New Automotive Markets: Genesee and General Motors' Outsourcing

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Chapter 1: Introduction

This report seeks to identify potential market opportunities for Genesee County within the automotive economy, but external to General Motors. Through a combination of interview, survey, and archival data, it identifies product markets with three characteristics. First, demand from suppliers is likely to increase due to increased sourcing rather than manufacturing by the automotive assemblers. Second, capacity levels in the independent supplier sector are unlikely to be adequate to meet those demands. Third, the skills and product-experience of the GM labor force in Genesee constitute an available, trained workforce.

The report also identifies companies, including domestic and transplant suppliers, that are likely beneficiaries of the increased outsourcing by the manufacturers; are likely to be capacity-constrained; and are likely to seek new locations.

The ultimate goal of the study is to provide some direction to Genesee's efforts to find near-term replacement activity and jobs for expected losses at General Motors. The strategy reflects a recognition that Genesee's immediate attractions are its location with respect to the automotive facilities of the manufacturers, and a workforce both acclimated to the industrial culture of the automotive industry and experienced and skilled in its work requirements. In the final analysis, Genesee must diversify away from its heavy reliance on the automotive economy, but diversification within that economy is an important step, both to alleviate the impacts of the coming losses at GM and to achieve a diversified economy.

Background

The Genesee County economy is heavily dependent on manufacturing, its manufacturing activity is almost exclusively automotive, and its automotive activity is virtually all General Motors. GM, the major employer in Genesee County, faces serious competitive threats in the domestic automotive market.

In 1978, the record production year for the Big Three, GM assembled about 6.9 million passenger cars in the United States. In 1988, GM made almost 1.9 million fewer cars in the United States, a decrease of about 27%. The U.S. light vehicle market fell some 6% from 1988 to 1989, to about 14.5 million vehicles. The share of the passenger car market held by GM's North American production fell from 33.5% to 32.3%, accounting for some 127,000 of its 358,000 total

sales decrease. GM performed better in the light duty truck market, increasing its share from 34.7% to 35.7%. While it made some 20,000 fewer trucks in 1989 than in 1988, its share increase avoided the loss of another 45,000 vehicles.

These lost sales inevitably convert to job losses. The 378,000 fewer light vehicles sold in 1989 is roughly equivalent to 1.5 full production assembly plants. While rational production allocation might prevent the actual closing of a plant, the decreased production eventually results in fewer jobs, as tasks are reconfigured to reflect lowered production volumes. Furthermore, reduced vehicle assembly decreases demand for parts and components from suppliers, and eventually converts to lower employment at these plants as well.

GM faces continuing challenges to its market dominance. In the early 1980s it was fashionable to expect that younger buyers, who were more likely to purchase imports than were older buyers, would shift their preferences back to the Big Three as they aged. This was predicated on the assumption that their needs and tastes would change as they aged. However, the Japanese manufacturers began offering larger and more luxurious cars, and such a shift has not developed. While total GM sales, regardless of production location, accounted for approximately 36% of 1988 U.S. car sales, they accounted for just 25% of sales to buyers under the age of 45. As GM buyers age, younger buyers continue purchasing imports, and as new cohorts of younger buyers enter the market, Big Three and GM sales are likely to continue declining.

However, GM has enormous resources, and it would be foolish to assume that its continued decline is inevitable. GM quality is improving, especially in the Buick Division, led by Buick City's LeSabre, which ranked second in the 1989 J.D. Power's Initial Quality Survey. The naming of a new Chairman and, perhaps, President, and the negotiation of a new labor agreement are on the 1990 calendar, and these present opportunities for the revitalization of current efforts and the development of new strategies and directions.

The competitive pressures on the traditional automotive industry both to improve quality and reduce costs will convert to further job losses, ones that will not come back when the market -- or GM -- recovers. The 1987 GM-UAW contract provides some individual protection for represented workers at GM, but there will be a steady erosion of the jobs that the corporation provides at any given facility or within a geographical concentration of facilities, as attrition and retirement lower employment levels.

Outsourcing -- purchasing a part or component from an outside supplier, rather than producing it in-house -- is a major GM strategic response to its competitive situation, a response that will shift jobs from GM to outside suppliers. Outsourcing is especially problematic for Genesee[1] because it currently has such a rich GM endowment and thin independent supplier base. That makes outsourcing a direct threat to levels of employment within Genesee, because Genesee lacks the supplier community to bid on and perhaps retain some of the work lost at GM. The increases in the levels of outsourcing that might occur from the Genesee GM endowment make it even doubtful that the majority of the work lost to Genesee might be gained by neighboring areas that would provide jobs to Genesee residents.

If we combine all three of these factors -- market, productivity, and outsourcing -- then the permanent loss of GM jobs in Genesee over the next few years could well number somewhat above 20,000, roughly one-third of the current GM workforce. While the new contract might slow these losses, and future developments might lessen them, they cannot be entirely avoided.

The Challenge to Genesee

What can Genesee do in the face of these losses? An obvious answer is to diversify, certainly away from reliance on the fortunes of one company, and surely away from the dependence on the cyclical automotive industry, and probably even away from manufacturing. However, there are numerous problems with these prescriptions. Diversification away from manufacturing involves time to develop the workforce and resources to support such a move, and probably would result in lower income for a large segment of the Genesee population. Diversification within manufacturing but away from automotive also requires time to develop new markets and the selling and servicing skills they require. Even diversification away from one company is difficult, as that company's dominance of the local economy represents an entry barrier for other employers.

We are persuaded that a middling strategy of diversified manufacturing less tied to the automotive economy is the long-term direction that Genesee should pursue. But we also feel that diversification within the automotive sector should be an important part of that strategy. In the long term, a diversified manufacturing base is important, but we believe that manufacturing for the

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[1] A recent review of GM facilities ranked it first as a threat to employment levels,ahead of market and productivity improvements, at eight of the 12 GM production facilities in Genesee; it ranked first for all three of the plants identified as most likely to close.

automotive sector will and should remain a core activity of the Genesee economy. That, after all, is where Genesee has some comparative strengths and experience. In the near term, we believe that replacement manufacturing within the automotive sector can be more readily secured, and that is important for transitional job and income support as the diversification strategy develops. Since GM is so dominant in the Genesee economy, such replacement activity is likely to be in the supplier sector of the automotive economy rather than in activity by other vehicle assemblers.

Genesee once had an independent supplier base, but that base has gradually been absorbed by GM -- AC Rochester and Inland Fisher Guide, Coldwater Road were once independent supplier companies, for example. Suppliers are now noticeably absent from Genesee's automotive economy, and recent attempts to attract them have not been very successful. The conventional wisdom is that suppliers have been reluctant to locate in an area so dominated by GM and the UAW. The pressure on wages, the perceived labor climate, and, in some cases, the reluctance to rely on an urbanized, unionized, significantly minority workforce have all kept suppliers away from Flint, or so the conventional wisdom would have it. As is often the case, there is a large kernel of truth to the conventional wisdom.

In view of this, why would suppliers now be willing to locate in Genesee? None of these factors have changed, so why would it make sense to pursue suppliers? We feel that the increased outsourcing by the manufacturers -- a particular threat to Genesee -- sufficiently alters the situation so that some suppliers may well discover that Genesee is an attractive location.

To be sure, there is likely to be surplus capacity in the supplier industry because of the declining market share of their traditional customers and the establishment of U.S. production facilities by many Japanese suppliers. Even so, it is doubtful that this surplus capacity will be adequate to meet the demands of increased outsourcing. In some cases, the available capacity will be too small; in other cases, the available capacity will be inappropriate for reasons of technology and/or location. Some additional capacity will be required to meet the specific demands of increased outsourcing.

An important issue for Genesee, then, is how much of these additional supplier investments it can secure. Genesee has advantages and disadvantages, to be sure, but it will have the unfortunate "advantage" of available facilities and workers. To increase the chances that these advantages secure new investment, and that investment will provide stable, well-paid jobs. Genesee must effectively market itself. That requires careful assessment of what Genesee has to

offer and identification of companies to which it should be offered. Both the assessment and identification of prospects must be as product specific as possible.

Overview

Chapter Two describes the current competitive challenges to the Big Three and GM in the market place, and likely responses in the areas of productivity improvement and increased outsourcing. All three of these are sources of potential job loss for the domestic industry and Genesee. It then provides a description of the supplier industry, a possible source of replacement economic activity for Genesee.

Chapter Three provides an introduction to the issue of overcapacity for both automotive manufacturers and their suppliers. It further presents survey data bearing on supplier capacity plans and relative advantages and disadvantages of Frostbelt locations like Genesee, and information on the supplier selection criteria used by the manufacturers.

Chapter Four provides an analysis of Genesee's current GM facilities, identifying their products, capabilities, and employment, and providing an assessment of the risk of outsourcing. This chapter draws on a set of interviews we conducted with five industry experts. These experts include a retired GM executive in manufacturing engineering, a former president of an independent supplier company, a former vice president of two major independent suppliers, an expert in stamping, and an expert in engines. These interviewees were selected because of their knowledge of GM and Genesee as well as their particular experiences.

Chapter Five examines the advantages and disadvantages of Genesee as an automotive production location, reviews the problems and threats common to its GM base, and discusses potential strategies of responding.

Chapter Six reviews supplier product markets, identifying five that merit particular attention in Genesee's efforts to replace probable losses at GM. It discusses strategies for attracting suppliers and methods of identifying companies that may offer opportunities to secure supplier locations.

Chapter 2. U.S. Automotive Industry: Threats and Opportunities

Introduction

The strategic decisions and competitive success of General Motors over the coming half-decade or so will largely determine the automotive future of Genesee. GM's competitive success will place a realistic upper limit on the business available to its internal assembly and supplier plants. To be sure, some GM supplier plants will secure business from GM's competitors and from independent suppliers, but this potential business will be balanced by GM business lost by these or other internal supplier plants to outside suppliers. On the whole, then, there is little reason to expect the volume of business for GM suppliers to grow in relation to GM vehicle sales. In fact, it may well fall in relation to GM vehicle sales, should GM increase its reliance on captive vehicles sourced from abroad. Further, GM internal or captive supplier business for some parts and components may even fall in relation to GM vehicle production. This could happen if GM's strategic decisions with respect to its proper level of vertical integration continue to emphasize lowering its current level, even though this has somewhat moderated of late.

The overall performance of GM supplier plants will surely reflect a combination of some plants that prosper and grow and some that perform poorly or fail. The broad range of supplier plants located in Genesee virtually assures that some of its GM supplier plants will be relatively successful, while some will be less successful and perhaps fail. Of course, success and failure might be due to the plant's own performance, to technical and material changes in products, to GM divisional or corporate decisions, or simply to excess capacity in the supplier industry.

But GM's strategic decisions and competitive success will reflect, depend upon, and itself influence general developments in the automotive industry. This chapter, drawing heavily from the results of the 1988/1989 OSAT survey of North American automotive suppliers, highlights some of the major competitive issues likely to face the industry over the next five years or so.[1] This survey serves numerous purposes and informs other sections of this report, but the material discussed here emphasizes broad developments that are likely to form the competitive context for GM's strategic decisions and market success.

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[1] Appendix I contains the survey instrument.

We think that this information provides potential benefits to Genesee economic development and planning specialists as they consider their strategic situation over the next four to five years. While these supplier reports are not necessarily accurate descriptions of objective reality, they are the respondents' perceptions of that reality, and are important in a number of ways. First, they identify suppliers' views on numerous issues. These general views provide information as to the range of opinions across many companies, and thus provide a useful check on the "conventional wisdom," an important step in developing a more refined environmental appraisal. That, in turn, is a critical element of forward planning. Second, it provides information that suggests the planning premises of North American suppliers, so that economic development agents and planners can take these into account in developing and formulating their own strategies and decisions. Third, much of the information is targeted to international competitors, and that may be particularly beneficial as we experience increasingly international competition for domestic vehicle and component markets.

This discussion is structured around the three threats to GM employment in Genesee identified in an earlier report.[2] These are *market threats*, reflecting GM's performance in the market, its required levels of domestic vehicle assembly, and thus demand for parts and components from its allied supplier base; *productivity*, GM's need to increase its ratio of outputs to inputs, and the resulting focus on reducing the labor content of its production; and *outsourcing*, a shift in GM's pattern of buying production goods from outside suppliers versus making them inside GM. The discussion concludes with a brief overview of the U.S. supplier industry, a potential target for Genesee's diversification efforts.

Market Issues

The traditional domestic automotive manufacturers continue to face severe competitive pressure from each other and from foreign nameplate manufacturers. We see no easing of this pressure in the next five years or so, nor do we see a dramatic turn-around in the competitive fortunes of the domestics. To be sure, 1988 saw an improved passenger car market share for the domestics, up some 3.6%, but this offers small comfort to Genesee. First, Ford and Chrysler were the beneficiaries of this improved performance, not GM. GM's share of the car market fell from 36.8% to 33.4%, a serious one year decline. Second, this improved *sales* performance was accompanied by a worsened U.S. *production* performance, as U.S. share of total Big Three build

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[2] Cole, D. E., M. S. Flynn, S. P. McAlinden, and D. J. Andrea, The Automotive Industry, General Motors, and Genesee County, Report to the Charles Stewart Mott Foundation, December, 1987.

fell 2.5%, roughly one assembly plant's annual output for a 10 million car market. GM's U.S. build declined 2% of its total build. The domestic manufacturers increased their sourcing of vehicles from their own facilities in Canada and Mexico, as well as from the facilities of foreign manufacturers elsewhere, and thus, while their U.S. sales increased, their U.S. manufacturing activity actually fell.

The Japanese have failed to meet their Voluntary Export Restraint (VER) target of 2.3 million vehicles since 1987, and this has been viewed as evidence of the increased competitiveness of domestic vehicles. However, the Japanese government allocates this quota to companies, and much of the shortfall is due to the poor market performance of Nissan. Many observers believe that Honda and Toyota could relatively easily have sold the Nissan shortfall had that been permitted.

There is little question that the Japanese manufacturers remain the primary competition for the traditional domestics, and no plausible scenario suggests that this will alter in the near future. However, the nature of the competitive challenge posed by Japan is changing dramatically, as the Japanese automotive companies have established a significant manufacturing presence in North America. These new North American facilities of Japanese manufacturers, or NAM's[3], present a heightened challenge to the domestics. They meet the quality and productivity targets of plants in Japan, enjoy the lower operating costs of greenfield sites and younger labor forces, and may mute sales resistance to "foreign cars."

Table 2.1 provides our estimates of North American NAM capacity by 1993. These estimates are based on public announcements and existing capacity, but include an extra 200,000 light trucks from Toyota. This addition to NAM capacity reflects our belief that Toyota will soon announce its often-rumored second U.S. plant, and that it will be a truck plant. Some of the Japanese manufacturers, perhaps especially Nissan and Toyota, are committed to being full-line manufacturers, and we think that indicates that they will aggressively compete in the light truck market. On the other hand, we do not expect the Lafayette, Indiana, Subaru-Isuzu plant to reach its potential 240,000 vehicles by 1993. We think this plant can reach that capacity only if GM sources Isuzu vehicles from it.

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[3] For "New American Manufacturers," the U.S. and Canadian assembly operations of Japanese and Korean manufacturers, such as Mazda's Flat Rock, Michigan plant.

Table 2.1
1993 Estimated
New American Manufacturer Capacity
(thousands of vehicles)

Manufacturer	Retail Auto*	Captive Auto**	Total Auto	Retail Truck*	Captive Truck**	Total Truck	Total Vehicle
United States							
Diamond-Star	120	120	240	0	0	0	240
Ford-Nissan	0	0	0	36	64	100	100
Fuji-Isuzu	60	0	60	60	0	60	120
Honda	510	0	510	0	0	0	510
Mazda	132	168	300	0	0	0	300
Nissan	250	0	250	150	0	150	400
NUMMI	50	100	150	100	0	100	250
Toyota	200	0	200	200	0	200	400
U.S. Total	1,322	338	1,710	546	64	610	2,320
Canada							
Honda	80	0	80	0	0	0	80
Hyundai	100	0	100	0	0	0	100
CAMMI	60	60	120	25	55	80	200
Toyota	50	0	50	0	0	0	50
Canadian Total	290	60	350	25	55	80	430
Total N. American	**1,612**	**448**	**2,060**	**571**	**119**	**690**	**2,750**

* Vehicles marketed through the New Manufacturers' distribution channels.
** Vehicles marketed through traditional domestic manufacturers' distribution channels.

In any case, increased NAM competition in light trucks represents a threat to Flint's Truck and Bus Assembly. Flint Truck and Bus lost the replacement for the Suburban to Janesville, WI and this might have meant the end of production at the Van Slyke Road facility. However, GM will transfer production of its full-size "G" van from Lordstown, OH to Truck and Bus Assembly. In view of the continuing shift to smaller passenger vans, it is still the case that the best chance for this facility remaining open through the 1990s will be that GM requires a second plant for its APV van. NAM success in the light truck segment would likely decrease the odds that this second plant will be required, as would the success of Ford, Chrysler, or import alternatives.

Table 2.1 breaks this capacity into vehicles that will be sold through the manufacturer's own dealerships, and those that will be supplied for retailing as captives to traditional domestic manufacturers. This permits distinguishing manufacturing and sales shares and reflects the possibility that current differences in sourcing for these types of vehicles (for example, the Mazda-

produced Ford Probe and Mazda MX-6) will continue. The captive versions of these vehicles typically have higher traditional domestic supplier content than do their Japanese nameplate counterparts.

Many analysts forecast a decrease in Japanese imports as the NAM's achieve full production, perhaps from the 1988 level of 2.1 million to 1.5 or so million vehicles. This decrease would not be trivial, since 300,000 vehicles would sustain about 1.25 assembly plants at current capacity planning levels. This expectation rests on the argument that the Japanese will essentially substitute some NAM production and sales for imported vehicles. However, we are skeptical that this will occur, and see little decrease in the current level of Japanese imports with increased NAM production. In fact, it may be more likely that they would increase to the VER limit of 2.3 million than fall to 1.5 million. First, the Japanese employment system pressures the manufacturers to maintain their employment levels in Japan, and we do not see market growth in Japan or other export destinations that would support significant reduction in exports to the United States. Second, a number of the Japanese manufacturers have ambitious growth plans, and it is difficult to create a credible scenario for meeting these goals that does not include level or increased U.S. sales. Third, some NAM production will be exports to Japan, and probably to Europe as well, and we think the Japanese will feel that this "export generation" obviates the need for "import substitution."

Underlying whatever changes there may be in the level of Japanese imports is an important shift in the composition of these imports. Japanese passenger car imports to date have been overwhelmingly concentrated in the subcompact and compact segments of the market, with these two segments accounting for about 92% of their 1988 NAM and import passenger car sales. Honda has recently introduced the Legend, Mazda the 929, Toyota the Lexus, and Nissan the Infinity. These cars represent a significant strategic shift for the Japanese manufacturers because they are targeted directly at the lower to middle luxury car segment of the market. We expect the Japanese to be quite successful with these cars, perhaps taking as much as 26% of the luxury market by 1993. Intermediates, like the Toyota Cressida and Nissan Maxima will probably capture about 15% of this segment. To be sure, many of these sales will be captured from European manufacturers, but some will come from the traditional domestics as well.

The luxury segment of the market is important in a number of ways. First, success in that segment can convert to sales in other segments as well because of the prestige it confers on the manufacturer's entire line. For example, some of the GM car divisions' problems in mid-size cars like the LeSabre have been attributed to the poor performance of the Cadillac marque in the early

1980s. Second, this segment contributes to the profit performance of the company far beyond its unit contribution to sales. This contribution to profit in turn supports lower profit production in other segments, and the loss of that internally generated "subsidy" might increase pressures to rely on captive vehicles and/or lower volume strategies in smaller cars. Therefore, significant erosion of sales in the luxury segment could undermine the domestic production of vehicles in other segments. Third, the loss of these profits would undoubtedly lead to severe pressure to reduce costs rapidly. That would probably lead to cuts in product development expenditures, and that might create further problems later. It would also probably restrict investment dollars available to supplier plants and raise the likelihood of increased outsourcing.

Of course, the Japanese are not our only international competitors, nor is Canada the only alternative production site available to the domestic manufacturers. We expect the Europeans to decrease their level of imports, losing sales to Japanese imports in the luxury segment, and to NAM's and to imports from South Korea and elsewhere in the less expensive segments. From a domestic automotive manufacturer's viewpoint, the losses the Europeans suffer will provide little in the way of captured sales. Mexico may increasingly become a production source for the domestics: the past few years have witnessed the shift of GM A-car (e.g., the Chevrolet Celebrity), Chrysler K-car (e.g., the Plymouth Reliant), and Mercury Tracer (Lynx replacement) production from the United States to Mexico.

