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THE UNIVERSITY OF MICHIGAN

*Forecast and Analysis of the
U.S. Automotive Industry
Through the Year 2000*

- **MARKETING**
- **TECHNOLOGY**
- **MATERIALS**

VOLUME 1: MARKETING

**DELPHI V FORECAST AND ANALYSIS
OF THE U.S. AUTOMOTIVE INDUSTRY THROUGH THE YEAR 2000**

MARKETING

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FOREWORD

INTRODUCTION

Delphi V is a detailed analysis of forecasts by three separate panels of automotive industry executives, directors, managers, and engineers who are expert in the areas of automotive technology, materials, and marketing. These individuals are selected because they occupy positions of responsibility within the automotive industry and have strategic insight on important industry trends. In many cases they are in a position to influence these trends. This report, published in three volumes, is the fifth in this series of in-depth studies of long-range automotive trends that began with Delphi I in 1979 and continued with Delphi II in 1981, Delphi III in 1984, and Delphi IV in 1987.

The Office for the Study of Automotive Transportation performs the data collection and analysis, presentation, and interpretation of the results. Since the forecasts we present are those of the panelists, Delphi V is, essentially a consensus industry forecast of itself. These forecasts are not "crystal ball" predictions, but rather well-informed estimates, predictions, and opinions. Such forecasts provide an important basis for business decisions and provide valuable strategic planning information for those involved in all areas of the North American automotive industry, including manufacturers; service, component, and material suppliers; government; labor; public utilities; and financial institutions. We believe these to be the most authoritative and dependable North American automotive trends available.

A key point to keep in mind with regard to the Delphi forecast is that it presents a vision of the future which is, in a sense, an important basis for industry decision-making. It is obviously not a precise statement of the future but rather what the industry *thinks* the future might be.

THE DELPHI METHOD: GENERAL BACKGROUND

This study is based on the Delphi forecasting process. With this method various groups of experts consider the issues under investigation and make predictions about future developments. Developed by the Rand Corporation for the U.S. Air Force in the late 1960s, Delphi is a systematic, iterative method of forecasting based on independent inputs regarding future events from these experts.

The Delphi method is dependent upon the judgment of knowledgeable experts. This is a particular strength of this method because, in addition to quantitative factors, predictions that require policy decisions are influenced by personal preferences and expectations. Delphi forecasts reflect these personal factors. The respondents whose opinions are represented in this report are often in a position to influence events and make their forecasts come true. Even if subsequent events result in a change of direction of a particular forecast, this does not negate the utility of the Delphi. This report's primary objectives are to present the direction of technological, materials, and marketing developments within the industry and analyze potential strategic importance.

PROCESS

The Delphi method utilizes repeated rounds of questioning (accompanied by feedback of earlier-round responses of peers) to take advantage of group input while avoiding biasing effects often typical of face-to-face panel deliberations. Some of those biasing effects are discussed in this excerpt from a 1969 Rand memorandum:

The traditional way of pooling individual opinions is by face-to-face decisions. Numerous studies by psychologists in the past two decades have demonstrated some serious difficulties with face-to-face interaction. Among the most serious are: (1) Influence, for example, by the person who talks the most. There is very little correlation between pressure of speech and knowledge. (2) Noise. By noise is not meant auditory level (although in some face-to-face situations this may be serious enough) but semantic noise. Much of the 'communication' in a discussion group has to do with individual and group interest, not with problem solving. This kind of communication, although it may appear problem-oriented, is often irrelevant or biasing. (3) Group pressure for conformity. In experiments at Rand and elsewhere, it has turned out that, after face-to-face discussions, more often than not the group response is less accurate than a simple median of individual estimates without discussion (cf. N.C. Dalkey, *The Delphi Opinion*. Memo RM 5888 PR, p. 14, Rand Corp., 1969).

In the Delphi method, panelists respond anonymously, preventing the identification of a specific opinion with any individual or company. This anonymity also provides the comfort of confidentiality, allowing the panelist to freely express his or her opinion. Among other advantages, this process enables respondents to revise a previous opinion after reviewing new information submitted by other panelists. All participants are encouraged to comment on their own forecasts and on the combined panel results. This information is then furnished to the panel participants in successive iterations. This procedure reduces the effects of personal agendas or biases and assists the panelists in remaining focused on the questions, issues, and comments at hand.

PANEL CHARACTERISTICS AND COMPOSITION

The very essence of a Delphi survey is the careful selection of expert respondents. The selection of such experts for this Delphi survey is made possible by the long-standing association of The University of Michigan faculty and staff and representatives of the automotive industry. Lists of prospective expert panelists were assembled: one each for Technology, Marketing, and Materials. Panel members were selected on the basis of the position they occupy within the automotive industry dealing with the topic being surveyed and are acknowledged to be deeply knowledgeable and broadly experienced in the subject matter.

The names of the panel members and their replies are known only to our office and are maintained in the strictest confidence. Replies are coded to ensure anonymity. The panel members are not made known to each other. Upon publication of the final Delphi report, all questionnaires and lists of panelists are destroyed.

The characteristics of the panels are as follows: 17% of the Technology Panel were composed of CEOs, presidents, or vice-presidents; 26% were directors; 36% managers or supervisors; 12% were engineers (chief, assistant chief, and staff); and 10% of the panel were made up of academic specialists and consulting technical engineering specialists. The Marketing Panel was composed of 22% CEOs, presidents or vice-presidents; 14% directors; 34% managers; 18% engineering specialists; and 16% academic and consulting marketing specialists. Among Materials panelists, 12% were CEOs, president and vice-presidents; 21% were directors; 36% managers and supervisors; 8% engineering specialists; and 23% academic and consulting materials specialists. Approximately 57% of the Delphi V panelists

were employed by vehicle manufacturers, 32% by components and parts suppliers, and 11% were specialists, consultants, and academics.

PRESENTATION OF DELPHI FORECASTS AND ANALYSIS

When a question calls for a response in the form of a number, the group response is reported in terms of the median value and the interquartile range (IQR). The median is a measure of central tendency that mathematically summarizes an array of judgmental opinions while discounting extremely high or low estimates. The median value is the middle response, and the IQR is the range bounded at the low end by the 25th-percentile value, and at the high end by the 75th-percentile value. For example, in a question calling for a percentage forecast, the median answer might be 40% and the IQR 35–45%. This means that one-quarter of the respondents answered 35% or less, another one-quarter chose 45% or more, and the middle-half of all responses ranged between 35% and 45%, with 40% representing a measure of central tendency. That narrow interquartile range would indicate a fairly close consensus among the respondents.

In contrast, the percentage forecasts for a different question might show a similar median forecast of 40%, but with an interquartile range of 20–70% indicating little consensus and a considerable degree of uncertainty about the issue in question.

Uncovering differences of opinion is one of the major strengths of the Delphi method. Unlike other survey methods, where differences of opinion among experts are often obscured by statistical averages, the Delphi exposes such differences through the presentation of the interquartile range (IQR).

Note that the median results are typically expressed as round numbers (5, 10, 50), rather than more specific-appearing numbers, e.g., 12.7, 45.3, which might develop if averages were used.

Discussion. Narrative discussions are presented, where necessary, to highlight and explain a particular set of data.

Selected Edited Comments. Selected edited comments from the Delphi panelists are shown following each data table in order to provide some insight into the deliberative process by which panelists arrive at their forecasts.

In a Delphi survey, respondents are encouraged to contribute comments to explain their forecast and to perhaps persuade other respondents to change their positions. Many of these edited comments are shown in the report following the forecast tables. Redundant or derogatory comments are excluded. These replies may be important indicators that are not apparent in the numerical data. An individual panelist may be aware of something unique that planners should carefully consider. However, readers should be careful not to over-emphasize a particular comment. It is possible for a well-stated contrary opinion to mislead the reader into ignoring an important majority opinion that is represented by numerical data.

Manufacturer/Supplier Comparison. Delphi V panelists include respondents from North American automotive manufacturers, the major suppliers of components, parts, and materials for the industry, as well as consultants and academics. A concerted effort is made to obtain a relatively equal distribution of manufacturer and supplier panelists. Within the context of this survey, categorizations will refer simply to either *Manufacturers* (or for brevity in tables, *OEMs*—Original Equipment Manufacturers) and *Suppliers*.

For obvious competitive reasons, the automotive vehicle manufacturers seek to maintain a degree of secrecy regarding their design, engineering, and marketing plans. While the relationship between the manufacturer and supplier is moving toward an increasingly closer degree of cooperation and integration, a considerable element of proprietary concern remains. Additionally, the very size and complexity of the automotive

industry works against optimum information transfer. Therefore, our analyses include a comparison of the forecasts from manufacturer and supplier panelists in an attempt to illustrate where significant differences exist between the opinions of the two groups.

Comparison of Panels. The three groups of Delphi panelists (Technology, Marketing, and Materials) are asked questions that specifically focus on their respective area of expertise. However, a few questions are considered common to two or more panels. The fuel-price question (see MKT-6) is considered so basic that it was submitted to all three panels.

At times, the panels will give differing responses to the same question. This may reflect the makeup of a particular panel and the panelists' subjective perception of the issue in question. Where differences do exist between the panels, serious consideration should be given to whether the difference reflects the composition and proprietary interests of that particular panel or whether there exists a substantial degree of uncertainty regarding the issue in question. We try to highlight both the differences and similarities.

Trend from Previous Delphi Surveys. A single Delphi survey is a snapshot that collects and presents the opinions and attitudes of a group of experts at that particular point in time. Some questions, in various forms, were asked in previous Delphis. This has resulted in the accumulation of trend data in the Delphi forecasts since 1979. The fact that forecasts for a particular question may exhibit considerable variation over the years does not diminish its relevance and importance to strategic planning because it is a reflection of the consensus of expert opinion at that time. These opinions and forecasts are predicated on the best information available at that time. Market, economic, and political factors change. An analysis of trend data can reveal either stability or volatility in a particular market factor, material, or technology. A careful analysis of trend data is an important consideration in strategic business planning decisions.

Strategic Considerations. Based on the replies to a particular question, other relative Delphi V forecasts, other research and studies, and OSAT's extensive interaction with the automotive industry, inferences and interpretations are made as to the core issues in questions and their impact on the industry. By no means are they expected to be exhaustive statements of critical issues but rather points the reader should consider.

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EXECUTIVE SUMMARY

The Marketing Panelists' view of the future through 2000 may be summarized rather simply: increasing competition. This competition is likely to occur in an environment of rapid and volatile, but not totally unpredictable, change. It appears Marketing Panelists foresee a period of significant opportunity, substantial risk, and unparalleled complexity requiring corporate strategies to be developed from the systematic application of all available resources. This volume of the *Delphi V Forecast and Analysis of the U.S. Automotive Industry Through the Year 2000* attempts to identify, define, and predict the major marketing-related issues that impact the overall U.S. automotive industry business environment, sales and service channels, sales and production levels, market segmentation, product attributes, and supplier and sourcing strategies.

Panelists predict a generally stable economic and political environment through 2000. Companies are likely to find increasingly complex strategic factors with continued globalization of the industry. Key issues include foreign-exchange fluctuations, foreign-investment regulations, and foreign-trade customs. Future energy prices are viewed as uncertain given Middle-East economic and political stability. Government regulation is expected to increase, but with a more constructive interaction between the industry and regulating community. The most significant trend within vehicle regulations is the movement of light-truck regulations toward passenger car safety and emission standards.

The basis of competition is expected to shift as many traditional differentiators become equalized across the industry. Dealer sales and service activities are expected to become increasingly important in developing manufacturer perception, customer loyalty, and market differentiation. The sales and service systems are viewed as needing significant improvement to achieve total customer satisfaction. Products will continue to be judged on price, styling, and perceived quality; however, the dealer is the company to an individual customer and, thus, a crucial factor in the customer's perception of the product. The entire distribution channel is likely to undergo significant change as customer satisfaction becomes a paramount objective and manufacturers and dealers respond accordingly.

Product-development timing will become a key manufacturer differentiator. Generally, panelists believe Japanese manufacturers will continue to set the industry's standard for short product-development cycles. However, both the U.S. and Japanese industries will improve high- and low-volume facelift and major platform product-development times. The Japanese industry is expected to be a moving target while maintaining its advantage through 2000. The companies maximizing value-added in every element of the internal product-development effort and external supply chain will achieve best-in-class products and profit.

The passenger-car and light-truck markets will continue to be a battleground between domestic and import makes. Overall sales are likely to remain almost stagnant with slow growth envisioned on a trend basis through 2000. This mature market will challenge the manufacturers to develop strategies that effectively integrate and execute price, product differentiation, market responsiveness, and marketing program efforts. Although panelists believe U.S. competitiveness has improved, foreign imports and U.S.-located production are expected to continue eroding Big Three market share. This forecast projects continued pressure on assembly and component production capacity. Panelists believe traditional domestic and new American manufacturer's overcapacity will continue to force industry rationalization.

Advanced product technology, primarily related to electronics, is expected to expand substantially in the coming decade. In particular, powertrain, suspension, and braking systems are forecast to be "up-teched." Panelists predict total powertrain performance will become a key product differentiator. As a result, superchargers and turbochargers, multi-valve engines, and other advanced powertrain features may increase penetration. All new product technology must be developed and offered from the perspective of improving customer value through a number of factors including function, utility, safety, and comfort. Technology for technology's sake will not be accepted in the marketplace.

Future vehicles are expected to take greater advantage of modular construction offering new opportunities for competent suppliers. Definition of modules and sourcing patterns are just now beginning to be determined giving proactive creative suppliers a special opportunity. Outsourcing by the Big Three is expected to continue due to cost pressure; however, labor considerations are likely to be a key limiting factor. Each manufacturer has unique needs and individual programs may have unique procurement requirements. Suppliers need to improve their customer orientation and market responsiveness to take advantage of these trends.

Overall, the U.S. market through 2000 is likely to remain a mature market. Certain segments such as light-trucks and passenger-car "specialty" segments may grow more rapidly than the overall market. However, these segments will be targeted by world-class manufacturers having cost, product-development timing, and quality advantages. The strength of these leaders will set the market standards others must match. The U.S. market is expected to remain a buyer's market through 2000 with manufacturers offering more models and responding effectively to a more demanding market. Competition among greater numbers of vehicle offerings for a relatively fixed set of customers will place significant pressure on pricing, marketing, and selling and servicing strategies to differentiate products, win customer recognition, and build customer loyalty.

I. STRATEGIC PLANNING FACTORS

MKT-1. Many factors are considered in strategic planning. Following is a partial list of macro-political and economic factors which affect the external business environment. Please indicate your trend forecast for each factor (increasing, remaining the same, or decreasing). Unless otherwise indicated, all factors refer to the United States.

Macro-Political and Economic Factors	1988-2000 Trend		
	Increasing	Same	Decreasing
Foreign investment in U.S.	83%	13%	4%
Personal taxation rate	71	24	5
Business taxation rate	65	34	1
U.S. world manufacturing competitiveness	65	25	10
Energy prices	62	30	8
Annual consumer price index change	61	36	3
Annual producer price index change	58	37	5
U.S. industry R&D expenditures	50	47	3
U.S. world technology competitiveness	48	42	10
U.S. political stability	16	75	9
U.S. unemployment rate	24	70	6
Federal investment incentives	21	67	12
U.S. personal savings rate	30	54	16
Annual U.S. GNP change	31	51	18
World political stability	29	49	22
Prime interest rate	46	49	5
U.S. trade deficit	14	18	68
Federal budget deficit	27	34	39
Foreign exchange predictability	31	36	33

SINGLE RESPONSES include: trade tariffs, *increasing*; U.S. plant investment and U.S. transportation infrastructure, *increasing*; world food supply, *decreasing*.

SELECTED EDITED COMMENTS

- **Energy taxes** could quickly become a major issue relative to energy prices. Government indicators are becoming less and less an accurate barometer of the true economic conditions, since more people are employed and GNP is influenced by small firms not included in government surveys.
- The economic barometer is at a peak and will be falling. The budget and trade deficits will be narrowed, but will have little impact on forestalling a flattening of GNP growth. If we are lucky, a lengthy, shallow downturn is more likely than a sharp, deep recession. This could be a healthy "consolidation" period for a decade of strong worldwide economic expansion beyond the year 2000.
- Unfortunately, where we need to compete—better education and training in the trades, export incentives, R&D, and business leadership—we are not advancing.

MANUFACTURER/SUPPLIER COMPARISON

The manufacturer and supplier communities disagree on two trends and differ on the magnitude of several others. The two groups differ on predictability of the foreign exchange rate: manufacturers forecast lessening predictability; suppliers forecast no lessening. Research and development expenditures are the second major differing point. A majority of manufacturers see rising levels of R&D, while suppliers forecast expenditures remaining level. Suppliers are equally divided between forecasting an increasing and a level prime interest rate; the majority of manufacturers project level prime rates. Manufacturers are equally divided between business taxes increasing and their remaining the same, while suppliers overwhelmingly believe that business taxes will increase. The suppliers, in turn, are equally divided on the prospect of level or increasing U.S. world technology competitiveness, while most manufacturer respondents see the competitiveness of U.S. technology increasing over the twelve-year period.

TREND FROM PREVIOUS DELPHI SURVEYS

Delphi IV and V Marketing panelists agree on the overall trend of strategic planning factors, but the 1988 forecasts included several interesting changes in magnitude (even given that the forecast period is extended five years to 2000). A higher percentage of 1988 panelists (71%) forecast increasing personal taxes and increasing business taxes (65%), compared to 32% and 56%, respectively, of the 1986 panel. This reflects the change of administration in Washington and, perhaps, a more pragmatic outlook by the business community. The outlook on world political stability has become more optimistic: only 16% of the 1986 panelists forecast increasing stability, compared to 29% of the 1988 panelists. Similarly, 42% of the 1986 panelists forecast a decrease in political stability, compared to only 22% of the 1988 panelists. A greater number of panelists also expect increased U.S. political stability. Two additional years of stable gasoline prices have lessened the expectation of energy price increases (71% in 1986 versus 62% in 1988).

STRATEGIC CONSIDERATIONS

This question presents overall business environment factors all automotive stakeholders face. Given these factors, the key strategic consideration is positioning and structuring an individual company to best take advantage of internal strengths and competitor weaknesses.

The responses to these factors show general baseline trends—they do not indicate the quarter-by-quarter change of economic cycles that can significantly affect a company that is not cost competitive. Trends such as energy costs or consumer and producer price increases generally can be dealt with if increases are gradual and expected. To be successful, companies must be cost competitive and have significant flexibility to respond to unforeseen business environment changes.

A factor remaining difficult to manage is foreign exchange. An almost equal number of respondents believe predictability of foreign exchange rates will increase, decrease, and remain the same. This uncertainty reinforces a strategy of developing international bases of manufacturing, sourcing, and marketing to diversify assets and cash flows in a portfolio of several major currencies and intelligently using financial markets to hedge risk.

Despite 1988 election year speeches, strong expectations are shown for increasing business and personal income taxes. The use of taxes to support a reduction in the budget deficit is shown by a downward trend forecast in the federal budget deficit and moderating levels of interest rate increases. As auto sales are in an approximate inverse relation with interest rates, the importance of tracking fiscal and monetary policy is apparent.

MKT-2. Many factors impact the level of demand for new vehicles. Following is a partial list of economic, social, and consumer factors that affect new vehicle sales. Please indicate your trend forecast for each factor (increasing, remaining the same, or decreasing).

Economic, Social, and Consumer Factors	1988-2000 Trend		
	Increasing	Same	Decreasing
Consumer attitudes/expectations	81%	18%	1%
Vehicle insurance premiums	75	22	3
Gasoline prices	68	26	6
Real transaction price of light trucks	64	27	9
Used light-truck prices	60	35	5
Real transaction price of automobiles	60	30	10
Maintenance costs	58	21	21
Used car prices	57	38	5
Real household income	52	37	11
Vehicles per household	49	48	3
Number of product offerings (models)	48	23	29
Real disposable personal income	38	37	25
Use of mass transportation	17	60	23
Real personal consumption expenditures on motor vehicles	31	59	10
Real personal consumption expenditures on parts and service	35	53	12
Dealer gross margin per vehicle	13	51	36
Personal loan interest rates	42	50	8
Vehicle travel per person	45	50	5
U.S. population growth	46	48	6
Manufacturer brand loyalty	8	18	74

SINGLE RESPONSES include: births/household, *increasing*; single population, *increasing*; rate of change in distribution channels, *increasing*; product-technology improvements, *increasing*.

SELECTED EDITED COMMENTS

- Consumer attitudes are very important. As we age, our 1980's values will stay with us.
- The number of specific vehicle models (platforms) will decrease while the nameplates/marques offered will increase.
- Personal loan rates will not be "real," that is, they will not be based on economic factors.
- Technology will increase vehicle feature costs faster than it will reduce manufacturing costs as increased competition feeds on consumer demand for the latest in technology improvements, safety, comfort, and convenience. Vehicle retail prices will be driven up faster than average CPI.

MANUFACTURER/SUPPLIER COMPARISON

Manufacturers and suppliers disagree on four of the twenty market-influencing factors. The manufacturers see increases in real disposable personal income, vehicle travel per person, and vehicles per household. The suppliers forecast these factors to remain the same through 2000. Manufacturers estimate that population growth will remain the same, while suppliers forecast increasing population growth. It is not apparent that these differences are significant enough to cause the groups to develop divergent strategies. It does indicate that vehicle manufacturers are more optimistic about future car sales.

TREND FROM PREVIOUS DELPHI SURVEYS

Most of the factors considered in MKT-2 were not covered in Delphi IV. Passenger-car and light-truck prices are surveyed in both. It appears that competitive pressures of the mature marketplace are expected to keep new vehicle prices from rapidly rising: where 75% and 72% of 1986 panelists believed passenger-car and light-truck prices would rise through 1995, only 60% and 64%, respectively, in 1988 view prices increasing through 2000. This tempering of opinion is even more pronounced, considering that the Delphi V forecast period is extended five years to 2000.

STRATEGIC CONSIDERATIONS

The automobile, and increasingly the light truck, will remain the primary method of local, non-scheduled, personal travel. However, the overall U.S. domestic industry is operating increasingly under the pressures of a mature industry—intensive international competition from a proliferation of manufacturers, capacity, and product offerings. This typically forces manufacturers to compete intensively on product and non-product attributes: increased and more frequent product introductions, marketing and advertising, distribution, and customer service.

With increased competition, manufacturers must strive to provide a total package of customer value and implement programs and services throughout the customer's ownership experience to maintain customer loyalty, an important attribute panelists forecast to decline. It is ironic that manufacturers spend more time and dollars to attract a new customer than to maintain a current customer. We think the price of maintaining a current relationship is far less than the cost to entice a customer to switch makes.

This question raises many interesting elements of the vehicle purchase decision that can be addressed creatively by vehicle manufacturers. For example, insurance rates are becoming an increasingly important purchase decision factor. The manufacturing cost for mass-produced airbags, serial number encoding on parts, or other theft deterrent systems may be less than the increase in premiums to an individual customer for not having such features, and therefore may decrease the *total* purchase and operating cost. Manufacturers need to address this issue or the future might bring insurance cost guidelines (similar to fuel economy ratings) posted on new vehicle window stickers. Another area that manufacturers may be able to address effectively is to guarantee the future value of a new car to reduce the cost and risk associated with a purchase decision.

The entire purchase and after-sale service relationship needs to be viewed as a value package. A manufacturer providing only a vehicle for sale will be able to compete only on marketing hype and price. A manufacturer that sells a value package addressing customer costs, uncertainties, and needs will be able to maintain customer loyalty, create a halo effect over other company products and services, and allow premium prices. This will be important as companies that maintain or increase unit margins will have the flexibility to respond to the market through aggressive pricing and product and manufacturing investment strategies. These strategic outlooks are for both vehicle manufacturers and suppliers.

MKT-3. In the following categories, please indicate your expected ten-year trend of federal regulations and/or likely new areas of legislative activity.

Categories	Government Regulatory Trend		
	More	Same	Less
Occupant restraint/interior safety: Light Truck	90%	10%	0%
Vehicle integrity/crashworthiness: Light Truck	85	12	3
Vehicle emission control: Light Truck	84	15	1
Occupant restraint/interior safety: Passenger Car	84	16	0
Vehicle integrity/crashworthiness: Passenger Car	83	17	0
Vehicle emission control: Passenger Car	65	33	2
Lemon laws	64	30	6
Product liability	57	34	9
Noise: Light Truck	51	47	2
CAFE: Light Truck	47	40	13
Noise: Passenger Car	39	59	2
CAFE: Passenger Car	34	52	14

NEW AREAS OF REGULATIONS

Vehicle Emission Control

Passenger Car

Fuel vapor recovery
Possible local (city or state) increases
CO₂
Formaldehyde (with methanol fuels)
Electromagnetic interference (EMI)

Light Truck

CO₂
On-board vapor recovery
Diesel particulate standards
Electromagnetic interference (EMI)

Noise: Passenger Car

Tire/engine noise

Vehicle Integrity/Crashworthiness

Passenger Car

Side barrier/impact
Interiors
Rear post-collision damage

Light Truck

Follow car pattern
Interiors/airbags
Bumpers compatible with cars, side impact

Occupant Restraint/Interior Safety**Passenger Car**

Side barrier/impact
Rear seat safety
Airbags

Light Truck

Airbags

Lemon Laws

Third party binding arbitration

Product Liability

Legal limitation of claim amounts and settlements

SELECTED EDITED COMMENTS

- Fuel economy and safety are two areas on which the auto industry must take a strong leadership position. Budget for it, advertise it, sell it, charge for it, be happier for it, and don't complain about it.
- I would not be surprised to see legislation requiring anti-lock brakes. As the government increasingly realizes that most light trucks are passenger car substitutes, legislation on fuel economy, emissions, and safety will become increasingly blurred with passenger cars.
- Light truck regulations will increase to match car regulations. Passenger car regulations will become more stringent overall, but not at an unmanageable pace.
- Something will be attempted in the area of alcohol impaired drivers, but I am uncertain as to what form this will take.
- Some studies in Europe have shown that interior air in automobiles is not as clean as the outside air. When consumer groups become more aware of this in U.S. there will be greatly increased demand for filtering systems.
- The philosophy of the next administration will determine to a large extent the regulations of the next ten years.

