Volume 1: Marketing

DELPHI VI

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

- *Marketing*
- *Technology*
- *Materials*

The University of Michigan

DELPHI VI FORECAST AND ANALYSIS OF THE U.S. AUTOMOTIVE INDUSTRY

MARKETING

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FOREWORD

INTRODUCTION

Delphi VI 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 were 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 sixth in a 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, Delphi IV in 1987, and Delphi V in 1989.

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

A key point to keep in mind with regard to the Delphi forecast is that it presents a vision of the future. It is obviously not a precise statement of the future but rather what the industry thinks the future will likely be.

THE DELPHI METHOD: GENERAL BACKGROUND

The study is based on the Delphi forecasting process. The method requires that 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, interactive method of forecasting based on independent inputs regarding future events from these experts.

The Delphi method is dependent upon the judgement of knowledgeable experts. This is a particular strength of this method because, in addition to quantitative factors, predictions that require policy decision 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, thus realize 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 objective is 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, including feedback of earlier-round responses, to take advantage of group input while avoiding the biasing effects possible in 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. The 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 between The University of Michigan faculty/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 and their knowledge of the topic being surveyed. They are 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 identity of panel members is not revealed. Upon publication of the final Delphi report, all questionnaires and lists of panelists are destroyed.

The characteristics of the 227 member panels are as follows 10% of the Technology Panel was composed of CEOs, presidents, or vice-presidents; 22% were directors; 23% were managers or supervisors; 42% were engineers (chief, assistant chief, and staff); and 3% of the panel were made up of academic specialists and consulting technical engineering specialists. The Marketing Panel was composed of 29% CEOs, presidents, or vice-presidents; 22% directors, 39% managers; 3% engineering specialists; and 7% academic and consulting marketing specialists. Among Materials panelists, 14% were CEOs, presidents and vice-presidents; 12% were directors, 51% managers and supervisors; 16% engineering specialists; and 7% academic and consulting materials specialists. Approximately 34% of the Delphi VI panelists were employed by vehicle manufacturers, 56% by components and parts suppliers, and 10% were specialists, consultants, and academics.

PRESENTATION OF DELPHI FORECASTS AND ANALYSES

When a question calls for a response in the form of a number, the responses are reported as 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: it is simply the middle response. 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 36% and 44%, with 40% as the middle response. That narrow interquartile range would indicate a fairly close consensus among the respondents.

In contrast, the percentage forecast for a different question might show a similar median forecast of 40%, but with an interquartile range of 20-70% indicating less 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 highlights such differences through the presentation of the interquartile range (IQR).

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 arrived at their forecast.

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 included. These replies may provide important information that is not evident in the numerical data. An individual panelist may have unique knowledge 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 accurately reflected in numerical data.

Manufacturer/Supplier Comparison. Delphi VI panelists include respondents from the North American automotive industry 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 Manufacturer (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, where it is considered relevant to a better understanding of or perspective on the forecast, our analyses include a comparison of the forecast from manufacturer and supplier panelists in an attempt to illustrate where significant agreements or differences exist between the opinions of these two groups.

Comparison of Panels. The three groups of Delphi panelists (Technology, Marketing, and Materials) are asked questions that specifically focus on their respective are of expertise. However, a few questions are considered common to two are more panels. For example, the fuel-price question (see MKT-8) is considered so basic that it was submitted to all three panels.

At times, the panels will give differing responses to these questions. This may reflect the makeup of a particular panel and the panelists' subjective perception of the issue in question. Where differences do exists between the panels, serious consideration should be given to whether the difference reflects the composition and proprietary interest 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 an attitudes of a group of experts at that particular point in time. Some questions, in various forms, were asked in previous Delphis, and thus provide trend data. 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 reflects the consensus of expert opinion at that time. These opinions and forecasts are predicated on the best information available at that time. However, market, economic, and political factors do change. Trend data can reveal the stability or volatility of a particular market, material, or technology issue. 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 relevant Delphi VI forecasts, other research and studies, and OSAT's extensive interaction with the automotive industry, this report makes inferences and interpretations as to the core issues in questions and their potential impact on the industry. By no means are they exhaustive statements of critical issues, but rather points the reader might usefully consider.

MARKETING CONTENTS

EXECUTIVE SUMMARY

The U.S. automotive industry, including its manufacturers, suppliers, and customers is proceeding cautiously through the decade of the 1990s. The *Delphi VI Forecast and Analysis of the U.S. Automotive Industry through 2000-Marketing* presents a broad overview of the state of the industry, drivers of change, likely strategies, and probable outcomes. While the data and comments presented in this volume are only the opinions of our panelists, we believe these are very informed opinions and representative of the North American vision of the North American industry's future.

Chaotic and challenging are the best descriptors of the current business situation. Changing customer demands without a clear understanding of customer values, the need to revamp plant and product without adequate cash flow or capital, and changing business strategies without a clear direction of organizational structures and human resources requirements are all contributing to the chaos. Added to these factors are increasing expectations of governmental regulation, increased competition in most, if not all, passenger car and light truck segments, and emerging bases of new vehicle production and markets. These are just a few of the simultaneous complexities our Marketing panel indicates await the U.S. automotive industry over the next eight years.

Overall, our panelists believe the U.S. passenger car market will grow only 1.1 percent per year over the next ten years (question MKT-23). This growth forecast is supported by import growth of 2.1 percent per year and traditional domestic growth at a mere 0.5 percent per year. The light truck and van market is expected to expand annually at a slightly faster pace-1.4 percent. Here again, the Big Three are expected to experience much less growth than foreign nameplates-1% versus 3%, respectively. Cycles will continue, but it is most likely that market cycles will be in a narrower band than what the industry experienced in the past (MKT-7). The combined, total U.S./Canadian light-duty vehicle market is forecast to produce consistently in the 16 million vehicle range. Corporate strategies must adapt to relatively flat markets and strive to creatively build market share, reduce costs, and increase profit margins and reinvestment rates.

These modest, future forecasts build from panelists' expectations within individual market segments (MKT-26 and MKT-27). At the segment level, competition will be intense, particularly in faster-growing segments such as compact- and full-size utility vehicles. Since these segments are growing faster than the overall market, manufacturers may be compelled to offer new or additional entries. Through 2000, foreign competition is expected to increase in small vans and large sport/utility segments; non-Big Three sales are forecast to increase 32 percent in small vans and 50 percent in large sport/utility vehicles over 1990 sales. While it is true that the base from which this growth is calculated is small, these segments are projected to grow 13 percent and 7percent, respectively, over the forecast period. Therefore, foreign nameplate market share is anticipated to increase in the fast growing markets, markets traditionally controlled by the Big Three.

While faced with this product competition within the North American market, manufacturers may expect increased production and competition from countries such as Mexico, Australia, and even India (MKT-29), and emerging vehicle and component production bases in east Europe and Asia (MKT-5). Mexico appears to the panelists as the most significant emerging producer with production doubling by 2000 from the 1990 base of 700,000 total vehicles. While a bit less optimistic concerning the vehicle and component quality of production in Czechoslovakia, Hungary, and Poland, our panelists agree that these countries will, by 2000, host profitable vehicle markets.

These global complexities and slow-growth markets are not the only challenges facing the U.S. industry. Regulatory activity (MKT-6) (not a major concern of our 1989 Delphi V panelists) has increased across all fronts and over 75 percent of Delphi VI panelists believe that passenger car and light truck emissions, fuel economy, and safety regulations will become more stringent. Activity across all of these fronts will require significant human and financial capital resources.

Auto manufacturers and suppliers are expected to come under increasing stress as they try to balance demands of globalization, customer demands for product innovation, and tough regulatory requirements. However, the industry must never lose its focus on providing true consumer value. The product development process is being fundamentally changed to provide better new products faster, but financial and human resource challenges are formidable. Forecasted product-development time in both Japan and the United States is substantially less than today's value but greater than that forecasted in Delphi V (MKT-21). Current panelists believe that in 2000 reskinning times on high volume products will be thirty-six months in the United States and twenty-eight months in Japan. This forecast is five months longer than the comparable Delphi V forecast. The real issue in today's more value-conscious environment is: are product changes adding real value or making change for change sake? The industry cannot afford the latter course.

Of course, with all of these business changes and increasing complexities, manufacturers cannot forget the purpose of their business: to provide motor vehicles that are desirable, affordable, and offer the customer real value. Panelists view

three factors as key product differentiators through 2000: customer satisfaction, styling/fashion, and new technology/product innovation (MKT-11). While these are guiding principles, within each segment certain attributes are dominant in the view of our marketing experts: *entry level price*--fuel economy, and operating costs; *intermediate/family level*--price, assembly quality, and perceived vehicle safety; and *luxury level*--status appeal, exterior styling, and assembly quality (MKT-10).

Government regulation, product innovation and increasing option content are some of the factors driving increases in vehicle prices. Panelists predict that by 2000 the average Big Three passenger car will be priced at $18,000 and an average import $19,800 (MKT-13). This contrasts with approximately $15,000 and $16,500 for Big Three and imports, respectively, in 1989. These prices-in addition to improved product quality and durability-are expected to result in increases in the average age of passenger cars from an estimated 7.6 years in 1989 to a forecasted 8.3 years in 2000 (MKT-15). Average length of original purchaser ownership is expected to lengthen approximately 10 percent from 1989 levels to 5.4 years in 2000. Beyond improved vehicle quality, the increase in original purchaser ownership is also driven by financing. Our panelists expect average loan maturities to increase from fifty-four months (1989) to fifty-seven months in 2000 and the average amount financed to increase to $15,000 (2000) from $12,000 in 1989.

Many of the trends we highlighted appear to be targeted at the vehicle manufacturer level. However, automotive suppliers are directly affected by the manufacturers' production schedules, product innovation demands, general strategies and policies, and a host of indirect factors. Specifically related to manufacturer/supplier relationships, our panelists predict quality performance, price, and delivery performance will remain the leading purchase criteria (MKT-40). While these factors are not new, the importance of all supplier attributes are expected to drive suppliers to continuous improvement in all performance areas.

The vehicle manufacturers are relying more on the supply base for design, engineering, and production capabilities. To leverage supplier resources, a great deal has been written about customer-supplier "partnerships," but not many venture to actually define the components of a partnership. Exploring this issue, our panelists believe a true partnership consists of common goal determination, knowledge and support of partner profitability, and mutual trust (MKT-37).

The 1992 Delphi VI Marketing Volume explores many of the driving issues shaping the U.S. automotive industry through 2000. The overall market, segmentation, competition, product and manufacturer differentiation, dealer and service channels, and suppliers are all discussed in a manner highlighting the interrelationships and complexities facing the industry.

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 (where 1 = increasing, 2 = the same, and 3 = decreasing). Unless otherwise indicated all factors refer to the United States.**

1992-2000 Trend	Ranking
Energy prices/availability	1.4
Personal taxation rate	1.4
Foreign investment in U.S.	1.4
U.S. manufacturing competitiveness	1.5
Annual consumer price index change	1.5
Annual producer price index change	1.6
Business taxation rate	1.6
U.S. technology competitiveness	1.6
Federal budget deficit	1.7
Annual U.S. GNP change	1.7
U.S. industry R & D expenditures	1.7
Federal investment incentives	1.8
U.S. personal savings rate	1.8
U.S. unemployment rate	1.8
U.S. political stability	2.0
Prime interest rate	2.0
U.S. trade deficit	2.1
Foreign exchange predictability	2.1
World political stability	2.2

Other increasing factors include: world trade, cleaner environment, "buy American," energy policy development, and limitations of foreign investment.

Other decreasing factors include: energy availability and consumer confidence.

SELECTED EDITED COMMENTS

- Based on actual dollars, not 1991 prices.
- Energy prices will increase. Availability will stay the same with more conservation.
- Energy prices/availability--this is two questions--energy prices and availability will probably be going in different directions.
- European governments will stall and slow down export opportunities for vehicle manufacturers and suppliers alike.
- I do not see an eight-year trend for many items. For example, personal savings rate is likely to increase slightly in the near-term and then either remain the same or decrease slightly in the longer-term. Much depends upon actions by the Federal Reserve and Treasury.
- I see energy prices increasing while availability decreases.

- Middle East will be permanently changed due to events in January 1991.
- Most of the bad news is, or will be, behind us after 1991. This country will get smarter in managing areas of taxation, encouraging private investment, and balancing the federal budget.
- There is a high risk of deflation during this period. Energy prices/availability--Middle East may influence. Federal budget deficit--government has not effectively dealt with deficit. They will when a crisis forces issue. Foreign exchange predictability--General Agreements on Trade and Tariffs (GATT) probably is a key. Prime interest rate will follow inflation.
- U.S. technical competitiveness will decrease because of an engineer shortage and the general technical illiteracy of the population. Personal savings rate will vary considerably by market niche and demographics.
- World political stability will continue to have peaks and valleys. The United States should improve overall competitiveness if we can improve our educational system effectiveness and scope.

MANUFACTURER/SUPPLIER COMPARISON

The manufacturer and supplier panels are in general agreement on the direction and magnitude of all of these factors except five: annual U.S. GNP change, business taxation rate, foreign investment in the U.S., U.S. political stability, and the U.S. trade deficit. The manufacturers are much more optimistic on the U.S. GNP, giving it a growth ranking of 1.6, while the suppliers' average rank is a somewhat bearish 2.2. The manufacturers are also more inclined to see increasing U.S. trade deficits (2.2) while the suppliers rate this factor 1.8. On the other hand, suppliers were more optimistic that U.S. political stability is increasing slightly (1.9) while the manufacturers--for some reason--rank this factor a decreasing 2.1. The manufacturers and suppliers agreed on the trend of business taxation rates and foreign investment in the U.S., but differed slightly in the magnitude of change. Manufacturers see business taxation rates increasing, but rank the magnitude at 1.6, while suppliers report a much stronger 1.2. Manufacturers continue to see increases in foreign investment in the U.S., ranking this factor a 1.4, while suppliers rank it 1.6. Although these differences exist, a general analysis does not reveal differences such that the two groups would pursue diverging strategies.

TREND FROM PREVIOUS DELPHI SURVEYS

For the most part, current survey results match our Delphi V forecast. And the top five 1991 responses tying for the strongest "increasing" positions are found within the top six positions in the 1989 Delphi V survey. The only factor dropping out of the "strongest likelihood of increasing" category is business taxation rates.

However, there are a few interesting changes. First, the largest opinion change occurred in world political stability. World political stability was increasing in 1989 (1.93), but takes a negative position (2.2) in the 1991 survey. This result may be more than a simple change in opinion, perhaps this indicates a change in the definition of "stability." In 1989 hot spots were known and understood. The 1991 first-round surveys were answered toward the end of the war in the Persian Gulf and, as a result, general unpredictability exists regarding changes in governments, alliances, and treaties. Known risk may be a more stable situation than unpredictable events.

Second, the federal-deficit direction changes from declining to increasing, and the expected ability to reduce the U.S. trade deficit declines as well. It is obvious that the realities of savings and loan bailouts and the difficulties of increasing exports and reducing imports is reflected in the panelists' responses. And third, foreign exchange rate predictability moves from a neutral position in 1989 to a slight decrease.

STRATEGIC CONSIDERATIONS

This question and the next highlight the broad operating parameters that businesses, unions, and government units will face for the balance of the decade. Improving the industry's competitiveness depends upon each of these groups understanding, planning, and adapting to social, economic, and market pressures--individually and in concert with each other. Within these parameters, organizations must leverage their internal strengths and take advantage of competitors' weaknesses. Otherwise, they must change industry success factors to lessen or increase the importance of these parameters.

It must be noted that these are simply trends; they do not indicate either the frequency or the degree of cycles. For the most part, each of these trends may be accommodated if changes are anticipated and companies, unions, and government units understand the significance of the changes and have the ability to adapt.

There is one interesting dichotomy presented in the survey responses. Although the respondents see U.S. manufacturing competitiveness, U.S. technology competitiveness, U.S. R&D expenditures, and federal investment incentives all

increasing, it appears that neither the level nor the effectiveness of these initiatives will be enough to overcome the U.S. trade deficit--a macro-economic factor the respondents believe will remain the same though 2000. The U.S. federal budget deficit also appears unlikely to be resolved, despite expectations of rising personal and business taxes. The implication then exists that the respondents do not believe the budget's expenditure side will be managed or that the government's fiscal and monetary policies will work in harmony.

As the industry pursues the integration of global engineering, sourcing, manufacturing, and marketing operations, it is interesting to note two factors the panelists deem as decreasing--although only very moderately: foreign exchange predictability and world political stability. Operating in a truly integrated global operation increases the need for employees to have a broad awareness and sensitivity to international politics, and for business operating practices and organization structures to respond quickly to changing international conditions.

MKT-2. **Many factors impact the level of demand for new vehicles. Following is a partial list of economic, social, and consumer factors which affect new vehicle sales. Please indicate your trend forecast for each factor (where 1 = increasing, 2 = same, and 3 = decreasing).**

1992 - 2000 Trend	Ranking
Consumer attitudes/expectations	1.3
Vehicle insurance premiums	1.3
Gasoline prices	1.4
Real transaction price of light trucks	1.6
Used light-truck prices	1.6
Real transaction price of automobiles	1.6
Used car prices	1.7
U.S. population growth	1.8
Maintenance costs	1.8
Number of product offerings (models)	1.8
Real personal consumption expenditures on motor vehicles	1.8
Vehicles per household	1.8
Vehicle travel per person	1.9
Use of mass transportation	1.9
Real personal consumption expenditures on parts and service	2.0
Real household income	2.0
Personal loan interest rates	2.0
Real disposable personal income	2.1
Dealer gross margin per vehicle	2.5
Manufacturer brand loyalty	2.6

Other increasing factors include: consumer attitude toward debt in general, technology application, Japanese-product loyalty, and government regulation.

Other factors remaining the same include: vacation use.

Other decreasing factors include: growth rate of real disposable personal income, growth rate of real household income, and Big Three loyalty.

SELECTED EDITED COMMENTS

- Gasoline prices will rise mostly due to taxes. Personal loan interest rates will rise and manufacturers may need to absorb some of the cost. Real transaction price of automobiles and light trucks will rise due to safety and emission requirements, etc.
- Inter-relationship of function, fashion, and value will increase in importance.
- Loyalty to Japanese manufacturers versus U.S., which is declining! This has a multiplier effect on the sales picture.
- Cars "live" longer now; so if a recession occurs, the need to purchase a new model is less.

MANUFACTURER/SUPPLIER COMPARISON

The manufacturer and supplier panels are in general agreement on the direction and magnitude of all of these factors except six: maintenance costs, real personal consumption expenditures on parts and service, use of mass transportation, consumer attitudes/expectations, gasoline prices, and vehicle insurance premiums. Suppliers believe maintenance costs will be reduced over the decade--they rank this factor 2.1. Manufacturers see an opposite trend, averaging a 1.7 response. These answers are consistent with another difference among the panel--suppliers believe real personal consumption expenditures on parts and service will decline (2.2), while manufacturers believe this factor will increase (1.9). Given the importance that the overall panel places on life-long customer satisfaction, it appears that suppliers and manufacturers should have a common strategic direction of reducing repair expenditures--overall and as a percent of income. The third factor of disagreement is use of mass transportation; suppliers see this decreasing over the decade (2.1), while the vehicle manufacturers' opinion is slightly positive (1.9).

Manufacturers respond more strongly than suppliers that consumer attitudes and expectations--the ever important factor in consumer demand models--is likely to increase (1.2 versus 1.73) over the decade. This is somewhat counter to the fact that manufacturers have stronger expectations of increasing gasoline prices (1.34 versus 1.55) and vehicle insurance premiums (1.28 versus 1.55).

TREND FROM PREVIOUS DELPHI SURVEYS

As with the previous question, the order and magnitude of the majority of factors remains the same from the previous Delphi V survey. There are a few opinion changes in direction that are of concern. First, real personal consumption expenditures on parts and service and real household income move from a positive, "increasing" attitude to "neutral."

Second, and perhaps the most worrisome trend between Delphi V and Delphi VI, the greatest attitude shift occurred in the expectation for real disposable personal income from a positive 1.87 in 1989 to a negative 2.1 in 1991. This trend dampens consumer confidence, lowers the affordability of vehicles, and, ultimately, reduces the demand for automobiles. It should be noted that responses to this question are based on national expectations, and factors such as real disposable personal income may be severely pressured in certain regional economics.

STRATEGIC CONSIDERATIONS

The responses to this question highlight the multifaceted problems facing manufacturers today. The issue of affordability is particularly emphasized. The respondents believe light-truck and passenger car real transaction prices will continue to rise while real household income remains the same and real disposable personal income declines. The effect of this is to force an increase in real personal consumption expenditures on motor vehicles. Decreasing affordability raises legitimate concerns: Will consumers lengthen their trade-in cycle, reducing the total number of vehicles they buy in a lifetime? Will downward segment shifts occur and changes in vehicle option loading? Will public transportation become a desired alternative? The outcome to each of these questions will significantly impact manufacturer profitability and the overall industry structure.

To counter weakening affordability, manufacturers must better understand what customers value because in a mature, competitive marketplace the buyer is in the driver's seat. Companies must cater to the customer through product, service, and marketing. These attributes have associated costs. As disposable income declines, consumer-buying behaviors change. The perceived value of new products, technical features, or services must match these consumer's shopping "wish list" or consumers will spend their precious money with another manufacturer. Manufacturers face a delicate balance of leading consumers towards product innovation while maximizing consumer value. This market complexity is indicated by the panelists' clear vision of increasing consumer attitudes and expectations, and decreasing manufacturer brand loyalty.