Table 2.2 presents the U.S. light vehicle market for 1988.[4] These data reflect the manufacturing source, rather than the marketing unit, because it is the manufacturer's U.S. build that determines demand for U.S. assembly jobs and production goods from the independent and allied supplier industries.[5] Table 2.2 also displays our projection for the 1993 vehicle market. We expect that there will be a cyclical downturn in 1990/1991, but that the industry will have largely recovered from it by 1993. We see a 1993 market that is some 4.5% larger, with light trucks maintaining about a 32% share. NAM's about double their market share, moving to 15.5% in cars and 9.6% in light trucks. Imports slightly increase their share of the car market to just about 31%, while taking a somewhat larger share (15.4%) of the truck market. Traditional domestic

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[4] Detailed breakouts for the Canadian market are not readily available, but it generally is some 10% of the U.S. market, with a somewhat higher proportion of imported cars (33.7% in 1987) and a somewhat lower proportion of imported trucks (10.3% in 1987). The Canadian market is a source of demand for U.S. independent and allied suppliers, as well as some assembly plants.

[5] The manufacturers' purchase vehicles for retail from other manufacturers (captive imports and NAM's), and those vehicles are typically included in sales figures. Such vehicles are assigned to their manufacturing source in Table 2. However, vehicles sourced from Canada and Mexico are included in the traditional domestic category because of the difficulty of accurately identifying them in published sales data.

Table 2.2
1988 and 1993 U.S. Light Vehicle Markets
by Production Sources
(millions of vehicles)

Source	1988	1993
Passenger Car		
Traditional Domestic	6.7 (62.3%)	5.9 (53.6%)
NAMs	0.8 (7.5%)	1.7 (15.5%)
Import	3.1 (29.2%)	3.4 (30.9%)
Total Passenger Car	10.6 (100%)	11.0 (100%)
Light Truck		
Traditional Domestic	4.2 (83.7%)	3.9 (75.0%)
NAMs	0.1 (4.1%)	0.5 (9.6%)
Import	0.6 (12.2%)	0.8 (15.4%)
Total Light Truck	4.9 (100%)	5.2 (100%)

vehicles lose share in cars, falling to 53.6%, and even more in light trucks, to 75%. To be sure, the traditional manufacturers' *retail* share of the total light vehicle market (64.0%) will be higher than their *manufacturing* share (60.5%), since they will likely source about 570,000 North American NAM cars and light trucks. Traditional manufacturers' retail market share will also be higher to the extent that they successfully market captive imports sourced from offshore manufacturers.

Our market estimate suggests that the Big Three will produce and market in 1993 about 90% of the total light vehicles that they did in 1988. That converts to a 10% loss of jobs due to market factors on the average, if everything else remains constant. Of course, these job losses will not be smooth, but "lumpy," as shifts are ended, plants are closed, and substantially lower production leads to job restructuring. Just as surely, everything else will not remain constant. Nevertheless, this provides a useful, if crude, general estimate of the impact of lost market share on job levels in the industry.

GM production and market shares have eroded for some years now, and we do not expect a major recovery in either share in the immediate future. Figure 2.1 displays GM's car market share by division since 1978. GM has issued numerous statements over the past few years that suggest that it is concentrating on a higher-profit, lower-volume strategy, and that its target for car market share in the early 1990s is 37%s. However, the Corsica-Beretta is doing moderately well

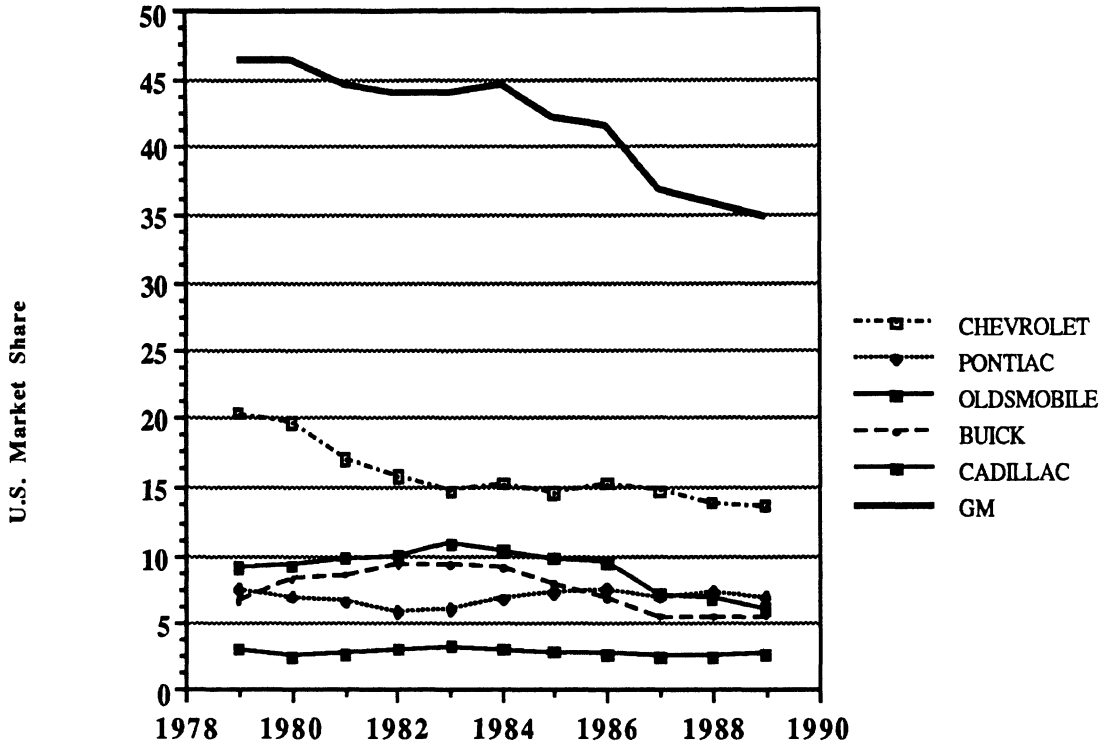

Figure 2.1: GM U.S. Total Passenger Car Market Share by Car Division

in the market, and GM is finally offering the first 4-door versions of its W-body, the Chevrolet Lumina, the Buick Regal, and the Olds Cutlass Supreme. If these W-cars and the rear-wheel drive GM300 program (Chevrolet Caprice), slated for 1990 mid-year introduction, do well, GM might just increase its market share beyond its announced targets. At the same time, it appears likely that GM will increase its reliance on captive vehicles from both offshore and NAM manufacturers, as indicated by it recent creation of the "GEO" label to cover these vehicles.

Nevertheless, at this point in time, it appears that GM's share of Big Three U.S. production is likely to be on the order of 45% in 1993, down from roughly 48% in 1988. That suggests that GM will build about 4.4 million of the 9.8 million traditional domestic light vehicles for our 1993 market, a decline in production level of some 800,000 cars and trucks from 1988. That is a decrease of some 15% in production volume, the equivalent of about 3.3 assembly plants. On the average, then, we would expect 1993 GM employment to fall some 15% from 1988 levels due to market factors and vehicle sourcing patterns.

Preliminary analyses of 1989 sales data suggest that GM's sale of North American produced vehicles was almost 400,000 below its 1988 level. That is halfway to our 1993 expectation, and the employment effects of that loss are being felt in the first quarter of 1990. GM

has temporarily idled or extended holiday shutdowns for the vast majority of its U.S. assembly plants, and reduced its planned first quarter build.

Genesee has two final assembly facilities, Buick City and Truck and Bus Assembly. Buick City assembles the Buick LeSabre. LeSabre ranked second in the 1989 J.D. Powers Initial Quality Survey, and its sales increased some 4%, although the passenger car market fell abut 6%. However, these sales are not sufficient to fill a plant, and so Buick City also assembles the Olds 88, adding the 4-door version from Wentzville, MO in 1989. Sales of this car fell some 13% from 1988 to 1989. Overall, sales of Buick City's current production models fell nearly 5% in 1989, although they increased their share of GM cars to nearly 9%, and marginally improved to about 3% of the total car market. In any case, the demand (250,000 to 300,000, depending on the market) for these cars should be adequate to keep Buick City operating two shifts for the next few years.

Truck and Bus Assembly will begin to assemble the GM full-size van. This vehicle lost about one-half a point of both GM and total market share from 1988 to 1989, as smaller vans continued to increase in popularity for the individual consumer market. However, commercial demand for full-size vans will continue, although the plant may require fewer employees as total demand falls. Full-size van production may also be partially shared with Canadian facilities adding additional caution.

If both assembly plants in Genesee look relatively safe, the overall GM performance is of direct concern to GM supplier plants in Genesee. Genesee's assembly plants constitute only 10% or so of their GM demand, a demand that fell some 7% in 1989 as GM sales declined.

Productivity Issues

The U.S. industry today faces an increasingly complex competitive challenge, including traditional competition between companies within the industry and competition between the industry and its offshore competitors. The issue of industry competitiveness is tied to the overall competitiveness of the United States as a production location because much of the automotive industry's overall competitiveness depends on the strength of so many U.S. manufacturing and material supply industries.

We asked our survey respondents to rate the importance of U.S. improvement in each of ten areas to its remaining a competitive production location. The breadth of the industry challenge is indicated by the relatively high importance respondents attribute to all of these performance

areas, displayed in Table 2.3. Eight of these performance areas are rated between 4.0 and 4.5 on our scale, anchored by 5.0 as "Very Important."

Table 2.3
Estimated Importance of Improved
U.S. Performance on Ten Competitive Dimensions

Factor	Importance*
Process Design/Engineering	4.5
Manufacturer-Supplier Relations	4.4
Machine Uptime	4.3
Product Design/Engineering	4.3
Capital Productivity	4.2
Hourly Labor Productivity	4.2
Capital Utilization	4.1
Salaried Labor Productivity	4.0
Hourly Labor Cost	3.5
Salaried Labor Cost	3.4

* On a scale with 1 = Not Very Important, 3 = Moderately Important, and 5 = Very Important.

Only two areas -- hourly (3.5) and salaried (3.4) labor cost -- fall below 4.0 on our scale, although they still fall to the more important side of the mid-point. Two major components of labor cost are the rates for wages and benefits and labor productivity. The weakening of the dollar against the currencies of most foreign automotive competitors has currently rendered wage and benefit rates competitively less important than they were in the first half of the decade. But currencies can and do shift in relative value, and there is no assurance that wage and benefit rates will not again become competitively important. Wage and benefit rates in North America are typically higher than those of emerging vehicle and parts producers, and that represents a specific competitive disadvantage, one that has historically been compensated by superior performance in other competitively significant areas.

The other eight performance dimensions included in our survey are all related, directly or indirectly, to productivity, and all fall between 4.0 and 4.5 on our scale. Productivity is the other component of labor cost, and presents a continuing and permanent competitive challenge. Productivity, in its broadest sense, is the maximization of output in relation to input. It encompasses the efficient use of all resources, including financial capital, facilities, and equipment, as well as effective transactions with both suppliers and customers, in addition to the more traditionally recognized area of unit labor output at both the hourly and salaried levels of the workforce. Manufacturing quality is an important source of productivity in this broader sense.

Higher productivity offsets the lower wage and benefit rates of newly emerging producers in less developed economies, and that is the realistic basis of competition with them. Productivity is also an important basis of competition with developed producers, perhaps especially Japan.

The relatively tight clustering of these eight items prohibits extensive discussion of the comparative emphasis suppliers place upon them. This clustering itself might reflect a number of different factors. It might be that the pattern of relative emphasis depends on the supplier's particular segment of the industry, or even the supplier's unique situation, and there are no clear "industry-wide" priorities. It might be that these areas are all quite important, and that simple fact overwhelms whatever distinctions there might be among them. Finally, it may be that productivity improvement is a "motherhood" issue, eliciting strong endorsement of any particular element or approach within its scope.

The automotive industry has improved its labor productivity substantially since the early 1980s. When output is constant, improved labor productivity is achieved through workforce reduction. This can occur smoothly, through workforce attrition due to voluntary separation, including retirement. However, companies often reduce their workforces through layoffs, shift terminations, and plant closings. Thus workforce reductions are often "lumpy," or concentrated, creating problems for communities, such as Genesee, with large concentrations of automotive employment as well as for the individuals that are directly affected.

The automotive industry has improved its labor productivity in excess of 3% per year since the early 1950s. We think that the industry must continue to achieve that level, and even better it, if at all possible, if it is to remain competitive. However, this improved labor productivity will have little benefit unless the companies also achieve the broad cost reductions available from improved multi-factor productivity. Labor content is too small a share of total automotive cost for its improvement alone to provide the necessary competitive advantages that cost reductions confer. It is also more difficult to increase labor productivity as production decreases than when production increases. Nevertheless, we expect to see a minimum of 3% per year improved labor productivity, and that converts to an annual 3% decrease in jobs, assuming that output is constant.

If the Big Three improve their labor productivity 3% per year between 1988 and 1993, then roughly 14% of Big Three jobs will be eliminated, assuming constant output. But we expect 10% of jobs to be lost due to production and market share declines. So the combined effects of market and productivity job losses suggest that some 22.6% (1 - [0.90 x 0.86]) of industry jobs will be lost by 1993.

GM is reported to be behind both Chrysler and Ford in labor productivity, although some observers feel this is primarily due to its lower rates of capacity utilization. However, absent a surge in GM market share, its low rates of capacity utilization suggest more likely plant closings, so we expect to see GM pursue even larger productivity gains. If GM achieves a 4% annual improvement rate, then roughly 18.5% of GM jobs will be lost with a constant market. Combining this with our estimate of GM's production and market share yields a total GM job loss of 31% (1 - [0.85 x .815]).

There is no evidence that suggests that Genesee's GM endowment differs from the overall corporation in productivity. Some of its plants are quite productive, some have improved rapidly, and some still face challenges. However, the high GM concentration in Genesee makes it likely that to suffer a "lumpy" loss -- that is, it is likely that one or more of its facilities will close as part of the corporation's downsizing, perhaps without regard to the plant's specific performance.

Outsourcing.

We asked our respondents to indicate how rapidly the manufacturers are moving to implement a variety of practices. These practices form the foundation of the changes predicted for the structure of the American automotive industry, particularly for the relationship between suppliers and manufacturers. Table 2.4 displays these results. Continuous quality improvement (4.5 on a scale ranging from 1= slow to 5= rapid) is the most rapidly developing change, followed by reduction in the number of suppliers (3.8), continuous price pressure (3.7), and reliance on supplier engineering (3.6).

There are two striking aspects to these results. First, the manufacturers' emphasis on quality improvement remains, in these supplier reports, the most rapidly developing change in standard business practices, as it has throughout the 1980s. This is important because some in the industry have been concerned that this emphasis might slacken somewhat with the relatively stronger sales and profit performance of the domestic Big Three over the past few years, fearing that the old habit of "pushing the iron out the door" would revive. Second, reduction in the number of suppliers shows the greatest increase in estimated implementation rate and relative ranking compared to earlier surveys. Reduction in the size of the supplier base, at least in direct suppliers to the manufacturers, seems to be occurring as the manufacturers introduce new models and platforms.

Table 2.4
Rate of Implementing Changes in Manufacturer-Supplier Practices

Factor	Rating*
Continuous Quality Improvement	4.5
Reduced Number of Suppliers	3.8
Continuous Price Reductions	3.7
Supplier Engineering Contribution	3.6
Sole Sourcing	3.5
JIT	3.4
Early Supplier Selection	3.1
Tiering	2.9
Modular Sourcing	2.5
Outsourcing	2.5
Non-U.S. Sourcing	1.9

* On a scale with 1 = Slow, 3 = Moderate, and 5 = Rapid.

So the American supplier base is shrinking, and suppliers will have to improve their quality and increase their engineering contribution to survive. This must be accomplished while facing continual pressure from their customers to reduce prices. These changes suggest an upgrading of the supply base is underway, and that, coupled with a reduction in the number of suppliers, indicates that extremely difficult and intense competition lies ahead.

The most slowly developing practice is the manufacturers' move to offshore or nondomestic sourcing. From 1982 until 1986 manufacturers sought, and traditional suppliers feared, major increases in nondomestic sourcing. Two events have seriously altered this expectation. First, the dollar weakened against the yen, mark, and other major currencies. That eliminated the cost advantage of many offshore suppliers. Second, the U.S. supplier base has significantly improved its quality level, and that undercuts the cost advantage of offshore sources, such as South Korea and Taiwan, where the currency shift has been much smaller. Our respondents report that increased non-U.S. sourcing is the most slowly developing change of the 11 practices we listed, at 1.9 on our scale, 0.6 points below the next most slowly developing trend. Non-U.S. sourcing exhibits the largest decrease in estimated rate and comparative ranking of any of these practices that were included in earlier surveys.

This decline in the growth of offshore sourcing is good news for communities such as Genesee. The manufacturers, and especially GM, had been expected to combine their increased outsourcing with moves to offshore sources. That is, many felt that it was particularly the allied or captive suppliers that were most at risk for losses to offshore sources. Currency changes have

made these competitors less attractive, and while that does not eliminate the outsourcing threat, it certainly decreases it.

The independent supplier community has welcomed, while the UAW and many Midwestern communities such as Genesee have resisted, the manufacturers' announced intentions to outsource more work to independent suppliers. These suppliers see increased outsourcing as proceeding at somewhat less than a moderate rate of speed (2.5 on our scale). Manufacturer outsourcing has been restrained by the current UAW contract, but could accelerate after this year's negotiations. This might happen if an industry downturn leads to decreased production for the manufacturers' allied suppliers. Such work might be outsourced as the industry recovers. However, on balance it seems unlikely that rapid, major changes in the allocation of work between the manufacturers and their suppliers will occur over the next five years.[6] To be sure, there will be product-specific threats and opportunities for allied and independent suppliers, as the manufacturers alter their specific make-buy decisions. But it is difficult to envision the substantial net increases in purchases that would accompany the significant decreases in manufacturer levels of vertical integration that analysts expected just a few years ago.

Analysts have expected two other related changes in the structure of the U.S. industry: an increase in the tiering of the supply base, and a move to more modular, or system, sourcing. Tiering involves a more unidirectional flow of goods through the levels of the supply base to the manufacturers. This is often represented as a pyramid shaped industry, with parts and components flowing upwards from material suppliers through part/component suppliers to the manufacturers at the apex. This structure is attractive to the manufacturers for a number of reasons, and many expected that it would come about as the manufacturers reduced their numbers of direct suppliers, and moved to sourcing more built-up components, and even complete systems. While the reduction in suppliers appears to be moving along somewhat rapidly (3.8), neither tiering (2.9) nor modular sourcing (2.5) are developing nearly as rapidly.

However, there are reasons to believe that both tiering and modular sourcing may accelerate in the future. The manufacturers find them quite attractive, since they both reduce the manufacturers' transaction costs. Tiering is an integral part of our image of the Japanese industry, and thus has a certain appeal to the manufacturers as they attempt to adopt elements of the Japanese industry structure. Modular sourcing will, in many cases, reduce the manufacturers' own labor

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[6] This represents a change in our own expectations. In our previous Report we relied on much stronger expectations as to the increased levels of outsourcing.

cost, as the suppliers take on subassembly work that is typically accomplished in the vehicle assembly plant. Both these developments may exhibit a long, slow start-up period, followed by a period of rapid acceleration. Modular sourcing, for example, may be introduced in a more clustered than smooth fashion, as the manufacturers make major moves associated with new model or platform introductions. It is possible that we will see modular sourcing follow the pattern that appears to have developed with reduction in the number of direct suppliers: generally slow development with concentrated periods of rapid implementation.

If the Big Three increase their level of outsourcing by about 1% per year from now until 1993, then their level of vertical integration will fall from just under 45% to just under 42%, implying a loss of about 6% of Big Three jobs. When we combine these with losses to production decreases and productivity improvement, we see a net loss of some 27% (1 - [0.90 x 0.86 x 0.94]).

Unfortunately for Genesee, GM also has the highest level of vertical integration among the domestic manufacturers, typically reported at about 50%, and is the company that placed the greatest emphasis on decreased vertical integration as a competitive strategy. However, we believe that GM has also decreased its emphasis on this particular strategy. Nevertheless, we think it is likely that GM will increase outsourcing somewhat more than Ford and Chrysler, perhaps on the order of 1.5% per year from now until 1993. That would lower GM's vertical integration to about 46% and put GM job loss due to outsourcing at about 8%. Combining all three factors suggests that GM job losses by 1993 may well be on the order of 36% (1 - [0.85% x 0.815 x 0.92).

The pattern of GM outsourcing that develops has important implications for Genesee. If GM carefully selects components and parts that do not rationally fit in its operations, then the losses may strengthen the remaining GM base. However, if GM seeks to divest itself of operations that have high labor content to avoid UAW labor rates, then the survival benefit provided remaining operations will be lower. This strategic choice will influence which plants are affected by outsourcing.

Will Genesee see a 36% decline in GM employment by 1993? These estimates are in the nature of "worst case" from an employment perspective. GM has resources that, properly deployed, should be capable of reversing its market slide. Such a reversal might capture sufficient production to cover reductions necessary for productivity improvement. It may be that rational restructuring will turn out to require less outsourcing than many experts believe, and that most expect. GM may decide that it makes sense to reconcentrate its production activities in its current

base area, so that Genesee suffers proportionately lower losses. But even a somewhat more optimistic scenario suggests GM employment losses by the mid-1990s are likely to be on the order of 20% to 25%, and Genesee will probably experience close to that level of job loss from its current automotive economy.

