filling. The Budd Company also estimated a manufacturing cost of the Minicars RSV at $5250 in 1980 dollars. The price to consumers was estimated to be about $6800.

5.4.4 Option 2 - Produce a Car Similar to the Calspan Safety Vehicle

The Calspan RSV was developed by modifying an existing car (the Simca 1308) to upgrade its performance in crashworthiness, pedestrian protection, and damageability by improving the structure and the occupant restraint systems.

The structural changes needed for controlled crushability in the area ahead of the cowl section and the passenger compartment can be accomplished through simple modifications to the existing structure. The engine supports and compartment of the Calspan RSV were redesigned to prevent the engine from infringing on the passenger compartment in frontal collisions. Other areas requiring modification to ensure the integrity of the passenger compartment include roof structural elements to provide rollover protection and strengthened doors. These structural changes can be accomplished using existing production facilities while maintaining normal assembly line processes.

The occupant restraint system consists of an air cushion on the driver side and an automatic air belt system for the front-seat passenger. For a production vehicle, one of these systems probably would be selected and produced by a component supplier. The foam filled front and rear bumpers are state-of-the-art components and could be produced by several component suppliers.

The feasibility of producing the Calspan RSV in annual volumes of 300,000 in a single assembly plant in the United States using conventional sources for components has been studied by Chrysler.[10] Engineering, program, tooling, facilities, preproduction, and launch costs were estimated by Chrysler to be about $76 million in 1980 dollars over and above the cost of the baseline tooling for the Simca. Figure 5-4.2 contains representative estimates of baseline tooling and capital costs and shows a range of $200-$260 million (in 1980 dollars) for an existing drivetrain. The lead time needed to make changes for

sumer price differential for this vehicle over the baseline Simca was estimated by Chrysler at about $1,800 for the basic occupant protection and pedestrian protection features. The base Simca was not imported into the U.S., therefore, it did not meet U.S. standards for safety or emissions. The cost differential between the Calspan safety vehicle and a base vehicle which meets the standards of the mid-80's should be less than the differential estimated by Chrysler.

It should be noted that the Simca 1308 was produced in Europe beginning in 1975. The Simca 1308 was an accurate forerunner of the successful U.S. designs to come later such as the Chrysler Omni/Horizon and the GM X-cars. These more recently designed vehicles have a higher level of safety than the base Simca 1308 but offer less effective protection than the Calspan safety vehicle.

Rather than using the Simca 1308 as a base vehicle, it would probably be more attractive to a U.S. manufacturer to utilize the safety design features of the Calspan vehicle in one of its production cars.

Producing an RSV-type car by using another existing production car as a base would be substantially cheaper and require less lead time than an all-new-car program (shown in Table 5.4-1) and would be similar in scope to production of the Calspan RSV.

Since the body structure needs to be substantially changed in the front end, floor, doors and roof, this change could be combined with a reskin of the body exterior to give the car an all-new look at an intermediate point in the model change cycle. It is likely that the dies for the exterior of the body would have to be changed anyway due to the significant modifications in the body structure. The instrument panel and steering wheel would be redesigned to incorporate the automatic restraint system. No damage bumpers and soft front end components would be designed by the manufacturer and furnished by component suppliers. Interior trim would be redesigned to incorporate safety padding. Exterior trim moldings, instrument clusters,

and other parts probably would require little change. Tooling costs for those components are included in the costs of assembly plant conversion.

The costs of the program to upgrade an existing car to include features of the Calspan RSV are listed in Table 5-4.2. Costs for this approach are in the range of $250 to $330 million. Expenses of such a program are about the same magnitude as those incurred for any intermediate model year program involving a reskin and are less than the all-new-car program. Extensive changes are required in the assembly and stamping plants due to the new body design. Should it be possible to design a new body without manufacturing new dies for the large body stampings, the costs for the stamping plant could be substantially reduced -- possibly by $100 million. Additional costs would be incurred for tooling for components manufactured by vendors such as the automatic restraint systems and the damage resistant soft front bumpers.

The lead time for such a program would be 3 to 3-1/2 years, depending upon the length of the design and planning phase.

5.4.5 Producibility of an RSV-Like Vehicle by Chrysler

For Chrysler, the manufacture of the Minicars RSV, Option 1, involves higher technical risks than the production of a conventional vehicle because it requires changes in production methods. The cost for launching an all-new-car program to produce quantities of 300,000 units per year is estimated at $400 million. It is assumed that Chrysler would be able to purchase the transmission and engines from another manufacturer or supply them from its own capacity. Production tooling for the Minicars RSV is estimated slightly higher than the conventional tooling, but this additional cost is offset by the savings from the government development to date. It is estimated that a RSV could be produced in 3-5 years depending upon the relative priority and risk acceptable to Chrysler. In the near future, Chrysler will have

TABLE 5.4-2. TYPICAL EXPENSES AND CAPITAL COSTS FOR A PROGRAM TO PRODUCE ONE CAR LINE OF EXISTING CAR UPGRADED WITH SAFETY FEATURES

COST CATEGORY	COSTS IN MILLIONS OF DOLLARS	
EXPENSES	USING EXISTING DRIVETRAIN	NEW DRIVETRAIN
R&D, Styling Advanced Engineering Product/Manufacturing Engineering Pre-Production and Launch	50-70**	240-290**
CAPITAL COSTS		
Assembly Plant	60-80*	60-80*
Stamping Plant	120-140*	120-140*
Engine Plant†	-------	200-240
Transmission Plant	-------	300-350
Component Plants††	20-40	20-40
TOTAL	250-330	940-1140

Costs in 1980 dollars
Capital costs include only tooling and equipment
*These costs can be reduced substantially if major stamping dies can be used for RSV body
**Total for all expenses
†4-cylinder engine plant.
††For tooling for vendor-produced special components including automatic restraining systems and soft bumpers. Major component systems, such as steering and suspension are assumed to reamin unchanged.

Source: Automotive Manufacturing Capital Cost Data Base, Transportation Systems Center

to decide on what new cars to offer in the 1984 and 1985 model years. At that time, Chrysler's production should include derivatives of the Omni/Horizon (L-body) and the Aspen/Volare replacement (K-body). A management decision must be made on whether or not to commit funds to tooling for a new large car. Chrysler may want to consider production of a new vehicle which incorporates many of the attractive elements of the RSV experimental vehicles when it plans its new car production program.

Two years ago, production of the Calspan safety vehicle might have been realistic for Chrysler. At that time, Chrysler France was building the Simca 1308, which was the base vehicle for the Calspan RSV. Much of the engineering for the RSV already had been done by Chrysler under a subcontract from Calspan. There remained advanced engineering and additional production engineering to incorporate the features of the RSV into the production design and the manufacture of the tooling. During the past year, however, Chrysler sold its interest in Chrysler France, and the tooling for the Simca 1308 belongs to Peugeot. Now, the cost of engineering and retooling a plant in the United States to manufacture a modified Simca would be equivalent to a new car program -- about $280 to $340 million for tooling and equipment and $110 to $140 million in engineering, pre-production and other program costs. Other alternatives may be more advantageous to Chrysler.

The alternative of modifying an existing production car in the same way that Calspan/Chrysler modified the Simca 1308 may be attractive to Chrysler. This alternative requires less time and fewer resources than an all-new-car program and Chrysler is thoroughly familiar with the RSV design. As a result, Chrysler experience and expertise could be utilized to quickly modify another base vehicle such as the Omni/Horizon. This modified safety vehicle could be introduced at an intermediate point in the model change cycle with an all-new look as well as improved safety and damageability performance. It is likely that Chrysler could use the same drivetrain as the car it replaces. Should

the same major dies for stampings be used, the cost of this alternative could be in the range of $150 to $230 million. The upgrading of safety performance of the Omni/Horizon might extend the life and the competitive edge of this vehicle at a fraction of the cost of developing an all-new car. The same prospect would exist 2-3 years from now with respect to the K-body cars. A detailed market survey would, of course, be required to determine the viability of this option compared to other alternatives.