Manufacturers that are best able to identify consumer needs, satisfy those needs in product and service over the owner-vehicle relationship, and execute in a cost effective manner (as judged by what the customer is willing to pay in terms of money, time, and experience) are most likely to build lifetime manufacturer and dealer loyalty. This places a focus on listening and educating. Manufacturers must listen and better understand customers and, in turn--if they have the right product and service package--explain to the customer the value of their product, sales, and service package.

MKT-3. **A great deal of speculation has surrounded the economic unification activities of the European Economic Community countries. Please indicate your trend forecast for each factor (where 1 = highly agree, 3 = neutral, and 5 = highly disagree).**

EC Unification Trends	Ranking
EC92 will offer U.S.-based Japanese vehicles a significant new export opportunity	3.0
EC92 will offer U.S.-based Japanese suppliers a significant new export opportunity	3.0
EC92 will offer U.S. suppliers a significant new export opportunity	3.0
EC92 will offer U.S. vehicle manufacturers significant new export opportunity	3.5

SELECTED EDITED COMMENTS

- Bigger effects on Europe, including U.S. and Japanese companies' European affiliates.
- EC92 will impact European-based producers favorably. Exports to Europe will decline because of stronger European competitiveness.
- EC92 will promote manufacturing in Europe--discourage importing.
- Fortress Europe will evolve.
- I believe the EC will demand a higher local content than the United States. They will be much more protective.
- I do not see how U.S.-based anything will be helped by EC92.
- If EC does not allow imports from the transplants, especially when the U.S. economy is suffering, you can look to higher tariffs on European imports or some form of retaliation.
- Major opportunity will exist for OEMs that "partner" early with existing Eastern manufacturers of those already established in Western Europe.
- The Japanese will move into the EC while U.S. companies will try to export first, then move into EC countries. Japanese strategic plans for EC seem more fully developed. U.S. suppliers that are already global may do as well, others will scramble.
- Vehicles and parts will be contained within Europe. There will be opportunities to manufacture these items within Europe.

MANUFACTURER/SUPPLIER COMPARISON

The manufacturer and supplier panelists are neutral on whether EC92 offers U.S.-based Japanese vehicle manufacturers significant new export opportunities (3.1 manufacturers, and 3.0 suppliers) and disagree slightly on the idea that EC92 might offer U.S. vehicle manufacturers a significant new export opportunity (3.6 manufacturers, and 3.2 suppliers). However, the suppliers see EC92 offering a more significant export opportunity for traditional U.S. suppliers and U.S.-based Japanese suppliers. Suppliers rank traditional supplier opportunities at 2.6 versus the manufacturers' 3.2. For U.S.-based Japanese firms, the suppliers' opinion average is 2.5 versus the manufacturers' 3.3 average. As U.S. vehicle manufacturers will be playing a leading role in EC92 activities and integrating more aspects of their worldwide operations, it seems important that the manufacturers and suppliers share and leverage European strategies with each other.

TREND FROM PREVIOUS DELPHI SURVEYS

This question was not asked in a previous Delphi.

STRATEGIC CONSIDERATIONS

The combined marketing panel is very neutral--or very uncertain--on the likely U.S.-based corporate opportunities that may arise with the unification of the European Economic Community. The panelists' comments certainly indicate advantages primarily for European-based firms. Perhaps the most significant strategic considerations surround the differences between the manufacturer and supplier responses. Compared with our supplier sample, manufacturers believe a greater export opportunity exists post-1992 for both U.S. suppliers and U.S.-based Japanese suppliers. The manufacturers are just about as positive as the suppliers are negative. Both groups are in general agreement--somewhat negative--as to the potential vehicle export market that may result after the unification.

Although the exact reasons behind these differences are unknown, it might be that the entire panel perceives potential import restrictions at the vehicle level, but limited restrictions (either at the EC block or individual country-lobbying level) at the component tier. Even though opportunities may exist at the component level, suppliers are not likely to export when they are under pressure from their customers for just-in-time manufacturing capability. These customer requirements promote local production for local consumption, or, at least, regional production strategies. For truly integrated global operations, the manufacturers and suppliers must have a general understanding of the developing global strategies. European operations are one area where Ford and General Motors have extensive experience and intelligence-gathering capabilities, and it behooves manufacturers to share non-proprietary information to reduce the cost of information gathering and to leverage available North American supplier resources.

MKT-4. Do you foresee significant rationalization--as defined by the following factors--of major automotive manufacturers over the next ten years (where 1 = highly agree, 3 = neutral, and 5 = highly disagree)?

Corporate Rationalization	Ranking
Companies offering vehicles	2.2
Financial ownership	2.3

SELECTED EDITED COMMENTS

- Chrysler will most likely merge with one of the Japanese car companies to strengthen many areas and allow it to survive.
- I am not sure I understand the question. Financial ownership references stock control. I highly agree that financial ownership rationalization will occur with funding of new programs. If "companies offering vehicles" is the range of vehicle per company, then I see no change to some increase.
- I am not sure I understand the question. My answer says that consumers will think about the financial ownership of the company in their purchase decision.
- I subscribe to the now common theory of more automaker joint ventures, financial tie-ins, etc. Yet all names of firms (e.g. Chrysler, Subaru) will remain in the marketplace.
- Overcapacity and cost of vehicle development are key considerations.
- The smaller manufacturers will merge to have a larger capital base.

MANUFACTURER/SUPPLIER COMPARISON

Both sets of panelists agree with the premise of MKT-4. However, the suppliers are a bit more strong in their opinion concerning the rationalization of companies offering vehicles (1.9 versus 2.3).

TREND FROM PREVIOUS DELPHI SURVEYS

This question was not asked in a previous Delphi.

STRATEGIC CONSIDERATIONS

Although the panelists appear to have some questions regarding this question and the definition of "rationalization," some valuable insight can be inferred. The purpose of this question, captured in the last comment, the possible need for smaller manufacturers to merge into larger pools of capital--was to identify the change of individual companies offering vehicles versus the change or rationalization of the number of actual corporate owners or "parents." Economies of scale have always been a barrier to entry in the automotive industry. Specialized manufacturers may exist if their brand image supports a retail price covering the costs of craft manufacturing or if the manufacturer depends upon outside suppliers for parts, such as the powertrain, which require substantial capital investments. However, as companies with particular product development skills (i.e., Honda) or cash reserves (i.e., Toyota) begin offering Acura NSX- and Lexus LS400-type vehicles, market success factors change. Specialized manufacturers who were comfortable and isolated competing on tradition and image or exotic, single-purpose parameters (e.g., performance without "livability" or luxury without performance) are now being thrust into a much more complicated marketplace. Today's marketplace is composed of sophisticated buyers searching to satisfy a more complex, although not well defined, set of wants at a minimal cost for maximum value. Although the Acura NSX and the Lexus LS400 are not priced for mass-market consumption, their product-delivered-to-price-ratio cannot be questioned, and these products leave one wondering how much product content and engineering may be transferred to lower-priced vehicles.

It is not likely that one corporate-structure model will dominate. Rationalization on a world basis may involve expansion at a country or regional level. In the United States, 1991 brought the withdrawal of Peugeot and Rover with the announcement of Mazda's Amati luxury line. Overall, the panelists believe there will be a reduction in the number of manufacturers offering vehicles and the number of corporate owners behind those manufacturers. This perspective most likely summarizes the opinion that corporations with stronger product portfolios will drive weaker companies out of business and that the complexities of design, engineering, manufacturing, and distribution demand more readily available and significant sources of capital. As competition between companies and countries is reduced, new corporate objectives and standards of performance must be envisioned to direct future strategy. This is especially true for joint-venture activities which must become more strategically-integrated into long-term corporate objectives.

MKT-5. **Many countries have the potential of becoming both world competitors in vehicles and component manufacturing and offering significant marketing opportunities. From the following list, please indicate your opinion (where 1 = highly agree, 3 = neutral, and 5 = highly disagree) of the manufacturing and marketing environment in these countries by the year 2000.**

Country	Will Match 2000 World Cost and Quality Standards		Will Provide a Profitable 2000 Market
	Vehicle Production	Component Production	Vehicle Sales
Czechoslovakia	3.3	3.0	2.5
Hungary	3.4	3.1	2.6
Poland	3.4	3.1	2.7
Yugoslavia	3.5	3.3	2.8
USSR	3.9	3.7	3.1
China, Peoples Republic of	4.4	4.0	3.6

NO COMMENTS

MANUFACTURER/SUPPLIER COMPARISON

Overall, the suppliers are more pessimistic than manufacturers concerning the development of vehicle and component manufacturing and vehicle markets for the developing countries listed above. Manufacturers working with suppliers to expand in developing markets simultaneously offer a viable opportunity for reducing risk on two sides. First, the manufacturers have a supply base they can count on, and second, the supply base has a ready market. The table below presents the significant differences in opinion between the manufacturers and suppliers.

Emerging Country Markets	Supplier versus OEM Responses	
Ability to Match World Cost and Quality Standards	**Supplier**	**OEM**
Poland	4.2	3.3
USSR	4.1	3.9
Component Production--Ability to Match World Cost and Quality Standards		
China, Peoples Republic	3.8	4.1
Czechoslovakia	3.3	2.9
Will Offer a Profitable Domestic Market		
USSR	3.0	3.2

TREND FROM PREVIOUS DELPHI SURVEYS

This question was not asked in a previous Delphi.

STRATEGIC CONSIDERATIONS

The panelists are neutral and uncertain considering the vehicle and component production capabilities of most of the given emerging Eastern European and Asian countries, with the exception of the USSR and the Peoples Republic of China (PRC) The panelists are much more positive, however, concerning the development of profitable vehicle markets over the next ten years (again with the exception of the USSR and the PRC).

The responses indicate several interesting issues. First, among these six countries panelist's perceive there is a manufacturing capability that ranks--in order--Czechoslovakia, Hungary and Poland, and Yugoslavia. The USSR and the PRC are far behind. This perception is a function of history, current status, predictability, and expectation of economic, political, and social systems within each of these countries. Second, for each country, component-production capability is judged more favorably than vehicle production. Interestingly, the general ranking and relative difference between the countries is the same

in both production categories. And third, just as the same ranking and general relative difference between the countries exist in production type, the same ordering also exists in profitable market expectations.

It follows then that manufacturers may look upon expansion in the following manner: initially, development around components will provide jobs and income to support the demand and affordability of a local vehicle market, which, in turn, will justify the further development of the domestic auto industry to include vehicle production. This flow follows a classic development model and is shown as General Motors and Ford Motor begin initial, wholly-owned component operations in Eastern European countries, indicating expectations of development into vehicle manufacturing. Investment in China and the USSR, however, is generally perceived as long-term investment, not for quick paybacks or returns, but for an early buy-in of industry participation. With the record-levels of automotive capital expenditures occurring throughout the world, investments in developing countries will face difficult allocation criteria. Uncertain profitability, political stability, and foreign exchange may limit the attractiveness of these investments relative to other world opportunities.

MKT-6. **Please indicate your view of the trend in U.S. federal regulatory standards over the 1992 to 2000 timeframe (more restrictive, current standard, less restrictive). Also list any likely new areas of legislative activity.**

Regulation	Percent of Total Respondents		
	More restrictive	Current standard	Less restrictive
Vehicle emission standards			
Passenger car	91%	9%	0%
Light truck	100	0	0
Fuel economy standards (CAFE)			
Passenger car	88	12	0
Light truck	92	8	0
Vehicle integrity/crashworthiness			
Passenger car	75	25	0
Light truck	85	15	0
Occupant restraint/interior safety			
Passenger car	77	23	0
Light truck	83	10	6
"Lemon laws"			
Passenger car	45	52	3
Light truck	44	53	3
Product liability			
Passenger car	42	52	6
Light truck	43	51	6

New areas of regulation include: Alternative fuels, child restraints, collision avoidance, electric vehicles, emission diagnostics on-board, national energy policy implementations, parts recycling/labeling, parts warranty, recyclability, total hydrocarbons emissions, ultra-low and zero emission vehicles, vehicle efficiency, and vehicle inspection requirements.

SELECTED EDITED COMMENTS

- Government will continue its "assault" on vehicle manufacturers. Manufacturers are visible and effort has shown "results!"
- I expect to see more, and better, local emission test standards.
- Material content of component parts will be more restrictive.
- Paint emissions standards for car manufacturers and suppliers have already been tightened without a clear path--cost and technology--as to achieving compliance.
- Regulations dealing with disposal of old cars, trucks, and parts including plastic and tires.
- The automotive industry will be more and more regulated, and these regulations will become increasingly more restrictive.
- Too many lawyers influenced by lobbyist groups involved in government--not able to recognize real needs (e.g., more restrictive drunk driving enforcement).

MANUFACTURER/SUPPLIER COMPARISON

The suppliers and manufacturers agree on the direction and magnitude of the major categories of regulation--emissions, fuel economy, vehicle integrity, and occupant restraint. However, the suppliers generally feel that there will be more regulatory efforts in the more non-traditional regulatory areas--lemon laws and product liability. Although these two types of laws have been in existence for a number of years, definitions, interpretations, and scope continue to change. Suppliers believe that these laws will become more restrictive--lemon laws, on average, 1.4 for suppliers versus 1.6 for manufacturers; and product liability, 1.5 for suppliers versus 1.7 for manufacturers. There has been a great deal of activity building the customer-supplier partnership. Political activity appears to be an area where the entire industry needs to better cooperate to

analyze proposed business environments and product regulation and legislation, create appropriate positions, and leverage resources to promote the best outcomes.

COMPARISON OF FORECAST: TECH-8 and MAT-8

In general, a significantly smaller percentage of Technology and Materials panelists expect more restrictive federal regulatory standards over the 1992-2000 time frame than the Marketing panelists. This is particularly evident in the areas of passenger car emission standards, crashworthiness, and occupant safety. The three panels, however, express a good consensus when addressing these issues as they relate to light trucks and expectation for increased standards. There is one obvious common area of agreement--fuel economy (CAFE) standards. Every one of the Material panel respondents expects to see more CAFE regulatory activity directed at both passenger cars and light trucks. This is matched by both the Technology and Marketing panelists, with more restrictive responses in the 90 % plus or very high 80% range.

There are differing perspectives between the three panels regarding regulatory activity directed at passenger car emission standards, crashworthiness, and occupant safety. The following table presents these differences. Many factors may cause these differing opinions. Technology panelists may expect that there are emerging automotive technologies will negate the necessity for legislation. The Marketing panelists, perhaps being more responsive to consumer and political considerations, expect to see more legislation regardless of new technology utilization.

The observation that a majority of respondents from all three panels do not anticipate increased regulatory activity in the areas of "lemon laws" and product liability may be a reflection of increased product quality and improved dealership customer handling.

Regulatory Activity
Marketing vs. Technology and Materials Comparisons
Percent of Total Respondents

Regulation	Technology Panel		Marketing Panel		Materials Panel	
	More restrictive	Same	More restrictive	Same	More restrictive	Same
CAFE:						
Passenger cars	90%	10%	88%	12%	100%	0%
Light trucks	89	11	92	8	100	0
Emission standards:						
Passenger cars	65	34	91	9	75	25
Light trucks	81	19	100	0	91	9
Crashworthiness:						
Passenger car	55	44	75	25	69	31
Light truck	77	22	85	15	81	19
Occupant safety:						
Passenger car	58	41	77	23	84	16
Light truck	78	22	83	10	91	9
"Lemon Laws":						
Passenger car	36	64	45	52	41	56
Light truck	35	64	44	53	38	59
Product liability:						
Passenger Car	27	67	42	52	34	66
Light truck	30	64	43	51	37	63

TREND FROM PREVIOUS DELPHI SURVEYS

Emissions and fuel economy regulations have again become the major regulatory concern. The 1990 passage of the California emissions regulation package requiring 2% of the 1998 vehicle sales to be "zero emission" vehicles has raised concerns not just for the California market--the largest single state market--but also for other states and the federal Environmental Protection Agency that might use California as a future standard model. Only 65% of the 1989 panel viewed passenger car emission standards as increasing. This compares with 91% for the 1991 panel. Light truck regulatory expectations remain high--84% in 1989 and 100% in 1991. This change in attitudes also reflects the initial consumer "green" movement. Manufacturers and retailers are struggling to understand environmentalism in terms of magnitude, significance, and

proper response. It will be interesting to track how much of the environmental movement remains "fad" and what percentage actually becomes ingrained in consumer buyer behavior.

The 1990-1991 Persian Gulf war rekindled concerns with gasoline pricing and availability and the strategic implications of U.S. petroleum imports. As with many current events, the war was used as a platform for political purposes and a wide range of fuel economy bills were introduced in the U.S. House and Senate. The strongest debate surrounded Senator Bryan's (Democrat-Nevada) bill calling for the increase of manufacturers' current fleet average by 20% in 1995 and 40% by 2001. This bill is still being debated with the entire auto industry--import and domestic--positioned against it. As the war came to an end, gasoline prices fell, other federal and state issues rose to the surface, and the Bryan bill's momentum slowed. Corporate Average Fuel Economy (CAFE) bills will again be debated in the winter of 1991, some of which are more reasonable and have a better chance of passage, particularly Senator Johnston's (Democrat-Louisiana).

Lemon laws are the only area of regulation where a downward trend is expected. Sixty-four percent of the 1989 panelists believed lemon laws would increase; that percentage is down to 45%. Perhaps overall efforts to improve dealer-customer satisfaction ratings, arbitration processes, enacted state legislation, and other factors pertaining to the sales and service experience has lessened consumer demand for this type of protection.

STRATEGIC CONSIDERATIONS

Pertaining to the physical product, the panelists overwhelming believe that regulatory standards over the next decade will become more restrictive. The panel is divided over the direction that federal lemon laws and product liability laws will take. A slight majority thinks standards will remain the same. However, a large percentage believes more restrictive standards will be enacted. The direction is clear--it is imperative that the industry develop a stronger working relationship with the federal, state, and local political systems. The goals of a cleaner air environment, fewer traffic accidents and fatalities, and better fuel economy are desired by everyone. The issues to resolve are not the end objectives but the magnitude, timeline, conflicting demands, and competing capital programs.

The panelists' new regulatory concerns are of particular interest. Recycling is likely to force a greater awareness towards material selection and even a perspective of total lifetime management from manufacturing through recycling and/or final disposal. The mention of vehicle inspection also connotes an increased involvement of the manufacturer throughout the owner-vehicle relationship, perhaps even extending into the second or third owner. As manufacturers begin to think in this systematic manner, interesting possibilities may be envisioned, such as opportunities for "renewal" stations that could install new instrument panels or seat options to give a vehicle a fresh look, or emission stations that would systematically replace parts designed for a 50,000-mile life in accordance with 100,000-mile warranties. As with emissions, safety, and fuel economy regulations, it is inevitable that society will need to address solid waste disposal issues. Industry should be proactive in shaping the legislative agenda and creatively pursuing the business opportunities that regulations may create.

MKT-7. **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?**

U.S. and Canada Light Vehicle Sales	Percent of Total Respondents		
	18 million "Good"	16 million "Medium"	14 million "Weak"
1992	3%	48%	48%
1994	29	57	15
1996	44	51	5
1998	30	60	10
2000	39	48	14

Note: Estimated 1990 = 15 million sales

SELECTED EDITED COMMENTS

- 1992-1994 recession; 1996-2000 recovery.
- 1998 and 2000--answers assume no recession during that period.
- Definition of "good," "medium," and "weak" may be overstated (e.g., "good" may be closer to 17 million).
- First time buyers have no money. No tax incentive for debt.
- I do not foresee the market for new vehicles increasing that much. Primarily, sales will be due to replacement and cars are being built better. We are virtually saturated in the U.S. and Canada.
- Population will fill volumes up in later years.
- There is little credibility beyond 1-2 years. Go back and check prior Delphi studies.

MANUFACTURER/SUPPLIER COMPARISON

The manufacturer and supplier panels are in general agreement except for 1996 where the manufacturers are more pessimistic. Six percent responded weak and 55% medium, while 0% of the suppliers responded weak and 64% good.

TREND FROM PREVIOUS DELPHI SURVEYS

While previous panels have been slightly stronger advocates of weak to medium short-term markets, medium intermediate markets, and medium to good long-term markets, the current panel takes a much stronger middle-ground approach: medium markets throughout the decade. This is a relatively safe prediction, but one that has implications for an industry that has built production capacity, labor relations, and other business strategies around cyclical patterns. This may lead to a better ability to schedule production, reevaluation of labor as a variable impact, and reconsideration of the risks involved with vertical integration of volume--sensitive engineering and manufacturing activities.

STRATEGIC CONSIDERATIONS

The majority of the panelists believe the North American market will be between 14 and 16 million units in 1992 and remain at a 16-million unit volume through 2000. Most panelists foresee 1996 as the most likely year an 18-million unit market ("good") will occur. This compares with the 1990 market of 15 million. We infer that most panelists do not expect the U.S. to surpass its 1986 sales peak of 16.3 million units in this decade.

Because the Delphi process relies on informed opinion and not sophisticated econometric models, the last comment is relevant. The objective of the Delphi process is to take a snapshot of decision-makers opinions--to get the current perspective of those making strategic plans and identify emerging trends. Responses do not precisely predict the market over the next decade. However, they do indicate two clear issues: one, the North American market is a mature, replacement market and, two, the large amplitude between peaks and valleys may be a thing of the past. Market maturity is suggested by the solid responses of a 16-million-unit market from 1994 though 2000. From 1990 levels, just a 1.5% growth rate would

cumulate to an 18-million unit market in 2000. The lower expected amplitude of sales is reflected in the solid 16-million-unit expectation and not a cycle of 14-, 16-, and 18-million units over the nine-year forecast period.