The U.S. Supplier Industry

Since GM, and thus Genesee, faces a continued likely erosion of jobs, it is reasonable for Genesee to seek to decrease its dependency on GM for jobs. While the ideal diversification strategy for Genesee calls for decreased dependence on the automotive industry in general, a near-term strategy of diversification of that automotive dependency away from GM also makes sense. After all, the workforce and infrastructure Genesee might offer a new employer are currently best suited to automotive production. But Ford and especially Chrysler are unlikely to add significant capacity in the next five years, and, in any case, each would probably resist locating in a region with such a high level of GM concentration. That still leaves the possibility that independent suppliers might locate facilities in Genesee, even though that, too, appears to be somewhat unlikely, for reasons that are detailed in our prior Report. This section provides some general information on that independent automotive supplier community.

The 92 respondents to our 1988/1989 supplier survey represent a fair cross section of the traditional American supplier industry in terms of products, geographic distribution, employment, and sales. Their locations range from Connecticut to California, but the majority are located in Michigan (34) and Ohio (16). The Frostbelt continues to be the heartland of the automotive supplier industry. Supplier size, measured by number of employees, covers a wide range: from 40 employees to 115,000. Four companies (4%) have fewer than 20 employees, 23 (25%) between 40 and 225, 15 (16%) between 250 and 450, and 50 (54%) have 500 or more employees. Our respondents, then, are probably somewhat skewed to larger suppliers. But these larger suppliers form an appropriate target group for economic development. First, they comprise a more limited, and therefore more targeted group. Second, information about them is more readily available and retrievable. Third, their sales are less concentrated in the automotive sector, and thus provide more intermediate diversification for Genesee. Fourth, they are probably more likely to consider adding production facilities beyond their current geographical base than would smaller suppliers.

Twenty-four (26%) report sales below $20,000,000 in 1987, 38 (41%) between $20,000,000 and $100,000,000, and 30 (33%) had sales greater than $100,000,000. While domestic automotive vehicle production decreased from 1986 to 1987, 91% of our respondents

enjoyed a sales increase from 1986 to 1987. We suspect this reflects three developments. First, the manufacturers probably increased their level of outsourcing, purchasing production goods and services, such as parts, components, and engineering, rather than supplying them in-house. Second, some reduction in the ranks of automotive suppliers occurred, making more business available to survivors. Third, some of these companies undoubtedly increased their nonautomotive sales as they pursued diversification strategies.

These suppliers are dependent on the auto industry, averaging about 58% of their sales to the manufacturers and another 20% to other suppliers. One-third of our respondents placed no less than 85% of their dollar sales with the automotive manufacturers, while 70% secured at least 50% of their sales from the manufacturers. While many suppliers emphasize their plans for diversification away from the automotive industry, these data are not substantially different from earlier surveys. Their import-export activity is typical of the industry, sourcing roughly 15% of their production materials and goods offshore, and exporting about 6% of their sales. Only six of these companies report exporting more than 15% of their sales.

We asked respondents to report up to three major products they supply the manufacturers and up to three they provide other suppliers. The 88 companies that responded to this item supply at least 326 parts and components to manufacturers and other suppliers for eventual on-board use in light vehicle production. Table 2.5 displays their major product categories. These cover a wide range of parts and components for a variety of systems and subsystems, including: seats (20%); body (17%); brake, wheel, and tire (10%); engine (7%); transmission (7%); steering (6%); and chassis (6%). The balance of their part and component production is divided between products not covered in our coding protocol (17%) and the four remaining categories (10%) of that protocol.[7]

The majority (58%) of these products are marketed directly to the manufacturers. Eighty-eight respondents provided product information, and 87 of those companies market to the manufacturers. As illustrated in Figure 2.2, most suppliers provide more than one product or product family to the manufacturers. Only 32% specialize in one product or family, while 48% supply at least three, and possibly more, products to the manufacturers.

But 42% of these products are marketed between suppliers, and that suggests the complex marketing arrangements characteristic of the North American automotive industry. It also means

[7] See page 8 of Appendix I for a detailed listing of our coding protocol.

that suppliers may be somewhat less dependant on particular manufacturers than their distribution of direct sales might indicate, since the "supplier" customers may have a very different distribution of manufacturer customers than their own. The suppliers marketing of products, then, breaks out about 3:2 between manufacturing customers and other supplier customers. On the other hand, we report above that supplier dollar sales break out about 3:1 between manufacturers and suppliers. We suspect that this reflects two aspects of the industry: first, sales to manufacturers typically are farther along the value-added chain of industry production; and second, the volumes represented by manufacturer sales are considerably higher than those represented by sales to other suppliers. This suggests that the rationalization of the industry, at least in terms of a reduced supplier base, is more developed at the supplier-manufacturer interface than it is within the supplier base itself.

Table 2.5
Supplier Products, by Type

Product Type	Percent of Products
Seats	20%
Body	17
Not Categorized	17
Brakes, wheels, tires	10
Engine	7
Transmission	7
Steering	6
Chassis	6
Other categories	10
Total	100%

Figure 2.3 displays the suppliers' patterns of providing products to other suppliers. Seventy-three of our respondents (83% of those providing product information) supply products to other suppliers, including one with no manufacturers as customers. Seventeen percent, then, supply only the manufacturers, while another 38% supply one product, 17% two products, and 28% three (or more) products to other suppliers. The pattern of providing products to other suppliers is somewhat different from the pattern of supplying the manufacturers: 48% supply three or more products to the manufacturers, but only 28% supply three or more products to other suppliers.

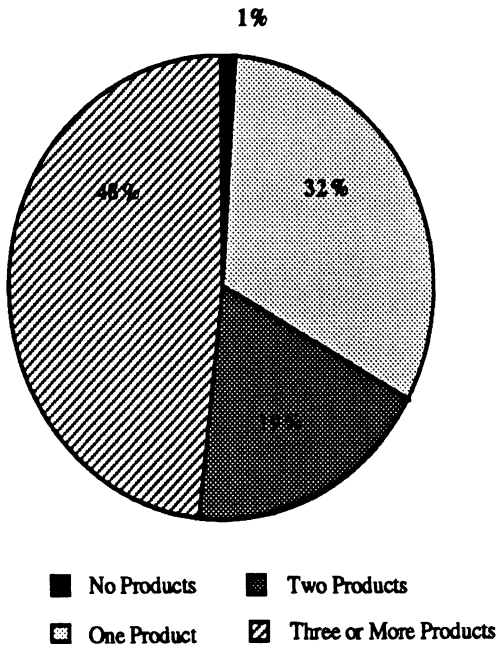

Figure 2.2: Number of Products Supplied to Manufacturers, by Percent of Suppliers

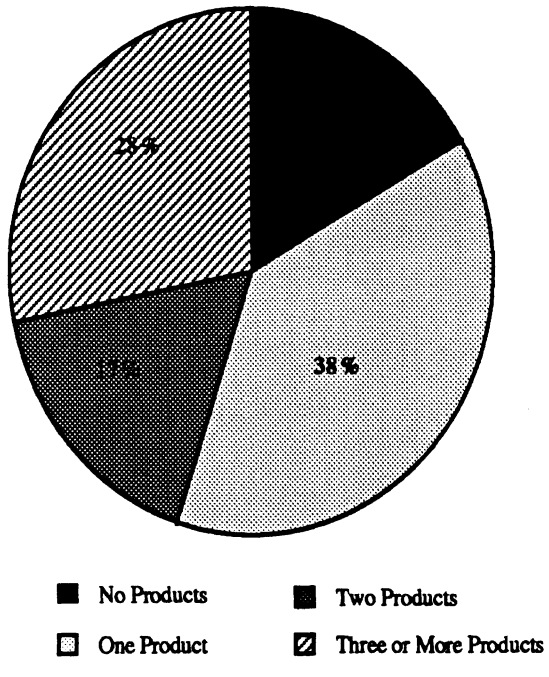

Figure 2.3: Number of Products Supplied to Other Suppliers, by Percent of Suppliers

Summary

The traditional domestic automotive industry continues to face a growing threat of international competition. The current major dimensions of this threat are the increased production presence of the Japanese NAM's in North America and the shift into the intermediate and, especially, the luxury segment of the car market, of Japanese imports. We also expect to see more serious competition in the light truck segment from a number of the Japanese manufacturers.

We expect the 1993 market to grow some 4.5% compared to 1988, but the domestic production of the Big Three to fall some 1.1 million light vehicles, the annual output of more than four assembly plants. This suggests job losses of about 10% from the 1988 base. If the Big Three improve their productivity 3% per year, this will result in the loss of some 14% of jobs at a constant production level. The industry is likely to increase its level of outsourcing about 1% per year, accounting for another 8% job decrease. These outsourcing estimates are substantially reduced from just a few years ago, and the business made available much less likely to go offshore. When we combine these estimates, Big Three employment losses by 1993 may well reach 27% of the 1988 workforce.

GM is the domestic manufacturer of overwhelming importance to Genesee County, and we expect to see it continue to experience erosion in its domestic market share and production volume. GM's 1993 domestic production of cars and trucks may fall to 85% of its 1988 level. Unfortunately, we also expect GM jobs to be more at risk due to greater productivity improvement (4% per year) and a somewhat higher increase in outsourcing (1.5% per year). This results in a combined potential job loss at GM of some 36% of its 1988 workforce. More optimistic scenarios still put job loss in the 20% to 25% range by the mid-1990s, and there is little reason to expect Genesee's experience to differ markedly from the total GM experience.

Although Genesee faces some realistic problems in attracting independent suppliers, that industry represents a logical near-term target for economic development. That industry is competitively stronger now than just a few years ago, and many of its constituent companies are healthy, and some will be seeking new production capacity.

Chapter 3. Capacity and Competition

Introduction

The previous chapter suggests that the traditional Big Three, and perhaps especially GM, face a continuing and serious competitive challenge from NAM's and imports. We expect to see some further erosion in their domestic production, and that implies less business for their suppliers, both independent and allied, and fewer jobs in the industry. Nevertheless, we remain persuaded that diversification within the automotive sector is a sensible strategy for Genesee County.

This chapter describes the overcapacity situation facing the traditional industry and presents information as to how it is likely to impact both independent and allied suppliers. It presents some recent data on supplier views of the competitiveness of the United States and the Frostbelt, supplier selection criteria for the Big Three, and supplier site selection criteria. Finally, it provides some identification of product areas that may be capacity constrained in spite of industry overcapacity.

Overcapacity

Our market projections suggest that there is little question that the traditional American automotive industry faces a serious issue of overcapacity as we move into the 1990s. Typical estimates of manufacturer overcapacity by 1992/1993 are on the order of 30%. That is, there will be as much as 130% of required Big Three capacity targeted on the North American automotive market by that time. But the internationalization of sourcing changes the patterns of supplier capacity as well, although not necessarily in exact parallel with manufacturer capacity. Supplier overcapacity is an important context for supplier decisions to expand or to add capacity, and thus important information for those seeking new supplier facilities or the strengthening of an existing base.

Before we turn to supplier capacity issues, we provide some estimates of manufacturer overcapacity. Table 3.1 displays our straight-time North American capacity estimates for the traditional domestic manufacturers. These estimates, combined with our market estimates in Table 2.2 of Chapter 2, suggest an overcapacity of about 36% (8.0/5.9 million) in cars and 23% (4.8/3.9

Table 3.1
Traditional North American
1993 Estimated Capacity
(millions of vehicles)

Manufacturer	Passenger Cars	Light Trucks
General Motors	5.0	2.0
Ford Motor	2.0	1.6
Chrysler Motors	1.0	1.2
Total	8.0	4.8

million) in light trucks, for a total straight-time overcapacity of over 31% (12.8/9.8 million). This is in line with most published estimates. However, our estimates compare North American capacity to the U.S. market. If we include the Canadian market, overcapacity falls to about 20% in cars (8.0/6.7 million) and just under 10% (4.8/4.4 million) in trucks. This suggests a total North American light duty vehicle overcapacity of just over 16% (12.8/11.0 million) for the traditional North American manufacturers.[1]

GM's capacity in 1993 will be about seven million light vehicles, ignoring the probable closing of about four assembly plants. We project GM's North American build at roughly 4.4 million light vehicles for the U.S. market, or about 5.0 million for the U.S. and Canada. That results in an estimated GM overcapacity of some 40%, and implies that capacity at Ford and Chrysler will just about match remaining sales available to the traditional manufacturers. Indeed, most analysts agree that it is likely to be GM that holds the lion's share of excess capacity.

We think that the NAM's are likely to sell about 1.7 million cars in the United States, and an additional 10% in the Canadian market. We also think they are likely to export roughly 100,000 cars to Europe and another 90,000 to 130,000 to Japan, primarily because of trade friction between Japan and both the United States and Europe. That suggests total NAM car build somewhat over 2 million vehicles, and about 99% straight-time capacity utilization. However, we forecast about 460,000 NAM truck sales and capacity for about 690,000, or overcapacity of some 50% in NAM trucks. Total overcapacity for the NAM's will be just under 9%. This level of "overcapacity" may not even represent a problem, since some slack is needed to permit flexibility.

[1] We projected Canadian sales at the same growth rate as U.S. sales, preserving Canada's larger import car share and lower import truck share at current levels.

Thus we see NAM overcapacity (9%) at about one-half the level of the traditional manufacturer (16%), but the patterns by type of vehicle also differ substantially. Traditional manufacturers are likely to experience proportionately greater overcapacity in cars, while NAM's are likely to face more overcapacity in light trucks. To be sure, if Toyota does not establish a truck plant, then NAM trucks, even at reduced sales levels, are likely to come closer to their reduced straight-time capacity.

Supplier Capacity Estimates. We asked our survey respondents to estimate the proportion of their 1992/1993 customers' requirements that could be met by various types of suppliers. The types of suppliers include the 1) the allied divisions of the vehicle manufacturers; 2) the traditional independent American supplier base; 3) traditional suppliers that move into product areas that are new for them; 4) New American Suppliers, or NAS's;[2] and 5) offshore or nondomestic suppliers. We asked for these estimates for two categories of manufacturers: their traditional Big Three customers and the New American Manufacturers, or NAM's. The fact that there are now two distinct types of manufacturers emphasizes the increasingly international and multinational nature of automotive manufacture.

It is important to bear in mind that GM allied suppliers constitute the vast majority of Genesee's current automotive endowment. From that perspective, other types of suppliers often constitute Genesee's competition. Nevertheless, two other types of suppliers represent possible additions to the Genesee endowment, and thus targets of opportunity for community economic development: the traditional independent supplier, and, perhaps to a somewhat lower degree, the NAS's.

Figure 3.1 displays the responses to these questions. Suppliers report that these various sources can meet 153% of their traditional customers' needs, while they can meet 190% of the NAM's' needs. That suggests that overcapacity at the supplier level may indeed be even more serious than that predicted at the manufacturer level. These levels of overcapacity indicate the probable development of even more fierce competition at the supplier level than the already heated competition of the past few years.

To be sure, we cannot determine whether or not these supplier projections are accurate. But we can ask whether they are consistent with other projections and assumptions, at least for their traditional customers. Suppliers estimate that the allied and traditional independent suppliers

[2] Most of these suppliers are U.S. production sites of Japanese suppliers, such as Ogihara's Howell, Michigan facility.

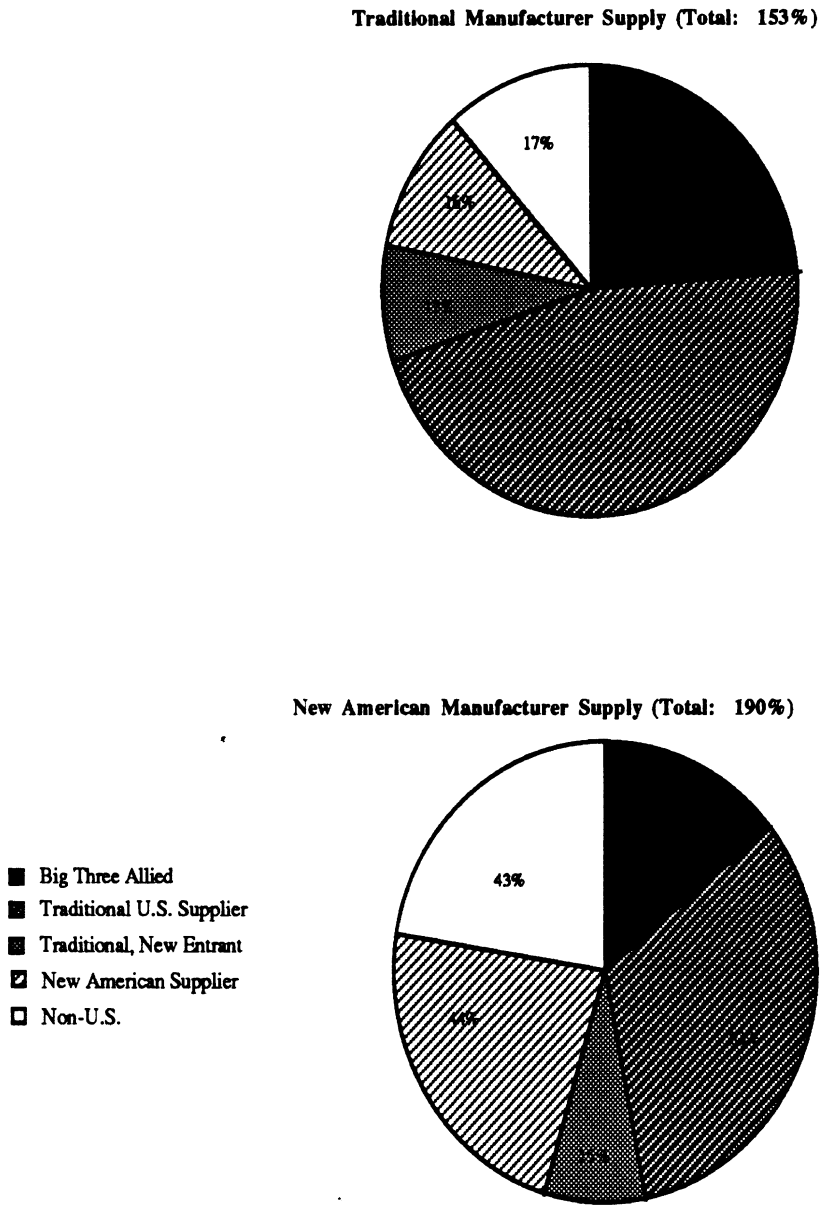

Figure 3.1: Available Supplier Capacity, as a Percent of 1992/1993 Customer Demand, by Source

combined can meet 108% of their traditional customers' 1992/1993 demand. This is below the typically estimated 130% of vehicle overcapacity and our somewhat lower estimate of 116%. However, supplier overcapacity is influenced by factors in addition to vehicle demand, and they do not all predict excess capacity.

First, suppliers report that reduction in the number of suppliers is moving rapidly. If we assume that some 10% of the supply base, and corresponding capacity, is eliminated by 1992/1993, that leaves 90% of today's suppliers pursuing business by then. That would raise the estimate of 108% to 120% (108%/90%), and therefore within the range of our own and conventional expectations. Second, outsourcing may provide some small increase in business, an increase that will probably not be completely offset by increases in nondomestic sourcing. To be sure, the net additional supplier business from these changes in sourcing patterns will likely be small, but it will provide some additional demand for surviving suppliers, thus restraining overcapacity.[3]

Suppliers view the two types of manufacturers as having quite different patterns of potential supplier capacity. The NAS's and nondomestic suppliers are viewed as potentially providing greater capacity to the NAM's than to the domestics (44% vs. 16% and 43% vs. 17%, respectively). We assume that most offshore sourcing for the NAM's will be from Japan, reflecting current practices, while there will probably be a continued shift of the domestic manufacturers' offshore sourcing to countries like Taiwan, South Korea, and Mexico, where currency values have not increased as much as Japan's.

How will this overcapacity affect different types of suppliers? If we assume that each type of supplier secures business proportional to its available capacity for each type of manufacturer, then Figure 3.2 displays the break-out of 1992/1993 manufacturer sourcing. But how likely is that business to be spread evenly across supplier bases? We cannot be certain, of course, but our estimate is that it will not be evenly allocated to all suppliers.

Traditional Manufacturer Sourcing Issues. The traditional manufacturers will undoubtedly re-source some of their demand to the NAS's, although this may be limited by purchasing policies. These suppliers have a number of significant competitive advantages, including their general reputation for high quality, the typically lower costs associated with a greenfield site (especially those afforded substantial public subsidies), and a younger labor force. Of course, it is unclear exactly what proportion of total traditional demand will be met by the NAS's, but most analysts assume that it will be at least the 10% proportional allocation, and probably closer to the 16% of demand they are estimated to be capable of meeting. This could change dramatically if the traditional manufacturers begin to view sourcing from the NAS's as increasing the competitiveness of competitor vehicle manufacturers.