MANUFACTURER/SUPPLIER COMPARISON

The two groups of panelists view new regulations for light-truck noise differently. The manufacturers project no increase in noise standards, whereas most suppliers forecast more stringent regulations. The manufacturers and suppliers agree on trend directions in other categories.

COMPARISON OF FORECASTS: TECH-5

The Marketing and Technology panels disagree only on one trend forecast: light-truck CAFE standards. Forty-seven percent of the Marketing panelists believe these standards will increase, while an equal percentage of Technology panelists believe that light-truck standards will remain the same. The difference between the two panels' "more" and "same" responses do not, however, indicate a significant opinion difference.

TREND FROM PREVIOUS DELPHI SURVEYS

The 1988 panel is more likely, compared to the 1986 panel, to project increasing regulation of the product itself (i.e., emissions, CAFE, and safety), while forecasting lesser amounts for related issues of lemon laws and product liability. The increasing forecast levels of product regulation is a direct result of the new Bush administration, which will be generally proactive in safety, emission, and fuel economy regulation but pragmatic concerning time frames and methods of achievement.

STRATEGIC CONSIDERATIONS

The major trend in industry regulation is equating passenger car and light-truck standards. This should not come as a major surprise as light trucks make up an increasing share of the total U.S. vehicle fleet and are purchased and used increasingly for exclusive, non-commercial use. The comment "Passenger car regulations will become more stringent overall, but not at an unmanageable pace" may be an accurate scenario. Government and industry are more likely to move together investigating, researching, and solving the external social and public costs of the automotive transportation system. Industry must be more proactive across each of these areas to discover problems and opportunities and respond to these issues in a prudent and responsible manner such that they set the agenda. This proactive stance appears more beneficial to industry than categorically denying and opposing all forms of government legislation.

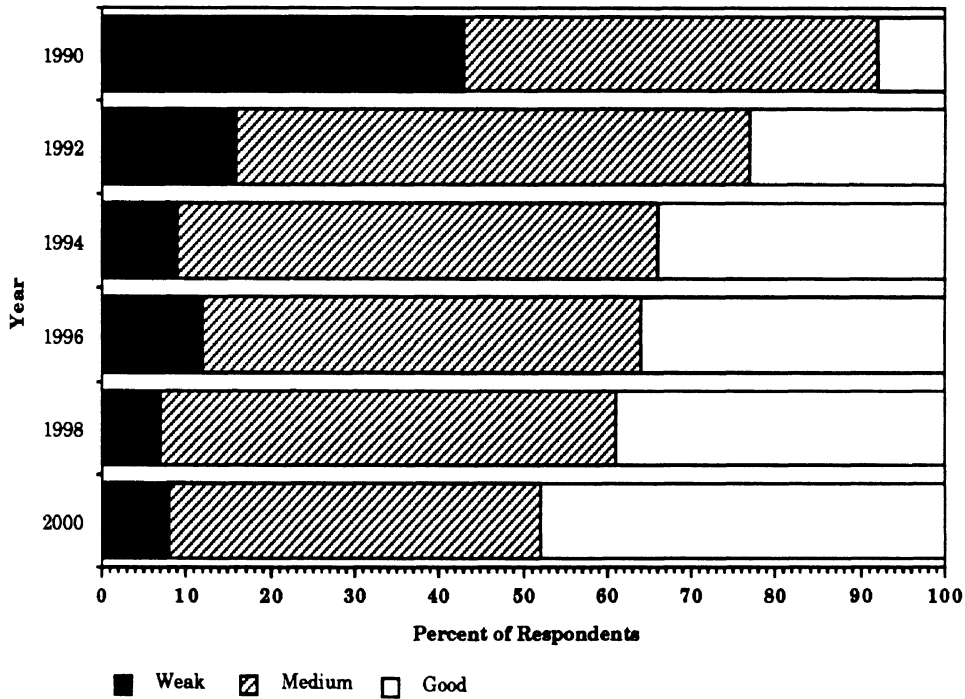
Certain new areas of regulation do pose challenges to suppliers and manufacturers. One area indicated is interior emissions. As new plastics are formulated and research is done in this area, new understanding and testing of potential standard levels must be investigated. This is an area where plastic resin and component suppliers and vehicle manufacturers could move together to address the issue, if necessary, in a way that would preclude needed legislation. Another emission receiving attention is air conditioning refrigerants. There is growing evidence that health problems may be associated with these emissions. In the recycling area, plastics companies are beginning to address the issue in a way that will direct research funds efficiently, increase public awareness, improve industry image, and effectively manage the problem. Legislation and regulation of the industry without significant industry participation might result in suboptimal solutions.

In another area, "lemon laws" are the result of neglecting a problem—poor vehicle quality and dealership/customer relations—and as a result, legislation has been put into place by default rather than by choice. The vehicle manufacturers could model the plastics industry's strategy in recycling: industry's setting and acting upon a public agenda. Industry must work in a cooperative, progressive way with all stakeholders to solve the product and service liability issue before commerce is halted by litigation.

MKT-4. If a “good” sales year is defined as the sale of 18-million passenger cars and light trucks in the U.S. and Canada, and 16-million and 14-million units define a “medium” and “weak” year, respectively, what is your expectation (good, medium, or weak) for each of the following years?

North American Light-Vehicle Sales						
Year	18 million		16 million		14 million	
1990	Good	7.8%	Medium	49.4%	Weak	42.9%
1992	Good	23.4	Medium	61.0	Weak	15.6
1994	Good	33.8	Medium	57.1	Weak	9.1
1996	Good	36.4	Medium	51.9	Weak	11.7
1998	Good	39.0	Medium	54.5	Weak	6.5
2000	Good	48.1	Medium	44.2	Weak	7.8

Economic Cycle Forecast for the North American Market, 1990 - 2000



SELECTED EDITED COMMENTS

- All history points to some degree of recession for the 1990 time frame; followed by a slow recovery.
- I do not believe anybody is very good at predicting the vehicle cycle—at best only two or three months ahead, at worst we are in a cycle six months before we believe it.
- I expect product proliferation and market segmentation will generally keep sales in the good range throughout this century.
- Market seems “overbought.”

- The “good” value of 18 million is too low for the long-term outlook.
- Recession years: 1989, 1993, 1997. These will be weak years for North American light-vehicle sales.
- The expected pattern is an extended, shallow, below-trend demand graph, with rising demand toward the end of the decade.
- Too far to predict. World macro issues could greatly change in any two-year cycle.

MANUFACTURER/SUPPLIER COMPARISON

A majority of the supplier community predicts that the market will be approximately 16-million units from 1990 through 2000. The manufacturers forecast a more traditional market cycle: 1990, weak; 1992, medium; 1994, good; 1996, good; 1998, medium; 2000, good. The difference may be because the manufacturers are supporting the market with incentives, fully understanding the underlying continued cyclical market, while the suppliers have been lulled into a false sense of security due to the incentive-supported market that has produced record consecutive sales quarters.

TREND FROM PREVIOUS DELPHI SURVEYS

Delphi IV (1987) panelists predicted a medium (15-million unit) 1987; a weak (13-million unit) 1989; and a good (17-million unit) 1991. The sustained strength of the domestic market has moderated panelists' views toward weak markets and has delayed forecasts of weak to moderate markets by one year to 1990.

STRATEGIC CONSIDERATIONS

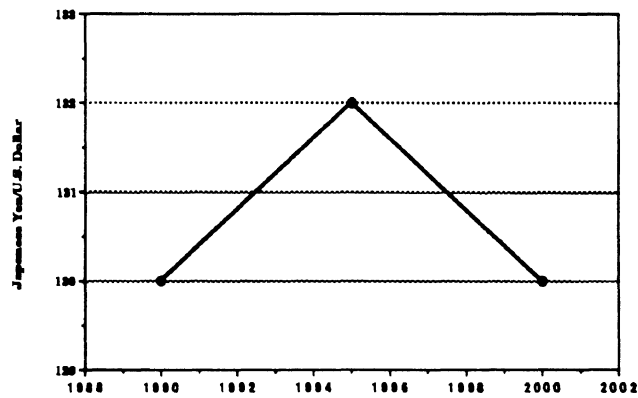
Although this question addresses market forecasts in a very general manner, it appears that most of the panelists forecast a general leveling out of the overall market, moving away from the five- to six-year dramatic 10–12% overall market fluctuations. Certainly, specific segments will experience varying degrees of sales patterns, and some may be eliminated altogether while new segments emerge. However, in sum total, the manufacturers are perceived as more willing to expand marketing and other expenses to prop up weak markets than to pull back and wait out general economic downturns. These extra costs increase the importance of having continual improving cost structures that permit aggressive market share-oriented pricing strategies.

Another view of this question is that although the future peak sales years will no longer be records, the troughs will be higher, with the industry basically growing at a rate of 1 to 1-1/2 percent per year. This should reduce the likelihood of large-scale layoffs and swings in engineering and production workload. This may affect engineering service firms that act as relief valves during peak years. However, it does increase the need to target individual market segments in an accurate and timely manner. If the total market pie is not growing, the only way a company can increase sales is by having a product portfolio that is more attractive than its competition (of which there is an ever-increasing number). The major ways to increase sales and profits in dollars are to reduce costs, increase price based on improving customer value, and/or move upmarket.

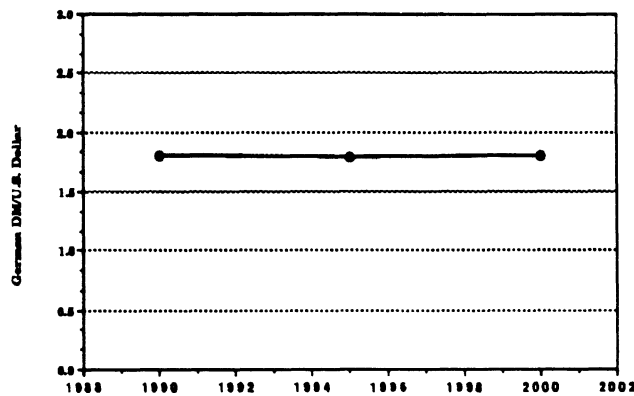
MKT-5. What is your estimate of the average yen and deutsche mark (DM) currency exchange rate for the following years?

Currency	Median Response			Interquartile Range		
	1990	1995	2000	1990	1995	2000
Yen/\$	130	132	130	120/140	115/150	110/145
DM/\$	1.80	1.79	1.80	1.70/1.83	1.70/1.85	1.70/1.95

Japanese Yen/U.S. Dollar Exchange Rate Forecast, 1990 - 2000



German DM/U.S. Dollar Exchange Rate Forecast, 1990 - 2000



SELECTED EDITED COMMENTS

- Substantial further realignment is needed to reduce imports and the trade deficit.
- Trade imbalance and inflation in Japan and Europe must be corrected over the next ten years.

MANUFACTURER/SUPPLIER COMPARISON

Manufacturers and suppliers estimate a stable DM/\$ close to the 1.8 DM/\$ rate through 2000. The panels are within 5% of each other's yen/\$ forecast: manufacturers forecast a slightly stronger dollar in 2000.

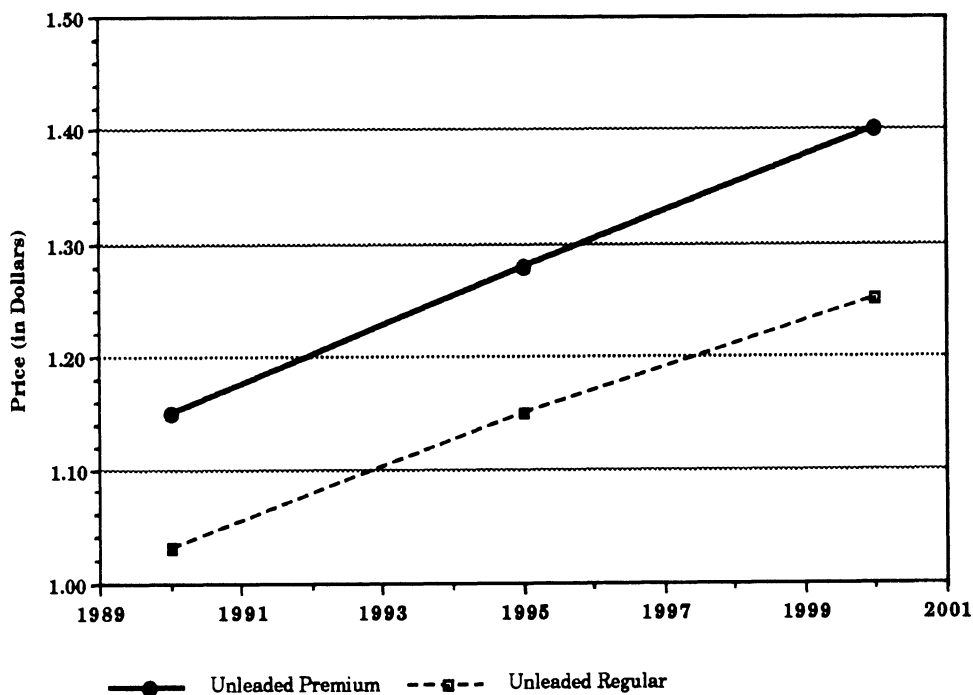
STRATEGIC CONSIDERATIONS

This question attempts to make a current estimate of likely 2000 exchange rates. This is a tremendously volatile forecast, influenced by local and international politics, trade flows, and economics. Interquartile ranges reflect this volatility, especially on the yen/dollar rate's varying 15 to 30 percent. These five-year intervals indicate relatively stable foreign exchange rates; however, recent history has proved that within five-year intervals tremendous fluctuation can occur. Yet, investment decisions are being made today based on similar estimates. Managing exchange rate risk will remain a strategic issue for large corporations and become an increasingly important issue for medium and small suppliers. As international involvement increases, companies—large and small—must increase their level of sophistication in the domain of international finance.

MKT-6. What is your estimate of retail fuel prices per gallon in the U.S. for the following years? (In constant 1988 dollars, that is, without adjusting for inflation.)

Year	U.S. Retail Fuel Price Per Gallon			
	Median Response		Interquartile Range	
	Unleaded Regular	Unleaded Premium	Unleaded Regular	Unleaded Premium
1990	\$1.03	\$1.15	\$1.00/1.05	\$1.10/1.20
1995	1.15	1.28	1.10/1.20	1.25/1.35
2000	1.25	1.40	1.15/1.45	1.30/1.70

Retail Unleaded Fuel Price Forecast (Price per Gallon in constant dollars)



SELECTED EDITED COMMENTS

- I anticipate a fuel supply crisis in the 1990s, although it will be relatively short. Prices are currently very low (when adjusted for inflation) and will remain so as long as the Middle East is relatively stable.
- See unstable fuel prices due to Middle East political instability. Wild swings between gluts holding prices down and hoarding forcing prices up. No end in sight for Middle East problems.

- Specific economic needs in individual countries will keep production high in the short term, which will hold down prices. In the longer term (2000), decreasing reserves will again put upward pressure on prices.
- Major issue will be taxes to fund budget deficit, road/bridge rebuilding, and selected mass transit.
- Demand increase will make a gas shortage in the early 1990s when alternative energy sources will begin to hold down the price of petroleum fuel. As a result, after the mid-1990s, petroleum fuel prices will remain stable.
- We should be into a full-blown gasoline shortage by 2000. Some alternative fuels, synthetic gasoline/methanol/LNG—should be coming into use.
- As older vehicles are replaced in the vehicle fleet by more fuel-efficient models, the price of fuel should remain constant. However, fuel consumption as a source of taxation for other purposes will cause prices to rise.
- A key question is how is the American auto industry going to reduce fuel price impact on auto sales? Domestic engines are not as fuel efficient as they should be.
- Powertrain improvements should lead to increased CAFE figures, and hold down growth in fuel demand.
- As leaded demand continues to decrease, I believe the oil companies will treat it as a specialty and price it near unleaded.

MANUFACTURER/SUPPLIER COMPARISON

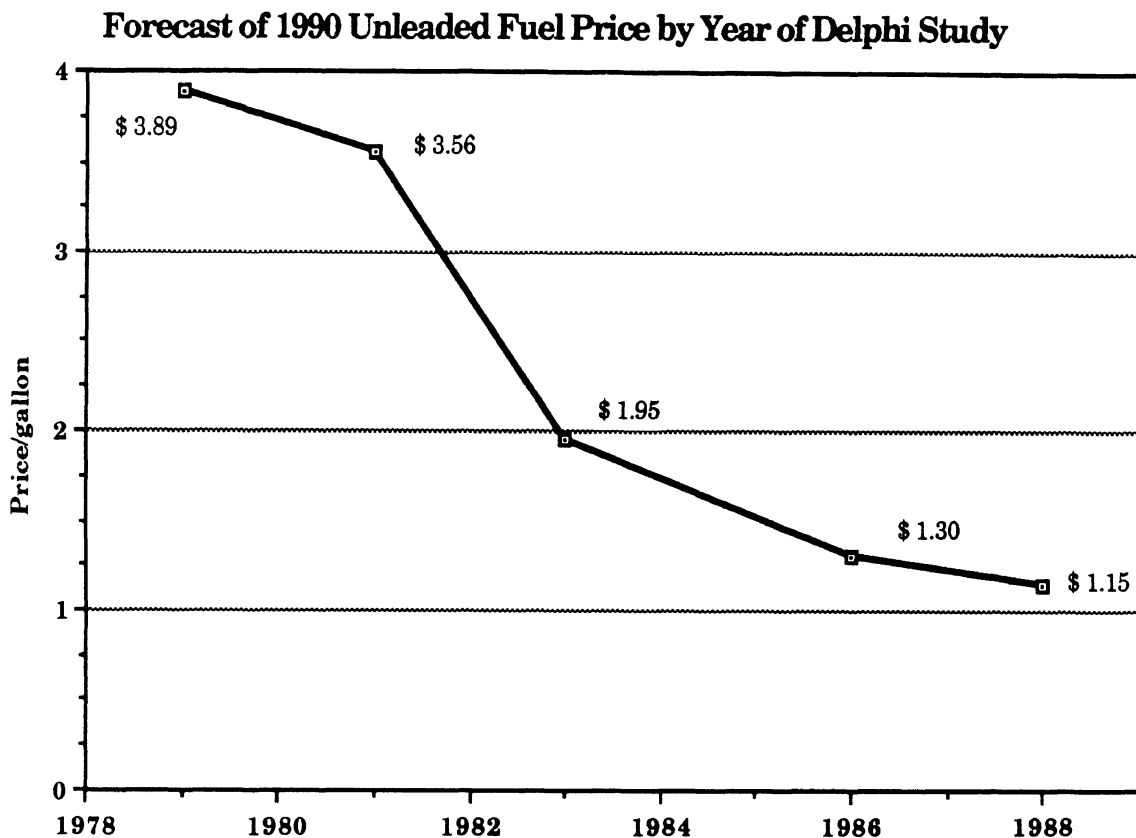
Forecasts of the two panelist groups are within approximately 10% percent of each other. The suppliers, in general, predict higher fuel prices for specific years and greater annual percentage increases in later years.

COMPARISON OF FORECASTS: TECH-1

The following table shows the forecasts of Marketing and Technology panels for fuel prices in the years indicated. As is illustrated in the fuel price forecasts, there is no significant disagreement between the panels as to the general trend and magnitude of price increases. The Technology panel expects fuel prices to increase more significantly than the Marketing panel over the ten-year period: 33% to 21% for unleaded regular and 33% to 22% for unleaded premium, respectively.

Unleaded Gasoline	Technology Panel			Marketing Panel		
	1990	1995	2000	1990	1995	2000
Regular	\$1.05	\$1.20	\$1.40	\$1.03	\$1.15	\$1.25
Premium	1.20	1.35	1.60	1.15	1.28	1.40

TREND FROM PREVIOUS DELPHI SURVEYS



STRATEGIC CONSIDERATIONS

The forecast of increasing gasoline prices appears to be gradual and predictable. Of course, these forecasts are for five-year intervals and do not reflect any substantial disturbances in supply or demand that would force gasoline prices off this predictable path. These forecasts appear to reflect 1988 oil price stability. It would be prudent for manufacturers and suppliers to be prepared for potential oil shocks that might disrupt supply and affect raw material costs and vehicle sales mix. Companies that can respond in the quickest time with the least cost will profit the most.

Panelists' comments suggest there will be an increase in the federal gasoline tax—to serve as a revenue generator and a conservation mechanism. The tax will most likely be in the 5–15 cent-per-gallon range. This might be implemented over a three-year period of, for example, 3–5 cents per year—a well known and manageable schedule. What may arise are regional shifts of demand as individual states attempt to increase their revenue for transportation infrastructure and overall increased debt service.

II. VEHICLE PURCHASE AND OWNERSHIP

MKT-7. There are numerous characteristics which profile the U.S. dealership network. Please indicate your 1988–2000 trend forecast for each of the following characteristics.

Dealership Franchise Characteristics	1988–2000 Trend		
	Increasing	Same	Decreasing
Number of “mega-dealers” (chain-ownership)	94%	5%	1%
Number of dual franchise dealerships	91	8	1
Number of vehicles sold per dealership	77	14	9
Percentage of financial, insurance, and extended warranty sales to overall dealership gross sales	71	26	3
Average import nameplate inventory levels	44	42	14
Average domestic nameplate inventory levels	10	47	43
Number of new car dealerships	16	21	63

OTHER responses include: “mall” sales centers, *increasing*; hours of operation, *increasing*; parts and service sales, *increasing*; public ownership, *increasing*; shared inventory pools, *increasing*.

SELECTED EDITED COMMENTS

- The profit margin squeeze and other economic factors affecting the operations of a dealership suggest numerous efficiencies must be found—the most obvious are related to expanding the size of the retail and service facilities for economies of scale.
- Decreasing number of new car dealerships assumes a dealer with multiple outlets is counted as one dealer.

MANUFACTURER/SUPPLIER COMPARISON

The two panelist groups differ on the trend direction of inventories: manufacturers forecast domestic inventories decreasing (suppliers forecast levels remaining the same) and import inventories increasing (again, suppliers forecast current stable levels). Finished vehicle inventories are a significant use of capital and need to be addressed from a cost/benefit standpoint.

STRATEGIC CONSIDERATIONS

Concentration of ownership, reduction of sites, and challenges for leverage of power between manufacturers and dealers are the major dealership network trends. As dealers take on multiple franchises, create auto malls, etc., the manufacturers need to address decreasing dealer loyalty to individual makes, lowering costs for consumers to shop competitive makes, and increasing dealer leverage against the manufacturers. The great efforts to improve assembly and component plant quality and costs have not been duplicated further down the distribution channel. For example, a large percentage of panelists believe

that domestic inventories will remain the same or increase from the generally accepted 60 days. The manufacturer that can address the issues of accurate forecasting, and order, manufacture, and delivery time compression can reduce finished goods inventories by tens of millions of dollars by shaving one or two days off "accepted" inventory levels. When approached from a corporate cost systems view, there are many cost centers which do not provide customer value, only cover inefficiencies and outdated traditions.

If product attributes of quality and value become equal across makes, then the sales and service relationship becomes a potential differentiation method. Each of these dealership attributes has implications for the total customer relationship. The manufacturer that operates a dealership network with comprehensive, integrated factory support of sales, service, and marketing will promote total customer satisfaction and, with continued product innovation, build customer loyalty—a loyalty that will be rewarded by trading up and personal recommendations.

MKT-8. True total customer satisfaction is difficult to quantify. Please select the five most important considerations you believe influence customer buying decisions. Do not attempt to rank these attributes, simply indicate those five characteristics you feel are the most important initial considerations to the customer.

Key Customer Purchase Considerations	
1.	Price
2.	Exterior styling
3.	Quality of fit/finish
4.	Previous make/model ownership
5.	Status appeal of vehicle

OTHER significant considerations include: financing/cash incentives; previous customer/dealership relationship; friend/family recommendation; perceived manufacturer reputation for quality/reliability; resale value; interior fashion/style.

SELECTED EDITED COMMENTS

- Very difficult to respond, given the wide variation based on product segments, price points, and needs/wants of increasingly smaller buyer groups in a fragmented market.
- Difficult choices to name top five—actually there are eight or nine I would rank as equal or musts in a car-buying decision.
- Initial impressions are impacted most immediately by the exterior appearance and sticker.
- Approximately 70% of the buyers are predisposed as to a “make” before visiting a dealer to purchase; therefore, functional performance attributes play a role primarily before the test drive. Future costs (ownership expenses) play a secondary role to immediate transaction costs.
- Reputation equals quality of workmanship, frequency of repair, reliability, durability, trustworthiness of management, image.

STRATEGIC CONSIDERATIONS

The comments raise several interesting points which must be addressed by suppliers, vehicle manufacturers, and dealers. First, the attributes that define customer-satisfaction change over time—the fit and finish that attracts the customer in the showroom has no bearing on the perception of quality while stranded on a back road late at night. Therefore, manufacturers, with full support of suppliers and dealers, must approach the design, engineering, procurement, and assembly of parts and components and sales and service from a lifetime, systems perspective. That requires understanding the customer’s needs, wants, and desires not just at the point of sale, but over a minimum five-year/60,000-mile relationship (considering an average ownership and usage).