Although somewhat confined, this forecast does portray a more stable industry on the whole. On the micro-level, of course, the total pie is not growing. So for all companies to achieve their objectives of sales, profits, production, and market share increases since these will come only at the expense of another company. This mature environment requires corporate cost competitiveness to deliver maximum consumer value in the most timely and efficient manner, and to provide the greatest unit-profit margin. It is this profit margin that allows companies flexibility in people, product, and plant investment and pricing and marketing strategies. This flexibility, in turn, allows a company to set the competitive rulebook rather than responding to, and following, the competition.

MKT-8. **Please estimate U.S. retail fuel prices (per gallon) for the following years. (Please use constant 1990 dollars without adjusting for inflation.)**

Unleaded Gasoline	Est. 1990*	Median Response			Interquartile Range		
		1995	2000	2005	1995	2000	2005
Unleaded regular	$1.38	$1.40	$1.58	$1.72	$1.35/1.50	$1.42/1.70	$1.50/2.00
Unleaded premium	1.54	1.55	1.75	1.95	1.50/1.69	1.60/1.90	1.70/2.25

*Source: Automotive News

SELECTED EDITED COMMENTS

- Advent of electric-powered commuter cars will decrease demand for gasoline, resulting in lower prices.
- Assumes a rational, coherent, national energy policy to stabilize North American energy costs similar to other developed nations' median prices with proceeds allocated to infrastructure, re-building, and deficit reduction.
- Base fuel prices likely to fall and be partly offset by additional taxes (unless Middle East situation curtails supply). However, I expect an oil shortage before 2005, then prices will significantly increase. Assumes comparable octane spread and engine requirements. Alternate fuels could displace premium.
- Best thing we could do would be to drive up cost of gasoline at the pump to European levels. Or at least in relation to early 1980s in real terms.
- Eastern European, Soviet, and third world fuel demand will rise slower than expected for foreseeable future as economic progress is disappointing.
- Environmental concerns and a stricter energy policy will dictate higher prices at the pump.
- Expect fuel prices to be relatively stable with increase in taxation. Expect a relatively constant price difference in regular to premium.
- I continue to see ample supply and a long term decline in real prices. I hope taxes will increase the pump price, but have not factored this into my forecast.
- I expect real prices will continue to decline from all cartel-supported levels they are at now. However, my forecast above excludes anticipated fuel tax increases which I think will continue to grow moderately over the long term.
- Improved CAFE and other conserving means will reduce demand (and emissions) long term, thereby increasing downward price pressures.
- Middle East over-capacity will moderate prices near term.
- Past Delphi surveys have always been high.
- Taxes will be higher. Profit taking by oil companies. Middle East constraints.
- Taxes will play a large part to support highway and bridge repairs.
- The political community will be unable to address gas pricing and taxation issues before 1995.
- The weighted average price for gasoline in 1990 was $1.19. This included the effect of the 5-cent tax increase and the Gulf War. Any possible "jumps" will be offset by knee-jerk fuel economy legislation in Washington.
- Unleaded regular should be promoted for use (typically) in more fuel-efficient cars.

MANUFACTURER/SUPPLIER COMPARISON

The manufacturers and suppliers are within 10% of each other, except for the 2005 forecasts where the suppliers estimate much higher gasoline prices than manufacturers: unleaded regular, $1.80 versus $1.60; unleaded premium, $2.00 versus $1.70. Given the volatility of this commodity, these differences are not likely to significantly affect the interaction between the suppliers and manufacturers.

COMPARISON OF FORECAST: TECH-1 and MAT-1

With the exception of the 1995 forecast (in which the Technology panel forecast $1.45 for unleaded regular vs. Materials at $1.35) the projections of the three groups were either identical or within 5 cents of each other.

TREND FROM PREVIOUS DELPHI SURVEYS

The timing of the survey has had an influence on the current fuel price outlook--expectations of 1995 and 2000 fuel prices have risen significantly since the 1989 survey. How these expectations--based on fuel taxes, supply and demand, and regulatory pressures--may change capital spending and program plans is unclear. Petroleum markets are politically volatile and need continual monitoring, not simple biennial data points. The table below indicates how current environmental factors may dramatically influence future expectations. Although panelists' comments indicate continued uncertainty in Middle East politics, they may already have different opinions after the settlement of the Persian Gulf war and the progress of restoring Kuwait's production capability.

Year	Retail Fuel Price Expectations: Delphi V vs. Delphi VI			
	Unleaded Regular Median Response		Unleaded Premium Median Response	
	Delphi V	Delphi VI	Delphi V	Delphi VI
1995	$1.15	$1.40	$1.28	$1.55
2000	1.25	1.58	1.40	1.75

STRATEGIC CONSIDERATIONS

Fuel prices--both unleaded regular and premium--are expected to increase approximately 2.5% per year over the next 15 years. This forecasted price increase--as predicted during the 1991 survey period--should be in addition to the rate of inflation and is subject to changes in dealer and refiner profit margins and crude oil prices. Because of the volatility of this market and the number of influencing variables, these forecasts should be referred to more for their general trend implications than the precise numbers.

The panelists' comments should be considered closely; these outline the many issues that must be tracked to understand the movement of fuel prices, and, in turn, the possible total auto demand or market segment shift that might occur because of fuel price changes. Of course, there is always concern over the politics of oil. The politics at the national--or cartel--level certainly impact the realities and perceptions of supply and demand, and thus, price. At best, companies need to be more internationally savvy, have contingency plans in place for rapid market shifts or input-material price increases, and be flexible to take advantage of changing temporary or fundamental market conditions.

Most panelists are also uncertain about changes in federal or state gasoline taxes--both in terms of timing and magnitude. Most comments allude to the inevitability of increased taxes; in fact, many have a positive, welcoming tone of increasing taxes. An increase in taxes might promote a change in customer behavior in line with CAFE regulation objectives, provide needed funding support to the U.S. highway and secondary road infrastructure, and supply a flow of revenue to reduce the federal budget deficit. Panelists making comments on increasing fuel prices view the cost/benefit trade-off positively. It may be that panelists believe known, moderate price increases may lead consumers to move rationally to different market segments and this may allow manufacturers to strategically respond to market demands.

A final interesting comments issue that will impact the gasoline market is the emerging market for alternative fuels--methanol, electric, and other. Beyond 2000 these fuels--particularly in regional markets like California--do have the potential for reducing gasoline demand and thus prices. It is uncertain how cartel supply control might respond to this change.

II. VEHICLE PURCHASE AND OWNERSHIP

MKT-9. **There are numerous characteristics which profile the U.S. dealership network. Please indicate your 1992-2000 trend forecast for each of the following characteristics (where 1 = increasing, 2 = neutral, and 3 = decreasing).**

1992 - 2000 Trend	Ranking
Number of "mega-dealers" — (chain-ownership)	1.2
Number of dual franchise dealerships	1.3
Number of vehicles sold per dealership	1.3
Percentage of financial, insurance, and extended warranty sales to overall dealership gross sales	1.4
Average import nameplate inventory levels	2.1
Average domestic nameplate inventory levels	2.6
Number of new car dealerships	2.8

Other increasing characteristics include: increased service capacity; customer satisfaction; average used car inventory levels; average used cars sold per dealership; service and parts operations as percent of dealer sales; and own, rent, and lease options.

SELECTED EDITED COMMENTS

- Although I think that mega-dealers will increase, they still will not represent a large percentage of total dealers. They will be large volume dealers which means that the number of vehicles sold for these dealers will be increasing while the number of vehicles sold by smaller dealerships may decrease. There is likely to be a lot of turnover in small dealership owners.
- Dealerships must become much more willing to fill customer needs for automotive transportation.
- I believe the OEMs and dealers will cut delivery time to dealers. Therefore, dealers can hold lower inventory levels and still satisfy their customer base (e.g., the Japanese in Japan).
- Inventory levels will stay the same on a day's supply basis, but will increase in unit terms as total sales increase.
- More "made to order" orders using a computer as a "catalog" to mix and match options.
- Need to get at impact of "near new" cars.

MANUFACTURER/SUPPLIER COMPARISON

There is a variety of differences between the manufacturers and suppliers regarding the magnitude of a few of these trends. Each of these trends have an impact upon the manufacturers and suppliers because of potential effect on the total number of vehicles and original equipment parts sold, as well as service parts, marketing, and logistics. While none of the differences presented below appears troublesome, manufacturers, dealers,and suppliers need to be proactive to understand distribution channel changes and resulting business opportunities and threats.

Dealer Network Characteristics	U.S. Dealer Network Trends--Supplier vs. OEM Responses	
	Supplier	OEM
Number of vehicles sold per dealership	1.1	1.4
Number of mega-dealers--(chain ownership)	1.6	1.1
Percentage of financial, insurance, and extended warranty sales	1.6	1.4
Average import nameplate inventory levels	1.7	2.2

TREND FROM PREVIOUS DELPHI SURVEYS

Although the order of the factor trends remains the same from the Delphi V survey, showing similar expectations of direction, the magnitude of some individual trends has changed. Certain trends like the growth of mega-dealers and dual franchise dealerships, show a slight weakening in expected increases. On the other side, the number of new car dealerships shows a dramatically strengthened belief that the number of new car dealerships will continue to decline. It appears that respondents believe import nameplate inventory level may level out at or near its current position and domestic manufacturers will continue to take finished vehicles out of their inventory system. The changes of trends are shown in the table below.

Dealer Network Characteristics: Delphi V vs. Delphi VI Trend Comparison

Characteristic	Delphi V	Delphi VI	Change
Number of mega-dealers	1.1	1.2	Growth rate slowing
Number of dual franchises	1.1	1.3	Growth rate slowing
Percentage of F&I to overall dealership gross sales	1.3	1.4	Growth rate slowing
Average import nameplate inventory levels	1.7	2.1	Level, stabilizing
Average domestic nameplate inventory levels	2.3	2.6	Reduction rate increasing
Number of new car dealerships	2.5	2.8	Reduction rate increasing

STRATEGIC CONSIDERATIONS

The dealership network is evolving as it responds to the business environment (a mature marketplace, regional and city/suburb growth patterns, etc.) and is integrated into the customer satisfaction, cost-reduction, and quality-improvement initiatives of the manufacturers. The responses to this question reflect a number of dealer trends that have been emerging over the last five years. The vehicle manufacturers and the dealers must creatively work together to establish new strategies and product and service offerings to address market changes. The manufacturers must realize that it is the individual dealership that represents the manufacturer to the customer and no amount of public relations, advertising, or executive speeches will overcome a poor sales or service experience.

One dealer network characteristic which panelists see changing to meet new business conditions is the level of average domestic nameplate inventories. Past Delphi surveys indicated no significant changes in the accepted practice of having 50 to 60 days of dealer inventory. The current panel responses do show a trend toward the reduction of these inventories. It would seem appropriate that the industry attack this inventory, which ties up hundreds of millions of dollars of precious capital. Of course, reducing this inventory necessitates changes from production scheduling and purchasing release to floor planning and rebate and other incentive programs. Because most individual vehicle purchases are "off the lot," it could be said that the customer values the ability of a wide selection. However, the industry must ask itself if it is providing this value in the most cost-effective manner.

The other indicated trends--increasing chain ownership, dual dealerships, and the number of vehicles sold per dealership--have the potential of weakening the already precarious levels of consumer loyalty. The manufacturers must view the dealers as an extension of their own efforts and they must support dealer network strategies that improve total customer satisfaction over the entire owner-vehicle relationship. This perspective will not only build customer loyalty--making the second and third vehicles that much easier and less expensive to sell--but provide an extra margin of product and manufacturer differentiation.

MKT-10. **True total customer satisfaction is difficult to quantify. From the following list, please select the five most important considerations you believe influence current buying decisions. Please do not attempt to rank these attributes; simply check those five characteristics you feel are the most important initial considerations to the customer.**

Entry-Level Vehicle Purchase	Percent of Total Respondents
Price	91%
Fuel economy	69
Operating cost	55
Cash incentives	48
Financing incentives	35

Other response include: reputation for reliability, manufacturer reputation, and durability.

Intermediate/Family Vehicle Purchase	Percent of Total Respondents
Price	63%
Assembly quality	55
Perceived vehicle safety	40
Fuel economy	38
Exterior styling	37

Other responses include: reliability.

Luxury Vehicle Purchase	Percent of Total Respondents
Status appeal of vehicle	69%
Exterior styling	54
Assembly quality	54
Comfort/convenience option availability	43
Interior styling	37

Other responses include: manufacturer reputation.

SELECTED EDITED COMMENTS

- Possibly "assembly quality" should be renamed "perceived assembly quality."

MANUFACTURER/SUPPLIER BREAKDOWN

These comparisons are not made for open-ended questions.

TREND FROM PREVIOUS DELPHI SURVEYS

This question was not asked in a previous Delphi.

STRATEGIC CONSIDERATIONS

Quality is often mentioned as a differentiator of product and manufacturer. The responses to this question highlight the variation of quality, best-in-class, and customer satisfaction definitional elements across various vehicle segments. Although certain elements of quality or customer satisfaction cut across all buying segments--fit and finish, dependability, reliability, and other fundamentals--the importance of certain dimensions of quality varies across segments.

It is clear that value is the most important entry-level attribute. Every entry-level characteristic is financial, from the outright purchase--price, cash incentives, and financial incentives--to ongoing operation--fuel economy and operating costs. Vehicle manufacturers and component suppliers to this segment must be equally concerned with the total package cost of the vehicle and the associated costs likely to accrue over the owning experience. As the respondents considered higher-priced vehicles, first intermediate/family and then luxury, issues of safety, assembly quality, and styling enter the purchase

consideration. Luxury car buyers are perceived as being primarily concerned with status, assembly quality, interior and exterior styling, and comfort/convenience items.

With so many competitive vehicle offerings it is imperative that manufacturers, and increasingly, suppliers, understand the needs of the customer and efficiently package and deliver those qualities. The vehicle attributes listed by our respondents must be conceived in the styling and design studios, implemented by product engineering, executed by manufacturing, and distributed by the dealer networks. No group may exclude itself from fulfilling customer satisfaction. Of course, considering these attributes further up the product development process reduces costs, providing better value to the customer and profit margin to the corporation.

MKT-11. **Many observers believe 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 form the bases of competition in the next decade? (where 1 = most important, 9 = least important).**

Elements of Competition	Ranking
Customer satisfaction	2.2
Styling/Fashion	3.4
New technology/Product innovation	4.0
Sales and service	4.9
Performance	4.9
Responsiveness to market demand/Lead time	4.9
Safety	5.0
Corporate reputation/Good citizenship	7.2
Other	8.6

Other "most important" factors include: durability/reliability and profits.

Other "least important" factors include: warranty, and ongoing contact/dialogue with customer base.

MANUFACTURER/SUPPLIER COMPARISON

Looking at the top three responses, manufacturers and suppliers select customer satisfaction and styling/fashion as the first two bases of competition in the next decade. Suppliers rank customer satisfaction higher than do manufacturers (1.6 versus 2.4) and significantly higher than the second highest competitive factor (suppliers rank styling/fashion 3.9, while manufacturers rank this factor 3.3). This may indicate that suppliers view customer satisfaction as an umbrella criterion that subsumes all other factors, making it far and away the most significant factor. There is also a difference in the third major factor: suppliers see responsiveness to market demand and lead time (4.6), while manufacturers choose new technology and product innovation (3.9). New technology and product innovation appears fourth on the suppliers' list (4.8); however, responsiveness to market demand and lead time is farther down the manufacturer's list in sixth place at 4.9. Therefore, while it appears that manufacturers are less concerned with market responsiveness, ranking this much lower than suppliers, the manufacturers' responses are ranked much closer together, perhaps indicating a sense of awareness that each of these characteristics are required for market success.

COMPARISON OF FORECASTS: TECH-17

As shown in the table on the following page, there is not a great deal of disagreement between the two panels regarding key elements of competition in the next decade: Customer Satisfaction is ranked first by both the Technology and Marketing Panels. Although the rank order of the other competitive factors differs slightly between the two panels, the ranking appears to indicate that the priorities of product development, engineering, marketing, corporate strategy, and other business functions should be well focused on common business objectives.

Elements of Competition: Marketing vs. Technology Comparisons		
Elements of Competition	**Marketing Response**	**Technology Response**
Customer satisfaction	2.2	1.5
Styling	3.4	4.4
New technology	4.0	4.7
Responsiveness to market	4.9	3.5
Sales/service	4.9	5.1
Performance	4.9	5.3
Safety	5.0	5.0
Corporate reputation	8.6	7.6

TREND FROM PREVIOUS DELPHI SURVEYS

The top five responses from this year's survey are relatively the same as the 1989 Delphi V survey. The factors of styling, product offerings, innovation and performance, and sales and service were the previous key factors for competition. Delphi V respondents also indicated marketing and meeting wide and changing customer expectations, values, and tastes. Delphi VI panelists list these attributes--responsiveness to market demand and corporate reputation--separately as well as under the umbrella "customer satisfaction" criterion. Although "customer satisfaction" is a catch-all phrase, more and more it is becoming the primary driver for all strategies and actions across all functional and organizational levels. The respondents believe that focusing without compromise on customer satisfaction is the key determining factor in competitive success. The problems are understanding what customer satisfaction is; creating the proper strategy of product, manufacturing, and distribution; and marshalling human, physical, and financial resources for strategy implementation.

STRATEGIC CONSIDERATIONS

All of the indicated individual bases of competitive differentiation may be combined into the top-ranked attribute--customer satisfaction. From the product itself, to the manufacturer's image, and the dealer network--all of the individual elements necessary to bring a vehicle from concept to customer and sales to service must be targeted at customer satisfaction. Competitive offerings are too attractive and numerous, and consumer loyalty and discretionary income too low to do otherwise. In fact, it is appropriate that the umbrella competitive attribute is ranked first and the elements that comprise customer satisfaction are prioritized below.

The true test of corporate responsiveness is not the awareness that styling, product innovation, or sales and service are important. Both MKT-10 and the MKT-11 clearly indicate the need for these attributes. The true test, the accomplishment that will set companies ahead, will be the understanding of which styles are attractive, which technologies provide value, and how to respond with corporate citizenship. The definitions and the understanding of customer needs are important, not the attribute labels themselves. This all relates to equating the "voice of the customer" with the "pen of the engineer." If these two match, the resulting product should be the car of the customer's desires.

It should be noted that although this question asks respondents to prioritize these attributes, all are important. A manufacturer or supplier that compromises the satisfaction of these individual elements gambles the success of individual programs, and, in turn, the corporation. The best scenario has corporate systems, structures, cultures, and philosophies all supporting the complete satisfaction of the customer--from vehicle purchase through its final disposal. Companies that make complete customer satisfaction their standard operating procedure have the greatest defense against eroding market share and the greatest offensive potential to grow their business.

MKT-12. **There is a debate concerning consumer-perceived versus real differences between U.S. and Japanese designed and manufactured automobiles. Considering vehicles in the large-compact/intermediate segment, for each of the following car buying attributes, please indicate your view of consumers' opinion and your industry-perspective "real difference" opinion comparing U.S. makes to Japanese vehicles (where 1=significant advantage, 3=no difference, and 5=significant disadvantage).**

SCALE

Significant Advantage 1 2 No Difference 3 4 Significant Disadvantage 5

Customer Perception	Car Buying Attribute	"Real" Vehicle Difference
2.7	Safety	2.6
2.9	Ride	3.0
3.0	Exterior styling	2.2
3.1	Powertrain offerings	2.4
3.1	Handling	3.0
3.2	Interior features	3.1
3.2	Future resale value	3.2
3.3	Price/Value	2.9
3.3	Standard equipment content	3.1
3.4	Durability	3.1
3.4	Manufacturer's reputation	1.8
3.5	Fit and finish	3.3
3.5	Fuel economy	3.1
3.5	Other	3.4

Other significant advantage single responses include: dealer service; and ease and cost of repair.

Other significant disadvantage single responses include: frequency of repair, refined materials dealership experience, and dealer service.

Other no difference single responses include: repair cost, and warranty coverage.

SELECTED EDITED COMMENTS

- All of these depend on market segments. Generalizations are dangerous but the key segments, I believe, have perceptions favoring the Japanese.
- Assume that significant advantage means the Japanese vehicle has advantage.
- Buying and servicing a "Big Three" vehicle is a frustrating, expensive, and untrustworthy experience. Big Three manufacturers and their dealers better find a way to work together or that alone will cost them more market share.
- Customers confuse durability with reliability. The actual median age of vehicles has become equal between the U.S. and Japanese.
- I believe the dealer must be factored into this evaluation. While the domestic dealers have elevated their performance level, it is sad to say they still fall far short of the import dealerships in customer service.
- Japanese cars are still better, but not by nearly as much as consumers perceive them to be, especially considering the Japanese car generally sells at a higher price. I judge the total package comparison to be nearly equal. The final Japanese advantage is brand image.

■ The U.S. OEMs are cutting the gap. The public is now much more aware of little differences.

MANUFACTURER/SUPPLIER COMPARISON

These comparisons are not made for open-ended questions.

TREND FROM PREVIOUS DELPHI SURVEYS

This question was not asked in a previous Delphi.

STRATEGIC CONSIDERATIONS

Although a difficult subject to address, there continues to be a debate about the differences between consumer perceptions of vehicle qualities and objective reality. This question, MKT-12, certainly will not answer all the debate questions, but it does outline some differences--at least from the view point of the panelists.