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[3] A latter section of the report presents supplier estimates of the rapidity of changes in these and other industry business practices.

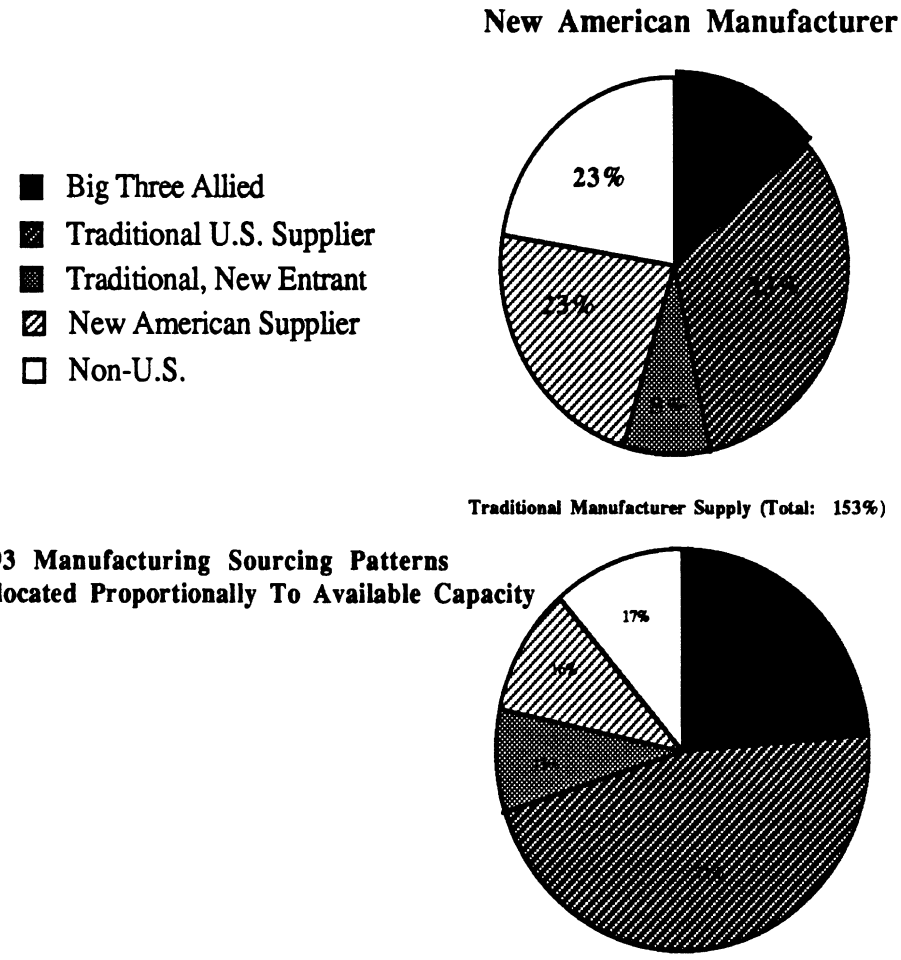

Figure 3.2: 1992/1993 Manufacturing Sourcing Patterns If Allocated Proportionally To Available Capacity

Offshore sourcing by the domestics would be on the order of 11% (17%/153%), assuming available manufacturer business is spread proportionately across different supplier bases. But it is possible that nondomestic suppliers will receive less than a proportional share, perhaps only on the order of 5% to 7%. This would be more in line with the supplier expectations for slow development of offshore sourcing discussed in Chapter Two. There are three reasons for this expectations. First, we think that traditional suppliers will compete fiercely to retain business, and many of them will compete on a variable cost basis rather than reduce capacity. Second, we think the early 1990s will see the NAS's making access to the traditional domestic industry their number one strategic priority.

Third, the strengthening of the yen has somewhat lessened the formidable competitive challenge of Japanese suppliers, and this challenge will not automatically be replaced by other offshore sources. The Japanese are no longer simultaneously the low-cost and high-quality source for many automotive goods. To be sure, the strengthened yen has not damaged their quality, and

there is evidence that they are capable of restraining their costs in the face of a strong yen. But now they must frequently face competitors that can best them on a cost basis, if not a quality basis. Moreover, we think that the domestic manufacturers will likely restrain their sourcing from Japanese companies to avoid increasing their dependency on their major competitor industry. Ford, for example, has already indicated that it will limit its sourcing from Japanese suppliers to cases where they have clear technological advantages.

CAFE regulations, on the other hand, may result in increased offshore sourcing for large vehicles that are made by traditional domestic manufacturers. The Big Three face the problem of how to structure their domestic and import CAFE fleets so as to avoid penalties. CAFE requires a particular calculation of domestic content, with vehicles at or above 75% considered "domestic" and those below 75% treated as "imports", regardless of where they are assembled. Domestic and import vehicles are separately evaluated for conformance to CAFE, and the fleets are therefore subject to separate penalties for noncompliance.

For the domestics, meeting CAFE standards for the domestic fleet may require moving some large vehicles into the import fleet, and that can be done by lowering the level of domestic content below 75%. These larger vehicles could then be offset by more fuel efficient imports, and they would not reduce the CAFE performance of other domestic vehicles. That strategy would require lowering the typically high current levels of domestically manufactured content, often reported to be in the 90%s, down to a level of at most 60%.[4]

If the manufacturers decide to lower the domestic content of some vehicles, how they elect to do so is critical for suppliers. If they choose to source offshore major powertrain elements, such as engines or transmissions, then their domestic allied supplier divisions may be hit hard. Genesee has two GM engine facilities serving intermediate and larger cars, and Buick City has some Hydra-Matic capacity; these plants could conceivably lose some work if GM follows a major component "de-contenting" strategy.

But such a strategy might permit current independent American suppliers to retain much of their present business. An engine sourced from Mexico, for example, is 100% import content, even if 50% of its value is composed of American exports to Mexico. If, on the other hand, the manufacturers elect to source many lower-value parts and components offshore, then independent

[4] In fact, it might be quite a bit lower than 60%. That is because these vehicles typically have a higher portion of inherently domestic content [profit and marketing expenses, for example], that must be offset by lower levels of domestic content in the sourceable portion of the vehicle.

suppliers may face a more broadly dispersed threat, and one more difficult to meet through increased export activity. In any case, suppliers may find that protecting their current levels of business requires substantial change in their current business practices and customer base.

Unfortunately for Genesee, if GM decides to "de-content" its large cars, it will probably elect to source major components offshore. This would be more efficient in terms of logistics, source selection, and quality control. In addition, GM has engine and transmission facilities in Mexico that could probably supply the required volumes relatively rapidly.

If the Big Three lower the domestic content levels of larger vehicles to meet CAFE standards, then offshore suppliers might well secure the 11% of available Big Three demand that reflects the proportional allocation of demand to available capacity. But how much of this offshore content consists of American exports will probably depend on the specific strategy the manufacturers pursue in attaining lowered levels of domestic content.

NAM Sourcing Issues. We see the NAM's seriously pursuing a high level of domestic content by 1992/1993. There are three primary motivations for this. First, there will be continued concern about the bilateral automotive trade balance. High domestic content will ease trade friction between the United States and Japan, both through its real impact on the deficit, and its symbolic value as evidence of good faith effort. Second, there are clear advantages to proximate sourcing, especially in the low inventory, pull manufacturing systems characteristic of the Japanese manufacturers. Third, we feel that the Japanese will want their U.S. production clearly viewed as "American" so that it provides a possible source of vehicles for the European market, should "Europe 1992" bring with it restrictions on import vehicles from Japan.

At the same time, CAFE standards may establish an upper limit on the domestic content levels of the NAM's. The Japanese certainly appear to be making a concerted effort to upscale their vehicle offerings, and most of these larger and more expensive vehicles will come from Japan. This allows the Japanese industry to reduce the unit level of vehicle exports to the United States without necessarily reducing the value of those exports. The Japanese industry can then argue that they have reduced imports in units, and that U.S. consumer choice is responsible for the continued high levels of the trade deficit in dollars. But it is entirely conceivable that these upscale imports will have trouble meeting the CAFE standards that may be in force by 1992/1993. Now, in the Winter of 1989/1990, discussions indicate a serious possibility of CAFE miles-per-gallon standards in the low 30s by 1992/1993. To guard against this, we think the Japanese manufacturers will want to keep their NAM vehicles as "imports" for CAFE purposes, so that

these more fuel efficient subcompacts (68% of projected NAM capacity) and compacts (32%) can be used to offset their less fuel efficient, upscale imports from Japan.

These contrasting pressures suggest to us that the NAM's will seriously target a level of domestic content just below 75%, to maintain their "import" CAFE status, while securing as much of an "American" image as possible. However, the CAFE domestic content calculation includes inherently domestic, nonsourced content of just over 37% for the typical NAM vehicle.[5] This portion of the vehicle is entirely domestic content in CAFE terms. That means the balance -- or "sourceable" content -- is just below 63% of the vehicle value. That portion of the vehicle represents supplier purchases, and it must be just under 60% domestic content for the vehicle's total calculated CAFE domestic content to be just under 75%.

For the NAM's, then, offshore suppliers are likely to secure just over 40% of the estimated 43% of NAM demand that they can fill. But that leaves the other four types of suppliers targeting a total 149% of capacity on 60% of the vehicle's sourceable content, or capacity at more than twice available demand. If the NAM's take the estimated available capacity of the NAS's (44%), as seems probable, that leaves the three types of traditional domestic suppliers with 105% of capacity to fill 16% of the originally estimated demand, or capacity that is some 650% of demand. If the NAM's equally split their domestic demand between NAS's and traditional suppliers, including all three categories, then the traditional suppliers will secure about 30% of NAM demand, but still face serious overcapacity, with 350% (105%/30%) of required capacity. On the other hand, NAS's will also secure about 30% of NAM demand, but that represents about 68% of their available capacity. Table 3.2 summarizes these possibilities.

Moreover, the NAM's' likely heavy reliance on NAS's will deprive these traditional suppliers of another important source of business: each other. These suppliers relied on other suppliers for some 20% of their 1987 sales. But NAS's are almost certain to source from offshore at a fairly high rate, perhaps as much as 50%. To be sure, traditional suppliers also source offshore, but at a rate of about 15%, based on these data. So traditional suppliers may lose an additional 41% (1.0 - [.5/.85]) of the business between suppliers generated by NAM manufacturing when that business goes to NAS's.

We suspect that the allied suppliers of the domestic manufacturers will experience special difficulty securing work from the NAM's. The NAM's are likely to source from allied suppliers

[5] This content includes assembly, manufacturing profit, marketing expenses, and so forth.

Table 3.2
Possible New American Manufacturing Demand, by Supplier Type

Supplier Type	Capacity Available	Most Likely	Best Case
Big Three Allied Traditional Traditional, New Product	105%	16%	30%
New American Supplier	44%	44%	30%
Non-U.S. Supplier	43%	40%	40%

only in those cases where they in fact have unique technology, or an extreme competitive edge in quality and/or cost. A minor, or even moderate, edge will probably not suffice to win the business. We think the NAM's will view such sourcing as potentially helpful to a competitor, and will therefore resist it. The major exception to this will be in situations where the traditional manufacturer sources vehicles from the NAM or has an investment position in it. We suspect that they will be able to negotiate access for some of their allied suppliers in those circumstances. This suggests that GM allied suppliers in Genesee are unlikely to secure significant business from Toyota in Georgetown, KY, but may fare somewhat better in supplying Toyota vehicles made at NUMMI in Fremont, CA.

Traditional suppliers, then, face a serious challenge. Their traditional customers are likely to provide decreased demand, and the ready replacement sources for this lost business, the NAM's, are not likely to come close to taking the suppliers' available capacity. Allied suppliers are particularly likely to find the NAM's inadequate replacements for their traditional business.

Summary. Overcapacity in the U.S. industry, then, will make entry into the traditional domestic industry more difficult for offshore suppliers. The competition between allied, traditional independent, NAS, and established offshore suppliers may effectively neutralize any cost advantage they might possess. This might preclude a typical entry strategy of quoting low prices to secure access and the opportunity to demonstrate competence. Overcapacity also suggests that domestic suppliers will be quite cautious about adding new facilities or expanding current ones. That is unfortunate news for communities such as Genesee that seek to acquire or expand an automotive supplier base as a component of their economic development activities.

CAFE regulations are likely to have the unintended effect of making it more difficult for the traditional U. S. supplier base of allied and independent suppliers to secure significant volumes of business at the NAM's. For the NAM's to meet the strategic needs of the Japanese manufacturers, it is likely that no more than 16% to 30% of their demand can be available to the traditional automotive supplier industry.

Capacity Constraint.

Of course, general levels of overcapacity conceal product areas that may in fact experience some capacity strain. Even in an overcapacity situation, some products are likely to face constraints, sometimes because they are new or face explosive demand, sometimes because of the decisions of current suppliers to leave a product area.

We asked our respondents to identify as many as three specific product areas where current capacity may not be enough to meet 1992/1993 demand. If all 92 respondents identified three products, there would be 276 nominations. In fact, only 16 respondents identified such opportunities, and they indicated 26 product areas that might experience strained capacity. This is just under 10% of the possible nominations, and reinforces the overcapacity estimates discussed above. But it still suggests there are likely to be specific product areas that experience undercapacity. Products for seats (6 nominations), vehicle bodies (4 nominations), and fuel systems (3 nominations) lead this list.

Capacity Plans.

We asked respondents about their current capacity and future capacity plans for ten different non-U.S. production locations and three U.S. regions: the Frostbelt, the Midsouth, and elsewhere. Genesee is, of course, a Frostbelt community. These companies, as displayed in Table 3.3, currently have at least one production location in all of these areas except Eastern Europe. The three U.S. locations total 131, or 58.5%, of the identified locations, followed by Canada at 13.4%, Western Europe at 8.0%, and Mexico at 7.6%.

We asked the likelihood that respondents' companies would add, replace, or reduce capacity in each of the thirteen locations. The scale covers 1= "near zero likelihood," through 3= "50/50," to 5= "near 100%." The three U.S. locations have the highest summed scale scores for adding capacity, with the Frostbelt averaging 3.3, other U.S. at 3.1, and the Midsouth at 2.9.

Table 3.3
Supplier Production Locations

Region	Existing Locations	Expected Additions	Expected Reductions
Brazil	9 (4.0%)	5.50	1.50
Canada	30 (13.4%)	12.50	4.50
China	1 (0.0%)	3.00	0.00
Eastern Europe	0 (0.0%)	1.25	0.00
India	3 (1.3%)	1.50	0.00
Japan	8 (3.6%)	2.50	0.00
Mexico	17 (7.6%)	12.50	0.75
South Korea	5 (2.2%)	6.00	0.00
Taiwan	2 (1.0%)	2.75	0.00
Western Europe	18 (8.0%)	14.00	0.00
U.S. Frostbelt	63 (28.1%)	35.00	9.00
U.S. Midsouth	36 (16.1%)	22.25	1.75
U.S. Other	32 (14.3%)	19.25	3.00
Total	224 (99.6%)	138.00	20.50

Western Europe and Canada follow at 2.6 and 2.3, respectively. The highest score for capacity reductions are the Frostbelt (1.9), Canada (1.7), and other U.S. and Brazil (1.5).

The Frostbelt (2.4), the Midsouth and Canada (1.9), other U.S. (1.6) and Western Europe (1.3) are the only regions above 1.1 on our scale for replacing capacity, even though our question asked for retrofit or greenfield replacement. Unfortunately, the data patterns suggest that respondents may have interpreted the replacement question in a number of ways, including 1) replacing in that location capacity already existing in that location; 2) replacing in that location capacity currently existing in other locations; or 3) replacing in other locations capacity currently in that location. Therefore, until additional analysis clarifies this item, we discuss it no further.

The probabilities of adding capacity clearly exceed those for reducing it. Does this mean that the supplier industry will indeed face increased future capacity, even above today's level, and that much of the nondomestic capacity targeted on the U.S. manufacturers may be owned by North American companies? We suspect that each of these respondents assumes that the capacity they add will be compensated by the reduction of competitors' capacity, and thus there will be little or no net added capacity. But if many companies pursue this strategy, there will inevitably be additional overcapacity and the eventual premature retirement of some companies' capital investments. Worldwide automotive growth is not likely to support the additional supplier capacity coming on-stream throughout the world, and companies will have to be competitively successful to

fill their capacity. That competitive success will inevitably be at the expense of other companies, with some facing idle capacity, and others forced to retire capacity. In any case, the general situation of overcapacity will not discourage some of these companies from adding capacity even where sufficient capacity exists on an industry-wide basis.

We converted these scale scores to probabilities, then multiplied them by the number of respondents to the item, to yield an expected value for each of these capacity decisions.[6] The results for adding and reducing capacity are also displayed in Table 3.3. The three U.S. regions, Western Europe, Canada, and Mexico are likely to see the largest number of additional sites, while the Frostbelt, Canada, and the "other" U.S. location are likely to see the largest numerical reductions.

We subtract the expected values for capacity reduction from the expected values for additional capacity to arrive at a net expected value for each region's additional production locations, displayed in Table 3.4. The three U.S. regions, Western Europe, and Mexico are likely to experience the largest absolute net gains. It merits comment that the Frostbelt, for all the adverse comment it receives in the popular and industry media, shows the largest absolute net gain in likely supplier locations, some 27% ahead of the second place Midsouth. These data also suggest that in many cases, the site location decision for a particular plant will focus on the selection of a region within the United States.

The Frostbelt, Midsouth, and other U.S. regions will receive some 53% of the expected net location gains, although this is somewhat below their share of current locations. Canada suffers the largest share loss, from just over 13% of current to just under 7% of expected net additions, followed by the Frostbelt, falling from about 28% of current to about 22% of additions. Western Europe gains about 4%, moving from 8% of current to just under 12% of expected additions, with South Korea and Mexico gaining about 3% share of additions compared to their current share.

[6] We treat each decision as equivalent to one plant, although that is undoubtedly an error in certain cases because some companies will be considering more than one plant for a location as they respond to this question.

Table 3.4
Supplier Net Capacity Additions, by Region

Region	Expected Net Gain*	Rate of Net Gain**
Brazil	4.00 (3.4%)	0.44
Canada	8.00 (6.8%)	0.27
China	3.00 (2.6%)	3.00
Eastern Europe	1.25 (1.1%)	— ***
India	1.50 (1.3%)	0.50
Japan	2.50 (2.1%)	0.31
Mexico	11.75 (10.0%)	0.69
South Korea	6.00 (5.1%)	1.20
Taiwan	2.75 (2.3%)	1.38
Western Europe	14.00 (11.9%)	0.78
U.S. Frostbelt	26.00 (22.1%)	0.41
U.S. Midsouth	20.50 (17.4%)	0.57
U.S. Other	16.25 (13.8%)	0.51
Total	117.50 (99.9%)	0.52

* Table 3.3, column 2 minus Table 3.3, column 3.
** Table 3.4, column 1 divided by Table 3.3, column 1.
*** Current base for Eastern Europe is zero, so no meaningful rate of increase can be calculated.

It is not surprising that the traditional heartlands of North American automotive production, the Frostbelt and Canada, take less of a share of expected future locations than they enjoyed in the past. Nor is it surprising that these losses, for the most part, are expected to be distributed throughout these other regions rather than concentrated in just one or two. However, it is somewhat surprising to see Western Europe doing so well in expected net gains. As an established region for these supplier companies' production, one might expect it to lose share to newly emerging regions, as is the case with the U. S. regions and Canada. We suspect that this reflects North American companies' considering European locations in light of the announced plans for a European free trade area after 1992. One strategic response to this situation is to establish new European production sites, to guard against restricted access to post-1992 Europe.

Table 3.4 also displays the rate of net gain for each of these regions, using their existing locations as a base. The low rates for the Frostbelt and Canada reflect their large existing base, while some high rates, such as China's, reflect a small existing base. Perhaps most noteworthy here is the continued growth of the Midsouth and other U.S. locations, perhaps at the expense of the Frostbelt and Canada.

Summary. There is no question that the traditional North American domestic automotive industry faces a serious threat of overcapacity as it enters the early years of the 1990's. To be sure, typical estimates of vehicle overcapacity of 130% are higher than our own estimates of some 116%, and the domestic industry's overcapacity may be more concentrated in cars than in light trucks. But it is serious overcapacity in any case. Suppliers, too, face overcapacity, perhaps even beyond that experienced by their customers. There is some evidence that this will be primarily due to the increased success of the NAS's. Nondemand factors will likely cancel out, although that cancellation involves a reduction in the number of suppliers, some increased outsourcing by the manufacturers, and some increase in the manufacturers' level of nondomestic sourcing. Each of these developments pose particular threats and opportunities for individual suppliers, as evidenced by some expectation of capacity constraint in certain product areas.