5.5 CONCLUSIONS

5.5.1 Marketability

- Existing small cars are not as safe as large ones, and are so perceived by consumers.
- RSV-type cars could provide a higher level of safety without compromising energy and efficiency.
- Most consumers recognize they are trading safety for fuel economy when they move to a smaller car, and are therefore placing increased priority on auto safety.
- Marketable demand for small safe cars like the RSV may exist, and preliminary estimates of such demand range from 250,000 to 1,000,000 vehicles per year.
- Research is needed to determine the extent of the demand, and the profit potential for building such a car.

5.5.2 Producibility

- RSV-type cars can be mass produced.
- The cost and expenses of developing new tooling to produce a safe, fuel-efficient car are about the same as those for launching a conventional new model -- on the order of $400 million.
- Production strategies include two options:
  1. producing the Minicars RSV
  2. producing a new vehicle similar to the Calspan vehicle through a process of modifying an existing production model.

  Option 1, producing the Minicars RSV, provides a vehicle substantially ahead of the competition, but it also carries considerable risk because it is a departure from current design and production practice. Studies estimate the price to the consumer of this RSV vehicle at about $6800 in 1980 dollars.

Option 2, producing the Calspan vehicle, would cost about the same for Chrysler to build as the Minicars vehicle. Studies by Chrysler estimate that the price of this car would be approximately $1,800 higher than the 1975 French Simca on which it was based.

A more conservative alternative within this option would be to upgrade the safety of an existing vehicle being produced by Chrysler -- such as the Omni/Horizon -- by integration of RSV design features. The cost of producing this modified vehicle is much less than the cost of producing an all-new-vehicle. Application of further Calspan/Chrysler safety vehicle technology in the building of the Omni/Horizon (in conjunction with a reskin of the model) has the potential advantage of extending the production life of this vehicle at a relatively low cost.

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APPENDIX

PROGRAM SURVEY:

DEALING WITH THE ECONOMIC AND EMPLOYMENT IMPACTS OF AUTO PLANT CLOSINGS

DEVELOPED BY

THE NATIONAL COUNCIL FOR URBAN ECONOMIC DEVELOPMENT (CUED)

WITH CONTRIBUTION FROM

THE DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT (HUD)

PREFACE

The National Council for Urban Economic Development (CUED) has been asked by the Transportation Systems Center of the Department of Transportation to compile a survey of the federal and state programs that could be made available to assist communities faced with economic distress due to the closing of a Chrysler auto plant.

The three major concerns defined by the Transportation Systems Center are: 1) What programs are available to assist communities to cope with the loss of tax revenue; 2) What programs are available to assist the other businesses in the community to expand to make up the job loss; and 3) What programs are available to assist the displaced worker to deal with the loss of salary and find new skills and new employment? Examples of adjustment assistance programs and strategies were also solicited by TSC. The eight states TSC chose to be included in the survey were Delaware, Illinois, Indiana, Michigan, Missouri, New York, Pennsylvania and Ohio.

Because many of the federal assistance programs are only available to specific, qualified communities such as: The Community Development Block Grant program; the Urban Development Action Grant program; The Economic Development Administration programs, it is difficult to determine how useful these programs will be until the specific plant locations are identified. The reader is cautioned that this survey should be viewed only as a starting point for a thorough review and analysis of the relevant programs. This report is an inventory of the available state and federal programs that can serve as a guide for future information collection.

OBSERVATIONS

While compiling this material, the project staff made several observations concerning the preparedness of the federal and state

economic development system for dealing with large scale plant closings such as may occur with the Chrysler Corporation. It is premature to call them conclusions. At the moment they are simply thoughts that deserve further data collection and analysis.

It seems clear that the immediate congressional budget struggles are going to impact the amount of federal funds available to assist communities dealing with the impact of Chrysler plant closings. Authorization and appropriation battles over the EDA Trade Adjustment Assistance program are going to determine the resources available for dealing with economic distress.

A less obvious observation is that none of the states interviewed gave evidence of having a strategy for dealing with Chrysler plant closings. Somewhat more disturbing is the fact that, with the exception of Illinois, none of the states' appear to have a pre-established mechanism for developing a state response to this kind of economic disaster. It should be empahsized that our purpose was to gather the program strategy of the states. We may well have missed very careful and well established plans for dealing with this very real possibility. Yet it is worth noting that if such plans exist we did in fact miss them. The states appear to be adopting a basically reactive posture allowing the federal government to develop the policies and the response.

This leads to a third observation that little analysis, at either the federal or the state level, has been given to the magnitude of the supplier problems associated with Chrysler plant closings. Clearly, there are a number of suppliers dependent upon Chrysler production. In our very brief review we were not able to discover any studies that have dealt with questions such as the geographic location of these suppliers, the extent to which they would be able to shift their market to other car makers, the number of jobs involved or the skill levels of the employees, the federal and state programs available to help these suppliers deal with dislocations. We are quite sure that, if these questions have been analyzed, the results have not been cranked into the state decision making processes.

A fourth observation is that it appears that the largest gap exists in programs that help communities deal with the loss of tax revenue due to a large plant closing. There are programs, although spotty and sometimes ill conceived, which help workers find new skills and new jobs to cope with the loss of a paycheck. There are also programs to stimulate new development to replace the lost jobs. There do not, however, appear to be programs to deal with a communities loss of tax revenue. A significant plant closing, particularly in a smaller community, is likely to have a significant impact upon community revenues. Property taxes, payroll and sales taxes will drop while local services will in the short run remain stable or even increase. In this context it should be mentioned that probably the most significant aspect in considering the impact of a plant closing is the development capacity of the local government. Without knowing the communities in question, the aspect of the problem was beyond the scope of this effort.

The final observation regards a national industrial policy. An intense economic debate has been growing about the desirability of a national industrial policy. The debate has been brought into sharp relief by isolated, but significant, actions such as government aid to Chrysler and the disappearance of a U.S. television manufacturing industry.

The shaky competitive position of many of the nation's maturing industries such as steel, auto, and rubber, combined with pressures on the federal government to adopt programs allocating credit for purposes such as small business development, pollution control, minority business, and urban infrastructure rebuilding have put the federal government at the crossroads of industrial policy making. An industrial policy would help the government get better control over its hundreds of subsidy, tax, spending, and regulatory programs. Beyond the question of maximizing the benefits from the existing programs is the development of policies for rescuing some industries, encouraging others, and leaving others to deteriorate.

Industrial nations of Japan, Europe and Asia are more deeply involved in government planning and control of industries than the U.S., even to the point of targeting the products and the countries where they hope to sell.

FEDERAL PROGRAMS

Department of Commerce

The Economic Development Administration (EDA) sponsors several grant and loan programs that could be useful in combating adverse economic and employment impacts caused by a Chrysler Corporation plant closing.

I Title IX - Special Economic Development and Adjustment Assistance

The purpose of this program is to reduce economic problems that are caused by either a sudden and severe economic dislocation or a long term economic deterioration. An eligible applicant could be a state, local government or a non-profit organization determined by EDA to be representative of a redevelopment area, or the smallest entity capable of dealing effectively with a dislocation problem. Any Chrysler plant closing would appear to meet the eligibility criteria of Title IX.

A. The Sudden and Severe Economic Dislocation Section - would be the most appropriate for a Chrysler plant closing. An Adjustment Planning Grant could be awarded to study the magnitude and impacts of the economic dislocation. The plan would address the adjustment needs and solutions to overcoming the economic problems of the area. It would consider both the short-term needs of the unemployed and the long-term adjustment needs of the local economy. If a plan were accepted, EDA and other Federal agencies could provide resources for a variety of activities.