The panelists believe that consumers perceive American cars having slight advantage in safety and ride performance. Durability, manufacturer reputation, fit and finish, and fuel economy are all considered--through the eyes of the customer--to be an advantage of Japanese makes.

When panelists considered "real" vehicle differences the rankings were somewhat different. The panelists believe that American vehicles hold a "real" advantage in manufacturer reputation, exterior styling, and powertrain offerings. Real advantages perceived by the panelists include fit and finish, future resale value, interior features, standard equipment content, durability, and fuel economy. These are significant "real" disadvantages.

Big Three executives lament the perceptions of the consumer. Many executives claim that the physical product attributes are present, but consumers are misjudging the "real" value of the current American product lineup. Again, we caution that these are only the panelist's opinions. However, the largest gaps between consumer perception and "real" vehicle differences should be the areas where the Big Three need to concentrate their greatest marketing efforts.

Considering the attributes that have a 0.4 or greater difference, the following areas need attention: exterior styling, powertrain offerings, price to value ration, manufacturer's reputation, and fuel economy. The panelists believe American vehicles hold an advantage in these areas that is not accurately perceived by the customer. However, perception is reality and that reality must either be accommodated--most likely through continued Big Three marketshare losses--or changes. Through corporate action, competitive product offerings, and marketing, the American manufacturers must address each of these product-related issues--as well as dealership issues--to significantly change consumer perceptions.

MKT-13. In the following years, what is your estimate of the average transaction price in constant 1989 dollars for vehicles sold in the U.S.?

Transaction Price Averages	Est. 1989*	Median Response		Interquartile Range	
		1995	2000	1995	2000
PASSENGER CAR					
Traditional American Manufacturer (TAM)	$14,939	$16,500	$18,000	$16,000/17,000	$17,000/19,500
Imported	16,563	18,000	19,800	17,000/18,500	18,400/22,000
LIGHT TRUCK					
TAM	n/a**	$13,000	$15,000	$12,500/15,000	$14,000/17,000
Imported	n/a	13,600	16,000	12,750/14,500	14,000/18,000

* Source: Automotive News
**n/a - not available

SELECTED EDITED COMMENTS

- About 1% per year above inflation which will be much less than cost increases from product improvements, new features, and regulatory requirements.
- Average expendable income will soften in the 1990s forcing OEs to provide a less expensive product. In the light-truck market the Japanese/U.S. competition will intensify, thus prices will escalate grudgingly.
- Average transaction price is becoming less meaningful. Some other measure such as monthly cost is more meaningful. Increased costs due to air bags should be offset by lower insurance costs, etc.
- Could increase much faster if knee-jerk environmentalists get anti-consumer fuel economy regulations.
- Environmental and material-use restrictions and consumer taxes will cause increases through 1995.
- Environmental and safety issues will push prices dramatically.
- Expect light-truck price to move more quickly due to greater technological advances.
- Government regulations and addition of features will increase average price. So will, consumers' desire to upgrade.
- Government regulations will cause rate of increase of prices to exceed CPI and rate of income growth.
- Imports will continue to penetrate the luxury segment.
- Increased fuel economy and safety standards will drive prices higher for everyone. Import car average prices will rise faster due to a continued move into higher priced, more profitable market segments. Increased competition for truck buyers will keep prices low. Imports move to full-size trucks will cause their price to rise more rapidly.
- Increased wealth effect will influence a richer mix of vehicles.
- Manufacturers' greed will drive prices up quicker than inflation. Many consumers will be pushed out of new car market--executives still don't seem to realize that yet.
- North American passenger car prices affected by move to small and mid-size segments lowering average price. But this is more than offset by additional safety equipment (ABS, air bags, traction control) which raises real prices. Long-term competition forces prices down. Trucks affected by much higher level of safety equipment and more options/features.
- Premium cars and trucks will be the predominant import versus low-end vehicles.
- Regulation and content level increases will push up prices, somewhat offset by real decreases in carryover content cost. Light truck prices will increase at a higher rate as passenger car safety equipment becomes mandated for them.
- TAMs will be fighting for market share and prices will level out for TAMs, NAMs, and imports.
- Without equalized total regulation, the shift to "truck registered" vehicles will continue.

MANUFACTURER/SUPPLIER COMPARISON

Median responses for manufacturer and supplier panels are approximately within 5% of each other for all forecasts.

TREND FROM PREVIOUS DELPHI SURVEYS

Across all passenger car categories and years, transaction price estimates--compared with Delphi V--are up 10% to 16.4% over the two forecast periods. This is the result of a variety of complicated issues, including expectations of increased standard equipment, specified options, and regulatory-mandated equipment. Although the light-truck forecast number might be suspect because a 1990 base-year number was unavailable, the comparison with Delphi V shows no change in TAM transaction prices, but an 8% increase for the 1995 forecast and a massive 23% increase for 2000. This most likely reflects the shift of import manufacturers towards high-contented sport utility and mini-van products and full-sized vehicles. Panelists' comments describe a number of changes over the past two years that have led to these forecast increases.

STRATEGIC CONSIDERATIONS

Panelists forecast approximately a 2% average increase per year in passenger-car and 3% in light-truck transactions costs. It should be noted that the panelists were given 1989 calendar year data for passenger cars only; thus, it is better to focus on the light truck transaction price trend rather than the specific forecast numbers. Given the respondents' overwhelming number of comments indicating that vehicle content will increase due to government regulation, consumer feature preferences, and the general mix of more larger/upscale passenger cars and trucks, this price rise may correlate with rising consumer value. Of course, the continuing question remains: to what extent does the customer value these additional product features and societal benefits. It appears the next five to ten years will remain a new car buyers' market, with a wide variety of product offerings in a price competitive market.

To preserve customer value--or competitive advantage by reducing prices--manufacturers must operate with a strategy of continually-reducing business-operating costs while keeping a close eye on value provided to the customer. Price increase "pass-throughs," which were an industry way of life, must now be re-evaluated. Cost increases may occur, but productivity gains or operational cost reductions--from the designers' canvas to the showroom floor--must occur to maintain the overall consumer benefit-to-cost ratio or, to grow market share, increase the consumer value ratio. A strategy of continuous, consumer-value improvement requires that organizations operate and respond to market demands, not internal bureaucracies, tradition, or other corporate attributes that offer the customer no value

One comment, "Some other measure [than transaction cost] such as monthly cost is more meaningful" raises a significant issue and will be covered in other questions. With new vehicle purchases requiring an ever-increasing share of average take-home pay, affordability is a major concern. The industry is in need of forecasting models that predict the impact and feedback of program cars, long-term loans, extended financial incentives, and other marketing activities that have the potential of significantly changing historic market cycles.

MKT-14. **Considering industry efforts to reduce costs over the next five years, how do you expect car prices to change relative to the consumer price index (CPI)? Please consider comparably equipped 1991 and 1996 passenger cars, and indicate your answer by circling the appropriate number below.**

1996 Car price increase compared with CPI increases	Percent of Panelists
Considerably higher	5.4
Somewhat higher	57.1
About the same	19.6
Somewhat lower	17.9
Considerably lower	0.0

SELECTED EDITED COMMENTS

- Actually, constant-feature car price increases will be lower than CPI increases, but added features and content will increase prices.
- Car prices could be less than the CPI, but will be driven up by legislation to meet the demands of special interest groups.
- Cars are being dragged by the likes of Mitsubishi toward the VCR/PC high-tech model: more functionality for less money. In this model, the price/performance curve is shifted outward.
- Government regulations will force price escalation beyond CPI.
- Historically, pricing has risen at a rate significantly above the CPI and Producer Price Index (PPI). The rate will decline to 1-2% above the CPI rate, except in recessionary years, through higher discounts.
- I believe supplier costs to the OEMs will be lower than the CPI levels, but the OEM costs will be greater; therefore, prices will go up, the same as the CPI.
- The customer will have to pay for our TAM inefficiencies until we catch up to the Japanese. To date, the supplier base has been bled dry profit-wise.

MANUFACTURER/SUPPLIER COMPARISON

There are many interesting differences between the manufacturer and supplier panelists. Manufacturers who actually set consumer suggested prices are almost evenly spread in opinion regarding the direction of prices compared to the CPI. This indicates both optimistic and pessimistic opinions. Suppliers are more focused in their views regarding prices. The following table presents the actual manufacturer/supplier breakdown. While these differences are not directly contradictory, suppliers' margins will be pressured as 50% of the manufacturers believe that vehicle price changes will be the same or lower as the change in CPI.

Price Expectations: Manufacturer vs. Supplier Comparison		
1996 Car price increase compared with CPI increases	Percent of Responses	
	Manufacturer	Supplier
Considerably higher	17%	2%
Somewhat higher	33	64
About the same	25	18
Somewhat lower	25	16
Considerably lower	0	0

TREND FROM PREVIOUS DELPHI SURVEYS

This question was not asked in a previous Delphi.

STRATEGIC CONSIDERATIONS

Vehicle pricing remains a sensitive, competitive issue at the manufacturer, dealer, and supplier level. Affordability of vehicles is at a critical point, keeping some customers out of the market and forcing other customers to reconsider specific vehicle or option selections. Although panelists believe prices of vehicles will increase somewhat higher than the CPI, certain segments may experience intense pressure to hold or reduce prices. Of course, this does not relate to corresponding price increases of input resources. Manufacturers must continue to continuously reduce costs of delivering a product to the showroom floor without any compromise to consumer value.

MKT-15. Within the U.S. market, what is your estimate of the average age of new passenger cars and light trucks, the length of time new car buyers will keep their vehicles?

Vehicle Age and Ownership Trends	Est. 1989*	Median Response		Interquartile Range	
		1995	2000	1995	2000
Average age of passenger cars	7.6	8.0	8.3	7.8/8.0	8.0/9.0
Length of ownership by new car buyers	5.4	5.7	5.9	5.5/6.0	5.2/6.5
Average age of light trucks	7.9	8.0	8.4	8.0/8.5	8.0/9.0
Length of ownership of new light trucks buyers	5.9**	6.0	6.1	5.8/6.5	5.6/6.5

* Source: Automotive News

** Based on compact pickup owner surveys.

SELECTED EDITED COMMENTS

- As financial plans lengthen and material usage insures that vehicles will last longer, people will have to spread payments over longer periods of time and the vehicle will literally last long enough to do so.
- Increase in leasing will increase ownership length.
- Used light trucks will increase in demand. Faster turnover on light trucks will occur because of business and home/business use.

MANUFACTURER/SUPPLIER COMPARISON

Forecasts for 1995 are almost identical for manufacturers and suppliers across passenger cars and light trucks. Compared with suppliers, the manufacturers' 2000 forecast predicts longer average ages for passenger cars (8.5 versus 8.0 years) and light trucks (6.2 versus 5.9 years) and length of ownership for passenger cars (6.0 versus 5.5 years) and light trucks (6.2 versus 5.9 years). These forecasts may indicate the great interest manufacturers have in maintaining or reducing trade-in time through creating innovative financing and leasing options.

TREND FROM PREVIOUS DELPHI SURVEYS

Respondents' estimates of current average length of ownership by new car buyer are greater in 1995 and 2000, than they are in the 1989 Delphi V. The Delphi V panel estimated five years for both forecast years. Increasing vehicle prices, weak used car prices, and resilient interest rates are keeping loan maturity periods long and average loans large. This has resulted in a negative equity position (the owner owes more on the car than the car is worth) for many people, keeping them out of the new car market.

STRATEGIC CONSIDERATIONS

The average age of the U.S. passenger car fleet and length of expected new vehicle ownership has risen over the past ten years and, as forecast by the panelists, is expected to continue in the future. This trend is driven by a number of factors, including vehicle reliability and durability, loan duration and amount financed, and used car prices. Vehicle manufacturers have pursued many strategies, including fleet operator program sales which force a continual turn-over of vehicles (sometimes as quickly as three to six months), and continued financial rebates, which attract future buyers into the showroom today. While these efforts have assisted short-term sales results, there are many questions that have not been answered concerning their long-term impact.

Fundamentally, the lengthening of the trade-in cycle and the availability of quality used cars (with extended warranties that can easily be transferred) demand a restructuring of production, sales, and service capacity. New operating models need to be developed to meet changed demand cycles, potentially lower showroom floor traffic, and increased service shop activity. Capacity changes in these three broad areas will require changes in corporate strategies, facilities, product, and, most important, personnel skills. While this discussion refers to the overall industry capacity levels, a fundamental issue for manufacturers, suppliers, dealers, and others dependent upon the industry is who will own this restructured capacity.

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 Est.	1995	2000	Current Est.	1995	2000
Cash	11%	10%	10%	10/20%	10/10%	8/10%
Cash plus personal loan	70	61	56	60/80	55/65	50/60
Personal lease	11	21	25	10/20	15/25	20/30
Other:	8	8	9	5/10	5/10	5/10
TOTAL	100%	100%	100%			

Other responses include: home mortgage loan.

SELECTED EDITED COMMENTS

- A big change will be an increase in leasing, but hard to guess how much it will grow.
- Cannot even guess, except leasing will increase as a means to direct dollars otherwise tied up in a vehicle to be used elsewhere.
- Car manufacturers will lease cars to an individual for his/her lifetime. A person will be hooked forever by turning in his car for a new one every two to three years, with no down payment.
- Home equity loans or loans against pension savings will become increasingly popular because of tax deduction. Captive financing is becoming too picky, missing the lower end and entry-level market. Payroll deduction for car use or purchase is needed.
- Home equity loans will become more attractive because of current tax laws. Demographic trends point to higher equity positions and higher income levels of the baby boom generation.
- I have included in "lease" other innovative lessor type schemes--pay for transportation service, etc.--schemes that I think will be invented during the 1990s. Cash buying will increase during early 1990s as consumers switch lending to deductible forms, such as home equity, and use proceeds to purchase vehicle.
- If tax laws still favor equity loans, percentage may increase to a high of 50%.
- Innovative finance packages will be developed.
- Lack of tax advantage will encourage leasing at the "expense" of borrowing.
- Leasing appears to be more interesting--perhaps through manufacturers. As prices increase, the down payment becomes too high for entry level buyers.
- Leasing will become "the" way to finance new vehicles.

MANUFACTURER/SUPPLIER COMPARISON

The two panels are essentially the same.

TREND FROM PREVIOUS DELPHI SURVEYS

There are no appreciable differences between the Delphi V and Delphi VI survey panels. For each financing source and forecast year, the two panels were within five percentage points of each other and show the same general trends.

STRATEGIC CONSIDERATIONS

It appears over the next five to ten years that a competitive battlefront will be played out, not only on the new car showroom floor between manufacturers and nameplates but also in the financing offices between vendors and forms of financing. As for the forms of financing, personal leasing will grow over the next ten years at the expense of personal loans. The significance of the affordability issue is highlighted by the number and type of respondent comments. It will be interesting

to watch the positioning of the automotive captive financial arms and the traditional and non-traditional financial vendors as changes in automotive financing evolve.

The panelists present many creative ideas in response to concerns about vehicle affordability. Most comments are favorable toward leasing. However, many comments suggest that "schemes," "creative financing," and "innovative finance packages" are needed to address the future market. Within this area, the suggestion that "car manufacturers will lease cars to an individual for his/her lifetime" and the use of payroll deduction are of particular interest. The first comment addresses both customer loyalty and financing issues. Manufacturers need to develop strategies like these that simultaneously solve two or more problems by looking at the corporation as a system. One note of caution--the consumer is already inundated with product choices and may find a proliferation of financial choices more confusing and dissatisfying than helpful. Any extension of financial offerings must come with proper dealer and consumer education.

The comment, "Captive financing is becoming too picky, missing the lower end and entry-level market" leads us to believe that the Big Three may not be fully utilizing their potential strength and resources through leveraging their captive financial arms. A manufacturer truly working towards operating as a corporate system and maximizing customer value might better operate vehicle manufacturing and credit operations as complementary activities rather than as two distinct profit centers. It might be less expensive to increase lending at the market's low end and incur some bad debt expense in order to operate the business's manufacturing side at higher rates of capacity utilization.

MKT-17. What is your expectation of the average amount financed (in constant 1989 dollars) and the average maturity (in months) for new passenger car loans in the following years?

Passenger Car Loans	Est. 1989*	Median Response		Interquartile Range	
		1995	2000	1995	2000
Average maturity (in months)	54.2	55	57	50/56	50/60
Average amount financed	$12,000	$13,600	$15,000	$13,000/14,000	$14,000/16,000

* Source: Automotive News

SELECTED EDITED COMMENTS

- About 80% of the average price in Mkt-12.
- Financing will be for only those who think they are gaining equity. They will finance less for shorter periods.
- Increase in 401k loans.
- Maturities must come down. Too many buyers are finding themselves upside-down in their 5-year loans.
- Slightly shorter maturities; about the same percentage financed, and more use of leasing.
- Smaller cars and more frugality.
- There will be more use of leases.
- This is a function of disposal income and interest rates.

MANUFACTURER/SUPPLIER COMPARISON

The two panels are essentially the same.

TREND FROM PREVIOUS DELPHI SURVEYS

Unless interest rates drop significantly, the current panel suggests monthly payments may be rising well beyond what was forecast in 1989. For the 2000 forecast, the current panel reduced that number of maturity months by three (from 60 to 57) and increased the average amount financed from $12,995 to $15,000. This certainly reflects the desire of the vehicle manufactures to promote shorter loan periods to increase the frequency of showroom visits and the expected increase in the average cost of a vehicle. However, this trend in addition to expected declines in real disposable personal income adds to potential affordability pressures.

STRATEGIC CONSIDERATIONS

Although the panelists' comments are directed towards shortened average maturities and outstanding loans, their numerical forecasts indicate ever-increasing maturities and average amount financed. There is no question that the problem of negative equity positions (owing more on the vehicle than the vehicle is worth) is keeping many people from the new car market. Manufacturers must consider the long-term market impact of loan structures and incentive programs. Chrysler Corporation is the first manufacturer to initiate new ownership financial plans--plans that have leasing benefits of low down and monthly payments and the advantages of building equity through a personal loan repayment. If these programs are successful, competitive manufacturers will quickly follow suit. Because these plans are so easily imitated, they offer little long-run sustainable competitive advantage. However, for the Big Three--and especially for Chrysler--they offer a short-term advantage that will increase showroom traffic, increase the likelihood of a sale, and allow the manufacturer to concentrate on building consumer loyalty.

MKT-18. What will be the source of capital for retail passenger car financing?

Sources of Vehicle Financing	Est. 1988*	Median Response		Interquartile Range	
		1995	2000	1995	2000
Commercial and savings and loan banks	45%	40%	35%	38/42%	31/40%
Manufacturer/captive financial arms	3	30	35	30/35	30/40
Other corporate financial arms	n/a	5	7	5/6	5/10
Credit union	21	20	20	20/20	17/20
Other	3	4	3	3/5	2/5
TOTAL	100%	100%	100%		

*Source: Automotive News

SELECTED EDITED COMMENTS

- Captive financing will become more and more dominant.
- Captives are good business for the manufacturers and will gain share.
- OEM financial arms will seriously challenge traditional banks for business.
- Other sources leasing companies include, private investors, or current car rental companies.
- There will be many changes. Tax laws and rates will affect.

MANUFACTURER/SUPPLIER COMPARISON

The two panels are essentially the same, with the exception that manufacturers believe their captive or allied operations will control approximately 10% greater market share in 1995 and 2000 at the expense of other financing sources.

TREND FROM PREVIOUS DELPHI SURVEYS

The most significant change between the last two Delphi surveys is the increased expectation of the importance of credit unions at the expense of other corporate financial arms and vehicle manufacturer captive financing operations. The 1989 survey indicated credit unions would fall off to only 12% of the 2000 market. The current survey shows the 2000 credit union forecast at 20%. In turn, the corporate, non-traditional financial organizations and other corporate financial arms are reduced 3% and 4%, respectively, from the 1989 survey. It is not clear whether these changes occurred because of the difficulties in the savings and loan industry, lower expected success rates of giants like GE Capital, or a consumer-driven change based on financing costs, credit availability, or other market factors. These forecast changes are probably a combination of all three factors.

STRATEGIC CONSIDERATIONS

Traditional financial organizations will continue to lose market share to the non-traditional lending institutions. The vehicle manufacturer captive financial arms--the Big Three and, increasingly, foreign manufacturers--will pick up the majority of this gain. However, as financial options proliferate, other corporate entities--such as GE Capital--have the ability to penetrate commercial as well as personal accounts. The traditional lenders face an even greater threat if the manufacturers begin to use their captive financial arms as an integrated marketing tool, relying on available financial incentive tools to increase sales and level out production runs or build market share. If viewed from this perspective, the manufacturers will be willing to take a loss on the financial side--increasing competition to traditional lenders--to gain profit or reduce cost on the finished vehicle marketing or production side. To compete in this arena, financial institutions must broaden their product offerings to earn a profit on an overall package of services provided to an individual while perhaps losing or only breaking even on specific, individual elements of that package.

MKT-19. Relative to each other, over the next ten years, what is your trend estimate of the percent of service performed (based on number of jobs) by the following service outlets (where 1 = significantly decrease, 3 = no change, and 5 = significantly increase)?