These respondents are not very likely to add capacity, but if they do, it is likely to be in the United States. This is not surprising in view of their estimates of the overall capacity situation in the industry. Nevertheless, some capacity will be added, and it is likely to evidence a wider geographical distribution than current facilities, and Western Europe may significantly benefit from those changes. The Frostbelt is likely to lose share in supplier production activity compared to today and faces the largest number of supplier reductions. But it is also likely to secure the largest absolute gain in supplier additions, and the largest net gain of any of these regions.

The challenge for Genesee is to recognize that its large allied GM supplier base poses serious risks for losses, and some barriers to securing an adequate share of Frostbelt additions by independent suppliers. However, those additions are targets of opportunity for Genesee to pursue.

Views of International Competition

We asked our respondents to provide their views on ten different international competitors/production locations, and, in some instances, on three regions of the United States. The competitor list is composed of Brazil, Canada, China, Eastern Europe, India, Japan, Mexico, South Korea, Taiwan, and Western Europe. As would be expected, Japan and Canada are viewed throughout these issues as a benchmark for competition. However, the relative views on other competitors are less consistent, and that makes them both interesting and potentially useful. These views suggest how the American supplier community views these competitors and potential competitors in relation to each other now, in 1992/1993, and the year 2000.

We think these views are important for communities like Genesee because they essentially define the competition that Genesee's current automotive endowment faces and that Genesee itself faces in securing additional automotive production. That is, these countries and regions are at once competitors in the automotive markets that Genesee serves, and competitors for expanded automotive production activity that Genesee may seek. Of course, these respondents represent critical decision-makers in Genesee's pursuit of the second goal.

Seriousness of Competitive Threat. We asked how serious a competitive threat each competitor industry poses in the respondent's main product area now, in 1992/1993, and in the year 2000, with 1= not very serious and 5= extremely serious. These data must be viewed cautiously. Competitiveness is a complex concept, and here respondents are considering it at its most abstract and general level. These responses are summary views across a range of differentiated dimensions, and represent a mixture of specific product areas.

These ten competitors currently average just about 1.9 on our scale, between not very serious and extremely serious. The average moves to about 2.3 by 1992/1993, and reaches just under 2.7 by the year 2000. The next decade, then, will see increasingly serious competitive threats from this group of countries and regions.

Figure 3.3 displays the evaluations for five competitors that are currently rated at 2.0 or above on our scale. Figure 3.4 presents evaluations for the five that currently fall below 2.0 on our scale. If we set 2.5 as the cut point for a moderately serious competitor (rounding to 3.0, the scale mid-point), U.S. suppliers now see only two serious competitors, Japan (3.2) and Canada (2.9). Mexico (2.1), South Korea and Western Europe (2.0), and Taiwan (1.9) form the next competitive tier. The very general nature of these ratings is probably reflected in the grouping of Western Europe with these newer, but perhaps more aggressive, competitors. Western Europe is probably viewed as a less serious threat than Japan and Canada because of its perceived lack of activity, rather than because of a markedly lower capability. Suppliers see Brazil (1.5), China and Eastern Europe (1.1), and India (1.0) as currently not very serious competitive threats.

In 1992/1993, Japan and Canada marginally increase their competitive threat, moving to 3.1 and 3.4 respectively. South Korea (2.9), Mexico (2.7), and Taiwan (2.5) reach a moderately serious level, while China (2.4), Brazil (2.5) and Western Europe (2.5) reach it in 2000. By 2000, South Korea (3.4) pulls just ahead of Japan (3.3) and Canada (3.2), while Mexico reaches 3.2 on our scale. Competition is increasing, and the number of credible international competitors is likely to grow over the next decade or so.

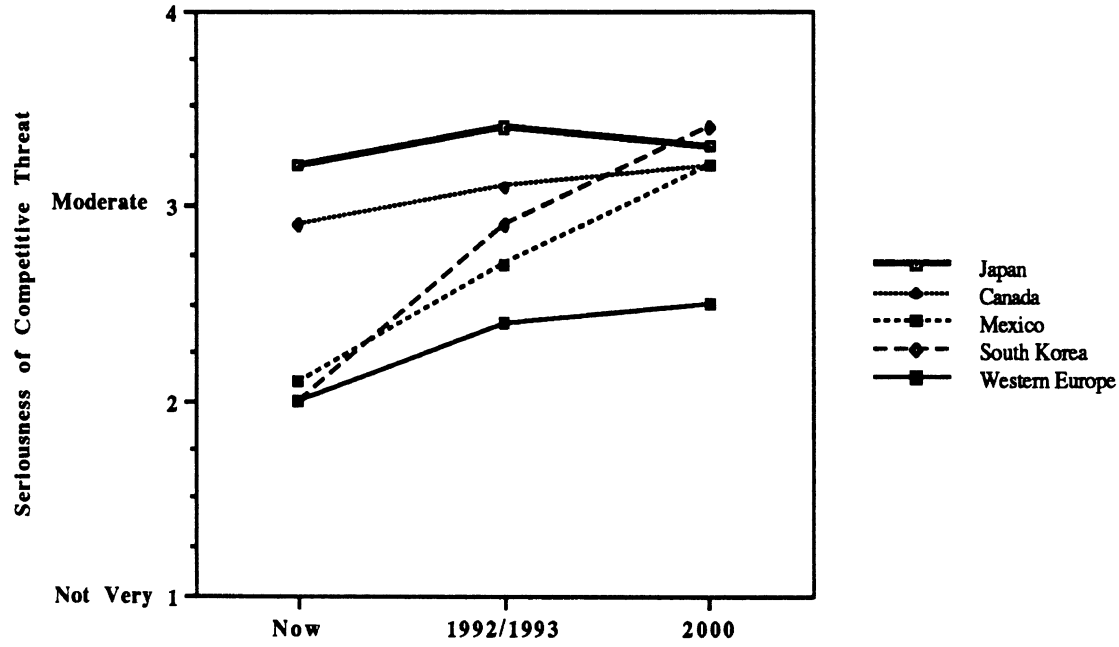

Figure 3.3: Competitive Threat to U.S. Suppliers, Over Time: Five Competitors

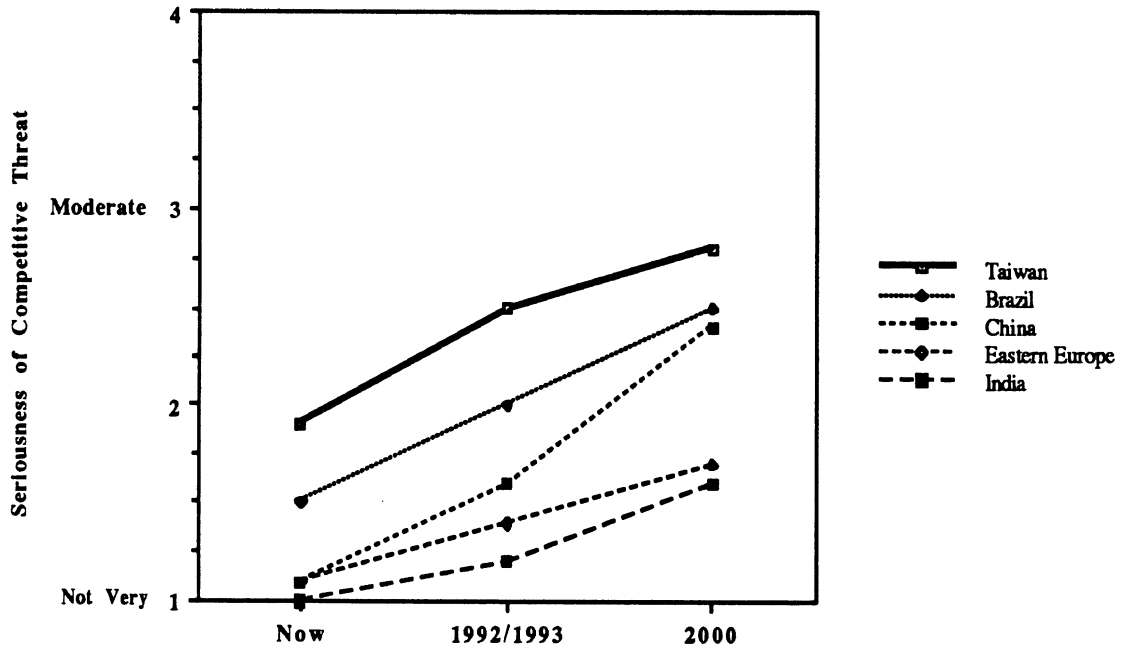

Figure 3.4: Competitive Threat to U.S. Suppliers, Over Time: Five Additional Competitors

China presents an interesting case in point. China scores 1.1 for the current period, tied with Eastern Europe and marginally ahead of India. China, at 1.6, is expected to pull ahead of Eastern Europe by 1992/1993, and to pull essentially even with Western Europe and Brazil by 2000, at nearly 2.5 on our scale. China, of all these competitors, shows the largest percentage increases from now to 1992/1993 (0.5 points, 45%) and from 1992/1993 to 2000 (0.8, 50%). These suppliers, then, view China as a competitor that is likely to show rapid development, perhaps somewhat more rapid during the 1992/1993 to 2000 period. They clearly believe that China will leave the less serious competitor group and establish itself as a moderately serious competitor by 2000.[7]

Canada poses the most immediate threat to Genesee, as it has for the past 20 years or so. The enhanced competitiveness of Mexico is probably the next most serious threat, because it combines many of the advantages of the developing economies, but is geographically much closer to the U.S. production base. GM has established numerous production facilities in Mexico over the past decade, and these pose serious challenges for products that are labor-intense but low in technical skill requirements. We see Taiwan and South Korea, whose currencies have not strengthened against the dollar as much as the yen has, to challenge more for business already lost overseas, especially to Japan. However, their emergence decreases the likelihood that much of that work can be brought back to the United States.

Competitive Dimensions. We asked respondents to rate each producing region on five dimensions: quality, cost, technology, material resources, and market potential. For this set of ratings we included three U.S. regions (the Frostbelt, the Midsouth, and other), so there are 13 locations under consideration. These ratings, presented in Table 3.5, provide more detailed evaluations that may form the bases for the summary ratings of competitive threat discussed above. In fact, if we take an unweighted average of each of the ten non-U. S. region's scores across these five dimensions, we find virtually the same rank ordering that we observe on the summary measure. The major exception, Western Europe, is just behind Canada on the sum of these five dimensions, while it falls at least 0.5 scale points behind Canada for each of the three time periods of the summary measure. That is consistent with the suspicion that its lower ranking on the summary measure does not reflect its capability, but rather its strategic decisions about where to compete.

The U.S. locations differ quite substantially from these ten competitors when we compare their averages on these five performance dimensions. While the U.S. locations incur a substantial

[7] We suspect that these views would be markedly different today, in June of 1989, because of the recent turmoil in China.

Table 3.5
Competitive Ratings*
on Performance Demensions

Region	Product Quality	Production Cost	Technical Capability	Material Supply	Market Potential	Average Rating
Brazil	2.5	3.9	2.3	2.7	2.7	2.8
Canada	4.0	3.4	3.7	3.8	3.7	3.7
China	1.8	4.0	1.8	2.2	2.9	2.5
Eastern Europe	2.0	3.1	2.2	2.3	2.3	2.4
India	1.5	3.5	1.6	1.8	2.1	2.1
Japan	4.8	3.6	4.7	3.6	3.5	4.0
Mexico	2.8	4.3	2.3	2.9	2.9	3.0
South Korea	3.4	4.2	3.0	3.1	2.9	3.3
Taiwan	3.0	4.1	2.7	2.8	2.7	3.1
Western Europe	3.9	2.7	4.2	3.6	3.6	3.6
U.S. Frostbelt	3.8	2.8	4.3	4.1	4.0	3.8
U.S. Midsouth	3.8	3.5	3.8	3.8	4.0	3.8
Other	3.6	3.0	3.8	3.6	3.9	3.6

* On a scale with 1 = Extremely Non-competitive, 3 = Average Competitiveness, and 5 = Extremely Competitive.

disadvantage in production cost (3.1 vs. 3.7), they possess clear advantages on the other four dimensions, exceeding this group of competitors by a substantial margin on each: 3.7 vs. 2.7 on quality, 4.0 vs. 2.9 on technical capability, 3.8 vs. 2.9 on material supply, and 4.0 vs. 2.9 on market potential.

But these regions compete individually, not as a group, so comparisons of individual locations are more important for business decisions. U.S. locations are rated fairly competitively on the summary measure of these dimensions in comparison with individual competitor regions as well. The Frostbelt and the Midsouth average 3.8, behind Japan at 4.0, but ahead of Canada at 3.7, while other U.S. locations tie with Western Europe at 3.6.

However, a company's product, the bases of competition appropriate to its industry segment, and the basis of competition it selects influence both the relative importance of these performance dimensions and the company's relevant competitors. Japan is the clear quality leader, followed by Canada, Western Europe, the Frostbelt, and the Midsouth.[8] India, China, and

[8] In view of the increasing importance of quality as a supplier selection criterion, the U.S. performance, especially in comparison to Canada and Western Europe, is disappointing.

Eastern Europe fall at 2.0 or lower on quality. Mexico, South Korea, Taiwan, and China are the production cost leaders, all scoring at or above 4.0, while Western Europe and the Frostbelt fall below 3.0 on this dimension. Japan is the clear leader in technical capability, followed by the Frostbelt and Western Europe. India, China, Brazil, and Mexico all fall below 2.5 on this dimension. In terms of material supply, the Frostbelt, Canada, and the Midsouth are the leaders, and India, China, and Eastern Europe the farthest behind. The U.S. locations, Canada, Western Europe, and Japan lead in market potential, while India and Eastern Europe trail substantially.

If we think of these competitors as comprising two groups, developed and developing, it is clear that the developed competitors typically score lowest on the production cost dimension. For the developing competitors, production cost is typically the highest rated performance dimension. Thus the balance of competitive strengths and weaknesses differ for these two types of competitors, and that suggests that the balance of competitive strength between them depends on the exact markets and products under consideration.

The average of the three U.S. regions, weighted by their proportion of current locations, puts the United States second to Japan on the summary measure of these five performance dimensions, and essentially tied with Canada. However, the pattern of performance differs across the three U.S. locations. Thus the Midsouth has a production cost advantage over the Frostbelt, but lags the Frostbelt in both technical capability and material supply, although these regions essentially are the same on the summary performance measure. The "other U.S." location is behind both the Frostbelt and the Midsouth on the summary measure. But it does seem that the Frostbelt and the Midsouth offer relatively balanced and strong competitive performance across these dimensions. While the Midsouth cannot compete with many of the competitor regions on cost, it compensates for this weakness with considerably stronger performance than those regions on other dimensions. The Frostbelt may be even weaker than the Midsouth in its competitive cost position, but it is comparatively even stronger than the Midsouth on technical capacity and material supply.

What are the implications of these results for the competitiveness of the United States as a source of automotive parts and components? The United States, with a weighted average of 3.00 on production cost, is ahead of only Western Europe on this critical performance measure, and may be noncompetitive in parts and components where this is the only basis of competition, few as they may number. But it should be noted that the United States cost position has improved against many of these competitors as the dollar weakened over the past few years. These data, in our judgement, do not appear to fully reflect these recent developments. For more typical products,

where competition is multidimensional, the United States is quite competitive. For products where cost is relatively more important, the Midsouth is quite a strong competitor in terms of these five performance dimensions, second only to Japan. For products where technical capacity and/or material supply are more critical dimensions, the Frostbelt is extremely competitive, also second only to Japan.

The Frostbelt, then, and by extension, Genesee, is likely to be more successful in pursuing automotive production goods that are relatively low in labor content, so that its perceived high cost position is less relevant, and those goods where technical capacity and material supply issues are more critical, so that its stronger performance dimensions are relatively more important.

However, if products are "lower in labor content," they provide fewer jobs than high labor content products, and probably fewer jobs than Genesee's current product mix. In the long run, Genesee simply cannot depend on automotive production to provide the high levels of employment it has in the past. Even an outstandingly successful strategy to preserve Genesee's current share of GM employment faces the reality that the number of jobs will fall, as industry employment falls in response to competition, efficiency, and restructuring.

Diversification within the automotive sector must recognize that components and parts with high labor content are likely to move. They may form a useful part of a transitional strategy to preserve levels of employment. However, lower labor content jobs are more likely to become a relatively permanent element of the Genesee economy, and thus play a more enduring role in an economic development strategy.

Production Site Decisions

The redistribution of production capacity in the face of industry overcapacity is a major focus of this survey, and that process will be in part driven by the fundamental factors influencing company decisions to select one from among many possible sites. This is particularly critical since our respondents make it clear that they primarily view the ten non-U.S. regions as sources for parts, components, and vehicles, rather than markets. Our respondents provided ratings of the importance of twelve considerations or factors in deciding where to locate a manufacturing operation. Table 3.6 displays these results.

Table 3.6
Importance of Factors
in Manufacturing Siting Decisions

Siting Factor	Rating*
Labor Force Attitudes	1.7
Loaded Direct Labor Cost	2.1
Loaded Indirect Labor Cost	2.2
Proximity to Customers	2.2
Transportation Infrastructure	2.4
Skill of Local Hourly Labor	2.5
Availability and Cost of Utilities	2.5
Loaded Salaried Labor Cost	2.6
Skill of Local Salaried Labor	2.6
Skill of Local Middle Management	2.7
Proximity to Suppliers	2.7
Land Cost	2.8

* On a scale with 1 = Major Importance, 3 = Moderate Importance, and 5 = Little Importance

All these items were rated below 3.0, and thus on the more important side of the scale.[9] On balance, these considerations are little differentiated by these suppliers. However, the results do establish labor force attitude as the most important of these considerations, averaging 1.7 on our scale. Loaded cost for both direct (2.1) and indirect (2.2) labor and proximity to customers (2.2) form the next cluster, with all of the rest falling into a third cluster.

There appears to be some inconsistency in the importance these respondents assign to direct and indirect labor costs and their responses to some of the other items in the survey. They rate both hourly and salaried labor costs, as discussed below, as important, but the least important by a considerable margin, of ten performance areas that the United States must improve to stay competitive. They also rate the U.S. weighted average for production cost as competitively ahead of only Western Europe among the ten competitor regions. Yet the United States will be the location of over half of the net additions to capacity developed from these responses. It is difficult to reconcile this emphasis on labor cost as a site selection factor with a much lower emphasis on the need to improve U.S. performance in the labor cost area, in light of the still heavy, albeit somewhat declining, emphasis upon U.S. siting for capacity investments.

[9] This scale is reversed, with 1 = major importance, 3 = moderate importance, and 5 = little importance.

However, it is important to recognize that these views, whether or not they are logical or consistent, do influence site selection decisions. And this is a handicap for Genesee. Genesee is a high labor cost location, and is likely to remain so. It also has the reputation of having a labor force with a confrontational, uncooperative attitude and lacking in a strong work ethic. While Genesee would score quite well on most of the other factors, decisions may be overwhelmed by these first three, especially labor force attitude. Any strategy for pursuing new automotive facilities will have to confront this drawback and develop information to correct it and offset it.

Supplier Selection Criteria

The vehicle assembly operations are the ultimate customers for automotive suppliers, whether independent or allied, and manufacturer purchasing representatives are thus the critical decision-makers. As overcapacity increases the competition among suppliers, the criteria used by purchasing become even more critical than in the past, when supplier capacity may have been more closely matched the demands of the manufacturers.

We asked our respondents to rate the importance that their OEM customers place on a variety of supplier characteristics when they decide where to place their business. We asked them to indicate the importance of each characteristic for three time periods: 1977, the glory years of the old traditional industry; now, 1988; and 1990/1992, a few years into the future. These responses indicate interesting changes from the past to the present, and expectations about future developments. Since they represent supplier beliefs about their customers' selection criteria, they suggest the suppliers' views of the bases of competition in the industry.

The supplier selection decision in the late 1970s was dominated by short-term price at 4.1, followed by delivery reliability at 3.3, almost one full scale point behind. Manufacturing competence and past performance, both at 3.1, were the only other factors that receive scores above 3.0, the "moderately important" point of the scale.

Quality (4.3), long-term price (4.2), and delivery (4.1) are currently more important than short-term price (3.9), and manufacturing competence (3.9) is essentially tied with it. By 1990/1992, quality (4.7), delivery (4.5), long-term price (4.5), manufacturing competence (4.4), and engineering competence (4.4) are clearly expected to form the cluster of the most important selection criteria, displayed in Figure 3.5. Product (4.0) and process (3.9) innovation, effective management (3.9), and past performance (3.9) cluster with short-term price (3.8) behind this first

set of factors, while financial resources (3.7) and location (3.3) are still expected to trail short-term price. This cluster of factors is displayed in Figure 3.6.