The second comment raising a significant issue for companies is the wide differentiation of customer-satisfaction definitions across vehicle segments, geographic regions, and even among buyers of the same car. Companies making a concerted, continued effort to intimately know their customer will have an advantage over those who do not. A

method to improve market knowledge, particularly for the traditional domestic manufacturers, is to change the mindset that the dealership network is a sales network—it must be viewed as a marketing tool. The dealers' orientation needs to be upgraded from an order-taking position to the ability to speak intelligently and authoritatively about new product technology, comparative value across a growing number of competing makes, and—to engineers, designers, and marketing executives—profiles of the buying public. Feedback from the dealers who are in direct contact with the public is a valuable source of marketing information. But to use the dealers effectively there must be an improvement in dealer personnel and the philosophy of the manufacturers' sales and marketing executives.

The third comment of significant importance is that there are not just five factors of influence; there could be as many as ten key factors and, again, the importance of any one of these varies by segment and length of ownership. This is why we did not attempt to rank these attributes. All of these five are equal among themselves, and given the segment, may or may not be more important than those listed in "Other significant considerations." As competition increases, the number of factors that customers judge products on increases. For example, if there are two vehicle choices, the decision is somewhat simple and the consumer can decide based on styling or price comparisons. But, if there is greater competition for that customer's dollar and there are four potential vehicles that the consumer is indifferent to on styling or price, he or she needs to use other criteria (listed further on MKT-8 response list) to "break the tie." This example can be extrapolated out to illustrate how important it is to be best-in-class in all product attributes that targeted customers perceive value in, and judge products by, in making their product decisions.

MKT-9. Through 2000, in your opinion, what will be the most fundamental marketing and distribution channel issues (from the perspective of the vehicle manufacturer)? Please include issues such as product, pricing, promotion, and distribution.

Marketing and Distribution Channel Issues	
1.	The ability to market competitive vehicle offerings and differentiate product offerings to various consumer psychographic/demographic profiles (including product quality, styling, dependability/reliability, feature content, and product technology).
2.	Pricing and the determination of the consumer's perceived cost/value relationship map.
3.	Dealership franchise issues and distribution channel changes (including growth of mega-dealers, public ownership, shopping mall outlets, balance of power between OEM and franchises, multi-franchises, and diversified distribution methods).
4.	Customer/dealer relationship (including simplifying the sales process, improving the professionalism of the sales force, and ever improving sales and service, e.g., convenience, competency, and price).
5.	Improved advertising and promotion to meet demands of a more sophisticated audience.

STRATEGIC CONSIDERATIONS

The response to this question reiterates the continued need to focus on the customer. The ability to deliver product quality, styling (interior and exterior), dependability, and reliability, with needed performance characteristics at a cost to provide maximum perceived customer value is the challenge to be met from material supplier to final assembly and distribution. This challenge affects every business function within the automotive industry, from market research (to understand changing cost/value relationship perceptions) to design (to create appealing yet functional exterior lines and interior spaces) and engineering (to provide technical innovation and dependable vehicle performance) and from manufacturing (to assemble high-quality parts in a high-quality manner) to delivery and service (to provide convenience). Each of these topics must be approached with a spirit of continuous improvement to meet the demands of an increasingly sophisticated and demanding customer. Many companies will excel in one or two of the categories above. But perhaps only a few companies can satisfy each of these issues, and these will be the companies that will achieve long-term market share increases.

The most important aspect of this question is that future market success involves more than just the product—it involves the entire customer relationship. Increasingly important is the professionalism of the sales force and the competency of the service force as well as product technology hardware and the soft technology of advertising, promotion, and communication.

MKT-10. It has been said that world-class cost and quality are prerequisites for competing within the various vehicle segments. From the perspective of the traditional domestic vehicle manufacturer, what will be the key elements that will form the basis of competition past 1990?

Key Elements for Basis of Competition
<ol style="list-style-type: none"> 1. Product offerings which meet the wide and changing expectations, values, and tastes of the consumer. 2. Vehicle design/styling. 3. Product innovation that provides overall vehicle performance and function/utility. 4. Aftersale consumer service and satisfaction. 5. Marketing, including improving the image of domestic companies and products vis a vis foreign competition.

OTHER significant considerations include: frequent product and mix changes; pricing; dealer/consumer relations; low vehicle operating costs, including insurance; vehicle safety.

STRATEGIC CONSIDERATIONS

The panelists' responses to this question highlight an interesting paradox to the generalized belief that cost and quality "don't matter because everyone will have cost and quality." The paradox is that the customer's definition of cost and quality is constantly altered by changing expectations, values, and tastes (if market research ever truly knows the customer's definition of quality to begin with). Each of these responses can be ultimately linked to the ability of a company to continuously improve total product cost (including all costs from product design through warranty repair) and keep pace with an ever-changing and expanding definition of quality.

Cost competitiveness allows greater margins, and greater margins allow flexibility to invest in new vehicle designs and product innovation. Investment in new designs, product innovation, marketing, quality, and flexibility to price aggressively increases customer value. It is clear that the panelists believe market responsiveness in physical product offerings and softer aspects such as pricing, customer education, and customer relations are keys to long-term success.

MKT-11. Through 2000, in your opinion, what will be the most fundamental post-sale and service issues (from the perspective of the vehicle manufacturer)?

Post-Sale and Service Issues	
1.	The ability to fix a problem right the first time in a timely manner (including quick diagnostics and quality of service performed).
2.	Increased vehicle reliability and durability to restrict need for service (including reducing the number of things that can go wrong and designing ease of service into the vehicle).
3.	Increased customer convenience (including lengthening hours of operation, providing car loaners, minimizing time spent at service department).
4.	Improve customer/service department relationship (including better communication, follow ups after service).
5.	Improve the technical skills of service personnel.

OTHER significant considerations include: warranty coverage for both vehicle and repair services; cost of repair services, providing value for dollar spent; availability of parts; resale value of vehicle; increased involvement of vehicle manufacturers in dealership service methods and practices.

STRATEGIC CONSIDERATIONS

Every supplier and manufacturer must strive to design and manufacture components and vehicles to eliminate non-scheduled service and reduce scheduled maintenance. Given that some scheduled maintenance will be necessary and the harsh and unpredictable environment within which motor vehicles operate, the manufacturers should concentrate on limiting the inconvenience caused by an out-of-service vehicle. This "value" opportunity allows many creative approaches. Shuttle van service, increased flexibility of sales and service hours, and even house calls may become standard practice to attract and maintain customers. Manufacturers may be required to work with individual dealers to create solutions tailored to specific regions or cities. The manufacturers and the dealerships—working together and in close communication with the final customer—must be active in addressing each of panelists' responses. If product attributes of styling, quality, and function are becoming more alike it is imperative that the manufacturer-dealer-final customer relationship be developed further.

In a different area, but fundamentally important as referred to in several comments, is resale value. Some manufacturers do offer resale value guarantees that are indexed to specific groups of vehicles or some other valuation scale. Manufacturers, dealers, manufacturers' financial arms, auction houses, and others may all be part of a difficult solution to the resale price issue.

MKT-12. In your opinion, how will the distribution and service channels need to change through 2000 to respond to your answers in questions MKT-9, MKT-10, and MKT-11? Please consider changes to the existing system as well as potential alternative distribution methods.

Changes in Distribution and Service Channels	
1.	An increased marketing- and consumer-orientation.
2.	Overall improvement in service quality, diagnostics, and convenience.
3.	Separation of sales and service facilities.
4.	Improvement of dealership management and the level of professionalism for sales personnel.
5.	Increased levels of training for service and sales personnel.

OTHER significant contributions include: closer vehicle manufacturer and dealer relations; increased number of mega-dealers; increased level of personal and individualized follow-ups for sales and service activities; decreased levels of finished vehicle inventories while maintaining or reducing the time between sale and delivery; product distribution through national retail chains.

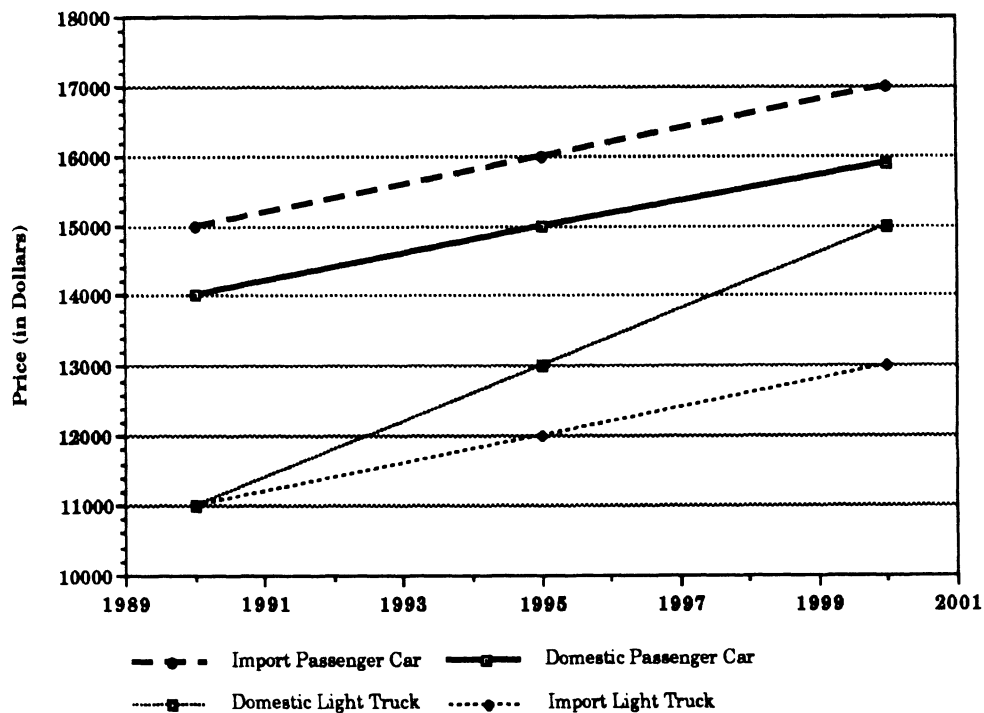
STRATEGIC CONSIDERATIONS

This question attempts to identify the changes needed to allow distribution and service channel improvement. Customer focus is a common theme. The panelists identify additional dealer-specific actions such as improvement in vehicle diagnostics, customer convenience, and staff professionalism. It appears the dealers alone cannot make these improvements. These actions must be supported and rewarded by the manufacturers. Both groups must work together toward common goals. There may be conflicts as mega- or multi-franchised dealers lose common interests with individual manufacturers. Manufacturers may be better served if they offer an integrated support package of financial assistance, training programs, marketing strategies, and managerial and leadership education in conjunction with attractive profit margin potential. It may be through an integrated program including all of these elements that dealer loyalty is maintained and customer-dealer relations improved.

MKT-13. In the following years, what is your estimate of the average transaction price in constant 1988 dollars for vehicles sold in the U.S.?

Vehicle/Year	Median Response	Interquartile Range
U.S.-Produced Passenger Car		
1990	\$14,000	\$13,850/14,200
1995	15,000	14,500/15,500
2000	15,900	15,200/17,200
Imported Passenger Car		
1990	\$15,000	\$14,500/15,300
1995	16,000	15,500/16,900
2000	17,000	15,900/18,200
U.S.-Produced Light Truck		
1990	\$11,000	\$11,000/12,000
1995	13,000	12,000/14,000
2000	15,000	13,000/16,000
Imported Light Truck		
1990	\$11,000	\$10,000/11,700
1995	12,000	11,000/13,000
2000	13,000	12,000/14,200

U.S. Average Passenger Car and Light Truck Transaction Price Forecast, Domestic and Import



SELECTED EDITED COMMENTS

- The actual median purchase price for retail domestic light-trucks in 1988 is \$15,000 and for imported trucks, including captives, is \$10,600. Based on these figures, respondents must still be thinking in terms of pickups and not "today's truck market."
- By the year 2000 there will be no significant price distinctions between imported and domestic products. All prices will increase in constant dollars due to significant product improvements, primarily in electronic systems.
- I see similar increases in traditional domestic U.S.-produced and imported light-truck areas—only slightly up for ABS.
- Japanese manufacturers will offset currency-induced price increases and U.S. manufacturers will "hold the line" on prices to retain market share. Increased value options on high-end vehicles will be offset by increases in inexpensive low-end vehicles from third-world manufacturers.
- Price disparity between domestic and foreign makes will narrow due to smaller differences in perceived quality and technological attributes of vehicles. Most of the yen's appreciation versus the dollar is complete.
- Prices in small and compact segments expected to fall below inflation increases due to excess product capacity, slower demand for these cars, and increased import penetration.
- Price changes are driven largely by mix impact of import vs. domestic vehicles within each class.
- Concept that gap between domestic and foreign imports will close ignores import growth (new Japanese entries) in high-price luxury segments.
- Consumer affordability will preclude an increase in constant-dollar prices. Softening economy in 1989 will lead to reduced "standard options." New market entries will tend to reduce averages.
- Excess capacity and fierce competition in generally all segments of the automotive market will drop prices.
- Import manufacturers will not let their hard-won market share slip.
- Increased domestic competition in the light-truck segment from Japanese products will create downward price pressure.
- Increases predicted for time frame are due to higher priced options that buyers will want and demand.
- More upscale cars will be sold and will move the average price higher. Also increased cost for regulation requirements.
- Probability that light-truck prices will increase more rapidly than passenger-car prices is because light-truck production capacity is tight (overcapacity for production of passenger cars) and light-truck demand could exceed supply.
- The answer is really based on the growth of the transplants and the market share of General Motors. If the transplants continue to grow and GM loses market share, there will be less pressure for Japanese imports into the U.S. Therefore, the imports will be luxury cars or specialty market vehicles like light trucks or MPVs. America has the auto market. The foreign vehicles will pursue the market through: (a) low price, (b) high value-high price, or (c) high value-medium price. Prices will follow segment demand and perceived value.
- The driving force for price increases will be rising material and labor costs. Productivity increases will not entirely offset these escalating costs.

- If the exchange rates return to historical levels, although at a lower differential, the production advances made by the Japanese will allow more value-added options on all vehicles at competitive prices.

MANUFACTURER/SUPPLIER COMPARISON

The two panelist groups are within approximately 10% of each other. Manufacturers forecast higher domestic and import light-truck prices, while suppliers predict higher domestic and import passenger-car prices.

TREND FROM PREVIOUS DELPHI SURVEYS

Although it appears that panelists forecast competitive pricing through 2000, the comparison to Delphi IV suggests panelists see a "stair-step" pattern to pricing: between 1988 and 1990, prices will be increased significantly and then held for the next ten years. The following table presents the median comparisons between the two surveys. This significant difference (even accounting for approximately 8% inflation) reflects, we believe, the devaluation of the dollar and the rapid increase in foreign car prices and the domestic strategy to match these price increases.

Year	Domestic		Import	
	1987 Delphi IV	1989 Delphi V	1987 Delphi IV	1989 Delphi V
1990	\$12,500	\$14,000	\$13,500	\$15,000
1995	13,800	15,000	14,700	16,000

STRATEGIC CONSIDERATIONS

Panelists forecast annual price increases to be level at 1 to 1-1/2% per year, making pricing a battleground for vehicle manufacturers. Automatic price increases for new model years no longer exist—increased profits will come from lower costs, increased perceived value (allowing premium prices), or larger market share. Customers are in the driver's seat, and successful manufacturers must provide best-in-class value. With pressure to limit price increases, prices will continually be "tweaked" to increase perceived value and respond to current general economic conditions and the competitive environment. Actual transaction prices, as a result of this competitive marketing environment, may be well below posted sticker prices. Apparently current manufacturer strategy is to use sales incentives actively, thus cushioning market fluctuations. Companies need to reduce costs continually to remain competitive—the company having larger margins can actively lead sales incentive programs. Cost reduction also leads to margin increases allowing investment in new product and process and permitting aggressive product positioning.

The relative difference between domestic and import passenger cars remains the same over the forecast period. These forecasts are average sums and, as a result, are not corrected for segment option content differences. Domestic trucks, however, become more expensive in comparison to imports. It is interesting that panelists forecast greater ability of domestic light-truck prices to rise. This may indicate a stronger competitive product position allowing domestic truck manufacturers premium prices. With any high-margin market, new entrants will be attracted and prices may become capped.

MKT-14. Within the U.S. market, what is your estimate for the average total life of new passenger cars and the length of time new car buyers will keep their vehicles?

Estimate in U.S. Market	Median Response		Interquartile Range	
	1995	2000	1995	2000
Average total life of passenger cars	11.4 yrs.	12.0 yrs.	11.0/12.0 yrs.	11.1/12.5 yrs
Length of ownership by new car buyers	5.0	5.0	4.6/5.0	5.0/5.5

SELECTED EDITED COMMENTS

- In general, consumers will attempt to offset increases in real new car prices with increased length of ownership and an increased emphasis on resale values which competition will force manufacturers to meet.
- Affordability will drive length of ownership up. New marketing and financing approaches will drive ownership lengths down.
- Decrease in length of ownership reflects increasing separation of socio-economic levels—two-income families.
- Dependent on inflation, interest rates, and tax rates.
- Increasing mechanical and electronic complexity of future vehicles could possibly have negative impact on average vehicle life.
- Quality will improve. Per-capita income will also grow.
- Average car life is an economic, not physical, lifetime. I see no reason for it to increase with overcapacity flooding the market and causing an abundance of good used cars. Slight shortening of new car ownership length will result because new merchandising and financing approaches will be more important than affordability.
- Car makers don't want the life of a car to extend past 11 years. Ownership will remain at 5 years based on: (1) need for change, (2) need for new electronics, and (3) need to trade before resale value is gone.
- Better warranties will extend ownership.
- Comment on average total life: more complexity will offset better construction quality and create more "throw-away" cars. Stereos are an example of this phenomenon—you don't repair, you replace. Comment on length of ownership: no more easy money?
- I don't believe financing alternatives will be sufficiently potent to offset rising costs. Changing perceptions about the practical life of the vehicle will be necessary for any more extended-term financing.
- Quality improvement will increase total life of passenger cars.
- This is somewhat of a fake statistic. Some owners trade after one year, others after ten—therefore, average equals five?

TREND FROM PREVIOUS DELPHI SURVEYS

The 1995 estimate of average vehicle life remains essentially the same, dropping slightly from the Delphi IV forecast of 12 years to 11.4 years in Delphi V. Average length of new vehicle ownership drops significantly between Delphi IV (6 years) and Delphi V (5 years). This reduction seems to counter the trends of the last two years: increasing price, lengthening warranty, increasing loan periods, and improving vehicle quality and durability. The expected growth of personal leases may be a component of reducing the first-time ownership statistic.

STRATEGIC CONSIDERATIONS

Results forecast no change in average length of new vehicle ownership and an increase in total vehicle life by one year over the next twelve years. Alone, these numbers do not indicate change—however, the panelists' comments raise many issues that are significant to individual buyers. Overall, these issues may average out to zero total market change, but targeted marketing efforts must respond to individual customer needs, and these issues may affect certain segments.

A fundamental shift of new car purchases being determined by physical appearance and mechanical wear indicators to more economic considerations is a major issue raised by panelists. The greatest factor driving this is rising vehicle prices, especially considering the amount of optional equipment being added to vehicles. This has pushed loans to an average maturity of 53 months. With longer loan maturities, customers will operate vehicles longer to build trade-in value equity. The second factor forcing a more economic viewpoint is extended warranties. A psychological factor driving new vehicle sales is the owner's thought, "My car is three [four or five] years old, now I can expect the high repair bills." With extended warranties written three, four, and five years out to a maximum of 100,000 miles, the customer's risk of cost and inconvenience drops. A third factor is the general improvement of quality, durability, and reliability of today's vehicles.

All of these factors are interrelated. As vehicle quality improves, used car prices should rise to reflect increased residual value. As used car prices rise, trade-in values rise, reducing the initial cash outflow or needed financing. As warranty coverage increases, consumers might weigh a reduction in operating expenses in favor of increased initial price. As vehicle acquisition and operating costs increase, manufacturers have great opportunities to customize purchase plans and service options to individual customers. A long-term trend of life-cycle management—from design to recycling—appears to be forming. Manufacturers need to look internally to captive financing arms, parts and service divisions, and dealership networks and externally to services and companies like AAA, independent warranty insurers, and others to package the best total acquisition and operating service value.

MKT-15. What is your expectation of the average amount financed (*in constant 1988 dollars*) and the average maturity (*in months*) for new passenger car loans in the following years?

New Passenger Car Loans	Median Response		Interquartile Range	
	1995	2000	1995	2000
Average maturity	55 mo.	60 mo.	54/60 mo.	55/60 mo.
Average amount financed	\$12,000	\$12,995	\$11,500/12,500	\$11,750/14,000

SELECTED EDITED COMMENTS

- Hard to tell as personal leasing and financing blur.
- Sixty-month loans will dominate, but longer term loans will not be popular, since most owners will get bored with their car and want to trade within five years.

TREND FROM PREVIOUS DELPHI SURVEYS

Delphi IV forecasted 1990 levels to be 52 months and \$11,000—a point the industry reached in 1987. This reflects the past three years of incentive use to maintain the unexpectedly sustained market; level fuel prices promoting a significant move upmarket in vehicles, option content, and powertrain configurations; and the dollar devaluation which pushed import car prices dramatically upward. The current Delphi increases the 1995 forecast of maturity by two months (from Delphi IV, 53 months). Average amount financed remains the same.

STRATEGIC CONSIDERATIONS

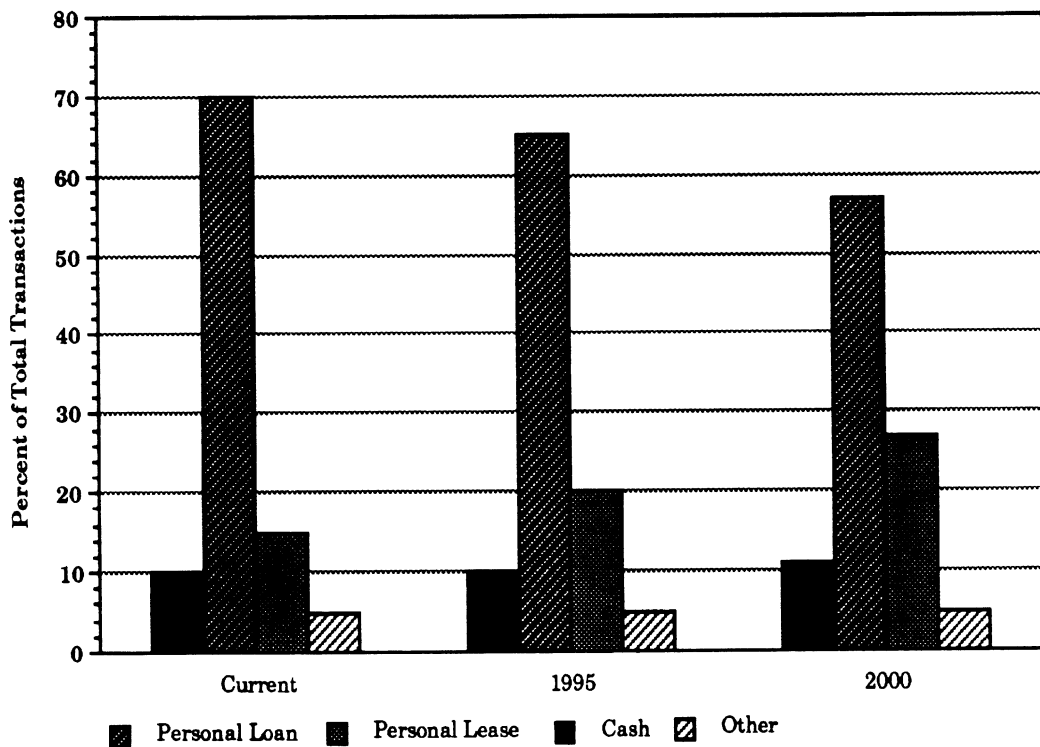
In recent history, average monthly personal expenditures for new vehicle purchases as a percent of total household expenditures has remained generally constant. During the past two years that percentage has grown. The responses to this question reflect that increase, forecasting customers to increase maturities and amount financed to again level off the percentage as a total of household expenditures. As new vehicle purchase and operating costs become increasingly expensive, successful manufacturers will be those providing the best perceived value in attractively styled vehicles.

MKT-16. For those cars that are financed, what is your estimate of the financing method mix for new passenger car purchases in the following years?

Financing Method	Median Response			Interquartile Range		
	Current Estimate	1995	2000	Current Estimate	1995	2000
Cash	10%	10%	11%	10/10%	10/10%	10/10%
Cash plus personal loan	70	65	57	67/70	60/65	50/60
Personal lease	15	20	27	11/20	19/25	20/35
Other*	5	5	5	2/10	5/10	5/10
TOTAL	100%	100%	100%			

*OTHER responses include: company and government lease; company purchase/subsidized; home equity; non-owner, i.e., rent as needed, pooled possession, etc.

New Passenger Car Financing Mix Forecast, Current and 1990 - 2000



SELECTED EDITED COMMENTS

- “Company cars” as a benefit will grow in importance. Leasing—in response to tax laws—will become the norm.
- Accept leasing as a growing means to finance cars. A trend to company cars would seem to contradict the current pattern and does not seem plausible to me.
- England may be a predictive market for U.S.; high percentage of lease/company cars.
- Baby-boomers, particularly urban dwellers, will seek to avoid the hassle of new vehicle ownership through leasing and other innovative means.
- There will be an increasing use of debt, cash will be scarce in the future.
- The answer/estimate depends on the price segment; i.e., Yugo=85% loan while Jaguar=40% loan.
- Leasing will be increasingly used as people move upscale in car selection.
- Personal car leasing has to grow. “Owning” a car is a very costly luxury!