Service Trends by Type of Outlet	Ranking
Service stations	2.2
Independent repair shop	2.9
Fleet operator shops	3.5
New car/truck dealers	3.5

SELECTED EDITED COMMENTS

- Complexity of cars and dealer/manufacturer emphasis on service will increase dealer service share, but not as much as many people expect.
- Dealers will be forced to get better and vehicle designs and complexity (especially electronics) will force car buyers to dealers and fleet shops. This will be a real discriminator. If U.S. dealers do not do this well, they will drive customers to the transplants.
- Engines are becoming more complicated; computers are needed for diagnostics.
- I also expect a shake-out among independent repair shops.
- Need examples. How would Goodyear and Firestone be classified? Kmart and Sears?
- Specialty independents will significantly increase, but general, non-specialty outlets will hold steady or decrease.
- Technology of powertrain items and diagnostic checking may become so expensive that smaller repair shops might find these repairs prohibitive.
- The service markets change for new versus used cars: First, new car owners tend to go back to dealer; then second, owners of older cars and new cars out of warranty go to service outlets that are convenient.

MANUFACTURER/SUPPLIER COMPARISON

The two panels disagree about fleet operator shops. Suppliers project this segment to grow--ranking it 3.6--while manufacturers forecast this segment to decline slightly--2.7. This may indicate that suppliers view potential growth in leasing as coming from both private leasing agencies and new vehicle dealerships, while manufacturers view potential lease increases coming primarily from new vehicle franchises.

TREND FROM PREVIOUS DELPHI SURVEYS

This question was not asked in the same manner in Delphi V. However, it may be noted that the previous panel did forecast a decline in jobs performed by service stations, and indicated slight growth for new car/truck dealers and fleet operator shops. The past panel was more optimistic concerning independent repair shop growth, showing an increase for this service channel versus the neutral view of the current panel.

STRATEGIC CONSIDERATIONS

The panelists foresee the greatest market share change for independent service stations. The reduction in the number of service station jobs performed is likely to be picked up by fleet operator shops and new vehicle franchises--two segments which are expected to gain slight shares in the market. While overall the panelists forecast moderate shifts in market shares, their comments reveal many interesting issues.

First, vehicle complexity suggests increasing dealer service. Customers reduce risk through long-term warranties linking them with the dealership and there is, most likely, a perception that the dealer mechanic is specialized and capable. Second, vehicle complexity increases the expense of training and diagnostic equipment, which reduces the type of repairs general service stations may perform and supports the specialization of single repair franchises. Although these two factors lead to an increase in dealer franchise service, consumer satisfaction pressure is apparent, particularly for the traditional domestic dealerships. This growth will be short-lived in a market of decreasing traditional domestic market share. The dealership and its service capacity and capability heavily determine consumer satisfaction and loyalty. If a dealer does not repair a vehicle the first time in a convenient and as pleasant as possible manner, it is unlikely that the customer will favor that manufacturer's models the next time he or she is in the market. The dealer will lose this new vehicle service business and opportunity for good. It is imperative that the manufacturer become a more involved partner in the driver-vehicle ownership relationship. It is less expensive to keep current customers loyal than to capture a new customer from a competitor.

MKT-20. From the perspective of the vehicle manufacturer, what will be the major bases of competitive differentiation within the franchised dealership and service channel through the year 2000?

Competitive Differentiators	Percent of Total Responses
Service quality (including price and value, and increased training--particularly for specialized electronics diagnostics and repairs)	39.0%
Customer handling (including customer sensitivity, loyalty, friendliness)	21.0
Convenience (including hours, car loans, pick up/ delivery, location)	18.0
Broad service/sales offering (including one-stop shopping, retail parts and merchandise, mail order)	7.0
Computerization of operation (including repair history, satellite links, diagnostics)	0.7

Single responses include: dealer experience base; dealer financing of major repairs; dealer support of trade-in and resale value; increased capital investment; marketing of service capabilities; and store design and appearance

MANUFACTURER/SUPPLIER COMPARISON

These comparisons are not made for open-ended questions.

TREND FROM PREVIOUS DELPHI SURVEYS

The Delphi V survey asked panelists to consider the "fundamental post-sale and service issues" rather than the bases of competitive differentiation. Their key issues were 1) the ability to fix a problem right the first time in a timely manner; 2) increased vehicle reliability and durability to reduce need for service; 3) increased customer convenience; 4) improved customer/service department relationship; and 5) improved technical skills of service personnel. Elements of each of these key issues are present in the current survey's bases of competitive differentiation. There are no dramatic additions or deletions from the 1989 survey.

STRATEGIC CONSIDERATIONS

The dealership is changing from a narrow, point of sales perspective to a broad, marketing viewpoint. The manufacturers need to move beyond dealership rewards based on ten-day sales performances and end-of-period clearances. Rewards, staffing, and strategies must be developed around the five dealership differentiators identified by the panelists: service quality, customer handling, convenience, broad service and sales offerings, and computerization of operations. To implement these attributes, the factory must change its dealer-operating philosophy from a sales to a marketing orientation and support that philosophy with specific strategies and actions. Two critical questions always emerge: first, how far do market share and consumer attitudes need to fall before changes are initiated, and second, will that point be too deep or too late for recovery?

Many companies are starting to address these issues. Certainly the new luxury car divisions of Toyota, Nissan, and Honda have raised expectations of customer handling in this market segment. Based on past experience, these companies appear to have better internal learning mechanisms and are more likely to transfer advanced operating styles and techniques to all operations. Saturn's efforts from dealership layout to factory support of product recalls are creative and support a marketing-oriented dealer network. These operating procedures may become the rule rather than the exception. Complete customer satisfaction becomes the rule when the manufacturer and dealer realize their individual success is mutually dependent. One may not succeed without the other. Therefore, the adversarial tension between the dealer and the factory must be eliminated. Working together, the dealers and manufactures have substantial resources to address the customer satisfaction issue. The barrier to progress is the lack of fundamental focus on the customer and a lack of coordinated commitment towards complete customer satisfaction by the factory and dealer.

III. VEHICLE DESIGN AND ENGINEERING ISSUES

MKT-21. **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 shorter.**

MKT-21a. **Please give your expectations (in months) of future development cycles from concept through Job One for the hypothetical reskinning of high and low volume platforms that maintain current hardpoints.**

Future Development Cycles Maintaining Current Hardpoints	Vehicle Development Time (In months)					
	Median Response			Interquartile Range		
	Current Est.	1995	2000	Current Est.	1995	2000
High-Volume Vehicle (production more than 50,000 units/year)						
United States	48	40	36	48/48	40/42	32/36
Japan	36	30	28	36/36	30/33	26/30
Low-Volume Vehicle (production less than 50,000 units/year)						
United States	44	36	32	42/48	36/40	28/36
Japan	30	28	26	30/36	28/32	24/28

SELECTED EDITED COMMENTS

- Japanese process is superior, it is less encumbered by bureaucratic and labor resistance.

MANUFACTURER/SUPPLIER COMPARISON

The two panels are essentially the same.

COMPARISON OF FORECASTS: TECH-16a

The Technology and Marketing panelists are in very close agreement with their median forecasts for development cycles for reskinned platforms maintaining current hardpoints. There are only two forecasts that exhibit a difference of opinion. One is the current estimate for low-volume vehicle production in the U.S: the current estimate of the Technology panelists is 40 months, the Marketing panelists estimate 44 months. Also, there are differing forecasts for high-volume vehicle development time by the year 2000. The Technology panel estimates the product development time for these minor facelifts to be 32 months in the United States and 25 months in Japan. This contrast with the Marketing estimates of 36 months and 28 months in the United States and Japan, respectively. It is very likely that these differences are definitional in nature. However, these differences do highlight the critical importance of competitive intelligence for manufacturers to assure that they are competitive with new product innovation, and for suppliers to assure they have the correct capabilities to serve both U.S. and Japanese customers.

TREND FROM PREVIOUS DELPHI SURVEYS

Compared to previous studies, the current vehicle development forecast times are significantly longer for both Japanese and U.S. firms. The table on the following page presents these differences. The process of product development is complicated by confusion and debate over definitions--minor versus major facelifts, starting points (concept definition versus funding approval), and other organization- or program-specific attributes that make cross-company and country comparisons difficult. The current lengthened forecasts may be the result of a better understanding of current corporate capabilities (the base point for improvement); skepticism about past-touted technological, organizational, and human skill progress; or, perhaps, a reconsideration of the corporate benefits to very quick product development cycles. There is obviously a point were the costs of driving quicker product development time outweighs the benefits in terms of profitability or increased market share. The forecast increases--up to 25% compared with 1989--are most likely the result of a blend of each of these three factors.

Category	Reskinning Product Development Timing: Delphi V vs. Delphi VI Trend Comparison (In months)			
	Delphi V 1995	Delphi VI 1995	Delphi V 2000	Delphi VI 2000
High Volume Vehicle				
United States	35	40	30	36
Japan	24	30	23	28
Low Volume Vehicle				
United States	32	36	28	32
Japan	24	28	20	26

MKT-21b. **Please give your expectations (in months) of future development cycles from concept through Job One for a hypothetical new platform that establishes new hardpoints.**

Future Development Cycles Programs Establishing New Hardpoints	Vehicle Development Time (in months)					
	Median Response			Interquartile Range		
	Current Est.	1995	2000	Current Est.	1995	2000
High-Volume Vehicle (production more than 50,000 units/year)						
United States	56	48	40	54/60	48/50	38/46
Japan	40	36	33	40/46	36/40	30/36
Low-Volume Vehicle (production less than 50,000 units/year)						
United States	54	48	40	50/56	44/48	36/42
Japan	38	36	32	36/40	34/36	30/36

SELECTED EDITED COMMENTS

- Although the Japanese may be able to get development cycles under three years, I am not sure except for very low production (less than 10,000 production units) there will be much advantage to do so.
- As far as components go the Japanese manufacturers have more things "on the shelf" which improves their development time for new platforms, and they work more closely with their suppliers up front.
- Design will be capitalized on by the Japanese.
- Development cycles must come down due to rapidly changing consumer demand and technology development. But as long as we move into more high-technology areas, development will be more time-consuming and mitigate these declines slightly.
- Domestics are much faster on programs they are now working on than programs from the last few years. It is critical that they get faster, and they will.
- GM, Ford, and Chrysler in decreasing order, continue to be too complex in their platform decision tree to permit attainment of needed reduction in lead times. GM especially cannot handle or turn around their battleship due to organizational gridlock.
- I would give greater credence to OEM feedback on these questions than from suppliers such as myself.
- Japanese manufacturers continually have the concept, experience, and desire to drive time out of the development process. U.S. manufacturers have a long way to go.
- Maybe we should stop and determine why this question is important. Does this challenge really sell cars and is the buying public aware? The United States versus Asia is going to be small in the future.
- Product development times must be improved. This needs new management structures and skills to accomplish.
- The Japanese manufacturers support a greater R&D effort so that their programs have more opportunity for shelf selection of components and systems.
- U.S. OEMs have not developed the mentality or the systems to design and tool vehicles in volumes less than 50,000 per year. Tooling will still be a major timing factor but CAD/CAM will help reduce timing if correctly utilized.
- Use of super computers for highly accurate design, modeling, and prototype will allow design cycles to be drastically reduced.

MANUFACTURER/SUPPLIER COMPARISON

There are no significant differences between the manufacturers and suppliers. Responses for all categories are approximately within 10% of each other. Where there are differences, the manufacturers tend to forecast longer product development times by two or three months.

COMPARISON OF FORECASTS: TECH-16b

There are significant differences between the two panels only in the low-volume vehicle estimates. The table below highlights these differences. As we discussed in MKT-21a, these differences are the likely result of a number of factors and signify the need for manufacturers and suppliers to better understand product development cycle strategies and methods.

Low-Volume Vehicles	Product Development Time: Marketing vs. Technology					
	Median Responses					
	Current Estimate		1995		2000	
	MKT	TECH	MKT	TECH	MKT	TECH
United States	54	48	48	40	40	36
Japan	38	36	36	30	32	28

TREND FROM PREVIOUS DELPHI SURVEYS

Although the differences between Delphi V and Delphi VI responses for new platform changes are narrower than the comparison for reskinning, where there are differences, responses to question MKT-20b indicate a lengthening product development time period. This is most likely for the reasons discussed in MKT-20a "TREND FROM PREVIOUS DELPHI Surveys." The table below compares Delphi V and Delphi VI response.

Category	New Platform Product Development Timing: Delphi V vs. Delphi VI Trend Comparison			
	Delphi V 1995	Delphi VI 1995	Delphi V 2000	Delphi VI 2000
High Volume Vehicle				
United States	48	48	40	40
Japan	36	36	30	33
Low Volume Vehicle				
United States	44	48	40	40
Japan	33	36	30	32

STRATEGIC CONSIDERATIONS

Product development time continues to be a differentiator between the U.S. and Japanese automotive industries. The panelists foresee the U.S. manufacturers reducing their time to market considerably over the next decade, from 25 to 29% depending upon the program type and market intention. However, the Japanese manufacturers will continue to improve as well, keeping a significant advantage. Although the gap among the various development efforts is estimated to be reduced from 12 to 16 months down to 6 to 8 months, the difference is significant for a number of reasons. As long as a competitor is first to the market it will be that competitor that sets customer expectations, styling cues, pricing, and other product and market expectations. Therefore, a product that is 6 or 8 months behind the competition's may fail because it was brought to market under old expectations, not those just set by the competitor's product introduction.

Although this question only asked expected time to market, we perhaps should have focused on expected dollars to market. Domestic manufacturer programs are being introduced with $600 million to $1.2 billion price tags. If the domestic manufacturers do not take cost out of program development as well, they will still have four-to six-year cycles, based not on market demands or engineering capability, but the financials of repaying development cost. This keeps the Big Three tied to satisfying internal demands and overcoming self-inflicted competitive weaknesses while foreign manufacturers are flexible and free to pursue a greater number of development programs and turnover of existing programs. This scenario leaves the Big Three on the defensive and allows foreign manufacturers to manage the offense.

A debate will continue concerning the "proper" timing of product development efforts; should a manufacturer have two-, four-, or five-year cycles? There is an expense to rapid product development efforts; is there a market competitive

advantage or consumer value associated with this cost? Also, cash flow, labor work hour restrictions, and available human resource skills may extend product development cycles. Manufacturers may find there is no magic number--18-month cycles for "fashion conscious" sport coupes to four-year cycle for intermediates and five- or six-year cycles for luxury vehicles. There may even be various segments of luxury vehicles: Rolls-Royce may have extremely long cycles, while status-oriented personal luxury sport coupes may have extremely short cycles. While this debate continues, there is no question of the competitive advantage in having the ability and flexibility to rapidly and efficiently respond to changing market demands.

MKT-22. What organizational, technological, and/or business environment changes will need to occur to realize your U.S. forecast in MKT-21a and MKT-21b?

Changes Necessary	Percent of Total Responses
Increase use of product development teams (including improvements in scheduling, accountability, responsibility)	18%
Reduce bureaucracy and hierarchy (including less top management involvement through product development)	14
Increase supplier integration (including early sourcing, closer relationships, joint R&D)	14
Increase use of computerization, CAD/CAM, and simulation	9
Improve product definition (including improved marketing, understanding of customer value)	8
Increase use of "real" simultaneous engineering	7
Increase focus on people resources (including workforce involvement, changing rewards, training, skills)	7
Increase R&D and technical innovation in product and process(including rapid modeling techniques)	6
Standardize component systems across vehicle lines	5
Reduce scale of plants (including improve flexibility)	4
Increase plastics/spaceframe construction	3
Revise financial evaluation systems	3
Stabilize regulatory environment	2

Single responses include: reorganize distribution system, refocus companies on automotive, and develop centers of expertise.

MANUFACTURER/SUPPLIER COMPARISON

These comparisons are not made for open-ended questions.

TREND FROM PREVIOUS DELPHI SURVEYS

As with the current survey, Delphi V panelists highlighted internal management and organizational issues as barriers to improved product development efforts. Increased use of CAD/CAM technologies, integration of supply base resources, and standardization of systems and components are mentioned in both surveys. There are no significant additions or deletions from this list.

STRATEGIC CONSIDERATIONS

The previous question identifies expected progress in traditional domestic manufacturers' product development timing schedules. It is one thing to say progress will occur, but it is a completely different matter to identify how that progress will be implemented. The answers to this question attempt to identify what changes are necessary to achieve the up to 30% product development timing reduction anticipated in MKT-21.

The respondents clearly believe that the majority of progress is to be made not through "hard" technology (CAD/CAM and rapid modeling techniques), but available "soft" technology (internal and external organizational structures and human relations efforts). For the most part, the "soft technology" hardware is already in place. The vehicle manufacturers and suppliers have the people, and it is a matter of improving skills and operating businesses (the software) to meet international competition. Responses of increasing use of product development teams, reducing bureaucracy, increasing supplier integration, increasing use of "real" simultaneous engineering, and increasing the focus on people resources (60% of the

responses) do not indicate the need for new hard capital investment or radical technological development. These responses indicate a new way of doing business: focusing on the skills, ideas, and energy of the entire workforce and managing every internal and external interface to leverage every available resource.

The product time to market progress identified in question MKT-21a and MKT-21b will not occur without fundamental organization and operating philosophy changes. Companies can no longer inappropriately reorganize staffs because of tradition or internal politics. Management needs to recognize that tradition and internal politics are potential barriers to change. Falling back on internal excuses as to why change cannot occur is not responsive to the external market. If strategies and actions are consistent with the demands of the market and competition, it appears workforces are more likely to change than if actions are inconsistent and internally politically motivated.

IV. U.S./CANADIAN LIGHT-VEHICLE SALES AND SEGMENTATION

MKT-23. **Please forecast, in thousands of units, the number of passenger cars and light trucks which will be sold in the U.S. and Canada by traditional domestic dealer networks and traditional import dealer networks for 1995 and 2000.**

Market/Network	Est. 1990*	Median Response (In thousands)		Interquartile Range (In thousands)	
		1995	2000	1995	2000
U.S. total passenger car sales					
TAM	6,148	6,300	6,500	6,200/6,300	6,350/6,600
Total import nameplates	3,171	3,500	3,900	3,300/3,600	3,670/4,000
Canadian total passenger car sales					
TAM	533	550	590	530/600	550/600
Total import nameplates	378	400	435	400/400	420/475
U.S. total light truck sales					
TAM	3,753	3,900	4,150	3,900/4,000	4,000/4,250
Total import nameplates	745	850	1,000	800/960	870/1,200
Canadian total light truck sales					
TAM	351	375	400	370/400	395/420
Total import nameplates	86	100	120	95/100	110/140

*Source: Automotive News

SELECTED EDITED COMMENTS

- Domestic manufacturers are getting better and the consumer will discover this soon.
- Imports will continue to capture share, but at a declining rate in the second half of the 1990s.

MANUFACTURER/SUPPLIER COMPARISON

Manufacturer and supplier forecasts are within 10% of one another on all categories except import U.S. light truck nameplate sales. Suppliers forecast this segment to reach 850,000 units in 1995 and 1 million in 2000. Manufacturers view this segment as being much more explosive, forecasting it to reach 1 million in 1995 and 1.3 million in 2000.

TREND FROM PREVIOUS DELPHI SURVEYS

The current panel's responses are more pessimistic compared with Delphi V results regarding the 1995 and 2000 U.S. passenger car and light truck market (only for the 2000 light truck market are the results slightly higher than previously forecasted). These overall forecasts reflect a specific snapshot of opinion in time and might well be different if the survey were conducted today. The most important insight from the panelists' opinion changes is that in each case where the market expectation dropped, the TAMs took a proportionately larger reduction than the imports. This indicates the potential downward marketshare risk that faces the TAMs and reinforces their difficult road ahead in rebuilding core market share--market share that exists from foundation customers, customers who are loyal, not those that buy strictly for the latest rebate offer. If the markets are to remain weak as predicted, then the game of rebates will likely continue. However, offering the product and service that build consumer loyalty and overshadow rebates will determine who loses proportionately less marketshare. The change to the 2000 light truck market--the only market revised upward--is split equally between the TAMs and the import distributors. The table below presents the comparison data.

Market/Network	U.S. New Vehicle Sales: Delphi V vs. Delphi VI Trend Comparison			
	Delphi V 1995	Delphi VI 1995	Delphi V 2000	Delphi VI 2000
U.S. total passenger car sales				
TAM	6,800	6,300	6,980	6,500
Total import nameplates	3,780	3,500	3,930	3,900
TOTAL	10,580	9,800	10,910	10,400
U.S. total light truck sales				
TAM	4,090	3,900	4,100	4,150
Total import nameplates	960	850	940	1,000
TOTAL	5,050	4,750	5,040	5,150

STRATEGIC CONSIDERATIONS

Although not as severe as market share reductions of past decades, the panelists foresee continued Big Three market share erosion in the passenger car and light truck market in the United States and North America. Overall, respondents believe traditional American manufacturers' (TAMs) marketshare will drop 3% between 1990 and 2000 in North America (from 71% to 68%). These losses will be approximately equal in both passenger car (3%) and light truck (2%) over the next ten years. In the total North American market, passenger car market share is expected to continue dropping through 2000, although not as dramatically as current market trends might indicate, to 67% of the market from 69% in 1990.

The responses indicate that at the macro-level the industry may be beginning to stabilize in terms of market share. However, nothing is guaranteed for specific domestic and foreign manufacturers. This question does not ask specific company expectations, and although the aggregate numbers may add up the same, battles will be won and lost at the company and that will determine the success of the manufacturers as well as their supply base. Even within this ten-year period, individual companies may cycle through increasing levels of market share with new product introductions and lean years, struggling to hold onto precious market share.