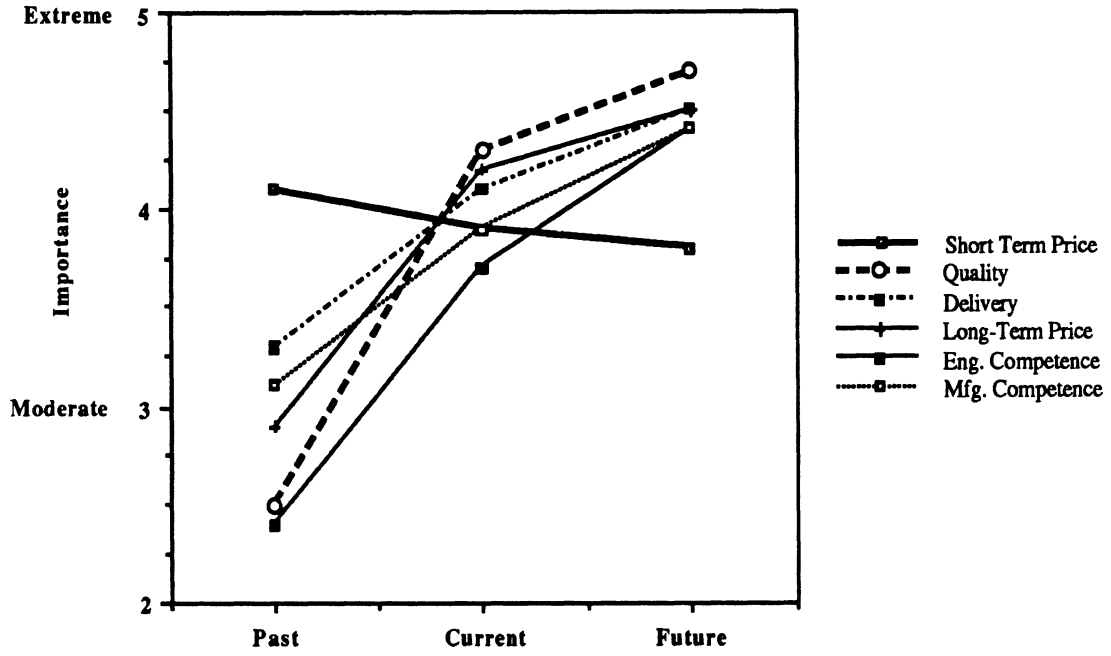

Figure 3.5: Supplier Selection Criteria

These suppliers, then, see rather dramatic changes in the manufacturers' selection criteria as we move from the past through the present to the mid-term future. Over time, all these criteria except short-term price increase in importance. Short-term price's absolute scale score falls from 4.1 to 3.9, and then to 3.8. To be sure, these are not major changes. But the *relative* ranking of short-term price shifts dramatically, as it falls from most important, by a significant margin, in 1977, to tied for fourth now, and to 10th in the future. Quite simply, more factors are rapidly becoming more important, and short-term price at best maintains the absolute level of importance it has held in the past.

As we look to the future, we find a new set of important selection criteria, but they are first among 12 criteria, all of which are now above 3.0 on the scale. No single factor dominates the selection decision as short-term price did in the past. The lowest ranking criteria for the future is supplier location at 3.3. In the past, only four criteria were rated above 3.0.

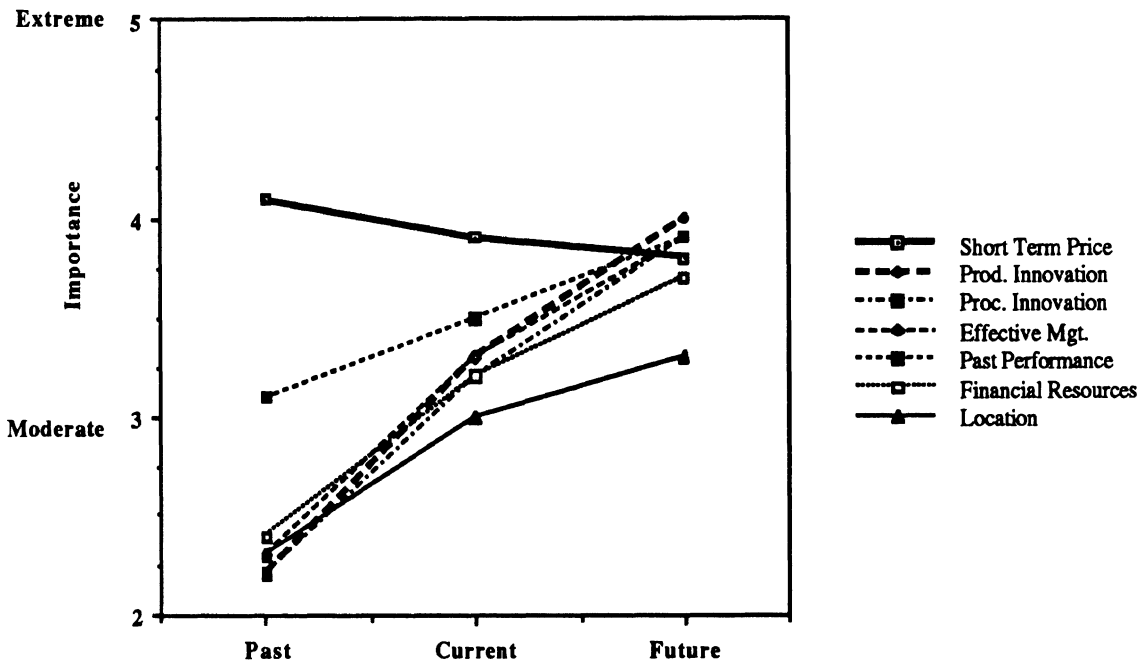

Figure 3.6: Supplier Selection Criteria

These data suggest that the sourcing decision has become more complex, and is likely to become even more complex in the future. More factors are important and therefore are considered in the decision, and no one strong supplier characteristic is likely to offset a series of weak ratings, as short-term price often could in the past. These data also imply that a traditional strategy for new entrants -- quoting a low price to "buy the business" and then demonstrating their competence -- is less likely to succeed now than in the past, and even less likely in the future. On the other hand, the stress on supplier proximity to facilitate Just-In-Time arrangements has by no means become an insurmountable barrier. It is a moderately important selection criteria, but it is the least important on this list.

Three aspects of these data merit comment. First, a vision of a broadly competent supplier seems to be emerging in the manufacturers' selection criteria. This supplier delivers high quality, to schedule, at a competitive long-term price, and has strong manufacturing and engineering capabilities. The preferred supplier will be good across the board, rather than simply best on one or two criteria. The two most important selection criteria in 1977 are separated by 0.8 scale points; in 1990/1992, eight criteria are within 0.8 scale points of the most important factor, quality. These broader, more balanced selection criteria do not support a supplier strategy of narrow strength.

Second, quality has emerged as the most important criteria, although as the "first among equals" rather than as the single dominant factor. Quality shows the greatest gain, in both absolute and relative terms, from the past through the present to the future. The industry now recognizes that quality is not separable from these other selection criteria, resting on a foundation of manufacturing and engineering strength, and contributing to long-term competitive prices. But this is a profound change from the past, and one that should continue to contribute to the industry's long-term competitive strength and survival.

Third, we first asked these questions in 1982-1983, and at that time the "future" we asked about was the current time frame. Suppliers then expected quality, delivery, manufacturing competence, and engineering competence to exceed short-term price in importance by now. The reports for this survey indicate that quality and delivery have indeed surpassed short-term price, while manufacturing competence has essentially tied it, and engineering competence is close behind. That provides some confidence that these supplier expectations about the future have some value and are not simply wishful speculation. There is another noteworthy change in these estimates over the past years, and that is that many more selection criteria are expected to become as important as short-term price than was the case in early administrations of this question. This again suggests the increasingly complex supplier selection decisions in the industry today and tomorrow compared to yesterday.

It is not appropriate to interpret these data as indicating that piece-price competition is dead in the automotive industry, or that current price quotes are competitively unimportant. If piece-price competition has receded somewhat, it is not dead, and probably never will be. The near-term price is an important part of a supplier's competitive offer, and will remain so. The critical point is that the industry now better understands its relationship to these other criteria and, especially, its failure to be a perfect, or even a good, indicator of a supplier's overall competitive strength. Consequently, while it is and will remain important, it will not dominate the supplier selection decision as it often did in the past.

These data are potentially troubling for allied suppliers. Most of them lack their own product engineering support function, and these data suggest that that will be an increasingly important capability for the future, as do the data presented in Tables 2.3 and 2.4 of the previous Chapter. In the past, allied suppliers relied on corporate engineering, effectively making to print. But that support is being withdrawn as the engineering function contracts, and it is unclear that allied suppliers will be in a position to expand their own product engineering. Lack of engineering

is a problem for any supplier that wishes to be first-tier, but is a special problem for allied suppliers because being first-tier is probably more critical to their survival than it is for independent suppliers. After all, it makes less sense to maintain an indirect than a direct supplier as part of manufacturer operations, and the higher value-added work of the first-tier supplier is probably necessary for allied suppliers to maintain their traditional practices and patterns.

One of Genesee's sets of supplier plants should be in relatively decent shape in terms of engineering. AC-Rochester is headquartered in Flint, and much of AC's engineering has traditionally been performed there. The engineering issue is more of a problem at the other GM supplier facilities, especially those that have historically survived by making many different parts and components. Most of these facilities are relatively weak in their own product engineering, and what they possess almost certainly is insufficient to cover a wide product span. The recent move of BOC engineering to Flint may attract more independent engineering houses to Flint, and that would provide opportunity for these facilities to compensate for that weakness. In any case, the ready availability of engineering service firms within an hour's drive provides Genesee's GM supplier plants with a significant advantage over many GM facilities that are more remotely located from this resource.

Quality is clearly emerging as a major concern in the automotive industry, and decisions increasingly are reflecting this. The perception of Genesee in the industry has a number of negative elements, but poor quality has not been one of them. On the other hand, good quality has not been been an especially strong element of its reputation either. The outstanding performance of the LeSabre in 1989, and the extensive publicity of that achievement, can only help Genesee, to the extent that it provides a halo effect. The improved sales of LeSabre in a falling market may also provide a local lesson that quality sells, and help energize efforts to improve quality at other Genesee plants.

Summary

The domestic automotive industry and GM indeed face a situation of likely overcapacity, and that situation extends to suppliers as well. Genesee's current suppliers are virtually all GM allied suppliers, and while that may help them retain GM business, it may hurt them in obtaining new business from GM competitors, especially the NAM's. In any case, NAM domestic content may be inadvertently constrained by CAFE regulations. Nevertheless, there are products that may well be capacity constrained, including parts for seats, vehicle bodies, and fuel systems.

Given a situation of overcapacity, does it make sense for Genesee to pursue independent suppliers that are not currently located in the county? The answer to this is a qualified yes. The Frostbelt reveals the largest number of expected facility additions and net gain, and Genesee is part of the Frostbelt. It has some particular disadvantages and advantages, but it is sensible to pursue the automotive opportunities that will develop in the next few years.

The Frostbelt is viewed as having high labor cost, but significant advantages in technical skill and material supply. This suggests that Genesee should focus on some types of products more than on others, depending on the time horizon. High labor content products are more appropriate for a near-term strategy, while those with critical skill and material supply characteristics are more preservable, and thus appropriate for a longer-term strategy. The primary international competitors to Genesee in the next few years are likely to be Canada and Mexico, rather than the emerging Asian automotive supply bases.

Supplier selection criteria have shifted, and that shift offers Genesee an opportunity to retain proportionately more of its GM activity. The enhanced importance of some criteria provide Genesee the opportunity to develop strength in these areas rapidly. Genesee's location should provide it an advantage in increasing the engineering content its facilities provide, and some advantage in developing a reputation for high quality.

The negative view of the Genesee workforce attitude remains a real and substantial barrier to securing new facilities, as does the less corrigible GM dominance of the local labor market.

Chapter 4. Genesee GM Facilities

Introduction

Chapter Three argues that there is indeed a series of competitive challenges facing the traditional North American supplier base today, and that these are compounded by the problems facing their major customers, the Big Three. Among these problems is a serious one of overcapacity, but the changing structure of the industry dictates that there will be products that will be capacity constrained. Suppliers recognize this, and indicate strong expectations that capacity will be added, and that many of those facilities will be in the U.S. Frostbelt, which includes Genesee.

This chapter will review the GM facilities in Genesee. It will provide, to the extent that available information permits, plant level estimates of facility usage, products, and number of employees. While there will be brief discussion of the general situation of the plant, the focus of the review will be on threats from outsourcing. The primary sources of information are GM itself and publicly available sources. This chapter also draws heavily on our interviews with industry experts to inform the analysis and recommendations. The interview instrument is contained in Appendix Two.

Buick City Complex

The Buick City Complex is the largest GM facility in Genesee. It incorporates Buick City Assembly, the Hydra-matic operations, BOC Engine Plant #36, Axle/Forge Plant #31, and a small Delco plant. We will review each of these operations separately, then comment on the Complex as an entity.

Buick City Assembly appears much stronger than it was just two years ago. Willow Run will produce the Chevrolet Caprice, and the Pontiac Bonneville has shifted from Willow Run to Wentzville. The four-door Olds 88 is now produced at Buick City along with the LeSabre and two-door 88. Thus the rationalization of H-car production has not injured Buick City, which should now have sufficient production for normal two-shift operation for the next few years.

The Buick LeSabre was rated second among all passenger cars marketed in the United States in the 1989 J.D. Powers Initial Quality Survey, up from the bottom quartile in the 1987

rankings. This achievement should be an asset for the plant if market conditions require any further consolidation of H-car production, unlikely as that may be. This product performance builds on Buick City's notable process performance in both Just-In-Time delivery and as somewhat a process technology test site for GM. The plant now routinely ranks among the best GM plants by the corporation's own measures of quality, schedule performance, and inventory control.

The H-cars are currently scheduled for a major facelift in 1992, and that is the earliest likely time for any risk of closure. If risk of closure is minimal, there still is a risk of job loss at the plant through the outsourcing of work it now performs to supplier plants, whether allied or independent.

Moves to modular sourcing and manufacturing increases this threat. Modular sourcing refers to the practice of buying built-up sub-assemblies or modules rather than purchasing the discrete parts and components and assembling them in the final assembly plant. The rationales for pursuing this strategy have to do with the costs associated with the work, and, in some cases, the quality of the module.

However, as Table 2.4 in Chapter Two indicates, modular sourcing is moving at a slower than expected pace. Moreover, Buick City has already "modularized" and outsourced the most common assembly plant components: seats and wheels come into the plant as built-up modules. It is possible that other modules will develop, most probably in door build-up and instrument panel assembly. These are labor intensive operations and might well be better performed prior to final assembly.

The most damaging outsourcing loss at Buick City would be the loss of in-plant stamping of major panels. This activity's low operating rates is a continual irritation to at least some of the more traditional planners at GM, and there are problems with using to service other plants. Countering these threats is the fact that adjacent stamping is a strategy that is finding increasing acceptance in the Big Three, and is part of the Saturn facility. Further, the "fit and finish" of the car's sheet metal is felt to be an important determinant of the customer's evaluation of its overall quality, so the LeSabre's quality ratings may provide some protection for continued in-plant stamping.

Buick City Assembly appears to be relatively safe, and is not likely to lose large amounts of work to outsourcing of parts and components. Employment at Buick City Assembly is variously estimated at 4,000 to 5,000. We assume these variations reflect whether or not the stamping

operations are included in the total. The plant faces continued challenges to increase its productivity while maintaining its new found reputation for quality and process excellence. If door build-up and instrument panel assembly are resourced, the plant might lose at most 100 or so jobs. If stamping is resourced, the loss could approach 1,000, but we think this is unlikely.

On balance, we think there is a low overall risk of outsourcing at Assembly, with a probable job loss of no more than 100 or so. If more extensive re-sourcing does develop, other Genesee facilities can probably bid on the work. If stamping is pulled from Buick City, Grand Blanc would be a possible source, as would Flint Met-Fab. Met Fab faces more serious risks than Grand Blanc, and, unfortunately, might be less likely to secure the work. Door modules might represent a product opportunity for Coldwater Road, and the Delco Instrumentation plant in the AC Rochester Complex could pursue modular instrument panels. If these shifts developed, re-sourcing might not adversely affect Genesee.

Buick City Assembly is important to Genesee. Most of the experts we interviewed see assembly plants as the critical underpinnings, or core facilities, of the Genesee automotive economy. They are the facilities that have holding power for the others. Moreover, the plant has received extensive and favorable notice in the industry press for its achievements, and this helps to counteract Genesee's image as a bad production location.

BOC Engine, is one of the newest of GM's engine plants, and currently produces two V-6 engines, the 3.1 and 3.8 liter, manufactures blocks and heads, and machines crankshafts and camshafts. The product program looks relatively safe through the 1995 period in view of constrained capacity in these engines. Both these engines are due for changes in 1991, and the old 3.1 is tentatively scheduled for termination in 1994. It seems unlikely that this plant will close in the foreseeable future. Whether it secures the changed 3.1 or additional 3.8 capacity in 1994 will be an useful indicator of its viability through the late 1990s.

Engine plants are not immune to resourcing pressures. The engine plant of the future might be quite different from those we find today. Richard Hervey of Sigma Associates has suggested that there are at least two different models for the way engine plants might develop in the next ten to twenty years.[1] One model calls for large regional engine plants that serve a number of assembly plants. Much of the machining and casting work would be performed elsewhere, although they

[1]Hervey, Richard P. "Engine Manufacturing Strategies for the 1990s," *Aim Newsletter*, 1, 3, pp. 4-8, June, 1986.

might acquire much of the engine "dressing" work currently completed in the vehicle assembly plants. The other model calls for adjacent, dedicated engine plants that serve primarily, and typically exclusively, a neighboring assembly plant. This is the Saturn model. These plants would have smaller volumes, and would also probably lose the many functions that the regional engine plant is likely to shed.

While a shift to either of these models is not yet clear, the key point is that the distribution of engine work among casting, engine, and assembly plants is not fixed, and could alter. BOC Engine could lose its manufacturing and/or machining work to upstream suppliers, possibly balanced by pulling work back from the assembly plants. BOC Engine employs roughly 4,000 workers, with about 25% of them in skilled trades. This suggests that probably no more than 500 are at risk if machining work is resourced. On balance, this is unlikely in the next few years, although there probably will be sporadic changes in the exact placement of work across these different types of plants.

Buick City Hydra-matic manufactures a number of transmission components, including shafts and planetary gear sets, for the 4L60 and 3T40 transmissions. It also makes two torque converters, the 245MM and the 298MM. Roughly two-thirds of the employees of the Buick City Axle plant were transferred to Hydra-matic about eighteen months ago, and they produce gears and pinions, as well as carriers for the 4L60.

The 3T40 transmission is a 3-speed automatic that will probably be replaced by the mid-1990s. Meanwhile, it has a relatively decent market, because it is used in the Cavalier and the Corsica-Beretta. The 4L60 is a 4-speed automatic that is widely used throughout the GM fleet of full size, front-wheel drive cars, including the new W-cars. So demand for components for these transmissions should be strong. Both torque converters are strong, and are components in a number of transmissions, including both rear-wheel and front-wheel drive vehicles.

This plant is probably more at risk from capacity consolidation than from outsourcing in the normal sense of the word. GM's declining volumes suggest that such consolidation is likely. However, Hydra-matic's Three Rivers plant has been transferred to the Saginaw Division, and Muncie is now under a joint venture with Chrysler in manual transmissions. The key question is whether volumes decline and productivity improves to the point that Genesee activities can be consolidated at Willow Run. This is unlikely in the next few years, although it could develop towards the end of the 1990s.

The major outsourcing threat comes from the possibility that machining work will be transferred to plants that cast the parts for Hydra-matic. This may be more likely as "near net shape" casting becomes more prevalent, and much of the need for rough machining as distinct from precision machining lessens. Mitigating against this is the plant's reputation for a skilled and good workforce.

The plant employed about 3,300 workers in summer, 1989. It has a high proportion of skilled workers (60%+ of the production workforce), and these are the ones most threatened by re-sourcing machining. Again, we think this is unlikely to develop substantially in the next few years, although some jobs could be lost over that period.

Buick City Axle and Forge, as discussed above, has undergone a major reduction in size with the transfer of the bulk of its workforce and space to Hydra-matic. It continues to make water pumps, lightweight pistons, brake parts, and some stampings, including engine covers and exhaust manifolds. The plant is composed of numerous small departments, and truly seems to be an "odds and ends" plant, lacking in product focus and organizational tightness. Some parts are engine related and some are not.

The threats to this plant are serious, and all center around GM's attempts to rationalize its operations and shed excess capacity. Product diversity can be a source of strength in a manufacturing operation, helping it weather the cyclical nature of many markets. However, the Axle plant receives little of this benefit since its products depend on the same final market -- vehicle sales. Diversity can also be a handicap for a manufacturing plant, interfering with coordination and coherent effort. This can disadvantage a plant in corporate-wide comparisons of cost, productivity, and quality. Such plants are often viewed as phasing out, and that is particularly true when the parent company is trying to rationalize its operations.