The types of activities that can be implemented and funded under this section of Title IX are development of public facilities, public services, business development, planning, unemployment compensation (through the U.S. Department of Labor), rent supplements, mortgage payment assistance, research, technical assistance, training, relocation of individuals and business and other assistance that furthers program objectives.

B. The Long-Term Economic Deterioration Section of Title IX - could offer funding in an area that experiences a Chrysler shut-down. The criteria for this section differs from the Sudden and Severe Dislocation Section, but the program tools available are basically the same to fund eligible activities.

*Authorization for Title IX - $100,000,000

Budget for Sudden and Severe Dislocation - $ 38,475,000

Budget for Long-Term Deterioration - $ 50,025,000

Since funding available under the existing Title IX program is limited, EDA has used other sections of the Public Works and Economic Development Act of 1965 to fund eligible activities. The other sections of EDA's enabling legislation have larger authorizations and funding levels that lend themselves to addressing economic dislocations.

II. Public Works and Development Facilities Program

Funded under Title I of the EDA Act, direct and supplemental grants are made for the expansion, improvement and renovation of existing public facilities or the development of new public works projects. Loans can be made in severely distressed areas when the applicant cannot meet the matching share requirements.

Direct grants are made for up to 50% of total project costs. Supplemental grants are available for up to 80% of the project when an area that has exhausted its taxing and borrowing capacity, has exceptionally high unemployment, or low family income. Revenue sharing funds and Department of Housing and Urban Development Block Grant Funds can be used for matching share requirements.

*New legislation is being considered by the Congress. The authorizations and budgets could be altered depending upon legislative changes which will be briefly discussed in another section of this report.

The principle requirements for an area's eligibility are high unemployment or low family income. Applicants may be states, local political subdivisions or private and public non-profit organizations.

Examples of eligible projects are (a) industrial park development including utilities, access roads, streets, water and sewer facilities that will serve industrial and commercial users (b) renovation of existing buildings (c) construction of training centers (d) downtown revitalization (e) construction for regional airports.

Authorization for Title I	$425,000,000
*Budget for Public Works FY - 1980	$248,500,000

III. Business Development Loan Program

EDA's Title II Business Development Loan Program provides capital to large industrial and commercial projects when private funds are not adequate or available. The primary purpose of EDA's loan program is to create new permanent jobs or preserve existing employment. EDA tries to accomplish this by making low interest-rate loans available to private business or by providing guarantees for loans from private financial lenders.

Direct loans are made to finance fixed assets with terms of up to 25 years. Direct loans can be used for acquisition of land, machinery and equipment, land improvements, or construction and rehabilitation of buildings. Direct loans are also available for working capital to finance training programs, for the acquisition of raw materials and for costs of normal business operations such as wages, salaries, rents, taxes and interest.

*This was FY 1979 appropriation. EDA is currently operating under a continuing resolution.

Loan guarantees can be made by EDA to cover fixed asset loans from private lenders to private borrowers or to guarantee working capital loans. EDA also has authority to guarantee leases for rent payments for buildings and equipment.

Most EDA loans are for $500,000 or more. Requests for smaller loans are usually referred to the Small Business Administration. EDA will cover up to 65% of eligible fixed asset loans and up to 90% on guarantees of fixed assets. For working capital loans, EDA can guarantee 100% of the loan.

Any loan must be in an EDA designated area. The average EDA loan is $1,500,000.

Authorization for Title II Business Development	
Loan Program	$125,000,000
*Budget for Business Development FY 1980	$ 89,700,000

IV. Technical Assistance and Planning

EDA may provide technical assistance grants under Title III of EDA legislation. Most applicants are non-profit organizations, state or local governments. The objective of the program is to build economic development capability and to help solve economic problems of a distressed area.

Technical assistance funds can be used for feasibility studies, management assistance, design and planning of development facilities, training seminars and hiring of consultants.

There are other planning and technical assistance funds available in EDA that could be used in areas that experience a Chrysler shut-down. An example would be funds available to

*This was FY 1979 Appropriation - EDA on a continuing resolution. EDA also had use of a revolving fund in FY 1979 totaling $75,000,000. They have only limited use of the fund in FY 1980.

each state under Section "304" of the EDA legislation. The state can offer grants with these funds to local governments.

Usually technical assistance funding levels from EDA are limited to 75% of a project's cost. Trade adjustment activities have been funded in the past from this program.

Authorization for Title III (Section 301 and 302)	- $75,000,000
Budget for Title III (Section 301 and 302)	- $34,580,000

*FY 1979 Appropriation - EDA on a continuing resolution.

EDA - Trade Adjustment Assistance

EDA has provided funds to communities and business firms that have been adversely affected by import competition. The Agency has used the business development financing and technical assistance programs as its primary sources of aid to affected industries. EDA is also an active member of the Commerce - Labor Adjustment Action Committee.

EDA also funds Trade Adjustment Assistance Centers (TAAC's) which are non-profit organizations set up to provide technical assistance to affected firms. As a practical matter the assistance available under EDA's portion of the Trade Adjustment Assistance program is too small to be relevant to the Chrysler situation.

Department of Housing and Urban Development

I. Urban Development Action Grants (UDAG) - this program is designed to help a city or town revitalize its economic base and to stimulate development and investment through public and private sector partnerships.

Eligible applicants are distressed cities of all sizes and distressed urban counties. HUD allocates 25% of its funds to small cities - those with populations of 50,000 or less. In order to qualify an area must meet a minimum standard of physical and economic distress as determined by HUD.

Urban Development Action Grants fall into 3 categories: industrial, commercial and neighborhood. Types of activities funded are: construction of public facilities, land acquisition, demolition, site improvements, relocation of business, plant construction and building rehabilitation.

Grants to distressed communities may be used by the community to provide infrastructure or other facilities required for projects. In addition, the grants may be used to provide financing subsidies or capital grants to private investors in UDAG projects.

The program is designed to leverage private sector funds. Firm investment committments are sought from private participants in projects prior to making the grant. Generally, private investments for which firm committments have been made average six times the size of the UDAG grant. Approximately 50% of the projects approved are industrial or commercial, accounting for 73% of HUD's UDAG funds.

*Authorization for Action Grants - FY 1980	-	$675,000,000
Budget - FY 1980	-	$675,000,000

II. Community Development Block Grant (CDBG) - In addition to HUD's Urban Development Action Grants, this existing program can provide substantial assistance to both large and small cities suffering economic distress. Cities with populations greater than 50,000 receive block grants determined by a formula. Smaller cities must submit separate applications to become eligible. Also, the Secretary of HUD has a discretionary fund that can provide money for technical assistance to communities.

The block grant funds can be used for acquisition of property, rehabilitation of buildings, demolition or other economic development activity. A substantial amount of program funds are committed by formula, thus it would be necessary to know the specific communities in which closing Chrysler plants are located to determine the amount of CDBG funds that could be used to deal with the economic impacts of such closings.

1980 - Appropriations (Estimate)

Metropolitan Areas	$3,022,550,000
Non-Metropolitan Areas	$ 681,700,000
Secretary's Discretionary Fund	$ 95,750,000

*Although HUD's authorization legislation is currently pending before Congress, it seems likely that the full $675 million will be authorized and appropriated.

III. Other HUD Programs - the following programs could provide some assistance to Chrysler Impacted Areas.

A. Section 701 - Comprehensive Planning - grnats to states, local governments and sub-state regional planning organizations to develop and implement planning. The estimated FY 1980 appropriation is $42,500,000.

B. Section 312 - Rehabilitation Loans - Loans at low interest for long-term to repair or renovate residential and commercial property. The estimated FY 1980 appropriation is $140,000,000.