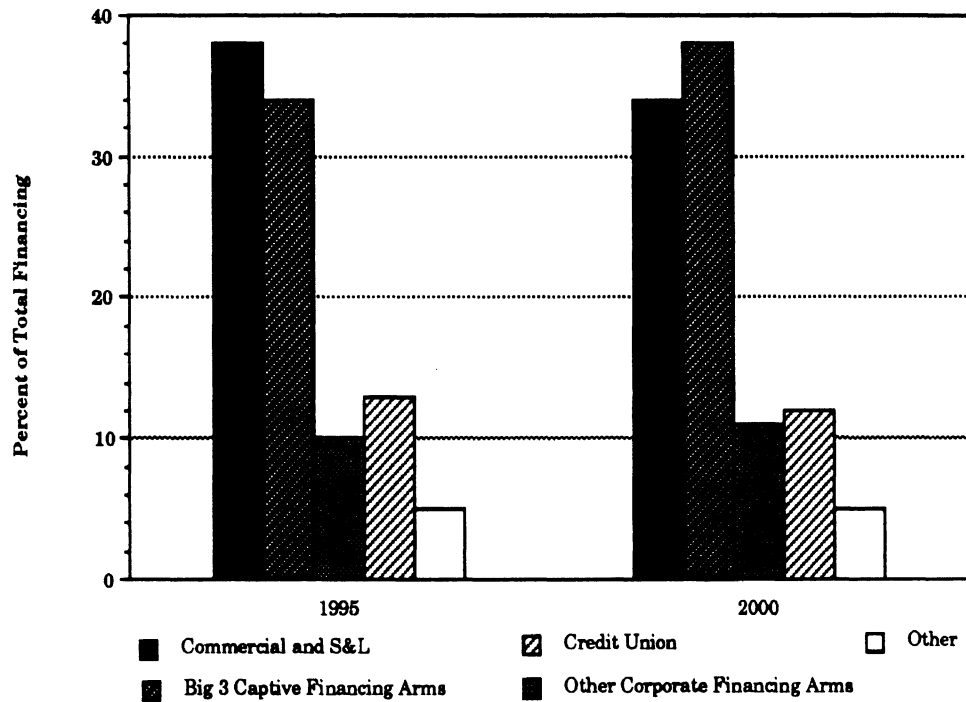
STRATEGIC CONSIDERATIONS

The major forecast change is a shift away from personal loans to personal leases. As vehicle prices increase, personal leases do allow customers to own and operate larger or more luxurious vehicles than personal loans. Lease payments are lower because the lessee is not contributing to vehicle equity. Although the panelists are very bullish on leasing with such comments as “*Owning* a car is a very costly luxury,” personal leasing is also very expensive—perhaps more expensive—considering the end-of-lease buy-out, mileage charges, etc. If personal leasing continues to grow through a recession it will be interesting—people may restrict car purchases within their true budget. Also, considering the competitive pressure which is likely to dampen price increases, personal leasing may not grow to the year-2000 25% share forecast. How customers react to the gradual elimination of a personal credit tax deduction also needs to be watched.

MKT-17. What will be the source of capital for retail passenger car financing?

Source	Median Response		Interquartile Range	
	1995	2000	1995	2000
Commercial and savings and loan banks	38%	34%	35/40%	30/40%
Big Three captive financial arms	34	38	30/40	30/45
Other corporate financial arms	10	11	5/18	8/20
Credit union	13	12	11/15	10/15
Other	5	5	5/5	5/5
TOTAL	100%	100%		

Source of Capital for Retail Passenger Car Financing, 1995 - 2000



SELECTED EDITED COMMENTS

- Big Three financial arms will increasingly dominate new car financing. Credit unions are forecast to maintain aggressive rates.
- Captive financial arms were able to expand market share through subsidized rates. If incentives decline, their market share will decrease.
- Import manufacturers will all have corporate financial arms before 1995.

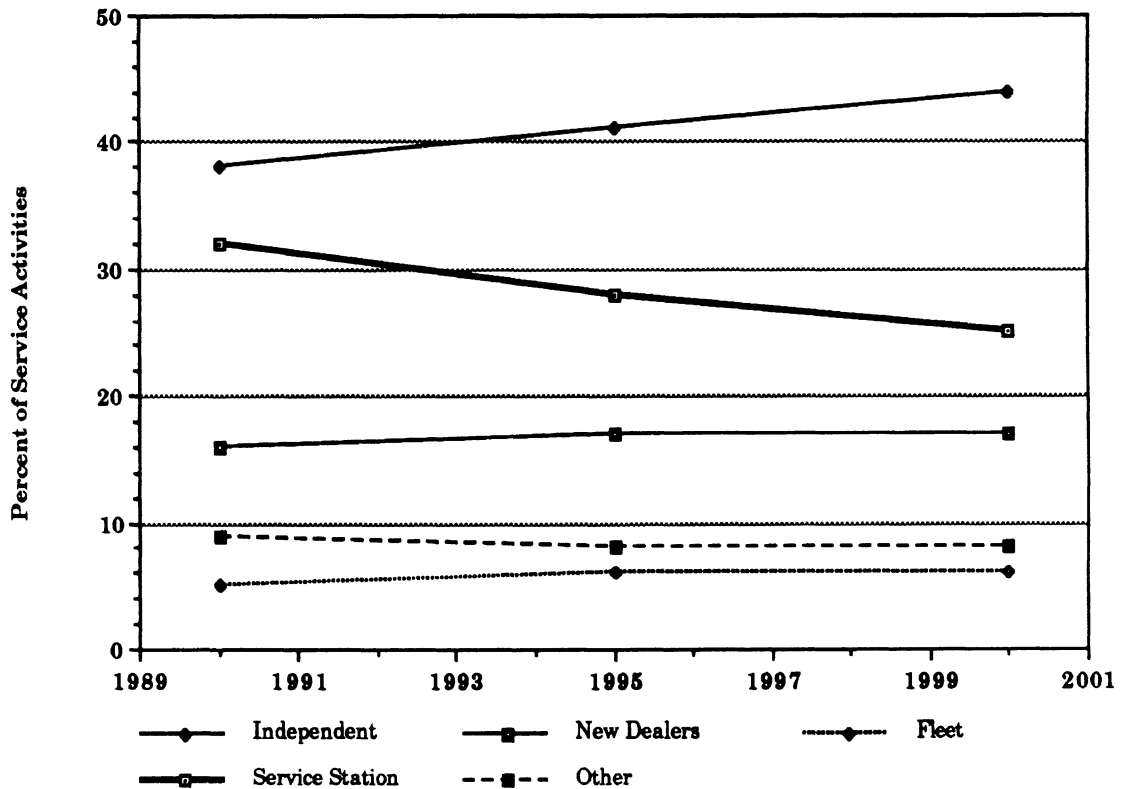
STRATEGIC CONSIDERATIONS

Financial institutions, including saving and loans, commercial banks, and credit unions, will face continued competition from the captive financing arms of Chrysler, Ford, and General Motors and increasing competition from other corporate financing companies such as General Electric Credit Corporation. The individual customer should have a larger choice of financing options. Manufacturers will be wise to respond with proactive customer education activities so customers may make wise, informed financing decisions. Purchasing a vehicle is difficult, confusing, and stressful enough without adding confusion of more alternative sources and types of financing. Manufacturers and dealerships will gain customer loyalty by assisting the customer to the least cost, most flexible form of financing. Taking risk and confusion out of the purchase decision is valued by the customer.

MKT-18. Not including do-it-yourself servicing, what is your estimate of the percent of service performed (based on number of jobs performed) by the following service outlets? The 1984 percentage (the best comprehensive data we have) is based on 48 major types of repair. (Please see definition of Repair Services on page 99 for services included).

Type of Outlet	Median Response			Interquartile Range		
	1990	1995	2000	1990	1995	2000
Service stations	32%	28%	25%	32/36%	26/34%	20/32%
Independent repair shops	38	41	44	40/43	38/45	37/49
New car/truck dealers	16	17	17	15/20	15/25	15/25
Fleet operator shops	5	6	6	6/7	5/8	5/9
Other	9	8	8	2/10	3/18	3/15
Franchises/chains: Tire, auto parts, discount/department stores						
TOTAL	100%	100%	100%			

Service Activity Mix Forecast, 1990 - 2000



SELECTED EDITED COMMENTS

- Service remains a major opportunity for OEMs and dealers but fundamental changes must be made.
- Technology such as electronics will make it increasingly difficult for service stations to compete. Independents will lose business to dealers and fleet operators for the same reason.
- Technology needs will increase dealer percentage.
- The wrench is being taken out of the hand of the service station mechanic. The economics of fleets doing their own service will bring more service in-house.

MANUFACTURER/SUPPLIER COMPARISON

The manufacturer and supplier panelists forecast similar directional trends and are concurrent on each outlet type except the "Other" category. Manufacturers estimate a significant growth of independent franchises, specialized tire and auto stores, and discount outlets to 15% of the 2000 market. Suppliers, it appears, estimate these outlets within the other categories, showing only a slight increase in total sales.

STRATEGIC CONSIDERATIONS

Trends of increasing vehicle complexity, longer ownership and vehicle life, and changing commuting and general living patterns all influence the customers' choice of service facilities. The panelists estimate an increasing share of the service market to the new vehicle dealership. Contributing to this are vehicle complexity and extended warranty issues. Through extended warranties, manufacturers are "locking" customers into the new vehicle dealership repair channel. As a result, the intense need of skilled personnel and capital encourage a concentration of resources at new vehicle franchises. However, customers, in general, are not pleased with the mechanical, customer relation, or business skills of current back shop operations. Manufacturers for the sake of building customer loyalty must work with the dealership network to improve vehicle service systems.

Considering the growth in personal leasing and specialized franchises, new vehicle dealers are not assured a guaranteed service market increase. If leased vehicles are not obtained through dealers, fleet operator shops may benefit (especially, as comments in MKT-16 indicate a growth of employment perk vehicles). Also, specialized shops such as quick oil change, muffler, brake, and tune up franchises offering convenience, value, and expertise may, as the manufacturing panelists estimate, be positioned to compete most effectively.

Manufacturers and suppliers must be aware of changing repair channels. If convenience or low price are pulling customers away from trained dealership mechanics for repair and vehicles are not being repaired or maintained properly the customer will be dissatisfied with the product. Manufacturers and suppliers may point blame that it "was not our fault you went to an inexperienced mechanic," but what pulled the customer away initially: vehicle dealerships not being customer responsive. How a vehicle is maintained and repaired is a manufacturer and supplier concern that needs to be addressed by customer education, investment in dealership franchises, assistance to independent repair channels (although this is in conflict with new vehicle dealerships, it may be better in the long run to cooperate and win product loyalty), and design and engineering of components and the vehicle.

MKT-19. New vehicle warranties appear to possess the ability to differentiate future vehicle offerings. In the various areas listed below, what are your opinions (please consider various vehicle segments) concerning the major considerations, variations offered, and level of duration (time and/or miles) in the following areas.

ENGINE/TRANSMISSION/TRANSAXLE

Length of Warranty	Percent of Respondents
3 years/36,000 miles	12%
5 years/50,000 miles	32
6-7 years/100,000 miles	12
8-10 years/100,000 miles	32
Lifetime	12
Other (see <i>Representative Responses</i>)	

REPRESENTATIVE RESPONSES

- Low-price cars: 3 years/36,000 miles.
- 3 Years/36,000 miles for imports.
- Subcompacts: 3 years/36,000 miles.
- Because of the complexity of these systems, warranty will be a key factor. I feel that the minimum warranty (at the low-end of the market) will be 5/50,000. This will increase as you move up in size/cost.
- Vehicle other than intermediate, full size, and luxury may be limited to 50-75,000 miles.
- Compacts/intermediate/full size: 3-5 years/36,000-60,000 miles.
- Standard warranty: 5 years/100,000 miles for domestics.
- 50,000 miles for four years, whichever comes first—all vehicles, all segments below luxury.
- Drivetrain systems are very expensive, and to compete with foreign and domestic competition there is a definite need for major coverage 70,000-100,000 km/miles.
- Luxury: 6 years/100,000 miles.
- Mainstream cars: 7 years/70,000 miles.
- 100% warranty for 6 or 7 years.
- 50,000-mile average will increase to 100,000 by 2000.
- Continue to increase—maybe to vehicle lifetime (10 years) by 2000.
- Goal is to achieve 10 years and/or 100,000 miles assuming prescribed maintenance is followed and documented.
- Luxury cars: 10 years/100,000 miles.

- Expect 100,000-mile warranties on intermediate, full size, and luxury—limited to 8 years.
- Will approach 10 years/100,000 miles within the next 5 years.
- Warranties could be simplified by stating “as long as original owner owns the car.”
- Life of initial ownership.
- Life of car on all luxury vehicles.
- Car warranties to increase in these areas, truck segments to lag behind.
- Competition will cause a leveling of these items. They will become “expected” and not a factor unless not offered or “tricked up” so as to confuse.
- Competitive pressures and improving quality will lengthen coverage. Consumer lack of interest beyond 5 or 6 years will limit duration. Consumers will not accept deductibles or transfer fees.
- Critical to successful positioning in market.
- These are covered well. Current warranty periods appear adequate.
- These are not suited to differentiate. These are basic warranty items, so manufacturers would give almost the same guarantee to all products and its content would be almost the same as other manufacturers.
- To the extent that warranties exceed average ownership by the first owner, they are attractive to the buyer—in effect they are a lifetime warranty. I would not expect warranty period to get any longer than they are today.
- Warranties for powertrain items across all segments. The time and mileage may differ, with longer coverage in the higher priced (full size and luxury) segments.
- Extended low cost additional warranties to coincide with higher quality, more durable power plants in combination with protection for additional and unavoidable incremental complexity.

COMPARISON OF FORECASTS: TECH-10

With respect to length of warranties for engine/transmission/transaxle, a greater number of Technology panelists expect longer warranty periods than do Marketing panelists. While a larger number of Marketing panelists expect lifetime warranties, the combined range of 6 to 10 years/70,000 to 100,000 miles received a significantly greater response from the Technology group.

Engine/Transmission/Transaxle: Length of Warranty	Marketing Panel	Technology Panel
Lifetime	12%	6%
8–10 years/100,000 miles	32	51
6–7 years/100,000 miles	12	7
7 years/70,000 miles	0	7
5 years/50,000 miles	32	11
3 years/36,000 miles	12	2
No change	0	7

NON-POWERTRAIN ITEMS
i.e., Body, Electrical, Comfort/Convenience Items

Length of Warranty	Percent of Respondents
Less than 3 years/36,000 miles	20%
3 years/36,000 miles	40
More than 3 years/36,000 miles	40
Other (see <i>Representative Responses</i>)	

REPRESENTATIVE RESPONSES

- Electrical items will still be 24/24,000 for basic system.
- 20,000 miles minimum.
- Standard warranty: 1 year/12,000 miles for domestics. Consumers will not be adequately informed so as to be able to distinguish between powertrain and other.
- One to 2 years minimum warranty for non-powertrain. Necessary to compete with foreign imports.
- Two years or 25,000 miles on all compacts.
- Subcompacts: 2 years/24,000 miles.
- All vehicles warranted for 3 years or 36,000 miles at no additional cost to customer.
- Clear trend toward complete coverage for reasonable time (about 3 years) in response to consumer preference for no hassles or repair bills. Will be limited to 3 to 5 years by increasing costs as cars age.
- Compacts/intermediate/full: 3 years/36,000 miles.
- Three years/36,000 miles for imports.
- 3 years or 45,000 miles on intermediates.
- These will be important to the automakers as an incentive to see high-profit convenience options. It is reasonable that these warranties should average 3/36,000 to 5/unlimited mileage.
- Continue to increase. Vehicle lifetime (10 years) by 2000.
- Luxury: 5 years/60,000 miles.
- 100% warranty for 6 or 7 years.
- Life of car on full and luxury.
- The manufacturer who can equip vehicles with an electrical system reliable enough to warrant profitably for an extended period stands to prosper greatly. The complexity of today's vehicles must be of concern to many owners.
- Warranties are not clear—too many complaints and hassle.
- Current warranty.
- Drag way behind engine/transmission warranties with car slightly ahead of truck.
- Growing demand.
- Important in specialty/luxury car.

- These items are covered under dealer-sold or OEM-sponsored additional cost warranties. I think that will continue.
- Warranties for non-powertrain items probably covered with standard warranty. Time and mileage may differ.
- Upgraded warranty packages will reflect commitment to OEM quality improvements.

COMPARISON OF FORECASTS: TECH-10

A significant consideration in the comparison of Technology and Marketing responses with respect to warranties on non-powertrain items is The percent of technology panelists that consider this feature not important or expect no change.

Non-Powertrain Items: Length of Warranty	Marketing Panel	Technology Panel
More than 3 years/36,000 miles	40%	48%
3 years/36,000 miles	40	16
Less than 3 years/36,000 miles	20	20
No change/Not important	0	11

MAINTENANCE ITEMS

i.e., Components with Normal Wear and Tear

Length of Warranty	Percent of Respondents
No change from current practice	32%
1 year/Less than 12,000 miles	32
Over 1 year/Over 12,000 miles	36
Other (see <i>Representative Responses</i>)	

REPRESENTATIVE RESPONSES

- I don't see it. There is too much money to be made in routine maintenance.
- Limited value.
- Remain principal responsibility of owners. Usable lifetimes will increase (e.g., tires=50,000 miles).
- Compacts/subcompacts/intermediate/full: 1 year/12,000 miles.
- Maintenance items: 8,000 miles minimum.
- 1.5 years/15,000 miles.
- This type of coverage will only be important in the luxury regular/specialty segments. I feel there will be 3-year unlimited mileage type warranty.
- Luxury: 3 years/36,000 miels.

- Two years or 20,000 miles.
- Should be increased to 2 years/24,000 miles.
- 50,000 or 3 years on all segments except luxury. Luxury can get full maintenance for life of vehicle.
- Will see some trials (e.g., tires may be warranted for 75,000 miles on new vehicles) same for struts/shocks—maybe brakes at 36,000.
- Only covered if clearly defective.
- I expect warranty coverage for maintenance items to become more widely included with luxury cars.
- Maintenance items: Attractive if you need to support a weak entry.
- Non-essential but demand will grow.
- One year free maintenance and free loaners are of great value to consumer and relatively low cost. Again, consumers want no hassles/no expenses to end the “honeymoon” with their new car.
- Only for high luxury or automakers in trouble.
- Used as a differentiator for luxury segments vehicles.
- Warranties will be based on typical life prorated on replacement and will vary in application (i.e., tires, muffler).

COMPARISON OF FORECASTS: TECH-10

It appears that once again the Technology panelists expect longer warranty periods for maintenance items.

Maintenance Items: Length of Warranty	Marketing Panel	Technology Panel
No change from current practice	32%	38%
Over 1 year/More than 12,000 miles	36	46
1 years/12,000 or less miles	32	13
Increased availability of service contracts (unspecified duration)	0	13

CUSTOMER SERVICE

i.e., Road Service, Resale Value, etc.

There is a wide variation of opinion on customer-service-related warranties. Because of this, it is difficult to classify responses. For the sake of tabulation, we broke the responses into two categories: *Yes, Some Variation* and *No* form. General comments follow in the *Representative Responses*.

Variations Offered	Percent of Respondents
Yes, some variation	75%
No	25

REPRESENTATIVE RESPONSES

- Area of competition.
- Customers have trouble determining the value of such intangibles. It is the one place where the dealer can most distinguish itself—largely beyond the control of the manufacturer, however.
- Great variability. Resale value on some luxury cars.
- Guaranteed resale value will be occasionally used as merchandising strategy. Roadside service will be a luxury car item. Guaranteed satisfaction (buy back within 30 days) will grow substantially. We will see real variety in warranties.
- Offer as sales inducement only.
- Only for high luxury or automakers in trouble.
- Resale value must be addressed as vehicles become more expensive.
- The next frontier!
- This is a traditionally blatant area of customer neglect in the U.S. auto industry and I believe the new distribution systems coming on-stream (Acura, Lexus, Infiniti, Saturn) will make this a much more important area of emphasis.
- Used as a differentiator and probably only available in the luxury segments or an extra cost option.
- Some new services as dealers try to differentiate among themselves.
- Customer service is the most important aspect in U.S. today. Road service will be offered by more and more companies. Used car programs to enhance resale values will become increasingly important.
- I do not think resale value will be guaranteed.
- Customer service is current buzz word—price competition in vehicles will erode possibility that these “value-added” items will be paid.;
- More trouble than they’re worth!
- Window dressing.

CORROSION

Length of Warranty	Percent of Respondents
Current warranties	8%
5-7 years/50,000-70,000 miles	37
Over 7 years/Over 70,000 miles	46
Lifetime	9
Other (see <i>Representative Responses</i>)	

REPRESENTATIVE RESPONSES

- Current warranty.
- Five years or 50,000 miles minimum (*7 responses*).
- Five years/50,000 miles prorated.
- Compacts/subcompacts/intermediate/full: 5 years/60,000 miles.
- This will be 7/70,000 on original owner coverage. There will continue to be the unreasonable catch of an annual inspection at cost to the consumer.
- All vehicles will require at least 100,000-mile/8-year warranties for corrosion—limitations will be “relaxed.”
- 100,000 miles or 6 years.
- Luxury: 6 years/100,000 miles.
- Part of standard warranty with probably 10 years/100,000 coverage.
- Should be increased to 8 years/100,000 miles.
- Standard warranty of 6 years/100,000 miles for domestics as improved materials and material quality is employed.
- Ten years/100,000 miles should become the norm.
- Seven years minimum on all vehicles, all segments.
- Seven years about the limit of value.
- Lifetime corrosion protection will become standard.
- Will be vehicle lifetime by 2000.
- Constantly improving—less of an issue. Need better dent resistance.
- Not a differentiator anymore.
- Growing demand. Will become essential.
- With improved materials and coatings, corrosion protection is one of the best ideas going. Buyers are expected to keep cars longer and styles do not vary much year to year. Continued emphasis on this makes good sense.

COMPARISON OF FORECASTS: TECH-10

A review of the following table indicates that a reasonably good consensus exists between the two groups of panelists.

Corrosion: Length of Warranty	Marketing Panel	Technology Panel
Lifetime	9%	7.5%
Over 7 years/Over 70,000 miles	46	43.0
5-7 years/50,000-70,000 miles	37	36.0
No change/Current warranties	8	7.5
Unspecified warranty improvements	0	6.0

OTHER: GENERAL RESPONSES

- Warranties are following a very predictable pattern in an increasingly competitive market. First we had extended powertrain warranties, then extended corrosion protection, then Ford's guaranteed fix-it-once policy, then bumper-to-bumper protection. I expect to see longer and more comprehensive bumper-to-bumper warranties, with the addition of roadside assistance programs, longer service hours, free loaner cars, and other services to serve the customer better. The forces of the free market are simply causing manufacturers to improve their ability to meet customer needs. Auto makers will do this by concentrating on the whole product, goods and service. We must remedy this weakness, and perhaps turn it into a strength, if we are to maintain our share in a market with 20, 30, or 40 competitors, instead of just three.
- I think automakers will (unless they change direction) create such a complex variety of warranties that consumers and dealers will be "turned off" by them instead of motivated.
- Companies will offer a menu of warranties in which the customer can customize a package to fit his/her driving needs and budget.
- Long-term service agreements are the last value-added the vehicle manufacturers have to offer.
- In general, warranties will become more comprehensive over time due to competitive factors. By 1992 almost all companies will offer 3 year/36,000 miles with no deductible. Warranties will encompass all systems, not just drivetrains.

STRATEGIC CONSIDERATIONS

Over the next ten years, warranties will continue to be a marketing and product differentiating tool. This question covers a variety of warranty types: powertrain; mechanical, non-powertrain; maintenance; customer service/convenience; and other related forms. The opinions vary. However, it is clear that manufacturers need to match the best perceived warranty offering within various competing segments, and warranty offerings will be lengthened and enhanced. Simple warranties on just powertrain or other mechanical items may be a thing of the past; packages to cover maintenance and consumer convenience attributes are increasing in popularity.

If extended to all automobiles at a lifetime of ownership or 10-years /100,000-mile rate, warranties may not be a product-differentiating feature. Warranties are too easily copied to provide long-term product differentiation. However, warranties will remain a strategic

competitive factor. If a manufacturer does not have world-class cost and quality and is forced to offer a world-class warranty—a warranty that is established by the world's cost and quality leader—that company will operate with sub-optimum margins and, thus, will be placed in a noncompetitive position.

Warranties need to be offered from the perspective of customer value-added. Manufacturers are at risk by offering too many variations if the result is customer confusion, not customer benefit. As vehicles become a greater purchase and operating expense, warranties are an excellent means of reducing customer risk—an attribute customers are willing to pay for in established, luxury cars or demand upfront to consider non-established models (particularly important for vehicles from newly industrialized countries). It appears that general improvements in warranty coverage increases the demand for improved product quality, and improved product quality allows for improved warranty coverage. Consumer values increase from this form of competition.

