MICHIGAN DEPARTMENT OF TRANSPORTATION

MDOT

State Long-Range Transportation Plan 2005-2030

Transportation and Economy Report

MI Transportation
MICHIGAN LONG RANGE TRANSPORTATION PLAN

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Executive Summary

Michigan's transportation system provides the backbone for all economic activities within the state. The transportation system, including roads, transit, non-motorized facilities and inter-modal facilities, plays not only an integral role in supporting the state and region's economy but also in the quality of life for residents. Transportation investments are part of the state's overall economic development strategy. Both the United States' and Michigan's, Department of Transportation identify the link between transportation and the economy as their top priority.

An efficient transportation system saves time and cost for individuals and business, advances productivity and competitiveness, which promotes economic growth. Michigan's improving transportation system along with other state assets: including a skilled labor force, its natural environment, and well-established manufacturing sector will all contribute to help the state overcome its economic challenges.

Chapter 1. Introduction

This report highlights the important linkage between the state's economy and its transportation system. As the lifeblood of the state's economy, an efficient transportation system moves goods and people throughout local, regional, national and international economies in a safe, timely and reliable manner. Transportation is closely tied to economic development and is a vital part of the nation's and state's overall economic competitiveness. Michigan's residents and businesses identify the state's transportation infrastructure as a critical component of economic growth.

One of the United States Department of Transportation top priorities is to keep the traveling public safe, increase their mobility, and ensure that our transportation system enables economic growth and development. The Michigan Department of Transportation (MDOT) vision, "Providing the highest quality integrated transportation services for economic benefit and improved quality of life," also recognizes this key link between transportation and the economy. Information from the *MI Transportation Plan* "Attitudes and Perceptions of Transportation in Michigan: A Survey of Michigan Adults" survey, Economic Advisory Group, Stakeholder, and Public Open House meetings show that Michiganders recognize this link.

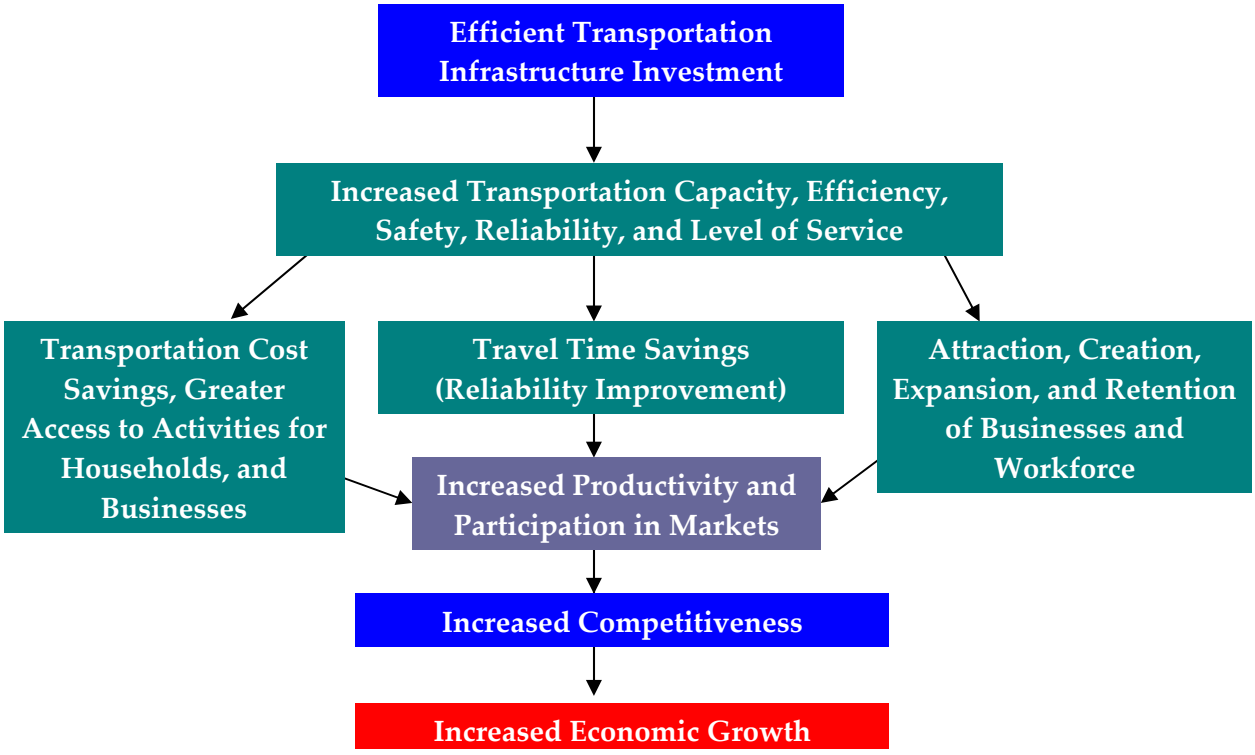
Chapter 2. Transportation and the Economy