C. Section 108 - Loan Guarantees - This program can help finance community and economic development activities. The program also provides HUD the authority to guarantee short and medium term debt issued by public agencies in larger communities which receive formula grants under the community development block grant program. Dollar amounts of such guarantees may not exceed three times the annual local block grant. Financing guaranteed by HUD under this authority can be used for property acquisition and for the rehabilitation item of publicly owned properties, as well as certain expenses associated with property acquisition, such as relocation costs. Section 108 authority can be used to aid private industries through purchase, leaseback arrangements, and in other ways. This program has not been widely used in the past. Local governments are required to pledge their current and future receipts of Community Development Block Grant Funds as security to cover any costs in case of default.

Small Business Administration

I. Section 7 (a) Business Loans - assistance to small business firms that are unable to find financing from private lenders. Assistance under this section of SBA's law can be either direct loans or loan guarantees. The majority of SBA's loans are for the loan guarantee portion of the program.

The SBA has developed criteria for defining an eligible small business.

A small business may use the 7(a) program for both short-term and long-term financing. Eligible activities include: construction or rehabilitation of a building, purchasing of machinery, equipment or materials and working capital.

The current administrative maximums for any single loan are $150,000 for direct and immediate participation loans and $350,000 for guaranteed loans. In some cases SBA may increase the loans to a borrower to $350,000 on direct and participation loans and $500,000 on guaranted loans.

The average loans from SBA in FY 1980 are:

Direct Loans	$ 55,902
Immediate Participation	129,600
Guarantee Loans	137,266

Funding Levels 7 (a) - SBA

1980

Direct Loans	$ 219,000,000
Guarantee Loans	$3,200,000,000

For FY 1981 - SBA has requested Congress to consolidate all loan funds. This would mean that the 7 (a) program funds would be in one pool along with other specialized SBA loan programs.

II. Local Development Companies - Section 502

SBA can work through local development companies (LDC) to assist small business with financing for fixed assets. An LDC can be either a profit or a non-profit organization. SBA may make direct loans to the LDC or may guarantee a loan made by an LDC. Working Capital loans cannot be guaranteed.

Using SBA funds, an LDC may provide assistance to a business for the acquisition of land, buildings or equipment. Funds can also be used for the construction costs associated with modernization or upgrading of plants or buildings.

An LDC may relend SBA money to a small business, it may also acquire property itself and lease the property to a small business, or sell property outright to a business.

The loan ceiling for each business assisted is $500,000. Loan terms may not exceed 25 years.

SBS - Funding Levels - Section 502

1980

Direct Loans	$ 34,000,000
Gurantee Loans	$100,000,000

For FY 1981 - SBA has requested Congress that the agency have one consolidated loan fund. The total request now pending in Congress is:

Direct Loans	$ 346,000,000
Guarantee Loans	$4,000,000,000

III. Small Business Investment Companies (SBIC) - the SBIC's obtain their licenses from SBA. SBIC's are corporations (either non-profit or for-profit) organized to make equity and long-term financing available to small business. SBIC's have a minimum of $500,000 of private capital. They receive funds from SBA to make loans to small business. They also provide management assistance to new and established businesses.

Funding Levels (SBIC)

	1980	1981 (estimated)
Direct Loans	$ 38,000,000	$ 55,000,000
Indirect Loans	$190,000,000	$160,000,000

I. Business and Industrial Development Loans

This program is devised to assist private or public organizations in rural areas obtain loans to improve economic conditions and to develop or retain jobs. Loans are guaranteed or insured. Areas that are eligible must have populations under 50,000.

Loans may be used to purchase or develop land, buildings and equipment. Working capital and refinancing of existing debt are also eligible items.

The funding level for FY 1980 is estimated at $1 billion.

II. Industrial Development Grants

This is a small grant program that enables public bodies such as states, counties or towns to finance industrial sites, buildings and equipment in rural areas. Priority is given to areas with a population under 25,000. The FY 1980 funding level is $10,000,000.

III. Community Facilities Loans

Loans are made available to public bodies to provide assistance in community and economic development projects. All facilities financed from this program shall be for public use. Emphasis is on towns of less than 10,000 population. FY 1980 funds are estimated at $250 million.

Department of Labor

The Trade Act of 1974 provides authority for the Labor Department to furnish assistance to workers who are adversely impacted by import competition.

I. Trade Readjustment Allowances (TRA's)

TRA's are weekly payments which, when added to state unemployment insurance (UI) payments to which a worker is entitled, equal 70% of the average weekly wage the worker earned before his or her employment was disrupted by import competition. The maximum TRA prior to March 20, 1980 was $250 a week. Since March 20, 1980 the maximum TRA will be $269 a week.*

A worker may receive TRA for up to 52 weeks. A worker 60 years of age or older may receive up to 26 additional weeks of benefits. Also, a worker enrolled in an approved training program may receive an additional 26 weeks of allowances in order to complete training. In no case may an adversely affected worker be paid trade adjustment allowances for more than 78 weeks.

Workers may qualify for job training programs, job search and relocation allowances. Maximum limits are established for each program. For instance, if a worker qualifies for a job search allowance, he or she may be paid 80% of necessary transportation and living expenses (up to a maximum of $500). A relocation allowance pays 80% of reasonable and necessary expenses of moving a worker's family and household goods to a new location. In

*The Department of Labor estimates that most Chrysler workers receive the maximum allowances from both the Unemployment Insurance Programs administered by State Government and the Trade Readjustment Allowance.

addition, a worker may receive a lump sum payment equal to three times his or her weekly wage to help get settled (maximum is $500).

The training and relocation budget is funded from Title III of the Comprehensive Employment and Training Act of 1973, as amended. The FY 1980 budget level is $13,700,000 which also includes administrative cost.

Proposed Funding Levels for Trade Readjustment Allowances

FY - 1980		FY - 1981
$1.7 Billion	- includes supplemental request pending in Congress	$890 Million - Estimated

II. Comprehensive Employment and Training Act (CETA)

Assistance under this Act is designed primarily to serve the economically disadvantaged unemployed or underemployed. Many provisions of CETA are not applicable to most Chrysler workers who would be adversely affected by a plant closing. The average Chrysler worker's income level would exceed the maximum income criteria of the CETA Act.

For lower income employees, training programs are available through the CETA prime sponsor. Prime sponsors are a consortium of units or a unit of local government which has a population of 100,000 or more. However, under Part C Section 221 of the CETA legislation, there is authority for "Occupational Upgrading and Retraining". A prime sponsor may make available up to 6 1/2% of its allocated funds to retrain dislocated workers. There would be an opportunity to retrain Chrysler workers if employment opportunities were available in the area.

EXAMPLES OF PAST ADJUSTMENT ASSISTANCE PROGRAMS

I. Mahoning Valley, Ohio -

Location - Mahoning and Tumbell Counties. The City of Youngston is the largest community

Dislocation - Youngston Sheet and Trade announced the closing of the Campbell Works. Initial jobs lost were 4800 - September 1977.

Assistance to Unemployed Workers:

Trade Readjustment Assistance - (TRA)	
Number received benefits	6913
Benefits Paid	$26.3 million
Number enrolled Training	619
Number received job search allowances	338
Number received relocation allowances	205
Number placed in new jobs	424

Since 1977 the Federal Governemnt and the State of Ohio have provided $12,173,370 of adjustment assistance to the area over and above $26.3 million of TRA. The Department of Housing and Urban Development and the Economic Development Administration were the two Federal Agencies that participated in the Adjustment Assistance program.