To date, successful, dominant auto industry players have capitalized on the industry's economies of scale as a method of limiting competitive entry and maintaining cost performance. There is a legitimate concern that when companies, or national industries, fall below sales market shares that justify production economies of scale, a "freefall" may occur. Continual cost cutting, asset reduction, capacity rationalization, and so forth, can spiral a company or a national industry downward in an ever-losing fight to regain competitiveness. It appears that the Big Three and many of their suppliers are nearing this point of "critical mass." This may be a major reason behind the many Big Three consortia and current and rumored anti-dumping cases. Many companies are at this fork in the road: to fight back or fundamentally change the direction and strategy of their company. The UAW may also face this decision. When their membership drops below one million, they too must join forces and fight back or change their perspective of the role they play within the U.S. auto industry.

MKT-24. The fragmentation of the U.S. passenger car market into niches can be measured by the number of nameplate offerings and average sales per nameplate. Please give your estimate for traditional domestic and foreign manufacturers' U.S. passenger car sales in 1995 and 2000.

Market Segmentation Trends	Est.* 1989	Median Response		Interquartile Range	
		1995	2000	1995	2000
Number of nameplate					
Traditional domestic	68	70	72	68/70	65/75
Import	69	72	75	70/72	70/77
Average Sales/Nameplate					
Traditional domestic	90,000	88,000	85,000	85,000/90,000	80,000/90,000
Import	46,000	49,000	50,000	48,000/50,000	48,000/52,000

* Source: Automotive News

SELECTED EDITED COMMENTS

- Auto leasing will drive greater variety, demanding faster and more plentiful models to choose from.
- By the mid- to late-1990s, the average age of the buyer will be significantly higher and the attitude of this customer-base will be a departure from the "statement of niches" vehicles to the more traditional models.
- I am having trouble with your framing of this question. I believe there will be more nameplates available and fewer sales per nameplate, principally due to erosion of high volume sales ability for both domestic and imports. More of the fragmentation, however, will be from different models and body styles under an umbrella nameplate because manufacturers will not be able to afford marketing too many nameplates.
- I personally believe the consumer is deluged with the number of vehicles offered. Many nameplates have lost their traditional identity. Manufacturers will tend to offer fewer models with higher promotional campaigns per vehicle.
- Light-duty trucks and sport utility vehicles will greatly increase the number of niches.
- My sales per nameplate are on the high end because of my sales forecast on MKT-21.
- Niche is a word Detroit has yet to understand. Bean counter mentality precludes niche markets expanding for domestics.
- With retailers' current concern about accessory package, model proliferation, and customer/salesman confusion, we should beware of nameplate escalation as well.

MANUFACTURER/SUPPLIER COMPARISON

The manufacturer and supplier panels are within 5% of each other on all forecast categories.

TREND FROM PREVIOUS DELPHI SURVEYS

There is a dramatic reversal in the trend of increasing offered nameplates and decreasing unit sales per nameplate from the previous Delphi survey. Where respondents forecasted 100 and 90 vehicle offerings for traditional domestic and import manufacturers, respectively, in 2000, the current panel projects only 72 and 75, respectively. Because of these expectations and the current expected 2000 market, the average sales per nameplate forecast for 2000 has risen significantly--30% for TAMs and 32% for imports. It is difficult to ascertain whether this is a clear shift in previous thoughts on market segments and niches. The change may be connected to the factors discussed in MKT-21. Whatever the cause of this reversal, the number of nameplate offerings, the flexibility to produce those offerings, and the related issues will be interesting to track over the next few years.

STRATEGIC CONSIDERATIONS

Two interesting trends are revealed in the responses to this question. First, the TAM's trend of average unit sales per nameplate is decreasing as the number of nameplates increase, and second, import average unit sales per nameplate continue to increase with an increase of nameplate offerings. It appears that these trends reflect more the panelists' views of these two manufacturing groups' sales expectations than the fragmentation of the market. In fact, the panelists do not see movement in the number of models: four more models for the TAMs, about one for each of the Big Three, and six more nameplates across all the importers. This is not a significant change over the next ten years.

In the mature market ahead, there obviously will be a substitution of new nameplates for old--balancing off the risk of losing current brand loyalty with the benefit of establishing a new brand identity. Suppliers must keep aware of the fortunes of individual manufacturers they depend on, as well as the success rate of particular nameplate lines, individual divisions, or plants. Many responses to other questions identify the need of manufacturing flexibility in a changing market. Suppliers also need flexibility for survival in meeting the changing needs of the manufacturers.

MKT-25. **Please forecast the percent of the total U.S. passenger car market (domestic and import) by body style type.**

Body Type	Est. 1989 MY*	Percent of Total Market			
		Median Response		Interquartile Range	
		1995	2000	1995	2000
4-door Sedan	50%	50%	51%	49/52%	49/53%
4-door Hatchback	3	3	3	2.8/3.3	2/3.5
4-door Station Wagon	7	6	5	5/6.7	4/6.5
SUBTOTAL	60	59	59		
2-door Coupe	21	21	21	20/22	20/23
2-door Hatchback	17	17	17	16/17.6	15/18
Convertible	2	3	3	2.1/3	2/3
SUBTOTAL	40	41	41		

* Source: Automotive News

NO COMMENTS

MANUFACTURER/SUPPLIER COMPARISON

The two panels are essentially the same.

TREND FROM PREVIOUS DELPHI SURVEYS

The only significant difference between the Delphi V and Delphi VI is the expected gain of 2-door hatchback sales at the expense of 4-door hatchback sales. The current survey shows 17% share for the 2-door hatchback in 1995 and 2000, while the 1989 survey forecasts only 12%. Three percentage points of this gain in 1995 and 2000 came from 4-door hatchback sales which were, in Delphi V, forecast to be 6% in each year. Although it is always difficult to precisely forecast particular slices of the market, the current forecast may indicate a slowing of growth rates experienced by the 4-door market over the past decade.

STRATEGIC CONSIDERATIONS

Although panelists forecast no significant changes over the next ten years, manufacturers and suppliers need to track developments within each category. Higher performance 4-door sedans may bridge the needed practicality of carrying four or five passengers with the excitement of a two-door coupe. Wagons, once thought to be boxy and without styling, are now being styled with increasing grace. As manufacturers respond to changing market demands, suppliers need to remain aware of program activity and innovatively support manufacturer product development activity.

MKT-26. **Please forecast in thousands of units, the number of passenger cars to be sold in 1995 and 2000 in the U.S. market. (Please see segmentation definitions on page 58).**

Passenger Car Sales by Segment	Est. 1990*		Median Response		Interquartile Range	
	Sales	Percent of Total	1995	2000	1995	2000
Lower Small						
TAM	783	8%	800	825	780/850	780/850
Import	1,049	11	1,100	1,120	1,051/1,200	1,055/1,300
Upper Small						
TAM	563	6	570	578	570/641	570/687
Import	404	4	420	425	410/440	412/475
Small Specialty						
TAM	218	2	225	225	220/250	215/300
Import	272	3	280	285	275/300	274/325
Lower Middle						
TAM	1,332	14	1,350	1,400	1,345/1,400	1,359/1,500
Import	884	9	900	920	890/919	900/950
Upper Middle						
TAM	1,050	11	1,100	1,110	1,075/1,100	1,075/1,200
Import	221	2	225	235	220/250	225/270
Middle Specialty						
TAM	309	3	310	311	300/320	275/325
Import	210	2	315	225	210/250	215/270
Large						
TAM	708	8	715	715	695/810	692/840
Import	0	0	0	0	0/0	0/25
Large Specialty						
TAM	184	2	185	190	180/200	160/200
Import	0	0	0	0	0/8	0/20
Lower Luxury						
TAM	144	2	150	150	145/160	146/175
Import	86	1	90	92	85/90	85/100
Middle Luxury						
TAM	351	4	360	365	355/400	353/428
Import	139	2	145	150	141/160	145/180
Upper Luxury						
TAM	0	0	0	0	0/0	0/25
Import	143	0.5	150	150	145/165	146/190
Luxury Specialty						
TAM	173	2	175	180	173/180	173/190
Import	21	0.5	25	25	21/25	23/30
Luxury Sport						
TAM	32	0.5	32	32	30/35	30/37
Import	46	0.5	48	50	46/50	46/55

* Source: Ward's Automotive

SELECTED EDITED COMMENTS

- Consider smaller or different groupings.
- Here again percent estimates would be easier to forecast.

MANUFACTURER/SUPPLIER COMPARISON

For the most part, suppliers and manufacturers agree on all but four segments: small specialty, lower middle, upper middle, and middle specialty. Every other total segment and TAM/import split is within 10% of each other. The table below presents data on the differing segments. These differences are a mixture of disagreement over total segment size, growth of import participation, and TAM competitiveness. It is obvious that TAMs are more optimistic than suppliers regarding their ability to market vehicles.

Category	U.S. Passenger Car Sales: Manufacturer vs. Supplier Comparison			
	OEM	Supplier	OEM	Supplier
	1995	1995	2000	2000
Small Specialty				
TAM	230	220	225	225
Import	280	220	290	220
Lower Middle				
TAM	1,350	1,150	1,400	1,200
Import	900	740	928	770
Upper Middle				
TAM	1,100	820	1,100	720
Import	225	225	235	230
Middle Speciality				
TAM	310	260	311	270
Import	215	210	225	215

STRATEGIC CONSIDERATIONS

Many factors are involved in the segmentation of the marketplace: overall economic conditions, personal disposable income, styling trends, and others. This multitude of factors complicates market forecasting, particularly when the market is divided into small divisions or the forecast period is long. Despite these difficulties the panelists ventured to complete this question and the next.

The respondents indicate the following segments growing 5% or more over the next eight years: lower small, upper middle, and all five of the luxury segments. Using this segmentation scheme, no individual segment is forecast to grow faster than the overall market. Competitive pressure will expand as every company struggles to increase production, market shares, revenue, and profit.

Although the panelists do not forecast any great change in the marketshare position of the TAMs in individual segments (plus or minus 2% over next decade) a distinct threat to the TAMs is shown. In most segments, imports have a very low percentage of the market or 50 to 60%. Only in a few segments (upper middle, middle luxury, and luxury specialty) where both imports and domestics compete, do the TAMs have segment control with over 75% of the market. Therefore, although the panelists may not foresee significant changes, it appears the imports have selectively chosen their initial entry and with the stagnant overall market must certainly be investigating product in those segments where they have little or no presence. In fact, there are rumored Nissan and Toyota large-car programs in development that will go head-to-head with the Chevrolet Caprice and Ford Crown Victoria. If these products are launched, the panelists' forecasts may be optimistic for the TAMs.

MKT-27. **Please forecast, in thousands of units, the number of light trucks to be sold in the following years in the U.S. market. (Please see segmentation definitions on page 58).**

Light Truck Sales by Segment	Est. 1990*		Median Response		Interquartile Range	
	Sales	Percent of Total	1995	2000	1995	2000
Small Sport/Utility						
TAM	567	12.0%	600	615	570/600	580/650
Import	163	4.0	170	190	165/200	170/220
Large Sport/Utility						
TAM	171	4.0	175	180	171/200	165/220
Import	10	0.5	12	15	10/15	10/20
Small Van						
TAM	832	18.0	875	925	840/900	860/955
Import	91	2.0	100	120	95/120	100/150
Large Van						
TAM	395	9.0	380	375	345/400	300/400
Import	0	0.0	0	0	0/0	0/0
Small Pickup						
TAM	782	17.0	800	815	790/800	800/825
Import	331	7.0	340	360	330/350	330/380
Large Pickup						
TAM	1,208	27.0	1,220	1,121	1,100/1,250	1,100/1,280
Import	0	0.0	10	40	0/40	0/100
TOTAL	4,500	100.5%**				

*Source: Ward's Automotive Reports

** Over 100% due to rounding.

SELECTED EDITED COMMENTS

- Small sport and small pick-up increasing.

MANUFACTURER/SUPPLIER COMPARISON

Each manufacturer and supplier forecast category is within approximately 10% of each other except one--large pickup truck. Suppliers forecast 50,000 import large pickup sales in 1995 and 150,000 in 2000, compared with the manufacturers' 5,000 and 12,000 expectations, respectively. The upper quartile range comparisons are equally troubling. Suppliers' upper quartile range is 200,000 for 1995 and 300,000 by 2000; manufacturers' range is only 20,000 by 1995 and 80,000 by 2000. Given that the Big Three and their suppliers derive significant sales and profits from this segment, a better understanding of foreign manufacturer strategies in the full-size light truck market is essential.

TREND FROM PREVIOUS DELPHI SURVEYS

This question was not asked in a previous Delphi.

STRATEGIC CONSIDERATIONS

The marketing panelists believe that the small sport/utility and small van are the fastest growing light-truck segments. TAMs dominate every light-truck segment (unlike passenger car segment) and are predicted to continue to do so. But TAM success is not guaranteed. There is a risk that myopic marketing and product planning practices may lead the TAMs down the same route of marketshare decline that occurred in the passenger car market. It is logical that with slow overall market growth, manufacturers will be attracted to those market segments that are growing the fastest. Thus, light trucks will be a tremendously

competitive market in the 1990s; the TAMs will be defending one of their last remaining strongholds and imports will be fighting to gain a foothold in this expanding market. The panelists' forecast import segment increases from 9% in the small pickup segment--the segment with the greatest import success to date--to 32% in small vans and 50% in the large sport/utility segments. Of course, Toyota is capable of launching a full-size pickup before the decade is over and this will be the initial entry of the Japanese into the full-size light truck arena. This product introduction will require sophisticated management of both market and political forces. The light truck competitive fight at the vehicle manufacturer and supplier levels has only just begun.

1991 MODEL YEAR

VEHICLE SEGMENTATION DEFINITIONS

Segment	Traditional American Manufacturers	Import
PASSENGER CARS		
Lower small	Escort, Horizon, Shadow	Fox, Sentra, 323
Upper small	Tempo, Reliant, Sunbird	Stanza, Cordia, Integra
Small specialty	Daytona, Probe, Eclipse	Miata, Storm, Capri
Lower middle	Grand AM, Ciera, Skylark	Camry, Audi 4000, Mazda 626
Upper middle	Sable, Regal, Grand Prix	Infiniti G20, Quantum
Mid-specialty	Camaro, Firebird, Mustang	Celica, Prelude, Stealth
Large	Caprice, Olds 88, Crown Victoria	
Large specialty	Thunderbird, Cougar	
Lower luxury	Fifth Avenue, Olds 98, Roadmaster	Cressida, Saab 900S
Mid-luxury	Lincoln, Cadillac	Volvo 760, BMW 325ix
Upper luxury	Jaguar, Lexus, Mercedes	
Luxury specialty	Mark VII, Seville, Riviera	BMW 850i, Mercedes 560SEC
Luxury sport	Corvette, Allante	Porsche, Acura NSX
LIGHT TRUCKS		
Small sport/utility	Blazer, Wrangler, Explorer	Amigo, Samurai, Rocky
Large sport/utility	Blazer, Bronco, Jimmy	Rover, Land Cruiser
Small van	Voyager, Trans Sport	Toyota, Mitsubishi, Nissan
Large van	Chevy, Ford, Dodge	
Small pickup	Ranger, S-10, Dakota	Isuzu, Toyota, Nissan
Large pickup	Ford F100-350, Chevy C/K	

Source: Ward's Automotive Reports

V. WORLD MOTOR VEHICLE PRODUCTION AND EXPORTS BY COUNTRY

MKT-28. **Please forecast, in millions of units, the number of passenger cars, trucks, and buses which will be produced in the following countries.**

Passenger Car Sales by Country	Est.[a] 1990	Median Response		Interquartile Range	
		1995	2000	1995	2000
Japan					
Passenger Car	9.2	9.4	9.4	9.0/9.7	9.0/10.0
Truck/Bus	3.3	3.5	3.7	3.0/3.5	3.3/3.9
United States					
Passenger Car	6.2	6.6	7	6.5/7.0	6.7/7.5
Truck/Bus	3.8	4.0	4.3	3.9/4.0	4.0/4.5
Germany [b]					
Passenger Car	4.2	4.5	4.7	4.3/4.8	4.4/5.0
Truck/Bus	0.3	0.4	0.4	0.3/0.5	0.3/0.6
France					
Passenger Car	3.1	3.2	3.3	3.0/3.4	3.1/3.5
Truck/Bus	0.5	0.5	0.5	0.5/0.6	0.5/0.7
USSR [c]					
Passenger Car	1.3	1.5	1.8	1.4/2.0	1.5/3.0
Truck/Bus	0.9	1.0	1.2	1.0/1.1	1.1/1.5
Italy					
Passenger Car	1.8	1.8	2.0	1.7/2.0	1.8/2.0
Truck/Bus	0.2	0.2	0.3	0.2/0.3	0.2/0.3
Canada					
Passenger Car	1.1	1.2	1.3	1.1/1.2	1.1/1.3
Truck/Bus	0.9	1.0	1.0	0.9/1.0	0.9/1.0
Spain					
Passenger Car	1.4	1.5	1.6	1.4/1.7	1.5/1.8
Truck/Bus	0.3	0.4	0.4	0.3/0.4	0.3/0.5
UK					
Passenger Car	1.1	1.2	1.2	1.0/1.3	1.0/1.5
Truck/Bus	0.3	0.3	0.3	0.3/0.4	0.3/0.4
Korea					
Passenger Car	1.1	1.3	1.5	1.2/1.5	1.4/1.8
Truck/Bus	0.3	0.4	0.4	0.3/0.4	0.4/0.5
Brazil					
Passenger Car	0.6	0.7	0.8	0.6/0.8	0.7/1.0
Truck/Bus	0.2	0.3	0.3	0.2/0.3	0.2/0.4
Sweden					
Passenger Car	0.30	0.3	0.3	0.3/0.35	0.3/0.4
Truck/Bus	0.06	0.1	0.1	0.05/0.1	0.1/0.1

a. Source: Automotive News

b. Includes 1988 E. Germany production.

c. 1988 actual

NO COMMENTS

MANUFACTURER/SUPPLIER COMPARISON

The two panels are within approximately 10% of each other.

TREND FROM PREVIOUS DELPHI SURVEYS

This question was not asked in a previous Delphi.

STRATEGIC CONSIDERATIONS

Among the top twelve world motor vehicle manufacturing countries, no significant changes in production volumes are expected to occur over the next decade. The respondents show only one position change--Korea surpassing the United Kingdom for ninth position and closely challenging Spain. There appears to be three distinct groups of country growth rates. On a percentage basis, the USSR, Korea, and Brazil are all expected to have total motor vehicle production growth rates of over 35% from the base 1989 levels. A second group of countries are clustered between 10% and 20% growth rates over the decade. These countries are Spain, Canada, Italy, Germany, and the United States. The third group--low growth countries below 10% increases over 1989--consist of the United Kingdom, Japan, France, and Sweden. Within each group is some combination of North American, European, and Asian countries; there is not one region that contains only fast or slow growth countries. The growth in Spain, Canada, Germany, and the United States may be partially explained by an expected rebound in the overall market from 1989 by 2000 and the expansion of Japanese manufacturing capacity.

The various patterns of growth highlight the internationalization of the industry. It appears that manufacturers and suppliers who wish to operate at world class levels and participate significantly in the world's markets can no longer remain within one specific trading block. Corporations are marketing, manufacturing, procuring, financing, and engineering products on a worldwide scale. Globalization efforts occur to gain access to growing markets, keep close proximity to valued customers, and leverage available human resources, financial, and physical plant capacities and capabilities. Of course, it is one thing to say a company is international and another to truly operate globally in a coordinated, integrated and leveraged manner. It will be a challenge for manufacturers and suppliers to leverage global resources through physical asset expansion or formal and informal business relationships. The tactical strategies for globalization should be determined by maximizing customer satisfaction and business-system efficiencies. The following question considers the next three largest producing countries after the twelve countries considered in MKT-28.

MKT-29. **Please forecast, in millions of units, the number of passenger cars, trucks, and buses which will be produced in the following countries.**

Country	Estimated 1990* (in millions)	Median Response (in millions)		Interquartile Range (in millions)	
		1995	2000	1995	2000
Mexico					
Passenger Car	0.514	0.70	1.0	0.6/0.8	0.75/1.0
Truck/Bus	0.205	0.25	0.4	0.2/0.3	0.28/0.5
Australia					
Passenger Car	0.349	0.40	0.4	0.35/0.4	0.38/0.5
Truck/Bus	0.021	0.10	0.1	0.03/0.06	0.03/0.1
India					
Passenger Car	0.215	0.25	0.3	0.25/0.3	0.28/0.4
Truck/Bus	0.142	0.17	0.2	0.15/0.2	0.18/0.3

*Source: Automotive News

SELECTED EDITED COMMENTS

- Mexican projections assume a free trade agreement.
- Not a factor--expect Mexico to be included in a free trade agreement.
- The potential for India becoming a major player in auto production is enormous.
- Who knows? It is tough enough forecasting U.S. production 10 years in the future.

MANUFACTURER/SUPPLIER COMPARISON

The two panels are within approximately 5% of each other.

TREND FROM PREVIOUS DELPHI SURVEYS

This question was not asked in a previous Delphi.

STRATEGIC CONSIDERATIONS

In MKT-26 panelists were asked to consider future production volumes for today's top twelve vehicle manufacturers. So that smaller, rapidly growing countries would not be missed, panelists were asked to consider Mexico, Australia, and India separately. The panelists believe that each of these countries will surpass Sweden as the twelfth largest producer and Mexico will surpass Brazil and challenge the United Kingdom for the tenth position. To achieve this, Australia's total production over the next decade is expected to grow 22%; India, 40%; and Mexico, 95%. As the comments indicate, many panelists believe some form of a free trade agreement will exist for automotive trade between the United States and Mexico, and probably including Canada. These production estimates present many opportunities for vehicle manufacturers and component suppliers. Particularly for Mexico, business opportunities will emerge for local production and export and import trade. Each market offers distinct operating conditions, business practices, and traditions--careful study is warranted before jumping into any one of these markets.