III. VEHICLE DESIGN AND ENGINEERING ISSUES

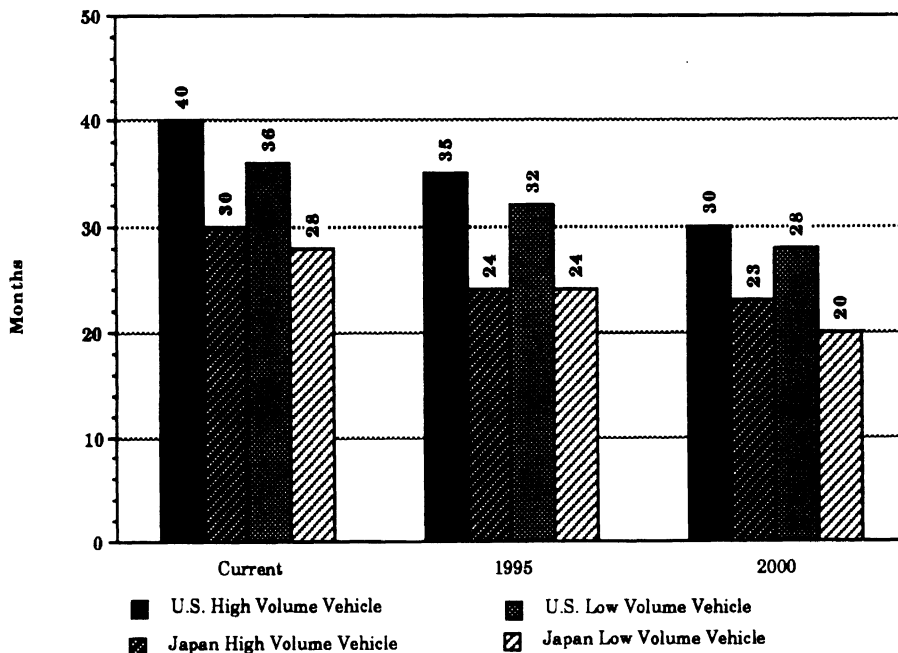
MKT-20. It is generally reported that the new vehicle development process is 48 to 60 months in the U.S. and that Japanese producers' development cycle is significantly less.

MKT-20a. Please give your expectation (*in months*) of future development cycles from concept through "Job One" for a hypothetical reskinning (a minor facelift) of an existing platform maintaining current hardpoints.

Development	Vehicle Development Time (<i>in months</i>)					
	Median Response			Interquartile Range		
	Current Estimate	1995	2000	Current Estimate	1995	2000
High-Volume* Vehicle						
U.S.	40	35	30	36/48	24/40	20/36
Japan	30	24	23	24/36	18/32	14/30
Low-Volume* Vehicle						
U.S.	36	32	28	24/48	22/40	18/36
Japan	28	24	20	20/36	16/30	12/28

*A high-volume vehicle is production greater than 50,000 units per year. A low-volume vehicle is production less than 50,000 units per year.

Minor Facelift Vehicle Development Cycle Forecast, U.S. vs. Japan



SELECTED EDITED COMMENTS

- Minor facelifts are less affected by the breakthroughs in product development processes. The U.S. disadvantage will continue to be primarily corporate decision-making bureaucracy, not manufacturing or engineering.
- Figures for low-volume vehicle assume use of outsourced engineering.
- Greater flexibility possible on low-volume production runs, quicker reaction times from suppliers.
- Low-volume vehicles will go to plastic skins, which will decrease the time significantly.
- Much of Japanese "speed" is overstated due to different timing of when a "concept" starts.
- Supplier outside of the OEMs will be doing more major "reskins" in less time.
- The best Japanese are already at 24 months.

MANUFACTURER/SUPPLIER COMPARISON

Overall, suppliers are more optimistic than manufacturers about current and future domestic product development cycles. Both groups estimate significant advantages by the Japanese through 2000, with suppliers estimating a narrower gap between the domestics and Japanese in 2000 (although equal variation, six months). These differences may reveal significant differences between the publicly announced OEM programs, strategies, and objectives (i.e., what the OEMs say and what the suppliers hear) and the reality that is known internally by the OEMs (i.e., the organizational difficulty in matching Japanese schedules). Both groups clearly indicate continued business system improvements are needed to match aggressive goals of domestic manufacturers, and Japanese manufacturers will continue to provide a moving competitive target.

Development	Manufacturer/Supplier Comparison: Vehicle Development Time (<i>in months</i>)					
	Current Forecast		Forecast for 1995		Forecast for 2000	
	OEM	Supplier	OEM	Supplier	OEM	Supplier
High-Volume Vehicle						
U.S.	45	36	36	32	34	26
Japan	30	30	25	24	24	20
Low-Volume Vehicle						
U.S.	42	36	35	32	30	28
Japan	28	27	24	24	24	20

COMPARISON OF FORECASTS: TECH-6a

The Technology panel results are presented in the table below. As the measurement of product development cycles is always under debate, it is understandable that the panels disagree on specific numerical results. Comparing relative trends, the panels agree that the U.S. manufacturers are presently and will remain at a disadvantage to the Japanese. It appears that the Technology panelists view today's minor facelift product development cycles higher than Marketing panelists and believe that both industries will be able to reduce product development time by a larger percentage through 2000.

Both panels estimate the Japanese advantage being reduced through 2000. The most significant difference is that the Technology panelists believe the Japanese will maintain only an 8% advantage over the U.S. companies in low volume vehicles, while the Marketing panelists forecast the advantage to be 28%.

These are interesting differences, because corporate marketing success will depend upon the ability of those represented by the Technology panel to deliver quick product development times. Technology-related corporate functions depend on marketing to identify and package styling, design, and customer value (along with advertising and distribution) so a company can compete successfully, earn adequate margins, and invest in people and plant needed by the technology groups. True product development times will not be set by these panelists, but by world-class competition.

Development	Technology Panel Forecasts: Vehicle Development Time (<i>in months</i>)					
	Median Response			Interquartile Range		
	Current Estimate	1995	2000	Current Estimate	1995	2000
High-Volume Vehicle						
U.S.	48	36	30	36/50	30/42	24/36
Japan	35	30	25	24/36	22/34	20/30
Low-Volume Vehicle						
U.S.	36	30	24	30/48	24/36	20/32
Japan	30	24	22	24/36	20/30	18/28

STRATEGIC CONSIDERATIONS

The aspect of time is and will continue to remain an important dimension of competitiveness. This question probes time involved in performing market research, design, engineering, manufacturing facilitization, and production. Japanese manufacturers will continue to set the industry's standard of product development cycles. This single competitive dimension may limit the long-term success of the domestic industry. Panelists estimate a 25% Japanese advantage (on a base of 40 months, the U.S. current development time estimate) on high-volume vehicles and a 22% advantage on low-volume vehicles. The high-volume vehicle differential is forecast to narrow only 2 percentage points by 2000. More interesting, the time differential for low-volume vehicle development time is expected to increase (22% current Japanese advantage to 28% advantage by 2000).

A two-year cycle (the 2000 forecast for Japanese manufacturers) allows a manufacturer to operate with a much shorter marketing horizon: two years from concept to customer plus the life of the platform in production (typically three to five years for the Japanese). Contrasted to a five-year product development cycle with a five- to ten-year

production schedule highlights the advantages that shorter development cycles have: closer planning proximity to the ultimate market, better response to new trends, and better limitation of poor product losses. A company with a time advantage is a company with market flexibility.

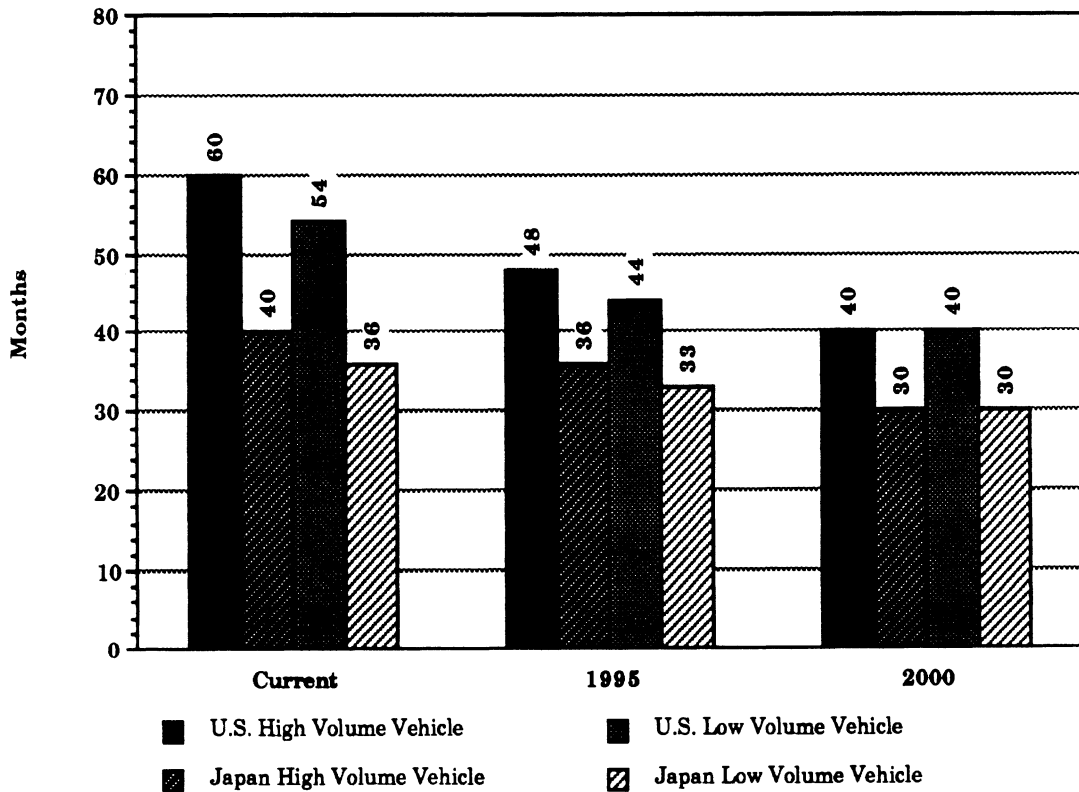
There will be disputes over these results concerning the time data, definitions, and other product-planning characteristics; however, it is clear that the Japanese are perceived as having and maintaining an advantage in this area (please see the fifth comment on page 47). Many internal and external barriers need to be reduced or eliminated in the United States in order to achieve Japanese-level flexibility and profitability. There must be a concerted effort in analyzing the entire value-added chain from market planning through engineering, manufacturing, sales, and service. Only those companies maximizing value-added in every element of the supply chain will achieve best in class products and profit. (Please see MKT-20b for additional discussion.)

MKT-20b. Please give your expectation (*in months*) of future development cycles from concept through "Job One" for a hypothetical new platform establishing new hardpoints.

Development	Vehicle Development Time (<i>in months</i>)					
	Median Response			Interquartile Range		
	Current Estimate	1995	2000	Current Estimate	1995	2000
High-Volume* Vehicle						
U.S.	60	48	40	49/60	40/50	36/45
Japan	40	36	30	36/48	30/40	24/36
Low-Volume* Vehicle						
U.S.	54	44	40	48/60	40/50	35/42
Japan	36	33	30	36/42	30/39	24/36

*A *high-volume* vehicle is production greater than 50,000 units per year. A *low-volume* vehicle is production less than 50,000 units per year.

New Platform Vehicle Development Cycle Forecast, U.S. vs. Japan



SELECTED EDITED COMMENTS

- Figures for low-volume vehicle assume an outsourcing strategy.
- I do not believe that we will see major reductions in product development cycles in the U.S. until truly progressive labor agreements and management incentives are implemented. We must learn to push responsibility, resources, and authority downward.

MANUFACTURER/SUPPLIER COMPARISON

The manufacturers and suppliers are more closely aligned with each other concerning forecasts for major platform changes. This may be the result of a better understanding of what defines a "new platform" than the many variations of a "minor facelift." Overall, manufacturers and suppliers are on the same strategic path, realizing the need to reduce product development time and considering the Japanese will continually improve from their current advantageous base.

Development	Manufacturer/Supplier Comparison Vehicle Development Time (<i>in months</i>)					
	Current Forecast		Forecast for 1995		Forecast for 2000	
	OEM	Supplier	OEM	Supplier	OEM	Supplier
High-Volume Vehicle						
U.S.	60	60	48	46	40	40
Japan	42	38	38	34	36	30
Low-Volume Vehicle						
U.S.	54	54	48	44	40	36
Japan	38	36	38	33	35	30

COMPARISON OF FORECASTS: TECH-6b

Unlike MKT-20a, the two panels are in relatively close agreement on product development time forecasts for new vehicle platforms. This may be due to a better understanding of what a new platform comprises than the make up of a "minor facelift." See discussion in MKT-20a, *Comparison of Forecasts: TECH-6a* for further comments.

Development	Technology Panel Forecast: Vehicle Development Time (<i>in months</i>)					
	Current Forecast		Forecast for 1995		Forecast for 2000	
	OEM	Supplier	OEM	Supplier	OEM	Supplier
High-Volume Vehicle						
U.S.	60	54	48	46	40	38
Japan	44	40	36	36	33	30
Low-Volume Vehicle						
U.S.	50	48	42	42	36	36
Japan	40	36	36	30	30	28

STRATEGIC CONSIDERATIONS

Panelists forecast significant U.S. product development challenges for new platform programs: 33% development time reduction in high-volume vehicles and 26% reduction in low-volume vehicles. However, the gap between U.S. and Japanese companies may not be reduced significantly. Panelists' current differential estimate for high- and low-volume vehicles is 33%; the year 2000 differential is 25%. This differential reduction, although significant, does not appear to be enough to shift the competitive leverage from Japanese to American manufacturers. Response to increasingly volatile market tastes and demands against more formidable competitors will set the competitive stage through 2000. U.S. manufacturer product-development time improvement does not appear to fulfill this competitive challenge. See *Strategic Considerations* in MKT-20a for additional comments.

MKT-21. What organizational, technological, and/or business environmental changes will occur or will need to occur to realize your U.S. forecast in MKT-20a and MKT-20b?

Organization, Technological, and/or Business Changes
<ol style="list-style-type: none"> 1. Improved vehicle program/project management (including better discipline in process, greater integration and rationalization of staffs, and an overall change in corporate philosophy to focus on customer satisfaction). 2. Improved and increased use of computerization in design, engineering, modeling, and simulation (including CIM, CAD/CAM, etc.). 3. Stronger OEM/supplier partnerships (including earlier supplier involvement and greater supplier involvement in design and engineering). 4. True implementation of simultaneous engineering. 5. Development of commonality among components and the focus on continuous development of existing components.

STRATEGIC CONSIDERATIONS

The ability to achieve reductions in product development time will depend upon organizational, cultural, philosophical, and technological changes. No one element alone will allow manufacturers or suppliers to achieve reductions in product-development time. Companies must attack the competitive issue of product development simultaneously through management, leadership, and technological advances. We have not ranked panelist responses for just this reason—no one element is more important than the others, each are equally weighted. The process from concept to customer must be approached from a systems viewpoint—activities should be performed in a manner that results in the greatest sum total of customer value.

Five significant focus areas are of major concern to panelists. First, internal barriers to streamlining idea flows through a corporation must be eliminated. This involves organization design focused on market response and a business philosophy directed at customer satisfaction. Second, information management must be improved. Information management (including all business, engineering, and design needs) will become a hub for activity, either stimulating or constraining activity. Third, partnerships must include every element in the supply chain. Improved communication, management, and leadership changes that improve intra-corporate activity are applicable to inter-corporate relationships. Fourth, definitions and interpretations of simultaneous engineering should not be construed to match current operating conditions and methods. New names for old methods do not result in improved systems. Fifth, U.S. manufacturers may achieve more productivity through a greater adaptation of Japanese-type philosophies of stressing continuous, incremental improvements in product and process. U.S. business must recognize and reward small individual gains that result in large systems' benefits.

IV. U.S. LIGHT-VEHICLE SALES, DOMESTIC AND IMPORT FORECASTS

MKT-22. What is your forecast *in units* for the following years of the number of passenger cars which will be sold in the U.S. by traditional domestic dealer networks and traditional import dealer networks? (Please see *Definition of Terms* on page 99.)

Networks	Total U.S. Passenger Car Sales (Units in Millions)					
	Median Response			Interquartile Range		
	1990	1995	2000	1990	1995	2000
Domestic	6.74	6.8	6.98	6.6/7.0	6.7/7.1	7.0/7.2
Import	3.41	3.78	3.93	3.4/3.6	3.5/3.9	3.6/3.9
TOTAL	10.15	10.56	10.91	10/10.6	10.5/10.8	10.8/11.0

SELECTED EDITED COMMENTS

- GM will strengthen somewhat and so will total sales.

STRATEGIC CONSIDERATIONS

The passenger car market will continue to be a battleground between domestic and import makes. The overall market for passenger cars in the U.S. is mature and sales are not forecast to increase more than 1% per year. Although certain market segments will grow more rapidly than this, some segments will decline (see MKT-30 and MKT-31) averaging very weak growth. In mature markets the only way to increase market share is to win customers from competitors. Price, product differentiation, market responsiveness, and marketing are individual elements that must be integrated and executed in effective strategies to increase market share.

Foreign nameplate sales (including both import and transplant) will continue to increase market share from approximately 33% today to 34%, 36%, and 36% in 1990, 1995, and 2000, respectively. Compared to other forecasts of the industry, these numbers may be conservative. This might represent the import base minimum. It appears from a company standpoint that domestics will hold their ground relatively well against import models. However, from a U.S. manufacturing perspective, this import share misrepresents total foreign involvement in the U.S. industry, because domestic shares are sales shares (including captive imports), not manufactured shares. MKT-24 through MKT-26 break out production sources.

MKT-23. What is your forecast *in units* for the following years of the number of light trucks which will be sold in the U.S. by traditional domestic dealer networks and traditional import dealer networks? (Please see *Definition of Terms* on page 99.)

Networks	Total U.S. Light-Truck Sales (Units in Millions)					
	Median Response			Interquartile Range		
	1990	1995	2000	1990	1995	2000
Domestic	3.86	4.09	4.10	3.8/4.0	4.0/4.2	4.1/4.3
Import	0.90	0.96	0.94	0.83/0.95	0.92/1.0	0.98/1.0
TOTAL	4.76	5.05	5.04	4.7/5.0	5.0/5.15	5.0/5.25

STRATEGIC CONSIDERATIONS

The Marketing panel estimates the total U.S. light-truck market to grow slowly, but at a greater rate than passenger car sales. This is consistent with maturing of the overall U.S. market with specific pockets of growth. Light trucks will continue to provide a flexible, functional alternative to passenger cars for primary transportation. Much of this growth will be within the grey area of vehicle classification between passenger cars and light trucks (the so-called multi-purpose passenger vans and sport-utility vehicles). Imports are forecast to be a competitive threat to the domestic Big Three, increasing their market share from 1988 approximately two additional percentage points. As with passenger cars, level overall market growth will put pressure on manufacturers from assembly through material providers. Easy sales resulting from rapid industry growth are history—future sales will be the result of providing the customer the best perceived value in the most attractively styled and functional package. A problem all manufacturers will face is marketing products in a crowded marketplace.

MKT-24. Given your forecast of traditional domestic U.S. passenger car sales in question MKT-22, please divide each of these figures into sales by company for each of the following years.

Production Source	Traditional Domestic Passenger Car Sales (Units in Millions)					
	Median Response			Interquartile Range		
	1990	1995	2000	1990	1995	2000
General Motors	3.62	3.66	3.70	3.5/3.8	3.6/3.8	3.7/3.9
Domestic produced	3.30	3.30	3.30	3.1/3.5	3.2/3.4	3.2/3.4
Captive import	0.19	0.21	0.25	0.17/0.20	0.20/0.25	0.20/0.30
Transplant	0.13	0.15	0.15	0.10/0.15	0.15/0.20	0.15/0.20
Ford	2.11	2.12	2.28	2.1/2.2	2.1/2.3	2.2/2.4
Domestic produced	1.92	1.90	1.98	1.8/2.0	1.9/2.1	1.9/2.1
Captive import	0.09	0.12	0.15	0.08/0.10	0.10/0.15	0.10/0.15
Transplant	0.10	0.10	0.15	0.10/0.10	0.10/0.15	0.10/0.19
Chrysler	1.01	1.00	1.00	1.0/1.1	1.0/1.1	1.0/1.1
Domestic produced	0.81	0.80	0.80	0.80/0.86	0.80/0.86	0.75/0.85
Captive import	0.12	0.10	0.10	0.10/0.12	0.10/0.12	0.10/0.10
Transplant	0.08	0.10	0.10	0.08/0.10	0.10/0.10	0.10/0.13

SELECTED EDITED COMMENTS

- As domestic plants get tired, transplant joint ventures will become popular to upgrade quality and lower cost. Captive imports will be used for niche-market models.
- Transplant joint ventures will grow while domestic plants get rebuilt. Captive imports will drop except for Chrysler which will need imports for certain models.

STRATEGIC CONSIDERATIONS

Erosion of the Big Three market share may continue through 2000. GM market share, panelists estimate, may decline as a percent of total passenger car market from 35.7% in 1995, to 34.7% and 33.9% in 1995 and 2000, respectively. Chrysler's share is forecast to decline approximately 0.5% over the same period. Ford Motor may essentially remain the same, increasing only 0.2%. As Ford has dramatically increased its market share to these levels from the third and fourth quarters of 1988 when this data was collected, it will be interesting if Ford can maintain these levels through the next economic downturn. If Ford maintains its string of successful introductions and remains cost competitive and is able to be the industry's price leader, Ford may be in a position to do more than just maintain current market share.

For the U.S. manufacturing position, the most significant outcome of this question is the panelists' projections for the composition of production sources for the remaining domestic sales. Domestic production is expected to continue to decline, while captive imports and transplant sourcing will continue to increase. These projections substantiate the continued outsourcing of small-sized vehicles to foreign producers. This trend is important for two reasons. First, these vehicles have significantly lower to zero domestic

component content. Therefore, a unit of domestic vehicle manufacturing that is replaced with a low-content transplant or zero-content import greatly affects the supplier community. A vehicle may be sold by the domestic suppliers' traditional customer, but because of low content these sales create excess capacity at the domestic assembly level and through the entire supply chain. This, in turn, weakens the supply base by forcing increased costs and reduced availability of investment capital.

Secondly, at the assembly level, the manufacturers themselves are hurt because vehicle purchasers understand that these vehicles are not manufactured by the Big Three, only marketed. Therefore, when a satisfied customer returns to trade-in a captive import or transplant, he or she may not return to the selling dealership—the owner shops the dealership whose company manufactured the vehicle. From this perspective the Big Three are weakening themselves in the long run. Of course, there are many factors involved in vehicle and component sourcing decisions. However, long-term, sustainable competitive advantage must be the primary objective fulfilled, given individual corporate business plans. Short-term cost advantages may result in long-term capability disadvantages.

MKT-25. Given your forecast of import passenger car sales in question MKT-22, please divide each of these figures into sales by company for each of the following years.

Production Source	Import Passenger Car Sales (Units in Millions)					
	Median Response			Interquartile Range		
	1990	1995	2000	1990	1995	2000
Honda	0.80	0.93	1.00	0.80/0.85	0.90/1.00	1.00/1.00
Import	0.40	0.40	0.40	0.35/0.40	0.35/0.40	0.35/0.43
Transplant	0.40	0.53	0.60	0.40/0.45	0.50/0.60	0.60/0.60
Toyota	0.65	0.75	0.81	0.65/0.70	0.75/0.80	0.80/0.85
Import	0.50	0.50	0.50	0.45/0.50	0.45/0.52	0.45/0.50
Transplant	0.20	0.25	0.31	0.15/0.20	0.25/0.33	0.30/0.40
Nissan	0.52	0.56	0.55	0.49/0.53	0.50/0.56	0.50/0.55
Import	0.40	0.40	0.35	0.35/0.40	0.35/0.40	0.30/0.40
Transplant	0.12	0.16	0.20	0.10/0.15	0.15/0.20	0.16/0.24
Hyundai	0.26	0.31	0.33	0.24/0.28	0.25/0.31	0.25/0.30
Import	0.26	0.25	0.25	0.22/0.27	0.20/0.26	0.15/0.25
Transplant	0.00	0.06	0.08	0/0	0.04/0.06	0.05/0.10
Mazda	0.24	0.26	0.25	0.23/0.25	0.25/0.30	0.25/0.27
Import	0.15	0.16	0.15	0.13/0.17	0.15/0.17	0.14/0.17
Transplant	0.09	0.10	0.10	0.08/0.10	0.10/0.15	0.10/0.15
Subaru	0.16	0.15	0.14	0.15/0.17	0.15/0.18	0.10/0.16
Import	0.15	0.14	0.14	0.13/0.15	0.10/0.15	0.10/0.15
Transplant	0.01	0.01	0.00	0.01/0.02	0.01/0.05	0.00/0.03
VW	0.15	0.15	0.15	0.11/0.15	0.13/0.15	0.12/0.15
Import	0.15	0.15	0.15	0.10/0.15	0.13/0.15	0.13/0.15
Transplant	0.00	0.00	0.00	0/0	0/0	0/0
Volvo	0.10	0.10	0.10	0.10/0.10	0.09/0.11	0.08/0.10
Import	0.10	0.10	0.10	0.09/0.10	0.09/0.11	0.09/0.10
Transplant	0.00	0.00	0.00	0/0	0/0	0/0
Mercedes	0.09	0.10	0.10	0.09/0.09	0.08/0.10	0.09/0.10
Import	0.09	0.10	0.10	0.08/0.09	0.08/0.10	0.09/0.10
Transplant	0.00	0.00	0.00	0/0	0/0	0/0
BMW	0.09	0.09	0.10	0.08/0.09	0.08/0.09	0.8/0.10
Import	0.09	0.09	0.10	0.08/0.09	0.08/0.09	0.08/0.10
Transplant	0.00	0.00	0.00	0/0	0/0	0/0
Mitsubishi	0.09	0.09	0.10	0.09/0.10	0.09/0.10	0.10/0.10
Import	0.06	0.05	0.05	0.05/0.06	0.04/0.06	0.05/0.05
Transplant	0.03	0.04	0.05	0.02/0.05	0.04/0.06	0.05/0.06
Saab	0.05	0.05	0.05	0.04/0.05	0.04/0.05	0.04/0.05
Import	0.05	0.05	0.05	0.04/0.05	0.04/0.05	0.04/0.05
Transplant	0.00	0.00	0.00	0/0	0/0	0/0
Other	0.21	0.24	0.25	0.18/0.21	0.19/0.26	0.20/0.27
Import	0.21	0.24	0.25	0.18/0.21	0.15/0.26	0.20/0.27
Transplant	0.00	0.00	0.00	0/0	0/0	0/0

SELECTED EDITED COMMENTS

- Importers with transplant facilities will push production in the U.S. as high as possible to overcome yen cost pressures with import cars.