Agency	Amount	Purpose
EDA	$100,000	Grant to Mahoning County for economic adjustment plan
HUD	$350,000	Grant to Ecumerical Coalition
EDA	$4,800,000	Grant to Jackson Township for new sewer system

Agency	Amount	Purpose
EDA	$600,000	Grant to Mahoning Valley Economic Development Committee
EDA	$1,350,000	Loan Guarantee for Aeroquip Rubber Co.
HUD	$750,000	Grant to Youngstown for loan to Aeroquip
HUD	$870,000	Grant to Youngstown for loan to McNichols Transportation Corp.
EDA/STATE	$179,880	Grant to Campbell for sewer, water and sidewalk
EDA/STATE	93,490	Grant to Lowellville for sewer, water and sidewalk repair.
STATE of OHIO	$2,800,000	Grant for development of Industrial Park.
EDA/STATE	280,000	Grant to Struthers for water and sidewalk repair

II. Johnstown, Pennsylvania

Location - Combine and Somerest Counties - Johnstown the largest city.

Dislocation - Bethlehem Steel reduced work force because of imports and a devastating flood in July, 1977. 3300 workers idled in Cambria County and 400 affected in Somerset County.

Assistance to Unemployed Workers

Trade Readjustment Assistance:	
Number received benefits	7,606
Benefits Paid	$13.6 million
Number received Job-Search Allowances	94
Number received Relocation Allowances	118

Major assistance from HUD and EDA. In addition to disaster assistance payments from the State and Federal Programs, the main emphasis was planning and the development of the Quehamoning Industrial Park.

III. Erie County, New York

Location - Erie County, The City of Buffalo is the largest community.

Dislocation - Bethelehem Steel announced a layoff of 3500 people in August, 1977. In addition, the area had suffered severe loss of jobs for over a decade.

Assistance to Unemployed Workers

Trade Readjustment Assistance	
Number received benefits	5,646
Benefits Paid	$18,074,851
Relocation Allowances	$858,011
Job Search Allowances	$31,249
Number completed training	486

EDA provided $380,000 under its Title IX program to the Erie County Industrial Development Agency (ECIDA) to develop an adjustment plan, to fund a labor-management council, to fund a crisis management center, to coordinate and manage a referral service for training and job placement and an information clearinghouse for displaced workers affected by the Bethlehem Steel layoffs.

After the Adjustment plan was completed, EDA awarded a $3 million grant to ECIDA to implement the county-wide strategy. HUD's Community Development Block Grant Program and the Urban Development Action Grant program provided funds for an Industrial Revolving Loan Fund and the construction of a downtown hotel. Over $12 million of Federal funds have been committed to the Erie County area.

POTENTIAL CHANGES IN FEDERAL PROGRAMS

I. The Economic Development Administrations Authorization has expired and new legislation has been considered in both the House of Representatives and the U.S. Senate. There are substantial differences between the House and Senate bills. The last conference was held on December 14, 1979.

Major changes in either the House of Senate versions, if they become law, would have a potential for increasing assistance to communities and firms in an area adversely impacted by a plant closing.

Public Works

Present - EDA is spending $248,500,000. The authorization for Title I is $425 million.

House - Would increase Title I authorization in FY 1980 to $700 million and in FY 1981 to $750 million. Would also authorize $2 billion for a Local Public Works program.

Senate - Would increase Public Works Grants in FY 1980 to $555.2 million and in FY 1981 to $600 million. Adjustment Assistance currently funded under Title IV would be funded in this section.

Business Development Financing

Present - Under the continuing resolution EDA is allowed to spend $89.7 million. They have limited use of this revolving fund this year.

House - In FY 1980, Loans and Loan Guarantees authorized at $569.3 million. For FY 1981 - $850 million. The Loan Guarantee authority would be limited to $1.8 billion in FY 1980 and $2.5 billion in FY 1981. The Revolving Fund would be authorized at $125 million.

Senate - Loan and Loan Guarantee in Fy 1980 would be increased to $227.9 million. In FY 1981, the authorization would be $195.9 million. The revolving loan program would be provided for under the Public Works Section. Loan Guarantee authority would be limited to $1.8 billion for both FY 1980 and FY 1981.

Technical Assistance and Planning

Authorizations in both the House and Senate proposed legislation would be increased. Modest funding increases could take place.

Adjustment Assistance

Present - Under the continuing resolution, EDA is spending $85.5 million this year. The current authorization level is $100 million.

House - The authorization would be $200 million in FY 1980 and $250 million in FY 1981.

Senate - Adjustment Assistance would be included in the Public Works Section.

II. H.R. 1543 was reported out of the House Ways and Means Commitee and passed by the House of Representatives on May 30, 1979. The Senate has not passed similar legislation, even though the Finance Committee has reported a similar bill.

The major changes in trade adjustment assistance would be to broaden the number of eligible firms affected by import competition. Under existing legislation only those firms and workers directly impacted by foreign competition are eligible for either the Labor and Commerce Department (EDA) programs. The new legislation if enacted would include benefits to suppliers (and workers).

EDA is limited to lending not more than $1 million for a direct loan and not more than $3 million on a guaranteed loan. The proposed legislation would increase those limits to $3 million for direct loans and $5 million for guaranteed loans. EDA

would be able to increase its share of technical assistance funding from 75% to 90%.

The Labor Department Trade Readjustment Allowance program would be able to provide payments to additional workers. While Chrysler workers are certified and receive payments, the individuals who work for a Chrysler supplier are not currently covered for readjustment benefits. These workers could be adversely impacted by a Chrysler plant closing. Therefore, the proposed legislation would extend to the employees of major suppliers the same benefits to which a Chrysler employee is now entitled.

The proposed new legislation would mean EDA's funding could increase by $22 million. The Trade Readjustment Allowance Program could increase by $400 million.

III. Budget revisions are currently under review in Congress. A number of programs which can provide assistance to impacted communities, firms and individuals could be altered.

Dept. of Housing and Urban Development Community Development Block Grant Program - current level is $3.9 billion. Revised level for FY 1980 could be cut by $150 million. FY 1981 levels of House and Senate budgets assume a level of $3.8 billion.

Section 312 - Administration suggested cuts in both FY 1980 and FY 1981 funding. Current level is $135 million. Reductions could be $40 million in FY 1980 and $64 million in FY 1981. These reductions would not have serious impact on adjustment assistance programs.

Urban Development Program - The House of Representatives is recommending a reduction of $175 million in FY 1980.

Small Business Administration

The House or Representatives is considering a reduction of $100 million in FY 1981 for the business assistance loan program.

STATE ASSISTANCE PROGRAMS
State of Delaware

Communities.

Direct state aid does not go to local governmental units for industrial development. Under Delaware law, local governments are authorized to form industrial development agencies capable of issuing industrial revenue bonds. Only the City of Wilmington has done so.

Wilmington and Newark offer tax incentives for development of industrial facilities. Wilmington offers a 100% tax credit on real estate taxes for the first year of operation of a newly constructed commercial or industrial facility; this percentage is reduced by 10% over each of the next ten years until the full tax rate is paid. Owners of qualified improved or expanded facilities are eligible for a 50% reduction of taxes for five years.

Newark offers a 100% tax reduction on the improved value of new facilities which like Wilmington's, is phased out over ten years at a rate of 10% per year. Only facilities located within certain zoning districts are eligible for this tax reduction.

Delaware offers technical assistance to local and county governments through its Department of Community Affairs and Economic Development. They send personnel to examine industrial sites and to help market sites to potential new industries. For example the state government helps, by purchasing advertising space in trade publications at cheaper, long-term rates, then resells the space to other units of government in which to advertise for new industries, passing on cost savings.

Businesses.

On February 12, 1980, Governor DuPont signed into law House Bill 663, providing a 15-year loan, at 15.5%, to Chrysler Corporation and establishing an Emergency Loan Committee.