Everything this plant currently makes is a prime candidate for outsourcing or resourcing to another GM facility. Pistons, for example, could go to Tonawanda, and most of the other products offer a wide range of options, both within GM and at independent suppliers. The plant faces intense competition from outside suppliers, and many of its products are facing stiff challenges from offshore. This competition has increased as Japanese suppliers have set up operations in the United States.

While we were unable to obtain current employment for this plant, it is probably in the range of, at most, 650 or so, and likely smaller. Coldwater Road is a potential local bidder for much, and possibly all, of the work currently performed at the Axle plant.

Buick City Delco Products makes suspension springs, and is likely to close in the next few years, as GM rationalizes capacity and consolidates production in Livonia in the face of its declining vehicle build. Its employment by summer, 1989, had fallen some 100 from its 1987 level of about 250.

The significance of this facility is that it adds another management group to the Buick City Complex. It is unclear to us why it is located in Buick City, so we see it as a prime candidate for closure in the face of excess capacity.

Buick City Complex is the direct descendant of the old Buick manufacturing facilities, and represents an attempt to establish a fairly integrated, diversified product, centralized manufacturing facility.

The facility continues to face a serious problem of organizational and production flow complexity. There are multiple GM management groups represented in the facility, and they must coordinate with each other as well as their divisional base. Some of its product leaves and returns. Torque converters and transmission parts leave Hydra-matic and return in transmissions bound for Buick City Assembly. Represented workers at the Complex are all members of one local (599), and thus have bumping rights throughout the Complex. That supports a "Complex-wide" labor climate, rather than the more typical "plant-wide" climate. The Union is forced to coordinate with different plant and GM Corporate managements.

These problems certainly prevent the Complex from being as efficient as it theoretically can be and enhancing the survivability of the set of plants beyond the survivability of its individual constituent plants. But the resolution of these problems almost certainly means job losses for Genesee, because they probably require removing some of the plants. While the Axle and Delco plants are liable to close, some of our experts would even remove Hydra-matic because of the logical placement of its operations at a much earlier stage of production. That would leave Buick City with BOC Engine and Assembly plants.

Truck and Bus is an assembly plant in the GM Truck & Bus Group. The past decade has seen steady growth in the truck share of the U.S. light duty vehicle market (cars plus light trucks) such

that these vehicles now comprise just over 32% of the market. The Big Three, and especially GM, have been more successful competing against imports in the light truck end of the market, holding about 87% of that market in 1989, as GM increased it share to nearly 36%. That makes these vehicles increasingly important in their own right, but also as a source of demand for parts and component facilities. GM markets vehicles in this segment under two nameplates, Chevrolet and GMC, with the GMC versions typically being somewhat more upscale and higher priced.

Truck & Bus Assembly traditionally ran two lines and employed over 8,000 people. Line #1 shut down in May of 1987, with a loss of 3,600 jobs. The plant was unable to secure the GMT400 program that replaced the full size C/K truck the line had made. Line #2 assembles the Suburban, Chevrolet Blazer, and the GMC Blazer-equivalent Jimmy, and the replacement program for those vehicles is going to Janesville.

GM has now announced the transfer of production for its full size "G" van to Truck & Bus. This vehicle's market share fell about one-half point from 1988 to 1989, reflecting the continued increase in sales of smaller vans. Nevertheless, the commercial demand for this vehicle provides a reasonable sales base. The major threat to the plant comes in 1993, when a minor facelift might provide the opportunity to move the vehicle as part of capacity consolidation. We really view the placement of the "G" van as another chance for Truck & Bus Assembly to prove itself rather than as a clear sign of success. Perhaps more than any other facility in Genesee, this is the one that suffers from a bad reputation, whether deservedly or not. The workforce is seen as recalcitrant and extremely resistant to any kind of change.

Outsourcing does not represent a clear threat to this facility at this time. GM product plans to not appear to involve sourcing captive imports or NAMs to serve this segment of the light truck market. But the loss of this program in 1993 remains a distinct possibility.

Flint Met Fab produces a range of stampings (floor pans, e.g.), but most of its output consists of engine cradles and exterior sheet metal. About 60% of its output goes to car programs, and roughly 40% is for trucks. Met Fab is threatened by two situations facing all large GM stamping facilities. First, the corporation is viewed as having far too much capacity. Second, the corporation's effective capacity will increase dramatically as the plants improve their performance, especially in the area of equipment uptime. These facilities are often reported to be actually operating at about half the rate of comparable Japanese plants. This, then, is a product area that is plagued by overcapacity.

Within that overall challenge, Met Fab receives mixed reviews. One of our experts described it as one of the worst stamping facilities he has ever seen, while another commented on its improvement, and a third identified it as one of GM's best. Unfortunately for GM, these may not be inconsistent views.

Met Fab's Center section has received capital investment, and makes engine cradles for a number of car programs, including the W-cars, and G-van frames. East section is probably the most modern, and does the sheet metal for the GMT400 and miscellaneous work for G-vans. West section is the most at risk, losing work, receiving little capital investment, and finding little new product.

Met Fab, along with other stamping plants, like Grand Blanc Stamping, or parts and component plants that do some stamping, such as AC Rochester Plant 2 West (old Flint Manufacturing) or Coldwater Road, face some uncertainty due to possible material changes. The specific risks are that plastics and/or other lighter weight material will replace stamped steel in the traditional vehicle. This appears to be less of a general threat than it was a few years ago. It is, however, likely that some of the outsourcing of smaller stampings will involve replacement of steel by lighter weight materials.

Met Fab produces a variety of medium and small stampings that are likely candidates for outsourcing to independent stampers over the next few years, although Coldwater Road might bid for some of this work. This outsourcing may permit the facility to concentrate and focus its efforts in ways that improve its attained quality and productivity, and hence increase its odds of survival. The resourcing of products for cars to BOC and CPC stamping operations as capacity consolidates is also a threat to Met Fab. Some of this work might go to Grand Blanc.

Met Fab employed about 4,500 workers in late 1987, the most recent estimates available. It is difficult to estimate how many are threatened by outsourcing, but the number through the mid-1990s could be quite large.

AC Rochester Complex currently employs some 6,200 workers spread over six distinct facilities, including the old Flint Manufacturing plant that was transferred two years ago. A seventh plant, the Instrumentation plant, has been transferred to Delco Electronics. The old AC division has merged with the Rochester division, and fortunately selected Flint as its headquarters, preserving administrative and research employment of somewhat under 2,000.

Plant 1 West is a stamping facility that makes G-van doors, exhaust manifolds, radiator supports, and does some injection molding. Its summer, 1989, employment was about 1,150. Plant 2 East produces mechanical and electronic fuel pumps and fuel senders, radiator caps, and a variety of other products. It employs roughly 1,500 people. Plant 2 West, formerly Flint Manufacturing, makes fuel tanks, valves, and some SMC (Sheet Molded Compound) parts, like medium truck grilles. It has about 1,000 workers. Plant 3 East produces spark plugs for gasoline-powered engines and glow plugs for diesel engines, and employs about 1,450 workers. Plant 6 East makes crankcase breathers, metal and plastic air cleaners, and some sensors. It employs about 550. Plant 7 East's 550 employees make a variety of air and oil filters. The Delco plant, the largest of these facilities at over 5,000 employees as of late 1987, makes parts and components for instrument displays, electronic controls, and a range of plastic moldings.

AC Rochester is the sole source for catalytic converters to GM, but this work is performed at plants outside of Genesee County. The division is focusing on air, fuel, and ignition systems, and some critical components are not made in Genesee. For example, fuel rails are made in Rochester, NY, and injectors in Coopersville, MI. But the division is strong in product engineering, and that is a major weakness for most other GM allied supplier plants.

It seems to us that AC Rochester faces significant loss of work to outside suppliers. The product mix of the Complex presents a variety of threats, and it is difficult to predict exactly the ones that will result in losses versus the ones that will be overcome. But it is highly likely that some of these products will be lost.

Some of AC Rochester's products are difficult to consider within the "core" automotive business of GM, especially as that definition continues to contract. Moreover, some of them are unusually exposed to potential outside competitors. Much of the stamping work performed at Plant 1 West would seem to face a high risk of outsourcing to independent or other GM suppliers. Stamping is not a critical process for AC Rochester, and that makes it a likely candidate for outsourcing. Plant 2 West faces severe threats. There are numerous independent sources for SMC, and gas tanks may increasingly be made of plastic. The filter products of Plant 7 East and the cleaners of Plant 6 East, in particular, seem to be prime candidates to be produced outside of GM. They are mature, commodity-like products with very low entry-barriers. Not only are there significant outside competitors, but further capacity could readily and rapidly become available should AC abandon these products.

Plant 3 East's spark plugs represent a more complicated case. They certainly do not seem to be "core" products for GM, but it is less clear that they are commodity products, although most would view them that way. There do appear to be barriers to entry: making spark-plugs, simple as the end-product may be, is not so simple a task, primarily because of the ceramic content and the precise process control required to obtain the specified resistance. There is excess capacity outside GM, but it is unclear that it is sufficient to meet GM's needs. The replacement of the traditional 8-cylinder engine of a decade ago with 6- and 4-cylinder engines and longer plug life clearly reduces demand for spark plugs. Both these circumstances have freed up capacity at Allied's Autolite and Champion, for example. There are also more readily available offshore suppliers today than a decade ago.

On balance, it seems likely that there will be enough resourcing and consolidation in the AC Rochester Complex to close one of these plants. It is impossible to say how much of that resourcing will be within the Complex itself, and how much to other Genesee GM facilities. The stamping work of 1 West and 2 West could be combined, perhaps adding the metal cleaners from 6 East. The stamping work could also go to Coldwater Road, but it could just as well go to any of a number of independents.

AC Rochester is in a better position than most allied GM suppliers to gain new work to replace lost products. It has product engineering and seems to be emphasizing system or modular products. The diversity of experience and customer base may provide it with an edge in securing nonGM business compared to other part and component operations, and that appears to be a priority for AC Rochester management.

The 1989 University of Michigan Delphi projections suggest that the automotive market for electronic controls and components will expand substantially by 1995, and even more by 2000. The Delco Instrumentation plant may well benefit from this shift in on-vehicle electronics usage. However, these products may be outsourced to the large and competitive electronics supplier industry. This plant might be a candidate for modular assembly of instrument panels.

Inland Fisher Guide/Coldwater Road makes over 20 products, including rear-deck and door hinges, power seat adjustors, window regulators, headliners, steel moldings, and a variety of small stampings. The plant currently has contracts with Saturn, Corsica/Beretta, APV Van, and has secured work lost by other GM plants. It enjoys a generally good reputation in the industry, and has received positive press for its labor-management relations.

Appendix One
Automotive Supplier Study
Supplier Survey Questionnaire

OFFICE FOR THE STUDY OF
AUTOMOTIVE TRANSPORTATION
David E. Cole, Director
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The University of Michigan
Transportation Research Institute
2901 Baxter Road
Ann Arbor, Michigan 48109-2150

August 1989

Dear Automotive Executive:

For a number of years the Office for the Study of Automotive Transportation has sponsored, organized, and participated in programs and research focusing on automotive customer-supplier relationships. We have been particularly interested in the industry role of the small supplier. In 1988, with the cooperation of General Motors Corporation, we organized a small supplier forum bringing 110 suppliers together with key GM purchasing executives. In 1988 we also presented a panel, "The Small Automotive Supplier in the Future Competitive Environment," at the University of Michigan International Automotive Conference. Because of strong interest, a second International Automotive Conference small supplier workshop was organized in 1989, "The Customer/Small Supplier Relationship: Managing the Transformation."

We have been asked by many suppliers to organize an on-going supplier communication forum independent, but complementary, to the activities sponsored by vehicle manufacturers, trade and professional associations, and others. This forum could facilitate company-specific supplier forums (e.g., the GM purchasing forum), specialized research, and other information gathering and dissemination activities.

In an attempt to best serve both suppliers and the vehicle manufacturers, it was suggested that we survey the supplier base to see how suppliers gather and use information and what additional types of information would be useful. We believe the attached questionnaire addresses these issues and will provide a base for potential program planning.

We greatly appreciate your time and effort in completing this survey. The results of this survey will be sent to the purchasing groups of the vehicle manufacturers and will be used for our internal planning. This survey will be conducted in strict confidence–we are not asking specific company name or respondent information, only your opinions on the customer-supplier relationship.

Sincerely,

David E. Cole

Attachment

Osat

Office for the Study of Automotive Transportation
Automotive Supplier Survey
August 1989

Background Information

1. From what perspective will you be answering this questionnaire? Except were indicated, we will appreciate you answering all the questions from this perspective.

I am representing (please check):

[ ] My entire company
[ ] My company's entire automotive activities
[ ] My individual group or division

2. Approximately what is your total company employment (please check):

[ ] 1 - 100
[ ] 101 - 250
[ ] 251 - 500
[ ] 501 - 1,000
[ ] over 1,000

3. Approximately what were your total company 1988 sales (please check)?

[ ] less than $1 million
[ ] $1 million to $50 million
[ ] $51 million to $100 million
[ ] $100 million to $500 million
[ ] $501 million to $1 billion
[ ] over $1 billion

4. Roughly what percent of your entire company (including your operations and any other automotive activities) sales were:

a. Direct to vehicle manufacturers? _____ %

b. To other automotive suppliers for incorporation into products ultimately sold to the manufacturers? _____ %

5. Did your fiscal 1988 automotive sales increase of decrease from fiscal 1987 (please check)?

[ ] **Increase** [ ] **Decrease**

6. Roughly what percent of your 1988 total automotive sales was exported from the United States? _____ %

7. Roughly what percent of your 1988 raw materials, parts, and component purchases were sourced from outside the United States and Canada? _____%

8. In what year did your did you begin automotive operations? _____

9. Please enter the code (from the list on page 6) of the three main products (by fiscal 1988 sales) you supply the vehicle manufacturers for installation on-board new vehicles.

1. _____ 2. _____ 3. _____

10. Please enter the code (from the list on page 6) of the three main products (by fiscal 1988 sales) your company supplies other automotive suppliers for eventual installation on-board new vehicles.

1. _____ 2. _____ 3. _____

11. Which of the following North American vehicle manufacturers do you supply directly (please check):

a. [ ] General Motors
b. [ ] Ford Motor
c. [ ] Chrysler Motors
d. [ ] Honda
e. [ ] Nissan
f. [ ] Subaru-Isuzu
g. [ ] NUMMI
h. [ ] Diamond-Star
i. [ ] Mazda
j. [ ] Toyota
k. [ ] Hyundai
l. [ ] GM-Suzuki (CAMI)

11a. Of these vehicle manufacturers, please indicate your largest customer (by sales dollar amount): _____

12. Please list other vehicle manufacturers you supply:

Sources of Supplier Information

13. How does your company collect information on the Big 3? How effective do you feel these individual methods are? Please check the appropriate box with 1=least effective, 3=moderately effective, 5=most effective, and N.A.=not applicable.

		Least Effective		Moderately Effective		Most Effective
Big 3 Customer:						
Buyer/purchasing agent contacts	[ ] N.A.	[1]	[2]	[3]	[4]	[5]
Advanced R&D	[ ] N.A.	[1]	[2]	[3]	[4]	[5]
Engineering	[ ] N.A.	[1]	[2]	[3]	[4]	[5]
OEM policymaker:						
Personal contact	[ ] N.A.	[1]	[2]	[3]	[4]	[5]
Industry conferences	[ ] N.A.	[1]	[2]	[3]	[4]	[5]
Big 3 company efforts	[ ] N.A.	[1]	[2]	[3]	[4]	[5]
Personal contacts	[ ] N.A.	[1]	[2]	[3]	[4]	[5]
Industry Trade Press						
Automotive Engineering	[ ] N.A.	[1]	[2]	[3]	[4]	[5]
Automotive Industry	[ ] N.A.	[1]	[2]	[3]	[4]	[5]
Automotive News	[ ] N.A.	[1]	[2]	[3]	[4]	[5]
Metal Working News	[ ] N.A.	[1]	[2]	[3]	[4]	[5]
Ward's Auto World	[ ] N.A.	[1]	[2]	[3]	[4]	[5]
Ward's Auto Reports	[ ] N.A.	[1]	[2]	[3]	[4]	[5]
Other _____		[1]	[2]	[3]	[4]	[5]
Other _____		[1]	[2]	[3]	[4]	[5]
Business Press						
Business Week	[ ] N.A.	[1]	[2]	[3]	[4]	[5]
Forbes	[ ] N.A.	[1]	[2]	[3]	[4]	[5]
Fortune	[ ] N.A.	[1]	[2]	[3]	[4]	[5]
Wall Street Journal	[ ] N.A.	[1]	[2]	[3]	[4]	[5]
Other _____		[1]	[2]	[3]	[4]	[5]
Other _____		[1]	[2]	[3]	[4]	[5]
Other Media	[ ] N.A.	[1]	[2]	[3]	[4]	[5]
Professional societies/trade associations						
AIAG	[ ] N.A.	[1]	[2]	[3]	[4]	[5
ESD	[ ] N.A.	[1]	[2]	[3]	[4]	[5]
SAE	[ ] N.A.	[1]	[2]	[3]	[4]	[5]
SME	[ ] N.A.	[1]	[2]	[3]	[4]	[5]
Other _____		[1]	[2]	[3]	[4]	[5]
Other _____		[1]	[2]	[3]	[4]	[5]

		Least Effective		Moderately Effective		Most Effective
Your internal corporate activities						
Strategic planning staff	[ ] N.A.	[1]	[2]	[3]	[4]	[5]
Central marketing staff	[ ] N.A.	[1]	[2]	[3]	[4]	[5]
Sales personnel feedback	[ ] N.A.	[1]	[2]	[3]	[4]	[5]

14. Within your company, what internal mechanisms are used to distribute auto industry information?

_____

_____

_____

_____

_____

15. What are the most significant problems your company faces in its direct customer relationships?

• _____

• _____

• _____

• _____

• _____

15a. Of these problems, which is the most significant?_____

16. What are your company's major competitive threats?

• _____

• _____

• _____

• _____

• _____

16a. Of these threats, which is the most significant?_____

17. What are your company's major competitive opportunities?

- _____
- _____
- _____
- _____
- _____

17a. Of these opportunities, which is the most significant?_____

18. Please list and evaluate the benefits of OEM-sponsored manufacturer/supplier communication efforts? Please check the appropriate box where 1=not effective, 3=moderately effective, and 5=extremely effective.

	Not Effective		Moderately Effective		Extremely Effective
• _____	[1]	[2]	[3]	[4]	[5]
• _____	[1]	[2]	[3]	[4]	[5]
• _____	[1]	[2]	[3]	[4]	[5]
• _____	[1]	[2]	[3]	[4]	[5]

19. Please list and evaluate the benefits you see in creating and operating an ongoing, independent supplier/manufacturer communication forum. Please check the appropriate box where 1=not effective, 3=moderately effective, and 5=extremely effective.

	Not Effective		Moderately Effective		Extremely Effective
• _____	[1]	[2]	[3]	[4]	[5]
• _____	[1]	[2]	[3]	[4]	[5]
• _____	[1]	[2]	[3]	[4]	[5]
• _____	[1]	[2]	[3]	[4]	[5]

20. Other comments you may have on supplier/manufacturer relationships and communication efforts.

_____

_____

_____

_____

Thank you.