STRATEGIC CONSIDERATIONS

As discussed in MKT-23, imports are forecast to continue to gain market share from the Big Three. This question breaks down overall imports into individual firms and sources of production. From this data, two trends appear to be emerging. First, the largest sellers are becoming larger and the smallest sellers are holding ground, increasing slightly. Honda (25%), Toyota (25%), and Hyundai (27%), three of the top five foreign makes, are likely to experience double digit sales growth. The other two top-five sellers, Nissan and Mazda, are expected to increase sales 6% and 4% by 2000, respectively. Mercedes, BMW, and Mitsubishi are likely to increase sales 11% each over the period, contributing to the establishment of two diverging groups. Medium-sized marketers such as Subaru, VW, Volvo, and Saab are likely to maintain current sales levels or decline. However, as companies such as Nissan have shown, a series of winning vehicle introductions can move a company from a downward spiral to the Wall Street "recommended" list in short order.

The second major trend is increasing North American vehicle sourcing by the largest foreign make sellers. Honda, Toyota, Nissan, Hyundai, and Mazda, the top five foreign makes, will have North American capacity in place by 1990 and in increasing amounts through 2000. Honda will be the most "American," sourcing 60% of their sales from North American sites. Mazda, within the top five, is forecast to be the next integrated into North American sourcing, at 40% by 2000. Mitsubishi, a company panelists view as increasing its sales through 2000, will source 50% of its sales from North America. Like Honda, which sourced domestically to by-pass the Voluntary Export Restraint agreement, Mitsubishi may become a formidable competitor, with U.S. production supplementing import units. It does appear that a company must manufacture in North America to be a significant player in the U.S. market. Also, other factors, such as product offerings, marketing, exchange rates and pricing, and perceived corporate quality image, are important factors of success as well.

MKT-26. Given your forecast of traditional domestic light-truck sales in MKT-23, please divide each of these figures into sales by company for each of the following years.

Production Source	Traditional Domestic Light-Truck Sales (Units in Millions)					
	Median Response			Interquartile Range		
	1990	1995	2000	1990	1995	2000
General Motors	1.50	1.60	1.60	1.50/1.60	1.5/1.65	1.6/1.8
Domestic produced	1.50	1.60	1.60	1.48/1.55	1.5/1.60	1.5/1.6
Captive import	0.00	0.00	0.00	0/0	0/0	0.0/0.1
Transplant	0.00	0.00	0.00	0/0	0/0	0.0/0.4
Ford	1.45	1.50	1.50	1.4/1.5	1.5/1.6	1.5/1.6
Domestic produced	1.45	1.50	1.50	1.4/1.5	1.4/1.5	1.5/1.6
Captive import	0.00	0.00	0.00	0/0	0/0	0/0
Transplant	0.00	0.00	0.00	0/0	0/0	0/0
Chrysler	0.91	0.99	1.00	0.90/0.95	0.90/1.00	0.95/1.00
Domestic produced	0.82	0.90	0.90	0.80/0.90	0.80/0.90	0.90/0.92
Captive import	0.09	0.09	0.10	0.08/0.10	0.05/0.10	0.03/0.10
Transplant	0.00	0.00	0.00	0/0	0/0	0/0

SELECTED EDITED COMMENTS

- Ford's joint venture efforts, combined with strong light-truck sales, may push the company's market share up considerably.
- Chrysler may conceivably, over the long term, be reduced to a "niche" vehicle manufacturer and light-truck market leader.

STRATEGIC CONSIDERATIONS

The light-truck market will be a competitive battleground through 2000. The growth in this market has attracted many new corporate and individual nameplate competitors. Competitive pressure is also likely to increase as light-truck market growth tapers off at the turn of the century. Battles will be fought and won within individual truck segments (see MKT-31), and the 1988-1989 passenger car marketing and incentive wars may be replicated in the truck market.

From a market share perspective, the Big Three may remain competitive against imports and transplants (81.1% of the 1990 market, 81.4% of the 2000 light-truck market). The panelists believe Chrysler will gain the greatest market share over the next 12 years. The acquisition and integration of the Jeep operation into Chrysler is seen as a competitive strength. General Motors is forecast to maintain its share of the domestic market through 2000. Ford Motor may lose approximately 0.7% domestic market share over the same time period. One product, which was rumored at the time we surveyed and is now confirmed, is the Ford-Nissan compact-van joint-venture. Panelists appear not to give this product any volume (because of the high Nissan content it might be defined as a "transplant"). This discrepancy emphasizes the difficulties of defining light-truck vehicles.

MKT-27. Given your forecast of import light-truck sales in MKT-23, please divide each of these figures into sales by company for each of the following years.

Production Source	Import Light-Truck Sales (Units in Millions)					
	Median Response			Interquartile Range		
	1990	1995	2000	1990	1995	2000
Toyota	0.32	0.35	0.35	0.30/0.35	0.34/0.35	0.35/0.38
Import	0.32	0.33	0.30	0.30/0.35	0.32/0.35	0.28/0.32
Transplant	0.00	0.02	0.05	0/0	0.02/0.08	0.03/0.11
Nissan	0.20	0.24	0.23	0.18/0.22	0.20/0.24	0.22/0.24
Import	0.10	0.13	0.12	0.08/0.13	0.10/0.14	0.10/0.13
Transplant	0.10	0.11	0.11	0.10/0.10	0.10/0.12	0.10/0.14
Mazda	0.12	0.12	0.12	0.10/0.12	0.11/0.13	0.12/0.13
Import	0.12	0.12	0.12	0.10/0.12	0.11/0.13	0.10/0.13
Transplant	0.00	0.00	0.00	0/0	0/0	0.00/0.30
Isuzu	0.10	0.11	0.09	0.09/0.10	0.10/0.11	0.09/0.10
Import	0.08	0.09	0.06	0.07/0.10	0.05/0.09	0.05/0.09
Transplant	0.02	0.02	0.03	0.00/0.02	0.01/0.05	0.03/0.05
Suzuki	0.07	0.06	0.07	0.07/0.08	0.06/0.08	0.07/0.09
Import	0.07	0.06	0.07	0.05/0.08	0.05/0.07	0.05/0.08
Transplant	0.00	0.00	0.00	0/0	0.00/0.05	0.00/0.03
Mitsubishi	0.06	0.06	0.06	0.05/0.06	0.05/0.06	0.06/0.06
Import	0.06	0.06	0.06	0.05/0.06	0.05/0.06	0.05/0.06
Transplant	0.00	0.00	0.00	0/0	0/0	0/0
VW	0.01	0.01	0.01	0.01/0.01	0.0/0.01	0.0/0.01
Import	0.01	0.01	0.01	0.01/0.01	0.0/0.01	0.0/0.01
Transplant	0.00	0.00	0.00	0/0	0/0	0/0
Subaru	0.01	0.01	0.01	0.01/0.01	0.01/0.01	0.01/0.01
Import	0.01	0.01	0.01	0.01/0.01	0.01/0.01	0.01/0.01
Transplant	0.00	0.00	0.00	0/0	0/0	0/0
Other	0.00	0.00	0.00	0/0	0/0	0.00/0.02
Import	0.00	0.00	0.00	0/0	0/0	0.00/0.02
Transplant	0.00	0.00	0.00	0/0	0/0	0/0

SELECTED EDITED COMMENTS

- Japanese will probably peak and decline. Regional problems selling import trucks will stall Japanese advances in the light-truck market.
- I believe we will see importers selling Big-Three-produced light trucks under private label brands (e.g., Mazda "Ranger" pickup).

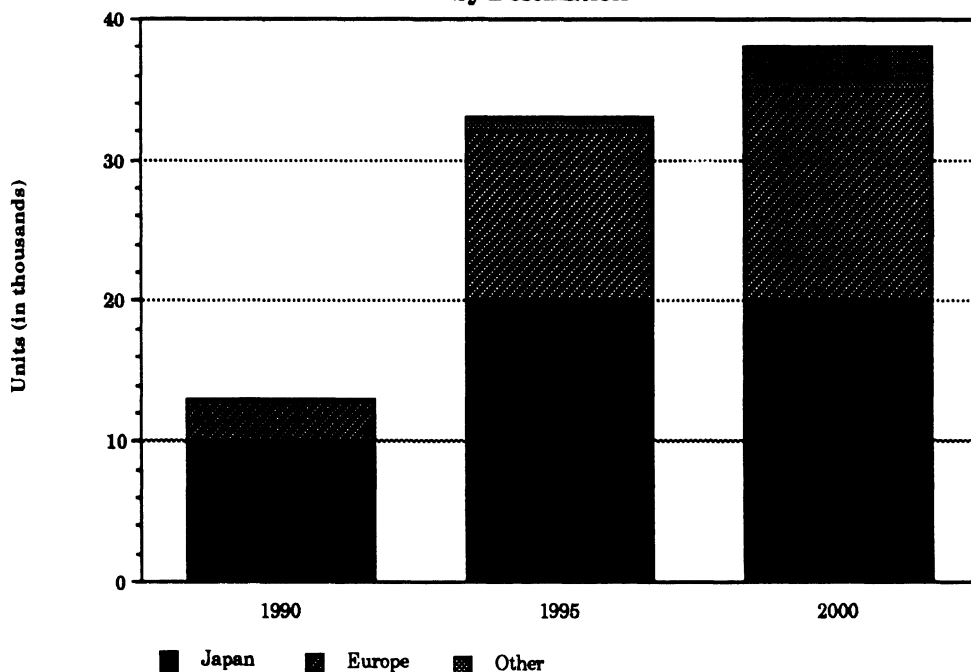
STRATEGIC CONSIDERATIONS

The competitive pressures on the foreign nameplate light-truck market will remain. Apparently there will be a separation in light trucks similar to the passenger car market: large importers will become larger, while medium and small firms will struggle to maintain market share. Only Toyota and Nissan are likely to increase market share (Toyota: 0.5%, Nissan: 2.28%). As with passenger cars, the Japanese are likely to use their product-development time advantage to seek market niches and introduce products into emerging light-truck segments. This will be evident as companies expand their light-truck offerings into new segments or enter completely new into the truck market. Also similar to passenger cars, transplant production—for the greatest extent—does not substitute for import units, only adds to total foreign nameplate sales.

MKT-28. What is your estimate of the number of passenger cars that the New American Manufacturers (NAMs, i.e., Honda, Toyota, and joint ventures such as Diamond-Star), will export from U.S.-located plants to the following regions?

Region	New American Manufacturer Vehicle Exports (Units in Thousands)					
	Median Response			Interquartile Range		
	1990	1995	2000	1990	1995	2000
Japan	10	20	20	3/25	5/40	5/50
Europe	3	12	15	0/15	1/50	2/60
Other	0	1	3	0/3	0/10	0/20

Exports from U.S.-based New American Manufacturers Forecast, by Destination



SELECTED EDITED COMMENTS

- Excess capacity in North America will likely be exported to Europe in future.
- Exports to Europe depend on the results from the economic unification of Europe in 1992.
- U.S. will become a major export source to both Japan and Europe.

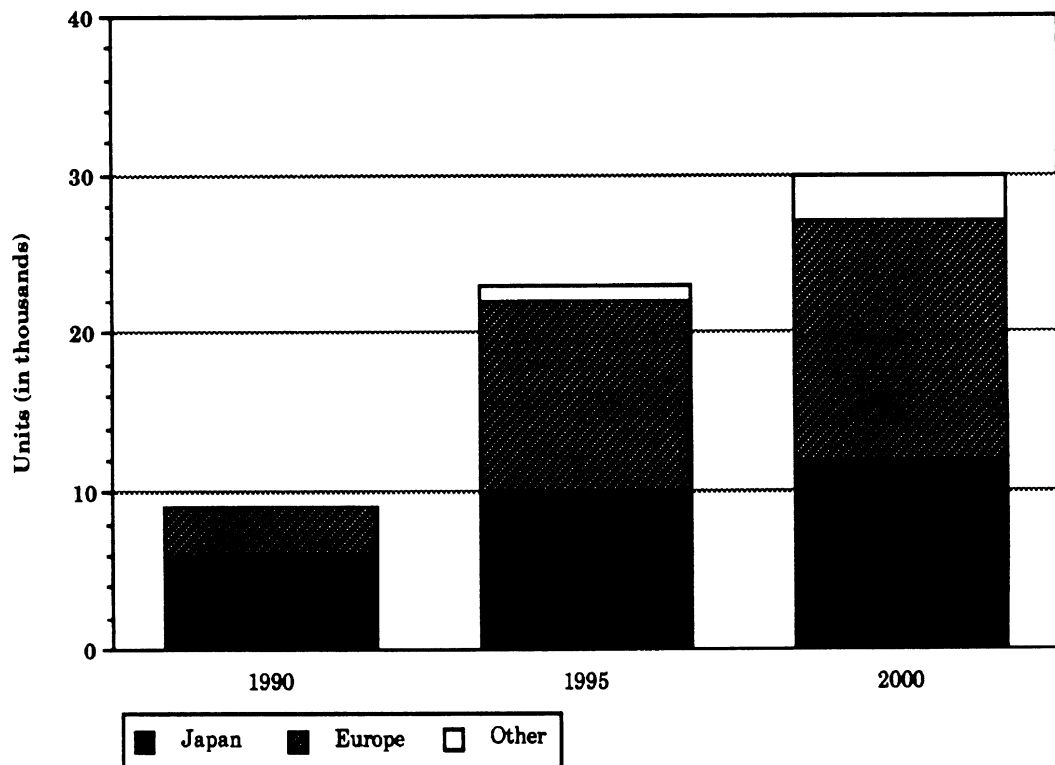
STRATEGIC CONSIDERATIONS

Panelists forecast the U.S. becoming a larger traditional domestic and new American manufacturer export base. However, exports are not expected to become a dominant force in the American industry, reaching only 145,000 units by 2000 (including both NAMs and TAMs, see MKT-29). The economic unification of Europe and future U.S.-Japan trade relations will greatly influence the United States' export participation in the world auto industry. Should Europe close the door to Japanese imports (and European-based Japanese capacity lacks the ability to meet demand) the U.S. could be used as a base for the Japanese to support European demand. This scenario is based on the assumption that the European common market will not fight this route for Japanese vehicles for fear of U.S. reprisal against "American" goods. For the U.S., export transplant vehicles may result in the increase of imported vehicles to satisfy U.S. demand, thus actually widening the U.S.-Japanese trade deficit. Should this scenario develop, it appears these forecasts seriously underestimate total NAM exports. Panelists' responses indicate NAM exports will be a goodwill gesture and not a serious attempt to establish U.S. exports. The reader is cautioned that this may not occur and NAMs may export a much larger number of cars.

MKT-29. What is your estimate of the number of passenger cars that the Traditional American Manufacturers (TAMs, i.e., GM, Ford, and Chrysler) will export from U.S.-located plants to the following regions?

Region	Traditional American Manufacturer Vehicle Exports (Units in Thousands)					
	Median Response			Interquartile Range		
	1990	1995	2000	1990	1995	2000
Japan	6	10	12	5/10	7/15	8/20
Europe	45	50	60	20/60	22/70	25/80
Other	25	30	35	15/50	16/55	20/60

**Exports from Traditional Domestic Manufacturers,
by Destination Forecast**



SELECTED EDITED COMMENTS

- The Japanese will use North American manufacturing as a means to penetrate Europe. I am tending to believe that the 1992 unification of Europe will only serve to push the protectionist boundaries, which exist around some countries today, to surround all of Europe.

STRATEGIC CONSIDERATIONS

Big Three vehicles are improving quality, styling, and handling to world-class levels. This plus the fact that the U.S. may be the low-cost industrialized-country producer makes Big Three vehicles more competitive in world markets. This results in the forecast 40% increase in TAM exports between 1990 and 2000. Export-led growth has not been a Big Three objective since the early 1900s. If international safety, emission, and custom regulations become more harmonized, Big Three (and their suppliers) may be able to consider this route for an increasing number of sales. See *Strategic Considerations* in MKT-28.

V. U.S. LIGHT-VEHICLE SEGMENTATION FORECASTS

MKT-30. Referring to your estimate of domestic and import franchise passenger car sales (MKT-24, page 56), please break out your forecast into the following segments. (See *Segment Definitions on page 101.*)

Year/Segment	U.S. Passenger Car Market Segmentation (Units in Thousands)			
	Median Response		Interquartile Range	
	Domestic	Import	Domestic	Import
1990				
Subcompact, regular	977	1,329	933/1,010	1,063/1,404
Subcompact, specialty	78	86	72/100	80/100
Compact, regular	914	700	900/1,000	600/739
Compact, specialty	1,254	550	1,200/1,300	503/600
Intermediate, regular	1,466	300	1,458/1,530	275/310
Intermediate, specialty	538	100	514/600	100/110
Full size	900	0	850/1,000	0/10
Luxury, regular	489	215	460/500	200/280
Luxury, specialty	154	70	150/200	53/80
TOTAL	6,770	3,350		
1995				
Subcompact, regular	1,000	1,400	800/1,100	1,000/1,500
Subcompact, specialty	80	100	75/100	80/125
Compact, regular	950	700	900/1,041	600/792
Compact, specialty	1,300	594	1,200/1,400	500/660
Intermediate, regular	1,530	300	1,409/1,600	260/353
Intermediate, specialty	550	123	500/650	100/200
Full size	900	0	875/1,000	0/20
Luxury, regular	500	250	450/550	200/310
Luxury, specialty	170	86	150/200	70/100
TOTAL	6,980	3,553		
2000				
Subcompact, regular	850	1,400	700/1,100	1,100/1,580
Subcompact, specialty	99	100	70/110	81/150
Compact, regular	980	720	860/1,050	650/800
Compact, specialty	1,350	600	1,208/1,400	525/700
Intermediate, regular	1,530	320	1,375/1,650	290/390
Intermediate, specialty	600	150	529/700	110/200
Full size	950	0	900/1,000	0/50
Luxury, regular	500	250	475/600	200/400
Luxury, specialty	180	100	170/200	64/192
TOTAL	6,949	3,640		

SELECTED EDITED COMMENTS

- Steady after 1995 "Baby Boom" wave.

MANUFACTURER SUPPLIER COMPARISONS

For most categories the two groups are within 10% of each other. As a general difference, manufacturers see a "richer" mix of larger (compacts in place of subcompacts) and better equipped (luxury, regular and specialty) vehicles.

STRATEGIC CONSIDERATIONS

Overall, segmentation is not expected to change dramatically. There will be a slight "richening" of the market, with vehicles moving from "regular" classifications into "specialty." The domestic Big Three will have increased competition within every passenger car segment except full size (although one panelist forecast import entries in this segment). In smaller vehicles the Big Three will apparently be competitive, maintaining or increasing their market share effectively in the higher-margined specialty segments (subcompact, specialty: 1990, 43%; 2000, 50%; compact specialty: 1990, 70%; 2000, 69%) while giving up ground in the "regular" subcategories (subcompact, regular: 1990, 43%; 2000, 38%; compact regular: 1990, 57%; 2000, 55%). The Big Three may be at a larger risk, losing market share within the more profitable intermediate and luxury segments. The full-sized segment is the only segment imports are not expected to penetrate by 2000. Within each segment, Big Three losses are expected to be: intermediate, specialty: 1990, 85%; 2000, 80%; luxury, regular: 1990, 70%; 2000, 67%; luxury, specialty: 1990, 69%; 2000, 64%.

MKT-31. Referring to your estimate of domestic and import franchise light-truck sales (MKT-26 and MKT-27), please break out your forecast into the following segments. (See *Segment Definitions on page 101.*)

Year/Segment	U.S. Light-Truck Market Segmentation (Units in Thousands)			
	Median Response		Interquartile Range	
	Domestic	Import	Domestic	Import
1990				
Compact pickup	675	600	660/700	560/638
Regular pickup	1,300	0	1,300/1,390	0/0
Compact van	700	55	675/800	50/100
Regular van	500	10	490/500	7/10
Compact utility	530	210	500/555	200/225
Regular utility	200	3	200/205	1/5
TOTAL	3,905	878		
1995				
Compact pickup	700	625	600/711	600/665
Regular pickup	1,330	0	1,330/1,390	0/0
Compact van	789	80	700/900	60/125
Regular van	500	10	477/510	0/11
Compact utility	550	220	500/600	210/240
Regular utility	210	3	200/250	0/5
TOTAL	4,079	938		
2000				
Compact pickup	710	630	670/800	600/686
Regular pickup	1,350	0	1,300/1,392	0/0
Compact van	845	100	720/940	65/150
Regular van	500	10	468/540	0/12
Compact utility	575	225	500/650	210/270
Regular utility	211	3	200/258	0/5
TOTAL	4,191	968		

MANUFACTURER/SUPPLIER COMPARISON

Overall, suppliers are more bullish concerning total import light-truck sales and manufacturers are more optimistic concerning the import manufacturers' ability to move rapidly in the regular van and utility segments. The table below details specific responses.

Segment	Manufacturers' Level of Vertical Integration (Units in Thousands)					
	Manufacturer			Supplier		
	1990	1995	2000	1990	1995	2000
DOMESTIC						
Compact pickup	500	500	450	690	700	710
Regular pickup	1,000	1,000	1,000	1,320	1,340	1,380
Compact van	700	700	700	700	789	845
Regular van	400	400	400	500	500	500
Compact utility	555	625	650	525	530	554
Regular utility	195	175	175	200	210	211
IMPORT						
Compact pickup	400	400	350	600	625	630
Regular pickup	0	0	0	0	0	0
Compact van	50	50	50	55	80	100
Regular van	10	100	100	8	10	10
Compact utility	100	100	100	210	220	225
Regular utility	5	25	25	3	3	3

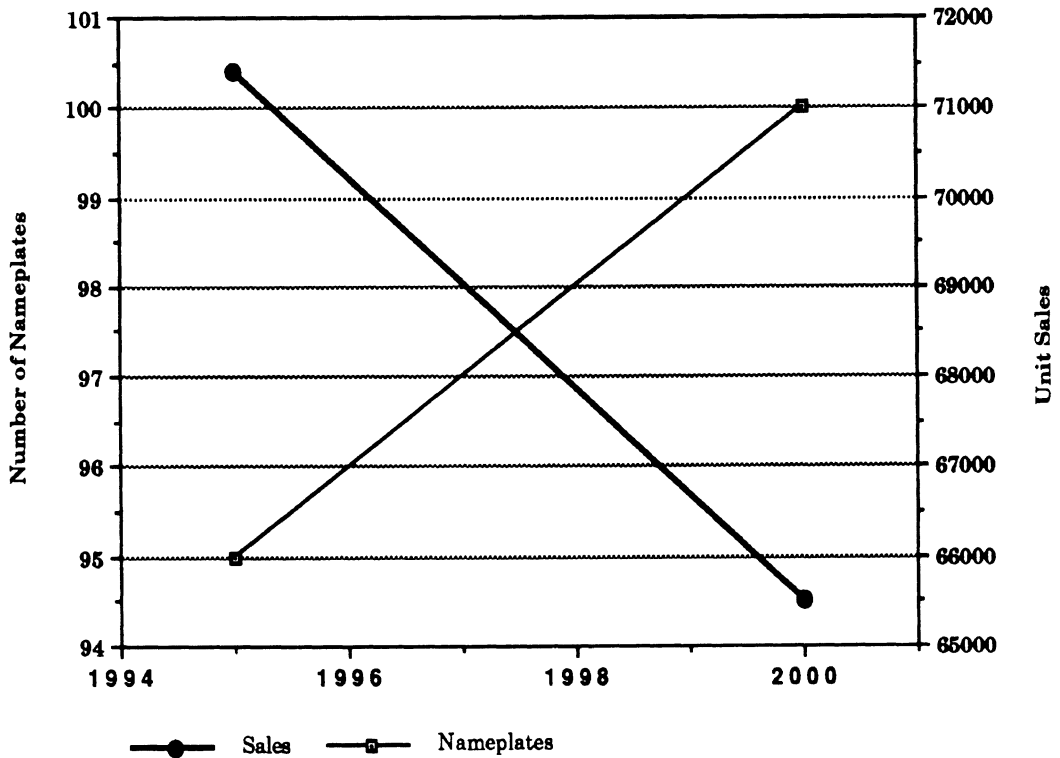
STRATEGIC CONSIDERATIONS

Forecasts show no major light-truck segment shifts. There is a continued trend from regular van and utility vehicles to compact-size vehicles; however, this is a two- to three-percent shift over ten years. One trend that Big Three and American light-truck suppliers should monitor is the establishment of imported vehicles (both Japanese and European) in the regular van and utility market. Just as in passenger cars, Japanese manufacturers may see these segments as upscaling opportunities. Panelists believe the full-size pickup segment will remain exclusively American. But then, there were very few estimating the arrival of \$40,000 Japanese passenger cars. Japanese manufacturers should not be discounted from complete and competitive participation in the light-truck market. It is not unreasonable to consider Japanese participation in the full-size pickup, van, or utility segments, particularly in view of the relationships between Mazda and Ford, Isuzu and GM, and Mitsubishi and Chrysler/Jeep. An unlikely competitor can become a competitor in quick order through manufacturing or marketing joint-venture arrangements. Every segment will experience increased competitive pressures from expanding product offerings and aggressive pricing strategies.

MKT-32. The fragmentation of the U.S. passenger car market into niches can be measured by the number of nameplate offerings and average unit sales per nameplate. Please give your estimate of these two statistics (please refer to MKT-22 for your total market forecast) for traditional domestic and foreign manufacturers.