MKT-30. **Please forecast, in millions of units, the number of total motor vehicle units which will be produced and exported from the following countries.**

Country	Estimated. 1989** (in millions)	Median Response (in millions)		Interquartile Range (in millions)	
		1995	2000	1995	2000
Japan	6.1	6.3	6.6	6.1/6.8	6/7
Germany*	2.7	2.8	3.0	2.7/3	2.8/3.1
France	2.3	2.2	2.2	2/2.3	2.0/2.3
Canada	1.6	1.6	1.7	1.6/1.7	1.6/1.8
Belgium	1.1	1.1	1.1	1/1.1	1.0/1.2
United States	1.0	1.2	1.4	1/1.3	1.1/1.5
Spain	0.9	1.0	1.0	0.9/1	0.9/1.0
Italy	0.8	0.8	0.8	0.8/0.9	0.7/1.0
Korea	0.5	0.6	0.8	0.6/0.7	0.7/1.0
United Kingdom	0.3	0.3	0.3	0.3/0.4	0.3/0.5
Brazil	0.3	0.3	0.4	0.3/0.4	0.3/0.5

* Includes East and West Germany.

** Source: MVMA

NO COMMENTS

MANUFACTURER/SUPPLIER COMPARISON

The two panels are within approximately 10% of each other.

TREND FROM PREVIOUS DELPHI SURVEYS

This question was not asked in a previous Delphi.

STRATEGIC CONSIDERATIONS

Five countries are expected to have double-digit export growth rates over the next decade: Korea, the United States, Brazil, Spain, and Germany. These countries are likely to build their export base an additional 11% to 60%. With these growth rates, the United States may surpass Belgium to become the fifth largest exporter and challenge Canada's position. Brazil may surpass the United Kingdom. In contrast, the leading exporter, Japan, may see only an 8% increase from 1989, but will still remain in first, exporting twice as many vehicles as Germany, the next largest exporting country.

The globalization of the Japanese automotive industry will play a significant role in determining export patterns over the next ten years. As Japanese manufacturing centers are established beyond their domestic borders, Japan may depend more upon local manufacturing for local sales. This will limit potential Japanese export growth, place Japanese manufacturers at risk dealing with local market cycles, and increase the complexity of managing a divergent workforce, organizational structure, and product lineup. However, globalization of manufacturing may be the only route to maintain or grow current market shares without political and consumer backlash. It will be an interesting decade of emerging changes in world vehicle and component trade flows.

VI. VEHICLE ATTRIBUTES AND FEATURE PENETRATION RATES

MKT-31. **Please prioritize the five most important product attributes that will differentiate passenger vehicles in the U.S. market over the next ten years. Please consider product-specific features as well as owner relationship services.**

Differentiating Product Attributes	Percent of Total Responses
Styling (including exterior and interior styling, status, image)	16%
Owner-dealer relationship (including sales and service satisfaction)	14
Powertrain (including engine, transmission performance, and fuel economy)	14
Advanced product features and functions (including ABS, high technology features)	13
Safety	10
Price/affordability (including customer value perception, financing, cost of operation, insurance)	9
Perceived reliability/durability	6
Comfort/convenience (including versatility)	6
Perceived quality	5
Ride/handling	4
Environmental responsiveness	3

Single responses include: resale price and lightweight materials.

MANUFACTURER/SUPPLIER COMPARISON

These comparisons are not made for open-ended questions.

TREND FROM PREVIOUS DELPHI SURVEYS

Powertrain and styling again fall into the panelists' top five considerations. However, perceived quality of manufacturer/vehicle, perceived vehicle reliability/durability, and price--the top five attributes in Delphi V--drop into the second five attributes for 1991. These three factors are replaced with the owner-dealer relationship, advanced product features, and safety. Although it must be noted that the percentages of respondents are very close so, it is difficult to make definitive statements. It is interesting how often price and affordability are brought up in Delphi VI panelists' comments since this factor dropped in importance. However, as mentioned in other questions presenting lists of priorities, the factors listed above are all important and must be simultaneously achieved to accomplish true customer satisfaction.

STRATEGIC CONSIDERATIONS

In the opinion of the panelists, styling (interior and exterior) remains the key point of product differentiation. One non-product specific attribute is in the top five--owner-dealer relationship. The other three key attributes, powertrain, advanced product features, and safety, each receive significant amounts of capital investment and marketing expenditures. Although the eleven attributes in MKT-31 are prioritized by total number of responses, it should be noted that for the mass market, no one attribute may be excluded or compromised for another attribute. All of these differentiators must be addressed with complete customer satisfaction. The customer is searching for the best place to spend his or her dollar and there is intense competition for that dollar. Therefore, if any aspect of the sales, ownership, or service experience is less than satisfactory, the customer will either eliminate or lower that manufacturer on his or her trade-in shopping list.

Complete customer satisfaction across this list seems a formidable challenge. However, many of these attributes are linked; i.e., solving one problem, feeds back into many other attributes. For example, safety may be directly addressed by the

availability of anti-lock brakes or driver- and passenger-side air bags, equipment listed under advanced product features. Of course, perceived quality is a consideration in the product's initial design and manufacture. Keeping people out of the service bays simplifies the owner-dealer relationship. If a problem does arise, good service satisfaction improves the image of perceived reliability and durability because problems are solved in a convenient and inexpensive manner.

One attribute that may never be slighted, that is first among equals, is price and affordability. Pricing of the vehicle and option packages has much to do with the success or failure of new and existing product Manufacturers must be aware of the transaction prices of both direct competitors as well as products in adjacent segments that, for reasons of price, indirectly compete for customers. Many market anomalies occur because, given incentive and option packages, some products become affordable compared with others.

MKT-32. **With the light truck market attracting many new nameplate and model competitors, what five key product features, designs, or offerings do you feel will be necessary over the next ten years to best differentiate models?**

Differentiation Attributes	Percent of Total Responses
Advanced product features and functions (including ABS, high technology features)	13%
Styling (including exterior and interior styling, status, image)	11
Comfort/convenience (including versatility)	11
Utility/function	11
Price/affordability (including customer value perception, financing, cost of operation, insurance)	10
Safety	9
Ride/handling	8
Powertrain (including engine, transmission performance and fuel economy)	7
Owner-dealer relationship (including sales and service satisfaction)	6
Perceived reliability/durability	5
Fuel economy	3

MANUFACTURER/SUPPLIER COMPARISON

These comparisons are not made for open-ended questions.

TREND FROM PREVIOUS DELPHI SURVEYS

This question was not asked in a previous Delphi.

STRATEGIC CONSIDERATIONS

For the most part, respondents selected attributes similar to passenger cars to describe future light truck differentiating features, although in a different priority order. In fact, four of the top five attributes are the same for both segments--clearly showing the predominance of personal transportation use of light trucks rather than strict commercial use. The panelists indicate utility and function--a traditional light truck attribute--as the second most important attribute, but it ties with styling and comfort and convenience items. Surprisingly, utility and function replace powertrain offerings in the top five differentiators for light-trucks.

The light truck market is similar to the passenger car market in that manufacturers must address each of these differentiators simultaneously. This is an especially difficult task for the light truck divisions because, for the most part, it has only been relatively recent that issues of styling, advanced product features, and safety--traditional passenger car concerns--have been priorities with light truck designers. With more competition in the truck segment, it is likely that there will be more frequent styling changes, greater emphasis on interior design, and proliferation of nameplates and body types. This will actually make the design of a truck that much more challenging: on one hand the truck must be comfortable enough for a weekday commute and stylish enough for a night out, while on the other hand, it must have the versatility to run moderate off-road excursions and haul or tow cargo. Of course this feat must be achieved without compromising price and affordability, safety, and the other attributes identified by the respondents. Indeed, effective light truck designing is a formidable task.

MKT-33a. **What will be the total passenger car and light truck U.S. market (domestic and import) penetration rate (in percentage) for the following powertrain, suspension, and chassis features?**

Passenger Car	Est. 1990 MY*	Median Response		Interquartile Range	
		1995	2000	1995	2000
Turbocharger/Supercharger	4%	5%	5%	5/5%	5/8%
Multi-valve engine cylinder	10	18	30	15/20	25/36
Active suspension control	2	4	5	3/5	5/7
4-wheel drive	1	2	3	2/3	3/5
Active 4-wheel steering	<1	2	3	2/3	3/5
CVT transmissions	<1	2	4	1/2	1/5
Light Truck	**Est. 1990 MY***	**Median Response**		**Interquartile Range**	
		1995	2000	1995	2000
Turbocharger/Supercharger	1%	1%	2%	1/2%	1/3%
Multi-valve engine cylinder	n/a	5	10	3/5	5/15
Active suspension control	0	0	1	0/1	0/1
4-wheel drive	30	35	40	35/40	40/45
Active 4-wheel steering	0	0	0	0/0	0/1
CVT transmissions	0	0	0	0/0	0/1

*Source: Automotive News

Other single responses include: advanced engines (e.g., Orbital); anti-theft (car): 1995 = 15%; 2000 = 60%; cellular phone: 1995 = 25%; 2000 = 40%; new hydraulic power steering: 1995 = 5%; 2000 = 10%; variable electric steering: 1995 = 25%; 2000 = 35%; and electric powered: 1995 = 2%; 2000 = 10%.

SELECTED EDITED COMMENTS

- I see active suspension with more application in trucks, as it is more difficult to get acceptable ride, handling, and other attributes simultaneously. Therefore active suspension will have more of a payoff.

MANUFACTURER/SUPPLIER COMPARISON

There are significant differences of opinion between the suppliers and manufacturers on a few of these advanced technologies. The issues outlined here are applicable to this set of technologies as well. The table below presents the technology features with the greatest opinion differences between the manufacturers and suppliers.

Powertrain System Technologies:	Manufacturer vs. Supplier Comparison			
	OEM	Supplier	OEM	Supplier
	1995	1995	2000	2000
Passenger Car				
Multi-valve engine cylinder	17	25	40	30
CVT transmissions	2	2	2	4

COMPARISON OF FORECAST: TECH-29 and TECH-72

With regard to the technologies surveyed, the Marketing panelists were asked to forecast the penetration rates of the designated features for the total U.S. market, including both imports and domestics. The Technology panelists were asked to present their forecasts for North American-produced vehicles (NAPPVs), including traditional American manufacturers (TAMs) and new American manufacturers (NAMs/transplants). Given these conditional stipulations, the Technology and Marketing panelists forecasts of the penetration of four-wheel steering are surprisingly similar. The Technology panelists' forecast for NAPP cars is 1% for 1995 and 3% for 2000. The Marketing panelists' forecast for total U.S. domestic market penetration rate is 2% for 1995 and 3% for the year 2000. The Technology panelists' forecast is 0% four-wheel steering for light trucks by the year 2000 and the Marketing forecast is 0% as well. It appears that these forecasts are similar enough to predict that the markets are fairly well understood.

With respect to CVTs, the Marketing panelists forecast a penetration rate at least twice that of the Technology panelists estimate. The interquartile ranges (IQRs) for the Marketing panel are tighter than those of the Technology panel for 1995. For both panels, the CVT IQRs for 2000 are large and indicate a considerable degree of uncertainty. It should be taken into consideration that the higher median and IQRs that Marketing forecast probably reflect the CVT of the import vehicle market. Both panels are in general agreement on the median and IQR forecasts for four-wheel drive.

TREND FROM PREVIOUS DELPHI SURVEYS

Delphi VI respondents' forecasts are similar to Delphi V panelists on turbocharging/supercharging, active suspension control, active 4-wheel steering, and CVT transmissions. From the panelists' viewpoint, there have been no market or product developments that changed their opinions from two years ago. The four-wheel drive forecast of 2% for 1995 and 3% for 2000 is down slightly from the 4% and 5%, respectively, forecast in 1989. The biggest change is the increased expectation of multi-valve engines. The current panel believes some 17% of the 1995 and 25% of the 2000 U.S. passenger car market will employ this technology. The Delphi V forecast was 10% for 1995 and 20% in 2000.

STRATEGIC CONSIDERATIONS

Passenger Cars

Except for turbocharging/supercharging, each of the identified advanced powertrain or chassis technologies are expected to increase penetration rates dramatically over the next decade. The lowest consensus, median responses are for four-wheel steering and four-wheel drive--each of these is expected to achieve less than three points. However, each of these technologies were at or below only one percentage point in the 1989 model year market, and the upper quartile responses indicate upward potential as well. Multi-valve engines and active suspension controls are all expected to at least double their current penetration rates.

As these systems' market penetration rates grow, suppliers to these systems will see increased opportunities, but these opportunities will be challenging. First, these opportunities may be incremental (that is, i.e., additional electronic sensors or actuators) or substitutional (that is, i.e., brake disc rotors for drums in four-wheel disc brake systems). Some new product technology will provide win-win opportunities, while other technology will provide win-lose situations.

Second, suppliers need to track carefully where these systems' development and engineering are taking place, as this indicates where sourcing and manufacturing decisions are made. System development and manufacturing may be contained within vehicle-manufacturer-allied supplier divisions or large, first-tier suppliers that have complete systems capabilities. Usually the vehicle manufacturer dictates sourcing strategy.

Third, suppliers need to be aware of who produces these cars. The question relates to both domestic and import vehicles; suppliers must be global to take full advantage of these feature growth rates.

And fourth, suppliers need to be aware that while many of these advanced features may be initially sourced to independent suppliers, as penetration rates rise, production climbs, and product and process developments lower production costs, vehicle manufacturer in-sourcing may become attractive. Therefore, suppliers must always be engaged in research and development and applied-product development to continually improve product value and remain competitive against in-sourcing strategies. This is particularly important for suppliers who serve more than one customer, as strategies differ significantly from manufacturer to manufacturer

Light-Trucks

As with passenger cars, light trucks are foreseen as a platform for many new product technologies. Multi-valve engines and four-wheel drive are expected to gain light truck market penetration. Turbocharging/supercharging, active suspension control, active four-wheel steering, and CVT transmissions are not expected to offer significant opportunities. The four general supplier cautions are applicable to light-trucks as well as passenger cars. As consumer preferences in passenger cars and light trucks become more similar, suppliers may leverage off both markets, spreading R&D over a greater base of vehicles. This may make some of these advanced technologies attractive as costs may be reduced and reliability improved.

MKT-33b. What will be the total passenger car and light truck U.S. market (domestic and import) penetration rate (in percentage) for the following brake-system technologies?

Passenger Car	Est. 1990 MY*	Median Response		Interquartile Range	
		1995	2000	1995	2000
4-wheel disc brakes	16%	25%	35%	20/25%	30/45%
Anti-lock brake system	6	25	50	20/36	40/65
Traction (anti-spin) control	<1	2	7	2/5	3/10
Light Truck	**Est. 1990 MY***	**Median Response**		**Interquartile Range**	
		1995	2000	1995	2000
4-wheel disc brakes	2%	5%	10%	5/8%	8/10%
Anti-lock brake system	75	80	90	80/85	90/95
Traction (anti-spin) control	0	2	5	2/3	3/10

*Source: Automotive News

SELECTED EDITED COMMENTS

- ABS will possibly be legislated for passenger cars.
- ABS is going to explode. Traction control then becomes cheap and desirable and its growth will follow ABS.
- These are improved safety features and they are sales differentiators when offered at acceptable prices. Cost savings in car manufacturers will challenge some OEMs to offer these options at acceptable levels.
- These items will become popular more rapidly than most people expect.
- Traction control can be a poor man's 4-wheel drive.
- Traction control is such a small cost add-on once you have anti-lock that I think it will become almost a standard feature with anti-lock. Anti-lock will also become essentially standard on all but the cheapest vehicles.

MANUFACTURER/SUPPLIER COMPARISON

There are significant differences between suppliers' and manufacturers' expectations regarding the application of these technologies. Manufacturers forecast higher penetration rates than do suppliers for these various technologies. These differences raise concerns that, one, real emerging market opportunities are not known; two, communication between the manufacturers and suppliers is less than optimal; and three, suppliers may not know their true customer--the vehicle buyer--as well as they should. Each of these issues affect R&D expenditure strategies, capacity utilization plans, engineering skill requirements, and other business operations. The table below presents the technology features with the greatest opinion differences between the manufacturers and suppliers.

Brake System Technologies	Manufacturer vs. Supplier Comparison			
	OEM	Supplier	OEM	Supplier
	1995	1995	2000	2000
Passenger Car				
Anti-lock Brakes	35%	25%	60%	50%
Traction (anti-spin) control	5	2	10	5
Light Truck				
Anti-lock Brakes	85%	80%	95%	90%
Traction (anti-spin) control	5	2	10	4

COMPARISON OF FORECAST: TECH-33

The Marketing panelists were asked to separate their forecasts for ABS by passenger cars and light trucks, including both domestics and imports, whereas the Technology panelists were surveyed for total North American-produced passenger cars (TAMs and NAMs). The Technology panelists forecast a passenger car ABS penetration rate of 25% for 1995 and 75% for the year 2000. These forecasts are significantly above the Marketing forecasts. It must be questioned whether these markets are well understood and if supply and demand will be matched as markets emerge.

There is also disagreement between the Technology and Marketing panelists regarding traction control. Even on an average, the Marketing panelists are significantly lower in their forecasts for the percentage of application of this technology: passenger car forecasts are 2% for 1995 and 7% for the year 2000; light truck forecasts are 2% for 1995 and 5% for 2000. This compares with the Technology panels NAPP car forecasts of 5% for 1995 and 15% for 2000.

TREND FROM PREVIOUS DELPHI SURVEYS

The current panel's forecasts for anti-lock brakes and traction control are almost exactly the same as the Delphi V panel. The current panel forecasts 4-wheel disc brake market penetration rates 10% above the Delphi V forecast for both 1995 and 2000. It is inexplicable why the two panels are in agreement with each other with such low expectations.

STRATEGIC CONSIDERATIONS

These three technologies--four-wheel disc brakes, ABS, and traction control--are broken out because they are inter-related. Many ABS systems--mechanical and electronic--are engineered to include four-wheel disc brakes and traction control as a relatively easy add, requiring basically only additional logic control circuits to ABS hardware. It is interesting that although the panelists' comments suggest high, if not complete, penetration of these features, the numerical responses are quite conservative. In fact, we believe that the panelists are severely underestimating the progress that may occur in simplifying these technologies (reducing component cost) and improving manufacturing processes that will further reduce cost and improve reliability. We believe that the penetration rates are likely to be the upper quartile responses, at a minimum, for each forecast year.

MKT-34. 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	Median Response		Interquartile Range	
	1995	2000	1995	2000
Factory-installed cellular phone	10%	20%	7/10%	12/25%
CRT dashboard displays	5	8	2/5	5/10
"Head-up" dashboard displays	3	5	1/3	4/10
Navigation information systems	2	5	1/3	2/10
Collision-avoidance systems	1	4	1/2	2/5

Other responses included: road condition indicator: 1995=2%; 2000=8%; electronic compass: 1995=5%; 2000=8%; electronically adjustable seating: 1995=8%; 2000=10%; vehicle location: 1995=5%; 2000=25%; and smart highways: 2000=10%.

SELECTED EDITED COMMENTS

- All of these will come eventually as costs come down and people get used to them. The questions regard timing and whether they will be factory installed or aftermarket.
- None of these features plays a major role in the purchase of an automobile.
- All these options are dependent on cost. If CRT dash is less expensive than current displays, people will opt for it.
- Amazing how cost effective a gas station map is. We do not need navigation systems.
- CRT packaging constraints make it unlikely. Cellular phones will become standard phone systems. However, personal cellular systems could eliminate vehicle cellular phones.
- Factory-installed cellular phones could also be factory specified but dealer installed.
- IVHS is gaining momentum in the U.S. IVHS navigation is a way to increase overall fuel efficiency and avoid driving frustration due to congestion.
- Navigation, display, and collision avoidance will together form a body computer system.
- There is a group of new satellite communication and paging systems being proposed.
- Too much glitz, enough is enough!

MANUFACTURER/SUPPLIER COMPARISON

Consistent with MKT-33a and MKT-33b, there are differences of opinion regarding driver convenience items. However, manufacturers tended to be more optimistic regarding the increased application of powertrain and chassis technology, and suppliers tend to be more optimistic regarding the driver convenience features of this question. The table below presents the technology features with the greatest opinion differences between the manufacturers and suppliers.

Driver Convenience Features:	Manufacturer vs. SupplierComparison			
	OEM	Supplier	OEM	Supplier
	1995	1995	2000	2000
Factory-installed cellular phones	7%	10%	10%	20%
Navigation information systems	2	2	2	5
Collision-avoidance systems	1	1	2	4

COMPARISON OF FORECAST: TECH-41 and TECH-42

The Technology panel question divided cellular phone usage between manual and voice operation and asked respondents for NAPPV installation rates. Given these differences, the Technology panel forecasts total 1995 applications at 13% and 2000 applications at 30%

The Marketing panelists were asked to forecast the penetration rate of head-up display (HUD) for the total U.S. passenger car market (domestic and import). Although not precisely comparable to the Technology panelists' forecast for NAPPVs, the forecasts of the two panels are essentially the same. The Technology panelists' forecast 2% and 5% in 1995 and 2000, respectively.