Delaware's Council on Industrial Development, headed by the Secretary of the Department of Community Affairs and Economic Development is authorized to provide bond guarantees, to a maximum of $3 million per project. The Council may issue industrial revenue bonds on behalf of industries, in order to pass on savings of the tax-exempt status, for paying up to 100% of the cost of land, buildings, machinery and equipment for use in manufacturing. The state also has the authority to issue up to $50 million in general obligation bonds for the purpose of economic development, but will not do so unless all other alternatives for financing have been exhausted.

The state provides a reduction of up to 50% of state corporate income tax to new or expanding firms who provide a minimum of 25 jobs or $1 million of new investment. The reduction is at a rate of $75 per full-time job created and $185 for every $1 million of new investment for up to 10 years. Firms creating 25 new jobs or investing $1 million capital in Delaware are also offered a 90% reduction in the gross receipts tax for the first 12 months of operation.

Individuals.

Delaware's Unemployment Insurance Fund is projected to be $20 million as of May 10, 1980. The state gives a weekly maximum allowance of $150, a minimum of $20, averages $110. (Note: state officials point out that Chrysler's relatively highly-paid 4,200 employees would be likely to receive close to the maximum weekly benefit allowance.)

One Delaware official offered an estimate of the impact on the fund of a Chrysler shut-down: without a 13-week extention of benefits, the drain on the fund would be approximately $16 million. He thought the fund would remain solvent until approximately the end of 1980.

Delaware's Department of Commerce has the authority to use its Special Projects budget -- $80,000 in FY 1980 -- for industrial training programs designed on an ad hoc basis. The funds are used to pay the cost of instruction and are often held in community colleges.

Delaware sponsors a free county-by-county service for recruiting and screening industrial employees. This service is offered in conjunction with the Delaware Technical College.

Communities.

Illinois does not offer direct grants to units of local government for industrial development projects. Municipalities with populations over 100,000 have the authority to establish industrial development agencies and to issue industrial revenue bonds for start-up capital for new businesses, for purchase or improvement of facilities and equipment and pollution control equipment. From 1973 to July, 1979, 164 local governments in Illinois issued 205 bonds, a total of $550 million.

Cities of over 200,000 population may reduce local property taxes by up to 60% on new industrial property.

Businesses.

The Illinois Industrial Development Authority (IIDA) provides financing for industrial development by making direct loans and by issuing industrial revenue bonds.

Direct loans are made to small businesses for start-up costs. Funds may be used to purchase land, buildings and equipment. Loans are also made for risk capital and seed money. Loans average $100,000 and are made from a revolving fund of $2.5 million. Interest rates are the same as those for long-term government bonds. Maximum term is 25 years. The IIDA has lent $978,625 since July 1, 1979.

IIDA bond proceeds may be used for purchase of land, buildings and equipment by new or expanding industries. Maximum term on a bond is 40 years. IIDA has issued $10 million in bonds under this program since July 1, 1979.

As of January 1, 1979, Illinois instituted a 2.85% addition to the state corporate income tax, and exempted from sales tax all manufacturing machinery and pollution control equipment, and authorized all industrial property with no economic by-

product be assessed for local property tax purposes at 0-.5%.

Individuals.

Illinois' Unemployment Insurance Fund currently totals $232 million, and pays maximum weekly benefits to workers with 2 dependents of $177. The minimum benefits total $15 per week. The February 1980 average was $120.41 per week. In May, 1980, officials in charge of the fund estimate, the quarterly contributions to the fund, will raise it to $800 million.

One Illinois Employment Service official estimated if Chrysler closes the fund would be depleted by 1981.

Illinois spends about $800,000 a year in general state revenue for skill training programs. Currently 1203 persons are being trained.

The Federally Funded Industrial Training Program provides the training of new employees as well as a portion of a trainee's salary. This program benefits new or expanding industries.

The High Impact Training Service is a program run cooperatively by the State Board of Education and the Department of Labor. The cost of training facilities, equipment and instruction are paid for by the state. This training service also benefits new or expanding industry.

The Rapid Approval of Programs in Industrial Development provides a fast-track for curriculum changes at state educational facilities. Vocational schools can quickly develop customized training programs for a industrial firm.

*Note: The State of Illinois has in the past reacted to plant closings by assembling a task force of state departments to design a strategy to address the problem. The purpose was to assemble the available state tools of public education, worker re-training, design a marketing strategy for the abandoned facility and obtaining financing to aid a prospective customer.

State officials feed this type of approach is showing results in the case of the abandoned US steel mills and in finding comparable employment for the workers from those plants.

Communities.

Under the Revolving Loan Fund for Communities program, Indiana has a total of $3 million for direct loans to local governments for industrial development. Up to $200,000 or 2% of the assessed valuation of the community is available for site development, including construction, lease or purchase of real and personal property. The first $50,000 of any loan need not be matched by local resources; beyond $50,000, communities must match, dollar for dollar, the borrowed funds. Interest rates are set by the State Board of Finance and terms are up to 10 years.

Local governments in Indiana have the authority to grant tax abatement on the increased assessment on any improvement on industrial or commercial property at the following rate: 100% of the increase in the assessment exempted in the first year, 95% the second, 80% the third, 65% the fourth, 50% the fifth year, 40% the sixth, etc. until the 10th year, when 5% of the increased value of the property is exempted from taxation.

Indiana permits establishment of local development corporations (LDC) which are non-profit, community-based organizations concerned with revitalization of the central business district. LDC's may borrow money from banks and Federal sources for the purchase and rehabilitation of buildings in downtown areas or to re-loan to developers of small businesses.

Funds may also be loaned to buy or lease equipment and machinery. There are approximately 50 LDC's in the state.

Under 18-6-4.5-1-30 of the Indiana Code, local governments may establish Economic Development Commissions empowered to approve industrial revenue bonds for the financing of fixed assets for new or expanding industries.

Businesses.

The Indiana Economic Development Authority (IEDA) guarantees mortgage loans to small businesses which have been turned

down by both the Federal Government and private lenders. Loans are made at the commercial rate for a maximum of 25 years. IEDA participation does not exceed 90% or $1 million of the cost of the project in the case of purchase of land and buildings, 75% or $1 million for purchase of equipment and machinery, and 75% or $100,000 for working capital. Used as a resource of last resort, this program is not used a great deal, as loans made under its authority count against the maximum which can be loaned by a bank.

Loans over $100,000 must retain or create 15 jobs. Indiana tax rates were frozen in 1973 and have not been increased since that time. No further tax incentives are offered for industrial development.

Individuals.

The latest figures available on the status of Indiana's Unemployment Insurance fund are from November 30, 1979. At that time, the fund level was $424,200,000. In July, 1980, the weekly benefit allowances in Indiana will increase to a minimum of $40, a maximum of $74 ($141 for those with 4 dependents). The 1979 average was $79.41.

One official contacted (Head of Research and Reports in the Unemployment Insurance Section) stated that to her knowledge, no studies have been done in the state to ascertain how fast the fund would be depleted in the case of a Chrysler shut-down.

Communities.

Although the State of Michigan does not provide grant or loan finds to local governments for industrial development, it has authorized local governments to issue industrial revenue bonds for development of industrial facilities. (It should be noted, however, that when the Chrysler Hamtramck plant was closed, the State Legislature passed special legislation to permit a loan to the City from the State's Common Cash account, for the purpose of initiating the recovery program.) (See supporting material.)

Public Act 338 of 1974 permits establishment of Economic Development Corporations (EDC's), which are public corporations formed to assemble and develop parcels of land on behalf of industrial and commercial enterprise. EDC's may issue tax exempt revenue bonds and notes or exercise eminent domain, in order to acquire property. Eligible activities are: financing property, buildings, equipment and related improvements and pollution control equipment. From 1975-1978, over 25 EDC's in Michigan financed 150 projects for $232 million. Interest on loans to industry range from 6-10%.