Statistic	Median Response		Interquartile Range	
	1995	2000	1995	2000
Nameplate Offerings	95	100	86/100	85/110
	90	90	80/95	85/100
Average Sales/Nameplate	71,400	65,500	62,000/75,800	57,400/80,000
	40,000	37,917	35,000/44,000	33,600/45,700

Domestic Nameplate Offerings and Average Unit Sales Forecast



SELECTED EDITED COMMENTS

- Average sales per nameplate is a misleading statistic: the top ten nameplates will continue to sell above 200,000 units each. However, probably 30 to 40 nameplates will sell 20,000 units or less.

MANUFACTURER/SUPPLIER COMPARISONS

The manufacturers and suppliers agree on the number of nameplate offerings by domestic makers. Manufacturers forecast, however, a greater number of import nameplates: 90 vs. 85 in 1995 and 100 vs. 90 in 2000. This indicates the manufacturers are aware of the Japanese competitive advantage within product-development cycles (both time and cost which allows more frequent and numerous product introductions) and European's increasing propensity to export models which were available only for the European market (primarily focused on eliminating the United States' "grey market").

STRATEGIC CONSIDERATIONS

The combination of increasing nameplates to match market niches and decreasing Big Three market share will put considerable cost pressure on the Big Three. Average domestic model runs were approximately 76,000 units in 1987. This is expected to decrease to 65,500 units in 2000. This forces the need for cost competitiveness and flexibility throughout the entire product development and delivery system. Every aspect of the business from inventory control, material scheduling, production planning, etc., must be focused on driving operating cost out of the system so that greater expense can be incurred in areas associated with smaller but more market-responsive runs (i.e., model change, tool setup, etc.).

For these smaller runs there needs to be a reduction in total costs, not an overall increase in costs that would result in increased consumer prices and non-competitive cost structures. The entire supply chain needs to be responsive to the need to increase flexibility and reduce costs. It will be to no manufacturer's advantage to have a highly flexible assembly plant if material supply cannot be equally flexible.

It is apparent that the domestic manufacturers will continue to be pressured by foreign companies. Foreign companies' ability to introduce and market more frequent and numerous product introductions will be a competitive advantage throughout 2000. This will put additional pressure on the domestic manufacturers' pricing structure: an older, domestic product may be able to compete against newer, fresher designs and technology of foreign makes if—and only if—the domestic product can be sold as a superior value.

Within the projected scenarios of niche marketing and low-volume production there remains a need for large-volume, mass-appeal production which provides tasteful styling and dependable transportation. Manufacturers should be careful not to stray from a sound marketing plan addressing their core market for fad niche markets.

MKT-33. What is your forecast of the total U.S. passenger car market share by body type?

Body Type	Percent of Total Market			
	Median Response		Interquartile Range	
	1995	2000	1995	2000
4-Door Sedan	54%	54%	52/55%	51/57%
4-Door Hatchback	6	6	5/6	4/6.5
4-Door Station Wagon	6	6	5/7	4/7
SUBTOTAL	66%	66%	64.2/67%	63/68%
2-Door Sedan	21	21	20/22	19/22.5
2-Door Hatchback	12	12	11.9/13	11/13.5
Convertible	1	1	0.6/1	0.6/1.5
SUBTOTAL	34%	34%	33/35.8%	32/37%

MANUFACTURER/SUPPLIER COMPARISONS

There are no significant differences. Manufacturers tend to be more pessimistic toward two-door sales, showing a slightly greater percentage of four-doors than the suppliers indicate.

TREND FROM PREVIOUS DELPHI SURVEYS

The current Delphi survey indicates a greater 1995 share of four-door sales compared to the 1986 survey: 66% versus 61%. This reflects customer tastes which are increasingly looking for the functional utility of a four-door (primarily for ease of entry and exit of passengers) and manufacturers that are offering more four-door vehicles having strong styling and performance characteristics.

STRATEGIC CONSIDERATIONS

The mix of vehicle body types is forecast to remain essentially the same. While body types may remain the same, response to population demographics may change powertrain offerings and other factors within these vehicles—high performance which was reserved for more sleek, two-door models may find its way to four-door sedans and station wagons. Manufacturers and suppliers need to stay attuned to demographics and psychographic changes that may result in interesting hybrids of the vehicles known today.

VI. PASSENGER CAR AND LIGHT-TRUCK PRODUCTION

MKT-34. What do you predict worldwide passenger car production volume will be for these major vehicle manufacturers in the following years?

Manufacturer	Worldwide Passenger Car Production (Units in Millions)					
	Median Response			Interquartile Range		
	1990	1995	2000	1990	1995	2000
GM	6.5	6.5	6.5	6.4/6.6	6.3/6.8	6.3/6.9
Ford	4.0	4.1	4.2	3.9/4.1	4.0/4.3	4.0/4.4
Toyota	2.8	2.9	3.0	2.8/2.9	2.8/3.1	2.9/3.3
VW	2.6	2.6	2.5	2.5/2.6	2.4/2.6	2.5/2.6
Nissan	1.9	2.0	2.0	1.8/2.0	1.9/2.1	2.0/2.2
Peugeot/Citroen	1.7	1.7	1.7	1.7/1.8	1.7/1.8	1.7/1.8
Renault	1.6	1.6	1.6	1.6/1.6	1.5/1.7	1.4/1.7
Fiat	1.6	1.6	1.6	1.6/1.6	1.6/1.6	1.6/1.7
Chrysler	1.4	1.3	1.3	1.3/1.4	1.2/1.4	1.2/1.5
Honda	1.3	1.4	1.5	1.3/1.4	1.3/1.7	1.4/1.8
Mazda	0.8	0.9	0.9	0.8/0.9	0.8/1.0	0.9/1.1
Daimler-Benz	0.6	0.6	0.6	0.6/0.6	0.6/0.6	0.6/0.6
Mitsubishi	0.6	0.6	0.6	0.6/0.6	0.6/0.7	0.6/0.7
BMW	0.4	0.4	0.5	0.4/0.5	0.4/0.5	0.4/0.5
Volvo	0.4	0.4	0.4	0.4/0.4	0.4/0.4	0.4/0.4
Hyundai	0.5	0.5	0.5	0.4/0.6	0.4/0.7	0.4/0.7
Rover Group	0.4	0.4	0.4	0.4/0.4	0.4/0.4	0.4/0.4
Suzuki	0.3	0.3	0.3	0.3/0.4	0.3/0.4	0.3/0.4
Fuji (Subaru)	0.3	0.3	0.3	0.3/0.3	0.3/0.3	0.3/0.3
Isuzu	0.2	0.2	0.2	0.2/0.2	0.2/0.3	0.2/0.3
Alfa Romeo	0.2	0.2	0.2	0.2/0.2	0.2/0.2	0.2/0.2
Daihatsu	0.1	0.1	0.1	0.1/0.2	0.1/0.2	0.1/0.2
Saab-Scania	0.1	0.1	0.1	0.1/0.1	0.1/0.1	0.1/0.3
Daewoo	0.05	0.06	0.07	0.05/0.1	0.05/0.1	0.05/0.15
Porsche	0.05	0.05	0.05	0.05/0.05	0.05/0.05	0.05/0.06
Other	0.05	0.08	0.1	0/0.1	0/0.3	0/0.4

SELECTED EDITED COMMENTS

- Other: KIA 1990=100,000 units; 1995=300,000 units; 2000=400,000 units.

VI. PASSENGER CAR AND LIGHT-TRUCK PRODUCTION

World passenger car production, by manufacturer, 74

TREND FROM PREVIOUS DELPHI SURVEYS

Current opinion is that the strong are getting stronger and the rest of the industry will maintain its own. Comparing 1995 production rates, current panelists believe, compared to the 1987 survey, GM will produce 8% more vehicles, Ford 11%, Toyota 4%, and VW 32%. Generally other 1988 production forecasts were within 100,000 to 200,000 the 1986 survey—too small a change to be statistically significant.

STRATEGIC CONSIDERATIONS

Overall, panelists forecast a general increase in each of the manufacturers' passenger car production rates. The only area of interest is the "Other" category: from less than 50,000 units in 1987 to 100,000 units by 2000. This growth is consistent with a mature industry: as product and process technology is transferred throughout the world, more countries and manufacturers will begin production and, thus, shift the centers of production from the early entrants to the new industrialized countries. There will be many firms in this "Other" category by 2000—particularly from the Peoples' Republic of China, Taiwan, and the Soviet Union. Future world growth of automotive fleets is likely to be within pockets of developing countries, and these countries will be developing automotive industries of their own. Because of the significant growth opportunity in these developing countries, it appears the "Other" category is underestimated.

MKT-35. What do you predict world total (light and heavy) truck and bus production volume will be for these major vehicle manufacturers in the following years?

Manufacturer	World Truck and Bus Production (Units in Millions)					
	Median Response			Interquartile Range		
	1990	1995	2000	1990	1995	2000
GM	1.9	2.0	2.1	1.9/2.0	1.9/2.2	2.0/2.2
Ford	1.9	1.9	2.0	1.8/1.9	1.8/2.0	2.0/2.1
Toyota	1.0	1.1	1.1	1.0/1.1	1.0/1.1	1.0/1.2
Chrysler/Jeep	0.8	0.8	0.9	0.8/0.9	0.8/0.9	0.8/1.0
Nissan	0.7	0.7	0.7	0.7/0.7	0.7/0.8	0.7/0.8
Mitsubishi	0.6	0.6	0.6	0.6/0.6	0.6/0.7	0.6/0.7
Suzuki	0.6	0.6	0.6	0.6/0.6	0.6/0.6	0.6/0.7
Daihatsu	0.5	0.5	0.5	0.5/0.5	0.5/0.5	0.5/0.5
Mazda	0.4	0.4	0.4	0.4/0.4	0.4/0.5	0.4/0.5
Isuzu	0.4	0.4	0.4	0.3/0.4	0.4/0.4	0.4/0.4
Fuji	0.4	0.4	0.4	0.3/0.4	0.4/0.4	0.4/0.4
Renault	0.3	0.3	0.3	0.3/0.3	0.3/0.3	0.3/0.3
Peugeot-Citroen	0.3	0.3	0.3	0.3/0.3	0.3/0.3	0.3/0.3
Daimler-Benz	0.2	0.2	0.2	0.2/0.2	0.2/0.3	0.2/0.3
Honda	0.2	0.2	0.2	0.2/0.2	0.2/0.3	0.2/0.3
Fiat	0.2	0.2	0.2	0.2/0.2	0.2/0.2	0.2/0.2
VW	0.2	0.2	0.2	0.2/0.2	0.2/0.2	0.2/0.2
Rover Group	0.1	0.1	0.1	0.1/0.1	0.1/0.1	0.1/0.1
Kia	0.1	0.1	0.1	0.1/0.1	0.1/0.2	0.1/0.2
Navistar	0.08	0.08	0.08	0.08/0.08	0.08/0.09	0.08/0.09
Hino	0.06	0.06	0.06	0.06/0.06	0.06/0.06	0.06/0.07

TREND FROM PREVIOUS DELPHI SURVEYS

Similar to MKT-34, the recent survey indicates a strengthening of the large companies, but specifically the Big Three. Forecasts of 1995 truck production, compared to the 1986 survey, show a 33% increase for GM, 36% increase for Ford, and a 100% increase for Chrysler. Obviously panelists believe the acquisition of Jeep by Chrysler (they were separate companies in 1986) will be a strategic success.

STRATEGIC CONSIDERATIONS

Similar to passenger cars, panelists estimate no major changes in the world's major truck manufacturers. Except for Chrysler Motors (because of the integration of Jeep), manufacturers are likely to maintain their relative market share. See MKT-34 for further discussion.

MKT-36. Given your projections of U.S. passenger car sales (in MKT-22, MKT-24, and MKT-25) and production, please estimate passenger car production capacity in North America (U.S. and Canada) for each of the following years. Please divide this number into traditional domestic and foreign-owned/managed facilities.

Facilities	North American Passenger Car Production Capacity (Units in Millions)					
	Median Response			Interquartile Range		
	Current Estimate	1995	2000	Current Estimate	1995	2000
Traditional domestic	9.3	8.6	8.5	8.0/10.0	7.5/9.4	7.2/9.5
Foreign-owned	1.2	2.1	2.5	0.7/1.80	2.0/3.0	2.0/3.8

STRATEGIC CONSIDERATIONS

Capacity estimates always make for a good automotive argument. Although specific numbers may be questioned, the relative participation between domestic and foreign firms is an interesting comparison. Panelists predict a shift in North American vehicle manufacturing capacity. Domestic share of capacity narrows from 89% in 1988 to 80% and 77% in 1995 and 2000, respectively. Conversely, New American Manufacturer (NAM) share grows from 11% in 1988 to 20% and 23% in 1995 and 2000, respectively. This indicates the impact of the NAMs will continue to be an issue with the traditional domestic manufacturer and supply base, labor unions, federal and state governments, and other interested groups. This increase in share is also an indication of greater activity by foreign supplier firms.

It appears that the domestic firms will be downsizing their capacity over the next twelve years by approximately 10%. Foreign firms, however, will be increasing production capacity 114%. Total North American capacity is expected to increase approximately 5%. Given a general total North American market growth rate of 1.5% per year, total sales should grow approximately 20%, using a compounded rate over 12 years. Given that a general estimate of overcapacity today is an often-quoted 30%, it appears that the industry will reduce its over-capacity situation by approximately 50% by 2000 ($30 - 20 + 5 = 15\%$ over-capacity). Perhaps this will be the proper level of capacity margin to carry; perhaps even this level of capacity burden might be too great to carry through an "auto recession." Two things are certain: (1) the entire industry—from assembler to services and material suppliers—will need to manage its way out of excessive capacity; and (2) the issue of overcapacity may shift from a domestic-firm-only issue to a NAM issue (both at the assembly and component manufacturing level).

MKT-37. Given your projections of U.S. light-truck sales (in MKT-23 to MKT-27) and production, please estimate light-truck (including vans) production capacity in North America (U.S. and Canada) for each of the following years. Please divide this number into traditional domestic and foreign-owned/managed facilities.

Facilities	North American Light-Truck Production Capacity (Units in Millions)					
	Median Response			Interquartile Range		
	Current Estimate	1995	2000	Current Estimate	1995	2000
Traditional domestic	4.4	4.6	4.8	4.0/4.5	4.2/4.9	4.7/5.0
Foreign-owned/managed	0.2	0.5	0.9	0.1/0.9	0.3/1.0	0.4/1.2

SELECTED EDITED COMMENTS

- Based on mini-vans classified as trucks.
- Includes Isuzu Trooper, Toyota pickup, Nissan pickup, and Suzuki sport utility.
- Light-truck demand growth will force a switch of auto capacity to light-truck capacity.

STRATEGIC CONSIDERATIONS

Similar to passenger cars, panelists estimate an increasing role of the New American Manufacturers (NAMs) from 4% of total capacity in 1988 to 10% and 16% in 1995 and 2000, respectively. Unlike the estimate for passenger cars, respondents forecast increasing capacity by both traditional domestic and NAMs. As the truck market is an increasing percentage of the total market (approximately 33%), this increase may not pose a significant problem. Most domestic light-truck facilities operated overtime in 1988. As panelists forecast a 6% increase in domestic light-truck U.S. sales over the 1990–2000 period, an increase of 9% production capacity seems reasonable. However, within the truck market individual segments may have strong or weak sales, creating over- or under-capacity within particular segments and, in turn, creating booms or busts for individual plants and communities. More so than with passenger cars, this may be more relevant to the new NAM capacity than it is to domestic light-truck capacity.

VII. VEHICLE ATTRIBUTES AND FEATURE PENETRATION RATES

MKT-38. Please prioritize the five most important product attributes that will differentiate passenger vehicles over the next ten years.

Product Differentiating Attributes	
1.	Engine/powertrain performance
2.	Exterior styling/design
3.	Perceived quality of manufacturer/vehicle
4.	Perceived vehicle reliability/durability
5.	Price

OTHER significant considerations include: option availability/packages; safety; vehicle size, roominess, interior packaging; availability of ABS; and electronic controls/displays.

STRATEGIC CONSIDERATIONS

Product differentiation and position will continue to be key success factors. Differentiating products in a period of international styling commonization and joint-venture intellectual exchanges will be challenging. So also will be positioning products against increasing numbers of competitors and levels of advertising and promotion. Product differentiation, panelists respond, will depend upon a customer-tailored combination of the following: vehicle performance, styling, quality, reliability, and price. For each customer these attributes vary: some define performance by a 0 to 60 mph surge, others by the sound of exhaust "rumble" while accelerating. Manufacturer quality may be dealership service to someone who is brand loyal, or a proactive environmental or safety stand to someone seeing themselves as an "environmentalist" or "consumerist." Overall, perceived value will drive purchase decisions—the price at which performance, styling, quality, and durability can be purchased. It is a bundle of compromises, each customer weighting these factors slightly different among equals.

These attributes are not ranked with percentage of responses for a reason: manufacturers must satisfy each of these characteristics (and even the second tier of responses) simultaneously to win customers in the competitive marketplace. The execution of each factor is paramount in today's non-brand loyal, crowded marketplace. Responses that emphasize this competitiveness include customers shopping on non-product attributes such as manufacturer quality. Positioning a company will be just as important as positioning the product. If products are perceived as having the same styling, other non-product attributes may win customers (perhaps a far-fetched comparison, but how many customers stop at McDonald's because of clean restrooms?). The dealer network is a key resource manufacturers may use to differentiate product. Manufacturers who satisfy each of these attributes at the lowest cost will have the greatest success. See MKT-8 for additional purchase selection criteria and discussion.

MKT-39. What will be the total North American passenger car market (domestic and import) penetration rate (in percentage) for the following powertrain, suspension, and chassis features?

Feature	North American Passenger Car Application Rates			
	Median Response		Interquartile Range	
	1995	2000	1995	2000
Anti-lock brake system (ABS)	25	50	17/30	35/60
4-wheel disc brakes	15%	25%	10/20%	15/40%
3- or 4-valve engine cylinder	10	20	8/15	12/30
Turbocharger/Supercharger	5	6	5/6	5/8
Active suspension control	4	5	2/5	4/10
4-wheel drive	4	5	2/5	4/8
Traction (anti-spin) control	2	5	1/5	2/10
CVT transmissions	2	5	1/2	3/5
Active 4-wheel steering	1	3	1/2	2/5
Drive-by-wire	1	3	0/5	0/15
Steer-by-wire	1	3	0/5	0/10

SELECTED EDITED COMMENTS

- "Active suspension control" needs to be more specifically defined. In my opinion, there are currently no cars with active suspension. There are some cars with active-control shock absorbers.
- Anti-lock brake system will be a mandated safety feature.
- At some point in this century safety has to become standard equipment and not an option. Who will be the first to be responsible: auto companies or government?
- CVT transmissions will be available on only some subcompacts.
- Drive-by-wire and steer-by-wire might begin to happen if congestion and vehicle growth continues to increase at an "uncontrollable" rate.
- Renewed interest in fuel economy will promote 4-valve small engines for performance. A properly designed CVT could revolutionize transmission applications. Drive-by-wire has cost and liability issues that may not be solvable.
- The revolution in electronics and computers will be the basis for the coming wave of new automotive technology. The U.S. passenger car market has been technologically stagnant for the past thirty years, in spite of the enormous R&D budgets of the Big Three, and I believe the Japanese see this as an area of competition. The increasing number of manufacturer, industry-wide, and government R&D programs in Japan suggests that new technology will bring a host of new products with shorter life-cycles, providing consumers with more choice than ever.

MANUFACTURER/SUPPLIER COMPARISONS

The two panels are within one or two percentage points on all estimates except anti-lock brake systems (ABS). Manufacturers are more optimistic on ABS, forecasting 30% penetration in 1995 and 60% in 2000. Suppliers' estimate ABS at 20% and 40% penetration in 1995 and 2000, respectively.

COMPARISON OF FORECASTS: TECH-19a and 21

The table below presents the responses from the Technology panel. In general, the Marketing panel estimates penetration for these features lower than Technology panelists. This may be the result of differences in perceived customer value, production cost estimates, and/or product and manufacturing engineering feasibility. Because of the differences between these two panels, it is extremely important that suppliers of these products have strong relationships with marketing, sales, engineering, and advanced product planning groups.

Feature	Technology Forecast	
	1995	2000
Anti-lock brakes	30	70
Active four-wheel steering	5	8
Traction control	5	15
Active suspension control	2	6

TREND FROM PREVIOUS DELPHI SURVEYS

Of the features surveyed in 1986 and 1988, panelists remained constant on 1995 penetration rate forecasts for anti-lock brakes (25%) and four-wheel drive (4%). However, active four-wheel steering and active-suspension application forecasts are dramatically reduced. In 1986 Marketing panelists estimated 5% penetration of active four-wheel steering (1988, 1%) and 15% penetration of active suspension (1988, 4%). This may be the result of a re-evaluation of the cost/benefit ratio for the customer: either cost of production not reducing at the rate believed possible in 1986 or benefit to customers not increasing to a level expected.

STRATEGIC CONSIDERATIONS

There will be an escalation of high-technology electronics, engine configurations, and transmissions through 2000. This should provide many opportunities for suppliers and manufacturers. Systems such as supercharging, traction control, 4-wheel steering, CVT transmissions, drive-by-wire, steer-by-wire, and heads-up displays are forecast to grow from zero penetration today to 3 to 5% by 2000. Each of these components has a relatively tight interquartile range; however, the lower quartile is typically closer to the median response. This indicates that the panelists are "cautiously optimistic" about the forecasts. Generally, the penetration rates of these features depend upon education (especially with traction control and four-wheel drive), reluctance to change (steer-by-wire), and perceived value (heads-up displays).

The greatest differences of opinion are estimates of four-wheel disc brakes, ABS, and multi-valve engines. The variation in four-wheel disc brakes and ABS is often explained by a person's opinion on whether ABS usage will be required by law. It seems plausible that this feature's penetration will be driven by the customer, not government, given the right

manufacturing costs and customer education. The safety advantages of ABS are substantial (especially on mechanical single-axle systems used in light trucks).

The advantages of multi-valve engines continue to be a debate. If powertrain performance does emerge as a product differentiator (MKT-38) then multi-valve engines may penetrate to the upper quartile rates. A significant advantage is now held by the Japanese in 3- and 4-valve technology. Current U.S.-produced offering is limited to the GM Quad-4. Other U.S.-vehicle offerings (Taurus SHO, Plymouth Laser) use Japanese designs and/or complete engines. By 1995 each of the Big Three will have more 3- and 4-valve offerings either of their own manufacturer or through foreign affiliates.

Throughout this "up-teching" of the automobile, a careful eye must be kept on providing maximum customer value. Quality, dependability, cost of ownership, cost of operation, and improvement of comfort, safety, and convenience will drive customer demand for new features. It is true that some of these features (i.e., multi-valve engines, active suspension, drive-by-wire, etc.) may be "transparent" to the driver. That is, the operator may not be aware of the technology providing the comfort, performance, and safety that is experienced. However, the transparency wears thin the first time the customer needs service, and is completely obvious the second and third times for service when the dealership cannot correct the problem.

MKT-40. What will be the total U.S. passenger car market (domestic and import) penetration rate (in percentage) for the following driver convenience features?

Driver Convenience Feature	U.S. Passenger Car Market Penetration Rate			
	Median Response		Interquartile Range	
	1995	2000	1995	2000
Factory-installed cellular phone	8%	14%	3/11%	5/25%
CRT dashboard displays	5	8	2/12	5/25
Heads-up dashboard displays	3	5	1/5	5/15
Navigation information systems	2	5	1/5	3/10
Collision-avoidance systems	1	5	1/5	2/10

SELECTED EDITED COMMENTS

- Early warning and preventative maintenance diagnostics: 1995, 25%; 2000, 50%.
- Collision avoidance system may be mandated as standard equipment by NHTSA.
- Factory-installed versus aftermarket may be a significant issue with regard to cellular phones—parallel example is car radio situation.
- Heads-up displays eventually will be the primary and only system, not a redundant, supplementary system.

MANUFACTURER/SUPPLIER COMPARISONS

Generally, both groups are in agreement. Suppliers estimate a greater use than manufacturers of factory-installed cellular phones by 2000 (15% versus 10%). Manufacturers are more optimistic than suppliers about customer acceptance of heads-up displays by 2000 (10% versus 5%).

STRATEGIC CONSIDERATIONS

This question explores more advanced electronic customer convenience, comfort, and safety systems. Penetration of these products is close to zero percent today. The forecasts through 2000 thus indicate new business opportunities for suppliers. As with MKT-39, maximizing customer value must be the driving criterion for the installation of these features. It appears that the customer cost/benefit ratio is uncertain: each of these features have very large interquartile variation. As with most advanced features, these products will likely be introduced on luxury vehicles at relatively high prices. As volume increases and manufacturing and warranty costs fall, the features will be offered as optional equipment on additional nameplates.

MKT-41. There has been a great deal of discussion concerning customer's price sensitivity and acceptance rate for advanced "high-tech" features. Considering the list of advanced features below, what do you feel would be the highest price that could be charged on a passenger vehicle and would still allow a 25% penetration rate?

Advanced Features	Highest Price to Allow 25% Penetration	
	Median Response	Interquartile Range
Anti-lock brakes	\$400	\$250/500
Traction (anti-spin) control	150	100/250
Active suspension control	300	150/500
Active 4-wheel steering	250	150/400
Navigation information systems	275	100/500
Collision-avoidance systems	250	150/500

SELECTED EDITED COMMENTS

- Collision-avoidance "value" will relate to its impact on insurance rates as well as effectiveness.
- Maps at a gas station cost 25 cents and are a remarkably effective alternative to navigation systems.
- Traction control, active suspension, and four-wheel steering at this time would not get 25 percent penetration regardless of price—benefit not clear enough to large enough part of population.
- The consumer is going to have to be sold that some of these are worth having for any amount of money.
- The price sensitivity and rate would vary considerably by segment.
- Based on safety and performance and with good advertising and marketing these items should reach 25 percent irrespective of any reasonable price. As for navigation information systems, this item can not be priced low enough to reach 25 percent—too gimmicky.