TREND FROM PREVIOUS DELPHI SURVEYS

The Delphi V and Delphi VI panels forecast similar penetration rates for these advanced features. There is an increased expectation for factory-installed cellular phones by 2000: the Delphi V panel forecast this penetration to be 14%, while the Delphi VI panel forecast the rate to be 20%.

STRATEGIC CONSIDERATIONS

Although product technologies such as cellar phones and "head-up" dashboard displays are viewed--and sometimes rightfully so--as gimmicks, the marketing panelists believe these technologies do have a place in the future U.S. market. Driver convenience technologies, over the next decade, may see a growth to 4% of the market for collision-avoidance systems, and to 20% penetration for cellular phones. For some of these features there may be stair-step break points where certain points of market penetration provide the economies of scale to reduce production costs (and therefore the consumer price) and boost penetration rates to the next plateau. Features similar to these are typically first offered in up-market vehicles, and as prices drop, the feature is offered through the whole product portfolio (i.e, cruise control, keyless entry, and compact disc players). At these higher levels of use, consumers may become conditioned to the convenience of the feature, requiring it on more future vehicles.

MKT-35. **There has been a great deal of discussion concerning customer's price sensitivity and acceptance rate for advanced "high-technology" features. For the 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 in the U.S. passenger car market?**

Feature	Est. 1991 MY*	Median Response	Interquartile Range
		Current MY	Current MY
Anti-lock brakes	$910	$500	$400/500
Collision-avoidance systems	n/a	400	200/500
Active suspension	n/a	250	200/275
Active 4-wheel steering	$1,485**	250	250/500
Navigation information systems	n/a	250	150/300
Compact disc players	$500	250	200/250
Traction (anti-spin) control	n/a	200	100/200

* Based on manufacturer's suggested retail price on domestic models offering these options as stand-alone features.
** 1990 Honda Prelude

SELECTED EDITED COMMENTS

- Anti-lock brakes will be standard as will other safety-related technology.
- Compact disc penetration (home or vehicle) is dependent on the customer/user's ability to replicate from other formats.
- Compact disc systems would have to be similar in price to cheap home systems, $150-250.
- Consumers will not pay much for safety if they have a choice. Give them convenience.
- I cannot imagine trying to explain to the great unwashed American public why they need traction control when the poor dealer just finished telling them that 4-wheel drive improves traction quite nicely. Belt and suspenders for the majority of the North American public.
- Safety items could go at a higher price and achieve 25% penetration if the insurance industry supports them via lowered premiums.
- Vehicle manufacturer's compact disc and other stereo equipment is considered inferior to non-automotive producers. Price/quality sensitivity is a balancing act.
- When? 1991, 1995, 2000?

MANUFACTURER/SUPPLIER COMPARISON

There is a variety of differences between the suppliers and manufacturers regarding the price sensitivity and value of the specific, covered features. Some differences are reinforced by the panelists' expectations of marketshare penetration; low penetration expectations should be reinforced by a low feature price response, indicating that the customer does not value the option. Other differences are somewhat contradictory to previous penetration rate expectations. The responses to this question result from a complicated mix of consumer value expectations, economic conditions, and other consumer behavior insights. The table on the following page presents the technology features with the greatest option price opinion differences between the manufacturers and suppliers.

High Technology Option Prices	Manufacturer vs. Supplier Comparison	
	Manufacturer	Supplier
Anti-lock brakes	$400	$500
Traction (anti-spin) control	100	200
Active 4-wheel steering	250	300
Navigation information systems	150	250
Collision-avoidance systems	200	400

TREND FROM PREVIOUS DELPHI SURVEYS

Comparing Delphi VI and V responses, panelists believe that consumers today may be willing to pay more for these features than before. The forecast median price in the current survey rose $150 for collision avoidance systems, $100 for anti-lock brakes, and $50 for traction control. Changes in consumer needs, marketing emphasis, dealer knowledge, and other factors certainly influence customer purchasing behavior. While these results may be suspect because they are executive opinion and not direct consumer research, it is useful to track the direction of the forecast prices solely as a proxy of customers' estimation of overall feature importance. If the prices are rising from those predicted in previous Delphi reports, then it may be inferred that the value that the customer perceives is increasing, whatever that actual value amount might be. Active suspension fell $50 and navigation information systems fell $25, showing some indication for weakening interest. Active 4-wheel steering remained the same from the 1989 survey.

STRATEGIC CONSIDERATIONS

For each of the listed performance or convenience features, panelists believe that offered consumer prices must drop dramatically to achieve a 25% penetration rate in the U.S. market. Some prices, such as $500 for ABS systems, seem within reason. Many of the comments reveal the complexity of the market: it is not solely the option price that drives consumer acceptance, but external factors as well. For example, some insurance companies offer incentives for air bags and ABS. Collision-avoidance systems would receive extra consideration if adequate insurance premium incentives were offered. Also, dealer and consumer education plays a significant role in feature acceptance.

Manufacturers must do a better job of explaining the value of these new features. Some, such as collision-avoidance systems and compact disc players may be obvious, but traction control, active suspension, and four-wheel steering may require creative blends of demonstrations, advertising, and consumer clinics. Although there is great "hype" today concerning "green marketing" and the safety-conscious consumer, the comment "Consumers will not pay much for safety if they have a choice," while perhaps not completely correct, does remind us of the difference in how consumers answer questionnaires and how they vote their pocketbooks.

MKT-36. What will be the total passenger car and light truck U.S. market (domestic and import) penetration rate (in percentage) for driver and passenger-side air bag passive restraint systems?

Air Bag Restraint System	1989 MY*	Median Response		Interquartile Range	
		1995	2000	1995	2000
Driver-side air bags					
Passenger cars	7%	30%	80%	20/75%	50/100%
Light trucks	0	15	50	5/25	18/70
Passenger-side air bags					
Passenger cars	0%	10%	40%	5/40%	25/90%
Light trucks	0	5	20	2/15	5/50

*Source: Automotive News

SELECTED EDITED COMMENTS

- It will get legislated.
- Light truck estimates include vans and mini-vans.
- Rapid growth towards 100% driver and passenger air bags by 2000 or shortly after. Cars sooner than trucks, and driver side sooner than passenger side.

MANUFACTURER/SUPPLIER COMPARISON

Compared to suppliers, the manufacturers forecast significantly greater application of air bag systems. The table below presents the differences, which imply significant possibilities of supplier engineering and production shortages should the manufacturers' forecasts occur.

Air Bag Applications	Manufacturer vs. Supplier Comparison			
	OEM	Supplier	OEM	Supplier
	1995	1995	2000	2000
Driver-side air bags				
Passenger cars	50	30	95	70
Light trucks	20	10	60	50
Passenger-side air bags				
Passenger cars	25	10	80	30
Light trucks	5	3	30	10

COMPARISON OF FORECAST: TECH-44

As reflected in their respective forecasts, the Technology and Marketing panelists show a surprisingly divergent difference of opinion regarding air bags.

Air Bags	Technology Panel		Marketing Panel	
	1995	2000	1995	2000
Driver-side	70%	98%	30%	80%
Passenger-side	30	80	10	40

These differences may be the result of the two market references: the Technology panel forecasts are for the NAPPV market while the Marketing panel forecasts are for the entire U.S. market of imports and domestics. The Marketing panel may believe that imports will have a higher mix of motorized belts and other passive systems than the domestically produced fleet.

STRATEGIC CONSIDERATIONS

It is expected that by 2000 an air bag and an active three-point belt restraint system will almost entirely replace passive belt systems in domestic and import passenger cars. The predominant system will be only driver-side air bags, but passenger side air bags may be installed in 40% of the 2000 model year vehicles. Of course, the initial impetus for air bag installations was federal legislation requiring mandatory, passive, front-occupant restraints. Manufacturers could meet this requirement through an air bag/lap-shoulder belt combination, motorized harness belt/active lap belt combination, or a door-connected, lap/shoulder belt combination. Over the years, consumer comfort and convenience complaints about non-air bag systems, and investigations into adequate occupant restraint, in addition to insurance company and vehicle manufacturer advertising, have driven customer demand for air bag systems.

As mentioned previously, the light-truck market is driven more and more by traditional passenger car characteristics and the vehicle manufacturers are responding in force to install air bags in light trucks--even before regulation. Current mini- and full-sized vans from Chrysler and Ford offer driver-side air bags, and as new models arrive in showrooms they will, for the most part, have redesigned dashboards providing air bags. This light truck safety attribute is being packaged with three-point, outbound passenger harness and lap belts and high-mounted brake lamps--all beating legislative timetables. This is a good example of understanding the inevitable direction of product demand--driven either by the market or government regulation--and proceeding forward in the most timely and financially effective manner. Rather than spinning one's wheels wasting precious resources and building animosity, manufacturers are managing safety progress in the light truck market by satisfying public demand and achieving progress on their own timetable rather than by a contrived, handed-down legislative plan from Washington.

VII. SUPPLIER AND SOURCING ISSUES

MKT-37. "Partnering" is a popular term used to describe future customer-supplier relationships. However, there is no common definition or concept of "partnering." From your viewpoint, in describing future customer-supplier relationships, what are the five most critical concepts, understandings, or features of "partnering"?

Customer-Supplier Partnering Issues	Percent of Responses
Common goal determination - including better communication, improved information quality, well understood objectives, and common focus.	27%
Knowledge and support of partner profitability, investment levels and cost structures to support long-term viability.	17
Mutual trust--including commitment and respect of business position and motivation.	14
True "teamism"--including compromise and equal commitment to providing resources and sharing rewards.	13
Limited number of relationships--long-term contracts.	9
Knowledge and expertise in areas of involvement.	7
Shared technology and expertise - including personnel.	5

Other responses include: early and close joint product development relationship 4%; joint engineering activity 3%; and close geographic location 1%.

SELECTED EDITED COMMENTS

- Customers want maximum product for minimum dollars. Suppliers want to give minimum product for maximum dollars. This obviously means a search for the balance point and it is this point that is elusive since the motivations are opposite.
- It sounds like the American version of Keiretsu, perhaps without the partial equity relationships and one way control by the OEMs.
- Suppliers have a much better understanding of this concept than the OEMs.

MANUFACTURER/SUPPLIER COMPARISON

These comparisons are not made for open-ended questions.

TREND FROM PREVIOUS DELPHI SURVEYS

This question was not asked in a previous Delphi.

STRATEGIC CONSIDERATIONS

The customer-supplier relationship is complex--pulled by the external business environment, varying business objectives, internal politics, human personalities, and a multitude of other factors. The respondents try to identify the working aspects of this relationship. Any two companies that claim to be operating at the top two or three listed attributes of "partnering" would be well along their way of effectively leveraging the resources of both companies for the satisfaction of the ultimate customer. Of course, each of these attributes is a broad objective in its own right. Each attribute needs objectives and strategies to instill these concepts as a standard operating procedure--across all corporate divisions, across all functions involved with the vehicle manufacturer and the supply base, and across all purchasing agents, sales personnel, and manufacturing representatives. However, it will be difficult to implement a true partner relationship until appropriate staffing skills and personnel rewards are put into place to reinforce these attributes.

MKT-38. 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.

Outsourcing Issues	Percent of Total Responses
Control/location of component engineering and design (including issues of sharing technology, long-term competitive capabilities, project and timing management, OEM resources, and long-term product differentiation)	18%
OEM commitment to customer/supplier relationship	14
Reduction of vehicle development and manufacturing cost (including capacity utilization, productivity increases, and supplier cost structures)	13
Vehicle manufacturer job security requirements	12
Control of quality throughout supply chain	7
Supply base financial strength/capital availability (including tooling ownership and payment)	6
International trade flows	4
Supply base engineering resource capabilities and capacities	4
Integration of global manufacturing resources	4
Reduction of product development lead time	4
Location of value-added and profit levels	3
Value-based purchasing	3
Potential supplier part warranty liability	3
Independent versus captive supplier cost structure differences	3

Single responses include: preoccupation with modeling foreign competition.

TREND FROM PREVIOUS DELPHI SURVEYS

While most previous considerations are repeated in the 1991 survey, "management issues" replaced the need for cost reduction as the number one response. It is encouraging that the current, identified, key, driving issue is not the blind pursuit of cost reduction without consideration of the whole system, but a more thoughtful strategic issue of overall control and location of component engineering and design (which was fourth on the 1989 list).

STRATEGIC CONSIDERATIONS

A significant amount of research, publishing, and consulting has evolved over the past ten years on the customer-supplier relationship. The direction of this activity has centered around leveraging supplier resources for improved cost, quality, and product time to market. Recent industry economic weakness has placed pressures on sourcing decisions, pricing considerations, and the overall concept of customer/supplier "partnerships."

The responses to MKT-33 raise the many issues that need to be considered when negotiating contracts, forming alliances, and formulating purchasing strategies. Many are conflicting in nature. For example, OEM commitment to the customer/supplier relationship and vehicle manufacturers' hourly-employee, job-security requirements may well conflict. But, if these outsourcing issues are managed creatively, communicated effectively, and implemented consistently across all corporate activities, business may proceed with an understanding of the objectives and constraints of all involved. Based on supplier interviews for other projects, we sense a great deal of frustration in OEMs' mixed signals and the lack of OEM strategic commitment to suppliers. While there is no single strategic solution for the whole industry--or even within one company--there should be a commitment to strategies of developing internal, vehicle-manufacturer capabilities and assuring concise program

timing and project management. The single highest response--control/location of component engineering and design--involves much of the uncertainty and frustration caused by mid-course changes in plans by the OEMs.

Responses also suggest the need to expand the supplier interface from a "transactional," day-to-day perspective to a strategic corporate initiative. The issue of international trade flows raises a very fundamental issue of corporate decisions driving the development of local supply bases and component trade flows. Because of the dominance and interrelationships of the automotive-industry manufacturers and suppliers, international sourcing impacts not just corporate operations but, literally, national manufacturing capacities and capabilities. Issues of long-term competitive capabilities, productivity increases, control of entire supply base quality capabilities, and other critical factors clearly show the importance of the purchasing decision beyond unit-piece price. Value-based purchasing appears to have far greater strategic value than price-based purchasing. Considerations such as these make the case for increasing the sophistication and skill of the vehicle-manufacturer purchasing operations and corresponding supplier interface.

MKT-39a. **For many years the concept of modular design and sourcing has been discussed. This concept has many merits but generally has limited application. Please indicate the three most significant factors limiting the application of modular designs.**

Modular Production and Sourcing Issues	Percent of Responses
Increased complexity in design, engineering, and sourcing (need for new business and engineering systems)	22%
Restriction of design, limited innovation	20
OEM resistance to change, fear of loss of control	19
Customer value in relation to development and total costs	16
Limited supplier engineering and technology resources	9
OEM job security requirements	7
JIT, material handling requirements	4
Pace of technology change and technology requirements	3

MANUFACTURER/SUPPLIER COMPARISON

These comparisons are not made for open-ended questions.

TREND FROM PREVIOUS DELPHI SURVEYS

This question was not asked in a previous Delphi.

STRATEGIC CONSIDERATIONS

Modular design and sourcing is a strategy that makes intuitive sense, gets a large amount of press, and begins many a debate. However, there is the chicken and egg dilemma: do vehicle designs lead the way--if there is no support and capability from the supply base--or do suppliers lead the way--even if there are no supporting production contracts? While each of these factors limits application by itself, they all are interrelated. Respondents' concern for increased complexity in design may be due to limited supplier engineering and technology resources, particularly when skills are needed to integrate mechanical, electrical, and operations engineering. And OEM resistance to change may result in restricted designs and limited innovation. Manufacturers and suppliers must work together, changing traditional work practices, control domains, and business systems to improve consumer responsiveness and product offering value. From that "pull" perspective--what are the absolutely needed steps to deliver a product to the showroom floor--modular design and sourcing may or may not evolve. Most likely, the industry will adopt various hybrid models or pursue limited applications at different companies or for specific vehicle programs.

MKT-39b. **In the previous Delphi forecast (Delphi V) respondents listed the following as potential systems for modular design and sourcing. Please indicate (where 1=quite rapidly, 3=neither rapidly nor slowly, and 5=quite slowly) the likely modular application of these systems over the next ten years.**

SCALE

Quite Rapidly		Neither Rapidly nor Slowly		Quite Slowly
1	2	3	4	5

Modular Design and Sourcing Issues	Ranking
Powertrain	3.3
Front/rear suspensions	3.1
Front/rear-end assemblies	2.7
Door assemblies	2.6
Instrument panels	2.5
Other	2.3

Other quite rapidly responses include: headliners, powertrain, suspension, brakes, corner assemblies, and seat systems.

Other quite slowly response include: lighting.

SELECTED EDITED COMMENTS

- Electronic bus systems with communication standards will help modularity.
- Part complexity and innovation is always an issue. For instrument panels, for example, the number of possible instrumentation, entertainment, control and color combinations make just-in-time delivery and correct assembly sequencing very important.

MANUFACTURER/SUPPLIER COMPARISON

The two panels are within approximately 5% of each other and there are no differences in the rapid or slow application direction.

TREND FROM PREVIOUS DELPHI SURVEYS

This question was not asked in a previous Delphi.

STRATEGIC CONSIDERATIONS

Although respondents suggest major barriers to modular sourcing, they are more optimistic over the next ten years when judging adoption of specific systems. Considering the greatest number of responses, we see that instrument panels and door assemblies (components that are, to some extent, built and tested off-line today) receive the strongest votes of confidence. Other attractive systems written in by panelists are not only seats and headliners (again components--by some definitions modular today) but also corner assemblies and powertrain/suspension systems, which are far more complicated than anything approached to date. There is enough interest that suppliers must track new-vehicle program engineering and design objectives to assure that they understand program intent and objectives, location of engineering decision-making and influences, and likely manufacturing sources. It is clear that module definitions are in flux and that there is great room for creativity. While the solutions may be different, the major objectives are clear: to reduce the number of parts and system complexity in order to improve assembly quality and manufacturing costs.

MKT-40. **Purchasing criteria priorities tend to change over time. Given the following criteria, please rank the priorities (where 1 = most important, 9 = least important) of the Big 3 vehicle manufacturer purchasing activity five years ago, today, and five years from now.**

Purchasing Criteria	Ranking		
	1986	1991	1996
Price	1.9	2.0	2.3
Delivery performance	3.4	3.0	3.3
Quality performance	3.8	2.3	1.9
Manufacturing competence	4.4	4.1	4.0
Engineering competence	4.5	4.2	3.7
Supplier's long-term relationship with customer	5.1	5.3	5.0
Effective management of supplier's supply base	6.5	6.1	6.0
Effective management of supplier human resources	7.6	7.2	6.9

Other least important responses include: price/value understanding.

SELECTED EDITED COMMENTS

- A piece-price mentality still permeates the OEM purchasing community. Until OEMs are able to understand, formulate, and implement a numeric price/value system, the best values will continue to elude them.
- By 1996 there will be significantly fewer tiers of suppliers--the weeding out process will focus in large measure on the categories that I have ranked 1.
- Quality is becoming recognized as a critical element--but it will not be totally accepted into process as a primary driving force for some time.
- Quality will stay number one along with delivery performance.

MANUFACTURER/SUPPLIER COMPARISON

The manufacturers and suppliers agree on the top three purchasing criteria of 1986: price, quality performance, and delivery performance. It is interesting that despite all the recent tension surrounding manufacturer cost-reduction efforts, the suppliers choose quality performance as the number one priority in 1991 with price and delivery performance following. The manufacturers still report price as the number one criteria (not hiding behind any rhetoric); cost of material purchases is critical to the competitiveness of the manufacturers.

The criteria change a bit further for 1996. The suppliers drop quality performance from their top three considerations--perhaps in line with the thought that quality needs to be built into components, business systems, and operating philosophies or companies will not be in business. Replacing quality in the suppliers' purchasing criteria perspective is manufacturing competence. Manufacturers, on the other hand, drop delivery performance from their 1996 listing and add engineering competence. While these are not large differences, manufacturers and suppliers need to continually communicate needs, preferences, and strategies to assure that resource investments are correctly allocated.

TREND FROM PREVIOUS DELPHI SURVEYS

This question was not asked in a previous Delphi.

STRATEGIC CONSIDERATIONS

It appears that the pressures of price and cost reductions will remain with the vehicle manufacturers and suppliers through the weak economic times and recovery, and in 1996 quality will again be perceived as the number one purchasing criterion. No one fails to understand the concern with price, profit margins, and competitiveness through continual cost reductions. It is the manner in which price rises to the top of purchasing departments' criteria list that frustrates suppliers and perplexes outside observers. The suppliers' job will become more complex and demanding over the years. This is signified by

the reduction of the gap between the most important and the fourth highest ranked attribute in 1986 (1.9 and 4.4) and 1996 (1.9 and 3.7) and the overall "inflation" of the importance of each individual factor. Two attributes expected to jump more than one position are quality and engineering competence. In fact, quality becomes the number one consideration for 1996. Supplier resources will continue to be called upon in increasing volumes and levels of sophistication to satisfy these two increasing requirements.

As expectations are increased, the manufacturers must consider an operating philosophy closer to value-based, versus price-based, purchasing. This philosophy allows attributes to change in priority with market conditions while purchasing strategies remain consistent with well communicated, long-term objectives. Suppliers, in turn, must better manage their business to operate in an environment of continued cost reduction with value enhancement. Suppliers, too, need to assist manufacturers' purchasing agents with value-added purchasing initiatives, including decision-based cost accounting, managerial information, and decision-making expertise.

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).

OEM. Original Equipment Manufacturer.

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

TRADITIONAL AMERICAN MANUFACTURER. 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.-headquartered 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.

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