Public Act 197 of 1975 permits establishment of Downtown Development Authorities (DDA's) which are state-authorized non-profit development corporations charged with preventing and correcting deterioration of central business districts through the use of development plans, issuance of negotiable revenue bonds to finance the acquisition and development of public facilities and tax increment financing. DDA's may levy property tax of up to $1 million (in a municipality of over 1 million) or $2 million (in communities of under 1 million population) to pay for its own operational expenses. A DDA may purchase and rehabilitate property and lease it to private industry.

The Michigan Economic Development Incentive Concept (MEDIC) is a state-administered program intended to develop local professional capacity in economic development organizations. It has an annual budget of $625,000 (in FY 1980) to help support the administrative costs of EDC's in the state.

Under the Public Act 198 of 1974, as amended, local governments have the authority to grant 100% exemptions on local property taxes for improvements to industrial properties by new industries. Exemptions are for up to 12 years. Inventory and certain tools are also exempt from local property taxes. Public Act 255 of 1978 offers similar examptions to commercial property-owners.

Businesses.

The Michigan Job Development Authority (JDA) is a statewide organization empowered to issue Industrial Revenue Bonds, to make direct loans or loan participations in projects exceeding $50,000. Eligible activities are: construction, acquisition, expansion or rehabilitation of industrial buildings and equipment. Loans may not be used for venture capital. Loans are only available if the applicant has been rejected by commercial lenders. Loans may not exceed 90% of the project cost. JDA has the authority to issue bonds for several pollution control projects at once. Legislation is currently pending before the State Legislature to expand this authority to all types of industrial development projects. As of March 12, 1980, the JDA had financed 9 projects for a total of $13.8 million, creating an estimated 1172 jobs. An anticipated issue of $36.4 million will finance 13 projects and create an estimated 10,936 jobs.

Individuals.

The State's unemployment insurance fund has borrowed $330 million from the Federal government and anticipated borrowing more in July. Michigan pays a maximum of $136.40 per week to unemployed workers. The minimum is $16 per week. (Note: legis-

lation currently before the state legislature will raise the minimum by $13 and the maximum by $26 per week). The February average weekly unemployment payment was $102.00.

Michigan's Comprehensive Employment Program provides a full range of training services to employers who hire at least ten people. Activities include referral service, candidate selection, orientation, pre-employment training and on the job training. The program can pay $25 per person for health care screening. In addition training is sponsored at skill centers, community colleges and universities. Approximately 480 people will receive some training in 1980. Funding is estimated at $1 million this year.

Communities.

Missouri does not provide funds to local governments for industrial development. Since 1963, any municipality in the state is authorized to issue both general obligation bonds and industrial revenue bonds to finance industrial expansion. As of this writing, revenue bonds require a referendum.

Under Ch. 353 of the Missouri Code, local governments have the authority to grant tax relief on industrial investments or reinvestments, staged over a period of 20 years. Local governments may also freeze taxes for up to 10 years on some expansion projects under the Planned Industrial Expansion program.

Businesses.

First Missouri Development Finance Corporation is a state-chartered business development company which makes direct loans to small businesses. Loans may be used to pay start-up or expansion costs including working capital and, to a very limited extent, venture capital. About 1/3 of the loans are guaranteed by the SBA. The maximum amount loaned is $750,000 with an SBA guarantee and $500,000 with no guarantee. Interest rates range from 2-4% over prime. Maximum term is 20 years. First Missouri has $8 million in loans outstanding at this time, and $1.4 million availabe.

Missouri attempts to encourage banks to make business loans by agreeing to deposit up to 50% of a loan amount in a time deposit at the lending institution.

The banks deal directly with the borrower and work out the details of the loan. Loans can be used for manufacturing activities, working capital, construction and site preparation. Prime considerations for approval of a loan are the unemployment rates and the number of new jobs that will be created.

The maximum amount of a loan is $4 million.

The Missouri House passed HJR 88 a bill amending the state constitution to permit issuance of a General Obligation bond which would provide up to $25 million in loans to the Chrysler Corporation. The bill was not passed by the State Senate when the legislature adjourned for the year on April 30.

Missouri's Environment Improvement Authority helps package SBA loans and loan guarantees for small businesses undertaking pollution control projects.

Missouri offers sales tax exemptions on all new equipment and machinery to be used in the direct manufacturing process, also an exemption on all raw materials. Bills now before the state legislature would offer tax credits for banks making industrial development loans.

Individuals.

The Unemployment Compensation fund in Missouri is currently $250.2 million. The maximum level of benefits is $105 per week, the minimum, $14, and the average $84. (Note: This is the projected average for 1980. Since the state raised the maximum by $20 per week recently, earlier figures for the average weekly benefits are not indicative of future allowances.)

As of this writing, Missouri does not have a state-funded industrial training program. Proposals to establish a state-funded industrial training program are currently under discussion by State labor officials.

Communities.

While New York State does not offer state-funded grant programs for economic development to local governments, municipailities have the authority to establish industrial development agencies. These agencies must be individually chartered by the State legislature and are empowered to issue industrial revenue bonds. Bond proceeds are used to finance the development of facilities for manufacturing and commercial use, research development or warehousing, on behalf of new or expanding firms. There are approximately 134 such agencies in New York.

Under revisions of the New York Job Incentives Act, communities may grant tax exemptions of up to 100% for up to 10 years on improvements on real property (e.g., New York City offers up to 95% tax exemption for the first year after renovation of commercial and industrial buildings.) New York communities may also grant tax exemptions for construction of industrial facilities designed to eliminate the need for pollution control facility -- exemption 100% of the increased value of the property from taxation in the first year, with the exemption declining by 10% for each succeeding year for 10 years.

Businesses.

Established under Article 5A of the New York State Banking Law, the Business Development Corporation (BDC) runs an extremely active loan program, offering loans at interest rates 2.5% over prime for working capital, plant acquisitions or construction. Amounts range from $25,000 to $500,000 for a maximum term of 15 years.

The BDC-Capital Corporation is a wholly-owned subsidiary of the BDC and only makes equity investment in conjunction with BDC loans. A licensed Small Business Investment Corporation (SBIC), the BDC-Capital Corporation invests no more than $60,000

per transaction and has a total portfolio of approximately $250,000.

The New York Job Development Authority (NY/JDA) makes low-cost, long-term second mortgage loans through local development corporations for industrial expansion, relocation, and purchase of machines or equipment. NY/JDA offers loans for up to 30% of the cost of the project (to a maximum of $250,000) from a total fund of $150 million. In November, 1979, New York voters rejected a referendum to increase the authority of the NY/JDA to $300 million.

The New York State Urban Development Corporation (UDC) is a corporate governmental development agency that provides financing and development programs designed to help business and industry.

The agency can issue tax-exempt bonds for commercial or industrial projects. Also a lease financing program is available to financially strong companies for large industrial or commercial development projects. Other programs offered by UDC are lease guarantee and technical assistance.

New York State offers an extensive package of tax credits and incentives. Investment tax credits of 4% against the corporate franchise tax are offered for the purchase or improvement of manufacturing facilities. This may be expanded by 2% per year for up to 3 years when the firm is maintaining or expanding employment in the state. (Firms taking this credit may not take other tax credits.) New York also offers exemptions from sales or use tax on new equipment and raw materials used in manufacturing. Incentives for purchase of pollution control equipment include a franchise tax credit for the sales tax paid on the purchase. A 1% credit is offered for meeting a 'maintanance of employment' standard, as well as additional tax credits for up to 10 years for firms of 5 or more employees that are locating or expanding in designated low-income areas and that provide approved job-training program.