MANUFACTURER/SUPPLIER COMPARISON

For each feature the supplier panelists believe customers will justify \$50 to \$100 more than the manufacturer estimated cost. This may be interpreted that the suppliers see more value in these features or that manufacturers believe customers are more price sensitive.

STRATEGIC CONSIDERATIONS

Responses to this question indicate several interesting aspects of advanced feature cost/penetration rates. First, there are differing opinions on the value customers place on these features. This is evident by the large interquartile ranges: variation between the 25% and 75% interquartile point is 100% to 400%. The high price estimates indicate responses to an automotive buff who would pay top dollar for the most advanced features. The low, or 25% interquartile rate, price indicates an indifferent point low enough to attract the customer who is more utilitarian in vehicle and option selection. These prices reflect a price

attractive enough to gain 25% passenger car market share, or approximately 2.5 million units—a sizable share of the market.

Second, given that there is a wide variation of opinion, looking at the ranking of features using the low, median, and high valuations to determine customer value, results in relatively the same ranking. Of these features, panelists believe that ABS is most valued. Active suspension control, active 4-wheel steering, and collision-avoidance systems are grouped second. And traction control is ranked third. The traction-control ranking indicates it is viewed as a specialty or high performance feature, not a widely attractive safety or convenience item. How traction control is packaged with ABS may determine its ultimate penetration rate.

Suppliers and manufacturers should compare these customer valuation estimates to current production costs to determine cost reduction needs to make these features attractive. Suppliers that provide product at these prices open up large potential component markets (approximately 25% of the U.S. passenger car market) and allow vehicle manufacturers to offer differentiated products. A win-win situation for both customer and supplier, although the customer has ultimate veto power.

VIII. SUPPLIER AND SOURCING ISSUES

MKT-42. There has been substantial discussion concerning vehicle "modularization." To date, there is no accepted definition of these modules. What are your opinions in this area? As a reference point, please consider vehicle and component programs which will be developed and sourced within the next ten years.

**Your general definition of a vehicle module:
(A definition of a vehicle module includes three main points.)**

Vehicle Module Definition	
1.	It is a system which allows the minimum of time and direct labor in final assembly. Typically described as "plug-in" or "drop-in."
2.	It is designed and sourced to allow off-line manufacturing or assembly and testing of a completely built-up vehicle system.
3.	It is designed and engineered as an integrated package of related, individual parts to form an independent, functioning system.

What criteria (engineering, purchasing, and/or manufacturing) will be used to define vehicle modules?

Vehicle Module Criteria	
1.	Reduction of assembly complexity (number of components, number of installation steps, etc.) at the assembly plant and the ability to automate.
2.	Feasibility of sourcing manufacturing (and for some systems, engineering and design) to a single supplier (including feasibility of manufacturing and testing).
3.	Reduction of total vehicle cost (including material, labor, and overhead).
4.	Material handling considerations (including receiving, shipping, and scheduling).
5.	Ability to use common modules across various vehicle models or platforms.

From the vehicle manufacturer's perspective, which staffs or departments will be involved in modular definition decisions?

Staffs/Departments Involved in Definition Decisions	
1.	Product engineering
2.	Manufacturing engineering
3.	Purchasing
4.	Product planning
5.	Design engineering
6.	Other Staff: quality assurance, marketing/sales, finance, industrial/labor relations, and service

What are five likely modules or subsystems?

Module	Major Individual Components
Instrument Panel	Dash/crash pad, all instruments/gauges/controls, clock, entertainment system, A/C and heat controls, duct work, wiring, trim, associated electronics, glove box, firewall, steering wheel, pedals
Door Assembly	Inner/outer door panels, interior trim panels, glass, window regulators, motors, locks, wiring, electric controls, mirrors, crash beam, hinges, speakers
Front/Rear Suspension	Subframe (cradle), control arms (axle), springs, struts (shocks), brakes (hydraulics, hubs, drums, discs, calipers, etc.), wheels, steering components
Powertrain	Engine and accessories, transmission/transaxle, drive shaft (half shaft), U-joints (CV-joints)
Front/Rear-End Assemblies	Head/park lamps (rear lamps), grille (plate pocket), radiator, sheet metal, trim, bumper (including beam, fascia, energy-absorbing system), associated trim and attachments

STRATEGIC CONSIDERATIONS

Definitions cloud most of the debate about modularization. The rate of implementation, key attributes, supplier participation, OEM coordination, and likely systems are all hotly debated issues. This question attempts to reduce confusion in these areas. There is significant opportunity for suppliers at this point in time as the systems and modules are determined and defined. Aggressive suppliers should approach the OEMs with innovative systems—there are no specific definitions of what a module should or should not be (or even if modules should or should not be used on specific programs). Suppliers and manufacturers should develop product ideas around their ability to satisfy the vehicle module definition criteria.

Five product areas or systems are likely to emerge: instrument panels, door assemblies, front and rear suspensions, powertrains, and front and rear end assemblies. To some extent, each of these systems are being produced in modules now. However, there is tremendous potential for new designs from a module viewpoint to further reduce assembly complexity. A new business discipline must be enacted to take advantage of systems' designing and sourcing. A discipline which is founded on the principles described under vehicle modules design criteria: reduction of assembly complexity, improving supplier capabilities, reducing vehicle cost, minimizing material handling, and commonization of non-product differentiating components. This basically describes a design for manufacturing philosophy. But it is a philosophy where advantages can be gained only through evaluating and streamlining the way we do business, not new names for old systems.

Suppliers need to develop new relationships within the OEMs. Product engineering and purchasing will remain valuable contacts, however, manufacturing engineering, product planning and design engineering will become increasingly important interfaces. This is especially true as suppliers are involved in programs early in the development stages and manufacturers begin to organize in product development teams. For smaller suppliers this may be difficult and financially expensive to develop these additional relationships. However, this should be viewed as a cost of doing business. These multi-functional relationships are necessary for future business.

MKT-43. What do you feel are the major issues and long-term strategic considerations of outsourcing (both manufacturing and design/engineering) decisions by the major U.S. vehicle manufacturers? Please consider vehicle manufacturer and supply base competitiveness, value-added, risk to return, and project management issues.

Major Issues/Long-Term Strategic Considerations of Outsourcing	
1.	Continuing cost reduction pressures.
2.	Labor relations, job security issues, and UAW position concerning outsourcing.
3.	Pricing (including the ability to reflect increased risk-taking by suppliers, the ability to share cost reductions, and the maintenance of profitability levels).
4.	Balance of OEM/supplier control (including the ability of the OEM to give up control over business functions and vehicle design and engineering, and the decision methods and criteria to determine what aspects of control the OEM can let go without jeopardizing its long-term competitive position).
5.	OEM/supplier relationship (including aspects of trust, requirements of opening supplier financial books, long-term commitment by both parties, value- versus cost-based purchasing, communication, supplier loyalty to OEM, early supplier involvement, and the proper reward for advanced development work).
6.	Continuous quality improvement requirements.
7.	Project management issues (including location of control, ability to evaluate, methods of assuring accountability, ability to coordinate increasingly complicated system, and vehicle design and engineering outsourcing projects).
8.	OEM requirements for supplier design, engineering, and project management capabilities (including ability to meet these requirements, costs of meeting these requirements, and methods by which OEMs will evaluate these capabilities before sourcing).
9.	Reduction of OEM skills and capabilities (including the major issue whether outsourcing of OEM design and engineering needs will reduce internal capabilities to the point that the OEM's long-term ability to differentiate its products and assure other competitive advantages will be jeopardized).
10.	Need to reduce product development lead time.

OTHER: Potential supplier exposure for warranty and product liability costs; overall investment requirements; efficient and successful implementation of product and process technology; delivery requirements—JIT; the accuracy of and the ability to balance assembly plant production schedules.

STRATEGIC CONSIDERATIONS

Reduction of cost will remain a focal point of make/buy and purchasing decisions. However, panelists recognize that cost alone cannot be the sole decision criterion—cost must be balanced against labor contract, pricing, power leverage, customer/supplier relationship, and other considerable pressures. These issues are complementary in some regards, but contradictory in others. The next ten years will witness an interesting international restructuring of OEM assembly and captive supply divisions and independent suppliers as the industry responds to global competition.

Business practices must change to achieve these results. Perhaps the most significant change is the evolution from cost-based purchasing to value-based purchasing. From a value-based perspective many of the respondents' issues may be addressed. Certainly cost reduction will continue as a major goal of OEM purchasing (and suppliers who purchase lower-tier components and materials). However, suppliers often report that piece cost reduction cannot occur while OEMs are demanding increased R&D, engineering, and certification requirements. The rate of change will be judged by matching words of "trust," "mutual dependency," and "loyalty" with actions between the suppliers and the OEMs. Successful companies will be those which can manage change effectively. Control, responsibility, and accountability are major issues needing attention in new-venture arrangements.

MKT-44. What are your estimates of the present and future percentages (*dollar volume basis*) of parts, components, and materials that the following U.S.-located companies will produce in-house in the U.S.?

U.S.-Located Companies	Parts, Components, Materials Produced In-House					
	Median Response			Interquartile Range		
	Current Estimate	1995	2000	Current Estimate	1995	2000
GM	70%	60%	50%	60/70%	50/65%	40/63%
Ford	50	45	40	45/50	40/48	35/45
Chrysler	30	30	30	30/40	27/35	25/35
NUMMI	25	25	25	20/30	20/35	20/35
Nissan	20	30	30	20/30	20/35	25/39
Toyota	20	30	33	20/30	27/30	25/40
Honda	30	30	40	20/40	30/45	25/45
Mazda	20	30	30	13/30	20/40	25/43
Diamond-Star	20	25	30	10/30	20/30	20/37

MANUFACTURER/SUPPLIER COMPARISON

Manufacturer panelists estimate current and future integration levels of the Big Three and NAMs at levels below supplier panelists. It appears manufacturer panelists calculate vertical integration more closely to estimates of total value-added than suppliers, which respond more closely to estimates of sourcing control. That is, suppliers exclude value which is added at lower tiers of the supply chain but integrated into higher value-added products produced by captive supply divisions (i.e., General Motors' Harrison Radiator Division, Ford's Engine Division, or Chrysler's Acustar). Overall, both groups estimate Big Three vertical integration levels declining and U.S. operations of Japanese manufacturers increasing.

Manufacturer	Manufacturers' Level of Vertical Integration					
	Manufacturer Panelists			Supplier Panelists		
	Current Estimate	1995	2000	Current Estimate	1995	2000
GM	60%	55%	45%	70%	60%	50%
Ford	45	45	40	50	45	40
Chrysler	30	27	24	30	30	30
NUMMI	20	25	25	30	30	30
Nissan	20	20	25	25	30	30
Toyota	20	20	20	25	30	35
Honda	20	25	25	30	35	40
Mazda	10	15	20	25	30	35
Diamond-Star	5	10	20	20	30	35

TREND FROM PREVIOUS DELPHI SURVEYS

Comparing 1995 estimates, the Delphi V survey forecasts a general increase in vertical integration by the U.S.-located vehicle manufacturers. For the Big Three, GM was forecast at a 50% level and Ford 40% level for 1995 in Delphi IV. The current increased expectation to 60% GM and 45% Ford is most likely the result of labor contract job-security clauses, new strategies of maintaining internal capabilities and capacities, and more streamlined captive division organizations. The NAMs, also, are expected to increase, from 1986 estimates, levels of vertical integration. This is primarily the result of recent announcements for increased U.S. sourcing of engines and transmissions, components which are produced in manufacturer-controlled facilities. Delphi IV forecasts Nissan, Toyota, Honda, and Mazda each having 25% levels of vertical integration by 1995; the current survey has each of these companies at a 30% level.

STRATEGIC CONSIDERATIONS

The dynamics of outsourcing have changed dramatically over the last five years. The expected pace of outsourcing has slowed from predictions five to ten years ago. The most significant change has been the job security clauses of the UAW contract. These clauses have forced the Big Three to re-evaluate plans of reducing vertical integration. Complementary to this is a new mindset of the internal capabilities needed to sustain long-term competitiveness: more consideration is being given to maintaining control over aspects of design or manufacturing that provide product differentiation, cost advantage, or critical capacity. Automotive suppliers competing for contracts against Big Three captive divisions must understand the individual sets of opportunities and threats that face each component.

As outlined in MKT-43, suppliers must be aware of and address the major issues surrounding outsourcing. With continued Big Three outsourcing there will be opportunity for suppliers who address these issues in the highest-quality, least-cost manner. Outsourcing's pace may have slowed, but, tremendous opportunity remains. The greatest threat will be the component manufacturing capacity being added by Japanese vehicle manufacturers and suppliers. This capacity will create manufacturing surplus, producing a buyer's market and increase supplier quality and price pressure during a time of reduced profit margins.

MKT-45. If there is no domestic content legislation for the U.S., what percentage of parts, components, subassemblies, etc., purchased (*dollar volume basis*) by domestic, U.S.-owned vehicle manufacturers will be sourced from the following countries in the following years?

Market	Percent Foreign-Sourced					
	Median Response			Interquartile Range		
	1990	1995	2000	1990	1995	2000
Japan	9%	8%	7%	8/10%	6/10%	5/10%
Europe	3	3	3	3/4	2/4	2/4
Latin America	3	4	4	2/3	3/4	3/5
Korea/Other Asia	2	3	5	1/2	2/5	3/6
Other	0	0	0	0/0	0/1	0/2
TOTAL	17%	18%	19%	15/19%	17/22%	17/25%

SELECTED EDITED COMMENTS

- Shift from Japan to U.S. as transplants expand. Mexico to increase sales to U.S. Areas such as Malaysia and India will become players.

COMPARISON OF FORECASTS: TECH-15a

As illustrated in the following table, a significant difference of opinion exists between the Technology and Marketing panelists with regard to the offshore sourcing of automotive components. The Marketing panelists forecast a much smaller total percent of foreign-sourced parts and components than Technology panelists—a difference which grows over the forecast period. The most significant difference is the forecast of sourcing to Mexico and South America. Technology panelists forecast 150% more offshore sourcing to this region by 2000. The Technology panel may have a more accurate forecast if the Big Three move large-car-component sourcing offshore to create two fleets: an import fleet (including Grand Marquis and Crown Victorias) and a domestic fleet of remaining vehicles.

Outside Parts Source	Forecast for 1990		Forecast for 1995		Forecast for 2000	
	Mkt Panel	Tech Panel	Mkt Panel	Tech Panel	Mkt Panel	Tech Panel
Japan	9%	10%	8%	8%	7%	8%
Korea/Other Asia	2	3	3	5	5	7
Mexico/S. America	3	5	4	9	4	10
Europe	3	3	3	3	3	3
Other	0	0	0	1	0	2
TOTAL	17%	21%	19%	26%	20%	30%

TREND FROM PREVIOUS DELPHI SURVEYS

The levels of offshore sourcing by 1995 have been dramatically reduced from the 1987 survey. Delphi IV forecasts 25% non-U.S. and Canadian sourcing for 1995 compared to 19% for Delphi V. For particular regions, Japan and Korea/Other Asia are expected to have the largest reductions (Japan: 10% in Delphi IV; 8% in Delphi V. Korea/Other Asia: 6% in Delphi IV; 3% in Delphi V). As discussed in MKT-44, the Big Three have re-evaluated outsourcing strategies, based on the need to best assure U.S. worker job security and reduce dependence upon foreign competitors for engineering and design capabilities and production capacities.

STRATEGIC CONSIDERATIONS

Offshore sourcing by the Big Three is expected to reach 19% by 2000. Most interesting, in the detailed region information, panelists estimate a reduction of total Japanese sources (52% in 1990 to 37% in 2000), being replaced primarily with a doubling of Korean and other Asian countries (12% in 1990 to 26% in 2000). This may indicate a shift in the countries with which the U.S. experiences difficult bilateral trade. It should be noted that foreign-owned U.S. operations are expanding rapidly. Therefore, although Japanese imports may be reduced, business with Japanese firms may actually grow (imports plus domestic U.S. production). These estimates, it appears, do not reflect a major push by the Big Three to source offshore to circumvent CAFE regulations. If Big Three CAFE attainment strategy is based on offshore sourcing of components to move large vehicles into an import fleet, these estimates might be conservative.

MKT-46. If there is no domestic content legislation for the U.S., what percent of parts, components, subassemblies, etc., purchased (*dollar volume basis*) by North-American-based but foreign-owned vehicle manufacturers will be sourced within the U.S. and Canada and what percent will be sourced outside North America?

Parts Source	Median Response		Interquartile Range	
	1995	2000	1995	2000
U.S./Canada	60%	56%	50/60%	55/70%
Internationally Sourced	40	44	40/50	30/45

SELECTED EDITED COMMENTS

- Dollar value spent by foreign-based OEMs is inflated because of the "scorekeeping" method. In local purchases they count building rent, heat, light, contract services, etc.
- Largely dependent on the strength of the U.S. dollar.
- Foreign manufacturers will stay around 75% North American content to qualify for shipment to Europe as a U.S. vehicle.
- The Japanese will build a global infrastructure to avoid the trade barriers imposed on them in North America in the 1980s. The more important question, I believe, is how aggressive the Big Three will be in establishing a true presence in the Japanese home market and whether the Japanese will be more accommodating than they have been in the past.
- U.S./Canada content assumes wide use of "transplant" or joint venture Japanese parts manufacturers in North America.

COMPARISON OF FORECASTS: TECH-15b

The Marketing panelists forecast that North American-based, but foreign-owned, vehicle manufacturers will source a significantly higher percent of parts and components from the United States and Canada than did the Technology panelists (see table below).

Parts Source	Forecast for 1995		Forecast for 2000	
	Technology Panel	Marketing Panel	Technology Panel	Marketing Panel
U.S./Canada	37%	60%	50%	60%
International	63	40	50	40

TREND FROM PREVIOUS DELPHI SURVEYS

Current survey panelists have increased expectations of U.S./Canadian-based sourcing by the foreign-owned vehicle manufacturers. Delphi IV forecasts 40% North American sourcing, while Delphi V forecasts 60%. This may indicate earlier panelists' reservations concerning the rate that foreign manufacturers would increase domestic sourcing and a new opinion that these firms are serious about sourcing significant value-added production in the United States and Canada.

STRATEGIC CONSIDERATIONS

U.S. content will continue to increase due to economic considerations, political pressure, and logistic simplicity. Three issues will dominate the determination of U.S. sourcing. First, yen/dollar exchange rates influence investment costs, production costs, and profit repatriation rates. Currently, it appears that rates below (that is, with a weaker dollar) 130 or 135 yen/dollar make U.S.-based manufacturing attractive. Second, the Corporate Average Fuel Economy (CAFE) regulation defines domestic fleets at 75%. That is, currently Japanese vehicles—both imported and U.S.-built—are calculated into the same fleet. If domestic content exceeded 75% the Japanese would create two fleets: an imported fleet and a domestic fleet. Obviously, with a limited number of vehicle types produced in the U.S. it would be more difficult to produce a fleet that exceeded 27.5 or higher miles per gallon. However, if domestic content remains less than 75% on U.S.-built vehicles, Japanese manufacturers may average their cars across a single fleet. Third, there have been great advances in the cost and quality competitiveness of the U.S. supplier base. The Japanese manufacturers have naturally favored their traditional suppliers. There are substantial established engineering and purchasing relationships and the manufacturers face political and labor-relations problems in Japan as they "export" jobs and investment to the United States. However, if U.S. suppliers compete successfully on cost, innovation, and quality, these issues may be overcome. Based on these three considerations, panelists' responses are realistic, in that Japanese manufacturers will desire to balance manufacturing between the two countries to limit exchange rate risk and keep content such that CAFE will be calculated on one fleet while sourcing to the most competitive supplier.

MKT-47. For the given years, please estimate what percentage of total automotive sales of the traditional domestic U.S. suppliers will be exported (excluding Canada).

Percent of Total Automotive Sales Exported					
Median Response			Interquartile Range		
1990	1995	2000	1990	1995	2000
15%	15%	17%	14/15%	15/17%	15/20%

Of the amount that will be exported, please estimate what percent of these exports will go to each of the following markets?

Market	Median Response			Interquartile Range		
	1990	1995	2000	1990	1995	2000
Japan	14%	17%	19%	5/25%	8/25%	8/26%
Europe	57	41	50	30/70	30/68	26/62
Other	29	32	31	5/50	10/47	10/47

SELECTED EDITED COMMENTS

- As more suppliers attain world class levels, U.S. exports will grow, aided by a continued slight devaluation of the dollar.
- By 1995 the U.S. will know whether open trade is available for U.S. cars in Japan and Europe. My belief is that by 2000 both Japan and Europe will reduce imports to protect their own economies.
- Opportunity exists mainly to Central and South America. Japanese and European sales are more a novelty than solid demand.
- Third world will continue drive for local assembly.

MANUFACTURER/SUPPLIER COMPARISON

Manufacturers and suppliers are within 1% of each other on forecasts of overall export sales percentage. Both groups are in relative agreement on the percent of goods destined to Japan (growing from 13% in 1990 to approximately 20% in 2000). However, suppliers estimate mix of exports to Europe to be approximately 10% below (and "Other" category 10% above) manufacturers in each period.

STRATEGIC CONSIDERATIONS

Exports, as a percent of total traditional domestic supplier sales, are expected to increase from a current estimate of 13% to 17% by 2000, a 30% increase. This increase is the likely result of U.S. suppliers strengthening manufacturing competitiveness and increasing international vision. Panelists' forecast of destination mix remains relatively

constant from 1990 to 2000, with Europe receiving 50%, Japan 20%, and all other countries 30%. From the perspective of the U.S.-Japanese trade deficit, the increase from 14% to 19% of total mix in an increasing market is encouraging. As vehicle manufacturers begin to realign regions of sourcing, manufacturing, and sales, suppliers must, in turn, reposition their resources and capabilities to match the manufacturers' needs. The need for suppliers to increase international operating sophistication is evident.

DEFINITION OF TERMS

CAPTIVE IMPORT. A vehicle built outside of the U.S. and Canada and which is sold through a traditional domestic dealer franchise (i.e., Dodge Colt).

CAPTIVE TRANSPLANT. A vehicle built inside the U.S. or Canada in a plant managed or owned by a foreign corporation and sold through a traditional domestic dealer franchise (i.e., Ford Probe).

IMPORT. Refers to all vehicles manufactured outside of the U.S. or Canada regardless of distribution channel used (i.e., forecasts should include vehicles such as Ford Tracer).

REPAIR SERVICES. Examples of the repair services included in MKT-18 (twenty-four of the forty-eight services surveyed) are listed below.

Air conditioners serviced	Mufflers replaced
Air filters replaced	PCV valves replaced
Alternators installed	Radiators replaced/repared
Automatic transmission overhaul	Sealed beam lights replaced
Ball joints replaced	Shock absorbers replaced
Batteries	Starters replaced
Brake drum shoes installed	Thermostats replaced
Disc brake rotors replaced	Tires
Engine tune ups	Valves replaced
Front end alignment	Water pumps replaced
Fuel pumps installed	Wheel bearing replaced
Lube jobs	Windshields replaced

RESKINNING. A minor facelift of a vehicle which does not require new safety, fuel economy, or emissions re-certification.

TRADITIONAL DOMESTIC. Refers to all U.S.-headquartered (parent company) manufacturers or dealership networks regardless of production location (i.e., forecast for General Motors should include NUMMI-produced Novas and imported Spectrums).

TRADITIONAL IMPORT. Refers to all non-U.S.-based vehicle manufacturers or dealership networks regardless of production location (i.e., Honda's U.S. production should be combined with their import vehicles).

TRANSACTION PRICE. The total cost of a vehicle to the customer including all factory- and dealer-installed options, taxes, and delivery charges.

TRANSPLANT. A vehicle built in the U.S. or Canada in a plant managed or owned by a foreign manufacturer.

**1988 MODEL YEAR
VEHICLE SEGMENTATION DEFINITIONS**

Segment	Domestic	Foreign
PASSENGER CARS		
Subcompact, regular	Escort, Horizon, Alliance	Corolla, Sentra, Civic, 323, Precise
Subcompact, specialty	Fiero, Charger	MR2, CRX, Starion, Impulse
Compact, regular	Cavalier, Tempo, Reliant	Camry, Stanza, Accord, 626
Compact, specialty	Camaro, Corsica, Grand Am, Mustang, Sundance, Daytona	Celica, 300ZX, Prelude, RX7, Subaru wagons
Intermediate, regular	Celebrity, Taurus, Premier	Cressida, Maxima, Integra, Audi 80, Volvo 740, Saab 900
Intermediate, specialty	Grand Prix, Thunderbird, LeBaron GTS	740 Turbo, 9000 Turbo, Legend
Full size	Caprice, 88, Crown Victoria, New Yorker	
Luxury, regular	Olds 98, Cadillac, Lincoln	Volvo 760, Mercedes, BMW, Audi 90, Peugeot
Luxury, specialty	Corvette, Eldorado, Allante, Continental, Mark VII	Volvo 760 Turbo, Audi 90 Quattro, Porsche, Jaguar
LIGHT TRUCKS		
Compact, pickup	S10, Ranger	Toyota, Nissan, Mazda
Regular, pickup	GM, Ford, Dodge conventionals	
Compact, van	Astro, Aerostar, Caravan	Toyota
Regular, van	Chevy, Ford, Dodge	VW Vanagon
Compact, utility	S/T Blazer, Bronco II, Cherokee	Trooper, Montero
Regular, utility	Blazer, Bronco, Wagoneer	

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