System/Component Coding

ENGINE - A0
- Balance shafts - A1
- Camshafts - A2
- Connecting rods - A3
- Crankshaft - A4
- Cylinder block - A5
- Cylinder head and cover - A6
- Exhaust manifold - A7
- Flywheel - A8
- Intake manifold - A9
- Oil pump/lubrication - A10
- Piston rings - A11
- Piston - A12
- Valve train components - A13
- Water pump - A14
- Other - A15

BODY STRUCTURE/BUMPERS/GLASS - C0
- Bumper assemblies - C1
- Cowl, dash, sill, pillar stampings - C2
- Frame - C3
- Glass (fixed and movable) - C4
- Misc. small stampings (brackets, etc.) - C5
- Underbody, hood, roof, deck, fender, quarter panel stamping - C6
- Weather stripping, seals - C7
- Other - C8

STEERING AND SUSPENSION - E0
- Front wheel drive sus. assemblies - E1
- Front wheel knuckle - E2
- Power steering pump - E3
- Shock absorbers - E4
- Springs - E5
- Stabilizer/torsion bars - E6
- Steering column - E7
- Steering gear box - E8
- Steering wheel and horn pad - E9
- Struts - E10
- Suspension control arms - E11
- Other - E12

ENGINE ELECTRICAL - G0
- Alternator - G1
- Coil - G2
- Cruise Control - G3
- Distributor - G4
- Engine wiring harness - G5
- Ignition module and assc. controls - G6
- Spark plug - G7
- Starter motor - G8
- Other - G9

BRAKES, WHEELS, AND TIRES - I0
- Brake disc - I1
- Brake tubes and hoses - I2
- Caliper assembly - I3
- Drums - I4
- Master cylinder - I5
- Shoes, linings, and pads - I6
- Tires - I7
- Wheels - I8
- Other - I9

CHASSIS ELECTRICAL - K0
- Audio - K1
- Battery - K2
- Electrical instrument controls - K3
- Fuses, switches, etc. - K4
- Lamps - K5
- Main body wire harness - K6
- Small electric motors - K7
- Other - K8

TRANSMISSION/TRANSAXLE - B0
- Clutch assembly - B1
- CV joints - B2
- Differential assemblies - B3
- Drive shaft - B4
- Gear sets - B5
- Torque converter - B6
- Transmission case - B7
- Other - B8

SEATS, INTERIOR/EXTERIOR TRIM - D0
- Exterior finish trim/ornamentation - D1
- Grille panel - D2
- Headliner/carpeting/trim panels - D3
- Inst. panel/console assembly - D4
- Interior finish soft trim - D5
- Interior/exterior mirrors - D6
- Occupant safety/restraint systems - D7
- Rough hardware (hinges, etc.) - D8
- Seat covers - D9
- Seat frames and mechanics - D10
- Other - D11

FUEL DELIVERY SYSTEMS - F0
- Carburetor - F1
- Electronic fuel injector units - F2
- Fuel injectors - F3
- Fuel lines - F4
- Fuel pump - F5
- Fuel tank and filler tube - F6
- Turbochargers - F7
- Other - F8

EXHAUST AND EMISSIONS - H0
- Catalytic converter - H1
- Exhaust pipes - H2
- Muffler - H3
- Other - H4

HEATING, VENTING, AIR CONDITIONING- J0
- Compressor - J1
- Condenser - J2
- Heater core - J3
- Radiator fan - J4
- Radiator - J5
- Other - J6

OTHER COMPONENTS - L0
- Bearings - L1
- Belts - L2
- Fasteners, clamps, bolts, etc. - L3
- Gaskets, adhesives, chemicals - L4
- Paint, plastic, vinyl - L5
- Filter assemblies - L6
- Steel - L7
- Wiper/washer systems - L8
- Other - L9

Appendix Two

Automotive Opportunities Project
Personal Interview Instrument and "Plant Map"

University of Michigan
Transportation Research Institute
Office for the Study of Automotive Transportation

Automotive Opportunities Project

OSAT has contracted with a Michigan Foundation to examine the possibilities for new automotive product markets that may be available to a regionally concentrated set of automotive plants. A parallel project is examining nonautomotive opportunities that may exist for these and other regional plants. Both projects are designed to assist local economic planners in decreasing the dependence of the region's economy upon one automotive company and the automotive industry in general.

Today we'd like to explore your ideas and suggestions as to what might be done with this concentrated group of about a dozen automotive plants. These plants all belong to one company (GM), and that imposes some realistic constraints upon what is feasible. But we'd like you to adopt two viewpoints throughout our discussion. The first is that of the new CEO of a company consisting of these twelve plants: what business opportunities and efforts would you pursue to enhance the company's survivability? The second is that of a community economic development specialist: viewing this as the most important economic base of the community, what might the community do to ensure its success, thereby preserving jobs and economic activity?

We are particularly concerned with identifying any potential synergies that might exist within this group of plants. Are there any product lines available to the plants as a group, that might realistically be unavailable to any single plant in the group?

We recognize that time and information do not permit the development of a business strategy for these plants. What we hope to discover today are some initial ideas and possibilities. Suggestions of questions that need to be asked, of ways to narrow the possibilities, and of issues that must be addressed are important to us.

The accompanying chart suggests the flow of value-added through the automotive production chain, identifying each plant by name and providing some pertinent information, including its current major product areas. Please take a moment to look this over, and then we'd like to ask you some questions.

1. What do you see as the major changes likely in the automotive business over the next five years or so? In particular, what are likely to be the promising product growth areas, and what are likely to be areas of shrinkage?

2. A. Which of these plants, if any, face particular threats to their current lines of business, from industry restructuring, technological developments, new competition, declining markets, or the like? B. Who are some of the likely major competitors to these plants?

3. Are any of these plants positioned so that they might face unusually high current or near-term opportunity, whether from industry restructuring, technological developments, declining competition, or expanding markets?

4. Thinking of particular business areas, are there threats or opportunities specific to any of these plants, or the set, from:

i. increased electronic content?

ii. material changes, including increased plastic content?

iii. Changes in powertrain design and production?

iv. Changes in manufacturing technology or approaches, including machining or stamping requirements?

5. Considering this set of plants as a whole, which ones are most critical, in theory, to maintenance of the entire set as a functioning collection? That is, which plants are really the critical core of the set?

a. What, if any, are the major threats facing these core plants?

b. What, if any, major opportunities may exist or develop for these core plants?

6. Again, considering this set of plants as a whole, which ones are least critical, in theory, to maintenance of the entire set as a functioning collection? That is, which plants are the most marginal to the rest of the set?

7. Does this set of plants appear to possess any special advantages or disadvantages in today's competitive environment?

8. Are there promising nonGM automotive opportunities for these plants, either at other manufacturers, or in the supplier chain?

9. Are there threats that might be avoided, or opportunities that might be secured, if these plants can cooperate in seeking business?

10. How might such a concentration of plants influence supplier site location decisions?

a. Does it represent an attraction, or a "pull" factor for suppliers seeking new site locations? What types of suppliers might see such an area as attractive?

b. Does it represent a negative attribute for suppliers seeking site locations? What types of suppliers might see such a concentration of facilities as unattractive?

11. On balance, what steps should these plants pursue to accentuate any advantages, or to mute any disadvantages, they might possess? What key success factors would you emphasize as CEO of this "company"?

a. Are there any process-linked, organizationally based strategies that you might pursue -- for example, machining or stamping?

b. These plants are well situated with regard to many vehicle assembly plants. Is such proximity an advantage? If it is, how might you try to leverage it?

12. Looking at this set of plants as a community resource, what would you, as a community economic development specialist, emphasize in your efforts to assist specific plants or this entire set of plants to accentuate their advantages and/or to mute their disadvantages?

13. Does GM's structure and divisional lines pose major barriers to these plants developing cooperative joint strategies?

14. What supplier firms are likely to be adding capacity in the next five years or so, whether to replace existing facilities or to add capacity?

Thank you for your time and effort.

FLINT, MICHIGAN PLANT MAP

AC/Rochester
World Headquarters. Fuel pumps, spark plugs, instrument displays, electronic vehicle controls, plastic moldings. 8,800 (1200 skilled), 1,000 salaried.

Flint Manufacturing (AC/R)
Exhaust manifolds, gas tanks, engine valves, engine covers, oil pans, SMC parts, some plastic gas tanks. 3,500 hourly (875 skilled), 500 salaried.

Coldwater Road (F-G)
Window regulators, rear deck stampings, door hinges, headliners, small stampings. 1400 hourly, 300 salaried. Major quality recognition.

CPC Engine
5.0, 5.8L V-8; flywheels and water pumps c. 2,000 employees.

Flint Met Fab
Engine cradles, exterior sheet, and structural stampings. 3920 hourly, (1200 skilled), 400 salaried.

Truck Assembly
Suburban.
4100 hourly, 400 salaried

Axle (Partly H-M)
Water pumps, pistons, engine covers, stamp manifolds, suspension and brake parts. 1900 hourly (600 skilled), 100 salaried. H-M in 7/88: 2/3 of employees: 125 Carrier; gears, pinions.

Hydra-matic
Shafts, gears, gear sets, and torque converters. 2900 Hourly, 300 salaried.

Delco Products
Springs. 250 total employment.

BOC Engine
3.0 and 3.8L, blocks, heads, machines cranks and cams. 3300 hourly, 700 salaried.

Grand Blanc Stamping
Responsible for Tooling plant; Now part of Cadillac. Large exterior sheet, doors, decklids, floorpans. 3,000 hourly (43% skilled), 450 salaried.

Buick City Assembly
H-body LeSabre,
Delta 88: two shifts.

Appendix Three

- Listing of U.S.-Based Automotive Suppliers with a Japanese Ownership Position (available on request from OSAT)

- Listing of the Largest U.S. Automotive Suppliers

Listing of the Largest U.S. Automotive Suppliers

(as estimated from trade journals, annual reports, and other sources)

Rank	Company/ Headquarters	Estimated Automotive Sales	Components Produced	Comments
1	Goodyear Akron, Ohio	$ 9.3 billion (1988 tires and transportation sales)	Tires, belts, hoses, tubing, chemicals, molded plastics	Well respected for product development and customer-support. International manufacturing and R&D facilities (including Japan).
2	Allied Signal Automotive: Southfield, MI	$ 4.1 billion (1988)	Brake systems, turbochargers, fuel injection systems, ignition components, restraint systems	Considered a first tier, systems supplier. Has capable internal design, engineering, and manufacturing skills.
3	Dana Corporation Toledo, Ohio	$ 3.9 billion (1988 vehicular sales)	Axles, differentials, drive shafts, clutches, hydraulic and engine components,	Known for customer support. Has built small satellite facilities to supply vehicle assembly plants. Strongest in heavy trunk markets.
4	Firestone Tire and Rubber; Akron, Ohio	$ 3.5 billion (1987 total corporate sales - bought by Bridgestone)	Air springs, molded rubber products, bumpers, rubber pads	Owned by Bridgestone Tire (Japan). Now has financial support but is considered weaker than Goodyear or Michelin's
5	Eaton Corporation Cleveland, Ohio	$ 3.4 billion (1988 total corporate sales)	Engine valve train components, brake systems, clutches, differentials, drivetrain components superchargers, electronics	Considered a first tier, systems supplier. Strong R&D support in Detroit area. International presence may supply vehicle manufacturers world wide.
6	Borg-Warner Automotive: Troy, Michigan	$ 3.2 billion (1988 total corporate sales)	Transmissions, transfer cases, suspension components, engine components	Well respected power transmission manufacturer. Has capable internal design, engineering, and manufacturing skills.

Rank	Company/ Headquarters	Estimated Automotive Sales	Components Produced	Comments
7	TRW Cleveland, Ohio	$ 3.1 billion (1988)	Occupant restraint systems, steering and suspension systems, engine components	A first tier, full systems supplier in many areas. Single source of many Ford occupant restraint systems. Strong R&D.
8	AMP, Inc. Automotive-Consumer Business Group; Harrisburg, PA	$ 2.3 billion (1987 total corporate sales)	Sensor components, connectors, and multiplexing components	Would be a strong partner for any automotive electronics program.
9	ITT Automotive: Bloomfield Hills, Michigan	$ 2.1 billion (1986)	Anti-lock brake systems; electrical, suspension, steering, and body hardware components,	Teves anti-lock brake system is standard on many high performance vehicles. Has strong financial and international strengths
10	Parker-Hannifin; Cleveland, OH	$ 2 billion (1987 total corporate sales)	Air conditioning components, hoses and assemblies	High quality reputation. Not considered a "systems supplier" but produces key components and does that well.
11	Uniroyal-Goodrich Tire Company; Troy, MI (sales office)	$2 billion (1987 total corporate sales)	Tires, chemicals, plastics.	Acquisition by Michelin soon to be completed. Fairly strong in original equipment sales, however this is based on price and not innovation like Goodyear, Michelin, and Bridgestone.
12	GenCorp Fairlawn, Ohio	$ 1.8 billion (1986 tire and plastics sales)	Seating and interior components, plastic and fiberglas molded exterior panels.	Panel supplier to GM APV van.
13	United Technologies Automotive: Dearborn, Michigan	$ 1.7 billion (1988)	Brake system components; seat and interior trim parts; steering systems; fuel injection and electronic control components.	A first tier, full systems supplier in many areas. Strong R&D activity in Detroit. Leader in electronic multiplexing technology.

Rank	Company/ Headquarters	Estimated Automotive Sales	Components Produced	Comments
14	Rockwell International Automotive: Troy, Michigan	$1.7 billion (1887)	Brake systems, axles, differentials, suspension systems, transmission components, body hardware	A first tier, full systems supplier in many areas, particularly suspensions and heavy-duty drivetrains.
15	National Semiconductor; Santa Clara, CA	$1.5 billion (1987 total corporate sales)	Integrated circuits and transistors	Motorola's major competitor for engine, transmission, and body system logic control chips.
16	Budd Company Corporate: Troy, Michigan	$ 1.4 billion (1987 total Budd sales)	Body panel stamping in steel and plastic, wheels, bumpers, frames, body hardware.	Unique because of its strong position in both steel and plastic. Known for its ability to take on responsibility for complete engineering and stamping of complete bodies.
17	Echlin Branford, Connecticut	$ 1.3 billion (1988 total corporate sales)	Wide variety of engine, electrical, electronic, transmission, suspension, fuel injection, and body hardware components.	Primarily a producer of aftermarket service parts. Recently expanded into Europe.
18	Gates Rubber Company; Farmington Hills, MI (sales office)	$ 1.2 billion (1987 total corporate sales)	Drive belts; hoses, connectors, seals	A primary competitor to Goodyear for belts and hoses.
19	Kelsey-Hayes Romulus, Michigan	$ 1.1 billion (1988)	Anti-lock brake systems, wheels, brake system components.	Most widely used light-truck anti-lock brake system. Has emerged somewhat financially weaker from a drawn-out failure of its parent (Frauhauf) and merger (to Varity) process.
20	General Tire Akron, Ohio	$ 1.0 billion (1987 total corporate sales)	Tires and related products	Recently purchased by European tire producer Continental.
21	Lear Siegler Seating Corporation Southfield, MI (sales office)	$ 1 billion (Total corporate sales)	Seat frames, trim seating, foam seating, interior trim components	A major competitor to GM's Fisher-Guide and Inland activities and Johnson Controls for seats.

Rank	Company/ Headquarters	Estimated Automotive Sales	Components Produced	Comments
22	Briggs and Stratton Milwaukee, WI	$ 921 million (1988 total corporate sales)	Door handles, latches, locks, security devices	Although known for its small engines, Briggs has a major position in the automotive lock market.
23	SPX Muskegon, MI	$ 900 million (1988 total corporate sales)	Piston rings; seals; cylinder sleeves; die cast engine transmission, steering, and suspension components; engine valve tappets; oil, air, transmission filters	Formerly Sealed Power Corporation. International in scope.
24	Johnson Controls Automotive: Ann Arbor, Michigan	$ 900 million (1988)	Electrical storage batteries, seats, interior components, body hardware.	Considered in a position to supply complete interior systems. Has won many recent seat contracts for new vehicle programs.
25	Masco Industries Troy, MI	$ 800 million (1988 transportation sales)	Front and rear wheel spindles; fuel, oil, and transmission filter assemblies; brake system components; engine and transmission components	Expanding engineering, R&D, and design capabilities. Strong financial base.
26	Timken Company Canton, Ohio	$ 800 million (1986 bearings sales)	Tapered roller bearings, specialty steel.	Has faced serious competition from imported and U.S.-based Japanese transplant bearing companies. Considered to have the most efficient and highest quality specialty steel operation.
27	Eagle-Picher Cincinnati, Ohio	$ 800 million (1988 total corporate sales)	Small exterior and interior plastic molded components; precision machined steel and aluminum engine and transmission components; molded rubber components; aluminum castings; gaskets; insulation parts	Has international operations. Strong part quality and customer-supplier relationship reputation.
28	Danaher	$ 800 million (1988 total corporate sales)	Engine, transmission, and suspension components	Built by acquiring smaller automotive suppliers.

Rank	Company/ Headquarters	Estimated Automotive Sales	Components Produced	Comments
29	Sheller Globe Detroit, Michigan	$ 800 million (1988 total corporate sales)	Interior trim, steering wheels, seat components, plastic injection molding, body hardware.	Recently purchased by United Technologies which has had a difficult time digesting Sheller-Globe's operations.
30	Champion Spark Plug; Toledo, OH	$ 719 million (1988 total corporate sales)	Spark plugs, windshield wipers, fuel rails	A major competitor to AC-Rochester Division, particularly in service markets. Recently has expanded into the DIY market with Champion-branded parts.
31	Walker Manufacturing (Tenneco); Racine, WI	$700 million (total corporate sales)	Exhaust system components, converters, manifolds	Has a high quality reputation.
32	Harvard Industries Southfield, Michigan	$ 700 million (1988 total corporate sales)	Brake system, steering system, and heating and air conditioning components; emission and fuel injection control components.	Has a high quality reputation.
33	Kuhlman Corporation Troy, Michigan	$700 million (1988 total corporate sales)	Blow molded gas tanks, plastic bumper components, load floors, brake and transmission components	
34	U.S. Gage, Division of Ametek, Inc.; Sellersville, PA	$ 620 million (1987 total corporate sales)	Speedometers, tachometers, electronic dash panels, gauges, sensors	
35	J.P. Industries Ann Arbor, Michigan	$ 600 million (1988 transportation sales)	Engine bearings, camshafts, valvetrain, and other engine and transmission components.	
36	Federal Mogul Detroit, Michigan	$ 600 million (1988 OEM and aftermaret)	Brake system components, bearings, seals, gaskets, electrical components, fuel pumps, air and oil filters.	
37	Robertshaw Controls; Knoxville, TN	$ 500 million (1987 total corporate sales)	Engine thermostats, emission controls; switches, sensors	
38	Molex, Inc. Lisle, Illinois	$ 500 million (1987 total corporate sales)	Electrical connectors, sensors	

Rank	Company/ Headquarters	Estimated Automotive Sales	Components Produced	Comments
39	A.O. Smith Milwaukee, Wisconsin	$ 500 million (1988)	Stampings for frames, engine cradles, suspension, and bumper systems.	A high quality, competitive supplier. Lost large amounts of business as passenger cars shifted to unibody contruction, but has remained competitive as light trucks expand market share.
40	Colt Industries Automotive: Troy, Michigan	$ 500 million (1988)	Fuel injection systems, emission control systems, superchargers, replacement carburetors, transmission components	Holly has made major strategic moves to shift from carburetor technology to fuel injection. Somewhat of an orphan product, Holly might get more attention given Colt's intention of selling off firearms and other divisions.
41	Arvin Industries Columbus, Indiana	$ 500 million (1988)	Emission, exhaust, and fuel injection control system components; stampings; interior trim components.	
42	GNB, Inc St. Paul, MN	$ 465 million (1987 total corporate sales)	Automotive batteries	New corporate name for Globe batteries.
43	Sprague Electric Company; Mansfield, MA	$ 455 million (total corporate sales)	Electronic and electrical system components, sensors, circuits, resistors	
44	Trinova Maumee, Ohio	$ 400 million (1988 transportation sales)	Hose fittings, plastic interior and exterior parts, hydraulic pumps and valves	
45	Modine Manufacturing Company; Racine, WI	$395 million (1988 total corporate sales)	Radiators, air conditioning condensers and related components	
46	Dayco Products, Inc.; Dayton, Ohio	$ 350 million (1987 total corporate sales)	Engine accessory drive systems, belts, fluid handling systems	
47	Dayton Walther Corporation; Dayton, Ohio	$ 350 million (1987 total corporate sales)	Wheels, hubs, drums, rotors, spindle assemblies, brake components	

Rank	Company/ Headquarters	Estimated Automotive Sales	Components Produced	Comments
48	Cooper Industries; Parsippany, NJ	$ 340 million (1987 sales, Wagner Automotive Division)	Lighting and braking products, circuit breakers	
49	CMI International Southfield, Michigan	$316 million (1987 total corporate sales)	Engine, suspension, drivetrain, and bracket parts	
50	Douglas and Lomason; Farmington Hills, Michigan	$ 297 million (1987 total corporate sales)	Seat frame assemblies, bumpers, hardware, stampings	

Other Large Automotive Suppliers - Unable to break out automotive sales from other sales				
Rank	**Company/ Headquarters**	**Total Corporate Sales**	**Components Produced**	**Comments**
	General Electric Automotive: Southfield, Michigan	$ 50 billion (total 1988 sales)	Plastic resins and finished components, small motors, electrical and electronic components, head and miniature lamps, sealants	Has significant financial resources. Considered to be a potential systems integrator across many systems.
	GTE Stamford, Connecticut	$ 2.2 billion (GTE's total 1988 Lighting Business and Precision Materials)	Headlamps, miniature lamps, precision materials, electrical components	Expanding its automotive focus.
	3M Automotive: Southfield, Michigan	$ 10.6 billion (total 1988 sales)	Sealants, film graphics, foam tapes, seals, gaskets, filters	Has significant financial resources. Considered to be a potential systems integrator across many systems. Known as an innovative company.

Appendix Four

• The U.S.-Japan Bilateral 1993 Automotive Trade Deficit

• The University of Michigan Delphi V Forecast and Analysis of the U.S. Automotive Industry Through the Year 2000: Volume One Marketing, Volume Two Technology

• Automotive News Roster of Auto Firms and Executives

• Automotive Industries Automotive OEM Source Guide

• OSAT Vehicle Program Cycle Charts

• OSAT Engine Program Cycle Charts

• OSAT Japanese Automotive Supplier Investment Directory

(These publications are available on request from OSAT)