The New York State Department of Commerce offers technical assistance to minority business owners and small business owners and Ombudsman service to cut red tape for businesses dealing with state agencies and to act as a liasion for businesses dealing with local and federal agencies.

Individuals.

By the second quarter of 1980, New York State's Unemployment Insurance Fund will total approximately $550 million. The maximum weekly allowance paid by New York is $125 per week, and the average is $94.23. The lowest allowance paid is $25 per week.

Under the State Manpower Training Act, the New York Department of Labor has broad authority to initiate programs for training the industrial work force, and may, on an Ad hoc basis, request funds from the state legislature for special programs. The State is currently running two on-the-job training programs: one, containing a total of $1 million is run jointly with the State Department of Commerce and pays for instruction and equipment required for training industrial workers; the other program, funded at $1.5 million for FY 1980, is directed through local Chambers of Commerce offering training to workers in small businesses.

Communities.

Pennsylvania offers direct grants to communities for industrial development through its Site Development and Community Facilities Programs. Established under Acts 61 and 552, respectively, these programs are run by the State Department of Commerce and contain $2 million for development of industrial sites. Up to $100,000 per project is available for local governments intending to build water and sewer systems or access roads to industrial sites.

The Local Economic Revitalization Tax Assistance Program (LERTA) gives local governments the authority to exempt from property taxes improvements on properties located in designated deteriorating areas, for up to 10 years.

Local jurisdictions may create an industrial and commercial development authority with power to issue revenue bonds for construction or rehabilitation of plant and equipment for industrial and commercial activities. The Pennsylvania Revenue Bond and Mortgage Program provides for both bond financing in which the lease payment from the firm would pay off the loan, and mortgage financing through a commercial lender. The mortgage is tax-free, thus permitting a cut in interest rates by as much as 3 points. No financing under this program may be used for working capital. Volume since 1967 has been $7 billion.

Businesses.

On September 18, 1979, Governor Thornburgh established an Economic Development Committee comprised of cabinet-level officials representing 7 state departments involved in stimulating economic development and job retention. The Committee coordinates the development activities of the separate departments.

The Pennsylvania Industrial Development Authority (PIDA) is empowered to make loans for acquisition or construction of

industrial or manufacturing facilities in counties with an unemployment orate of 4% or higher. PIDA will participate with local financial institutions or industrial development organizations to offer loans at an average rate 4% interest. PIDA will finance up to 30% of the cost of the project in areas with 4-6% unemployment. PIDA involvement increases with the unemployment rate to a maximum of 50% where the county unemployment is 10% or higher. Term is up to 20 years. To date, PIDA has loaned $547 million.

Pennsylvania has three business development credit corporations:

(1) In the Pittsburgh Area, the Regional Industrial Development Fund provides loans to those businesses unable to secure conventional financing. RIDC typically makes loans for working capital and expansion at interest rates 3% above prime. Maximum term is 10 years.

(2) Southeastern Pennsylvania Development Fund (SPDF) serves Philadelphia area businesses unable to secure conventional loans on reasonable terms, by extending loans for working capital and expansion at 3-5% above prime interest rates. Maximum term is 10 years. SPDF also provides loan and equity packages for start-up firms and works closely with EDA, SBA.

(3) Businesses located outside Pittsburgh and Philadelphia may apply to the Pennsylvania Development Credit Corporation (PDCC), which is funded by band contributions, for loans at interest rates approximately 2.5% above prime. PDCC activity averages $2-3 million annually, and focuses on small businesses which, though having trouble obtaining conventional financing, show promise of growth.

Pennsylvania excludes from sales and use taxes industrial purchases used directly for production or research and offers exemptions for manufacturers from its 10-mill capital stock tax.

Individuals.

Pennsylvania's Unemployment Insurance Fund balance is the

Communities.

In 1973, under the Impacted Cities Act, Community Urban Redevelopment Corporations (CURC) were established as a flexible mechanism for managing local redevelopment projects. CURC's may be private or public, non-profit or for profit. Financing for the project is usually provided by the developer but CURC's may apply for Federal grants or loans. An important function of CURC's is to advise local government on the extent of property tax abatement needed to ensure the economic viability of the project.

The Community Reinvestment Areas program was established in 1977 to correct certain weaknesses in the Impacted Cities Program. The Community Reinvestment Areas program permits municipalities and unincorporated areas to designate deteriorated neighborhoods in which tax abatement is available. Improvements of over $5,000 to industrial or commercial property may be granted 100% exemption for up to 15 years.

Ohio law allows establishment of local community improvement corporations to issue revenue bonds to the Federal limit of $10 million per project. Local governments are also authorized to issue industrial revenue bonds.

(Note: SB 313, passed last week by the Ohio State Legislature, provides $15 million, earmarked from the state liquor profits tax, for grants to local governments to finance expansion of existing industries. Sources in state government note that this program will not likely be funded until FY 1981.)

1976 legislation establishing a tax increment financing program authorized local governments to give up to 30 years tax exemption for improvements on publicly-owned property (such as urban development land.) Local governments may require that the owners of the improvement pay the amount which would have

been paid in taxes into a fund for use by the local government.

Businesses.

The Ohio Development Finance Commission (ODFC) can help provide funds for new construction or acquisition of existing facilities. Direct loans are available not to exceed 30% of a total project cost. ODFC loans may be made at an interest rate as low as 2% Terms usually run from 15 to 20 years. A local Community Improvement Corporation normally provides at least 10% of a total project cost. The remainder of the funds comes from commercial banks or other lending institutions. ODFC currently has $2.9 million available for loans and will soon receive an additional $2.5 million in state appropriations.

The ODFC also can provide loan guarantees of 50-80%. The maximum term is 25 years. The maximum amount of state participation is $5 million. Companies engaged in manufacturing, distribution or research and development are eligible.

Ohio provides a corporate franchise tax credit based on the property taxes assessed on machinery and equipment used in manufacturing. The state also has other tax incentives to existing or new industries locating in Ohio.

Individuals.

Ohio's Unemployment Compensation Fund balance is $285.2 million. Maximum weekly benefits are $202 per week for those with three dependents, $128 for those with none. The minimum weekly benefit allowances is $10 per week, the average is $124.

Ohio does not have a state-funded program for industrial training.

lowest in the nation, currently in debt to the Federal government for $1.4 billion. The maximum weekly allowance for unemployed workers is $162, with an additional $8 per week for dependents; the minimum allowance is $13, with $8 for dependents; the average is $103 per week.

The Pennsylvania Department of Labor and Industry offers a free computerized state-wide system for matching workers with employment opportunities. It also offers an apprenticeship program, currently training 11,910 workers. The State Vocational Education Program has a management information system to help place its graduates.

Pennsylvania's Department of Education sponsors the Pennsylvania New Industry Training Service which, on request of a new or expanding industrial firm, provides a training program for workers presently unemployed but who will be hired by the firm when trained. This program spent $750,000 to train 2107 workers in FY 1979. The program channels funds through the local educational agency (through the area vocational technical school where available) and may be used for in-school, in-plant or work experience training. For example, an in-plant project fund may be used to pay the salaries of instructors and supervisors and their fringe benefits. A percentage of the cost of equipment, training supplies, janitorial and clerical services are eligible items.

Under this program, all 5,200 workers in the Volkswagen New Stanton plant were trained during the last 3 years; VW plans to train another 2,000 under the program this year.

Pennsylvania runs an employment and training program, the Training Employment Assistance and Manpower program (TEAM) which uses $1,336,000 to train minority, youth and other unemployed persons through the use of locally based, non-profit organizations. Administered by the Department of Community Affairs, TEAM has been leveraged with up to $4 million in funds from other sources -- including federal -- to train or employ 4,739 persons. The

money may be used to rent space, equipment, pay salaries of administrative or training staff and to give stipends or salaries to participants.