2.1. The Role of Transportation

The transportation system plays a key role in the economy. It serves as the backbone of the economy, connecting markets and providing for the movement of people and goods. A well-developed and maintained transportation system can help businesses, people reduce travel times, and costs, improve safety and reliability, and increase the accessibility of market areas. The extent to which a state can facilitate the efficient flow of goods and people directly impacts productivity and economic competitiveness; thus, future economic growth and increases in the standard of living in the state of Michigan will be directly related to the quality of its multi-modal transportation system.

Transportation system capacity is one of the constraints on the development and transition of Michigan's economy. Likewise, economic growth, especially in terms of global trade, and changing needs are placing pressure on the capacity of the transportation system. As the state's economy has grown and diversified, so has the volume of trade. These factors have led to a significant increase in the demands on the transportation infrastructure. As the transportation system reaches capacity, infrastructure and transportation services are unable to satisfy the demands of system users, leading to increases in the costs of doing business and resulting in negative impacts on industry and economic performance. Maintaining and increasing the level of service of the transportation system through the efficient and intelligent investment of transportation capital is a necessary element in retaining existing businesses and attracting new ones. As shown in **Figure 1**, investments that lead to efficiency gains such as reduced travel times lead to lower transportation costs and increase access to markets. This gives rise to productivity gains, which enhances economic competitiveness.

Figure 1: Transportation and the Economy

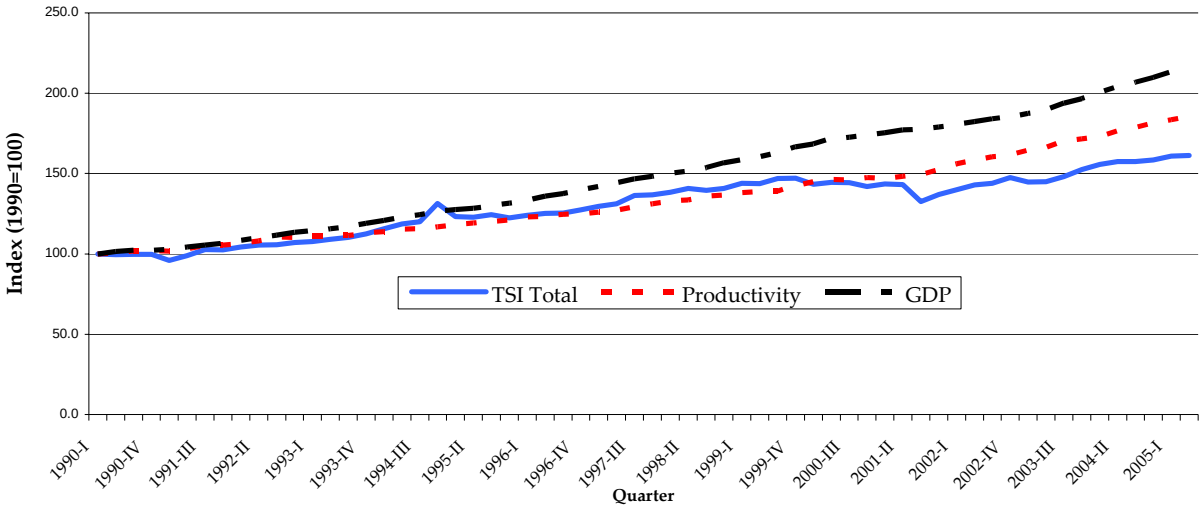


Source: Adapted From FHWA Office of Freight Management and Operations, 2004

Not only is transportation a necessary input to other industries, it is a major contributor to the economy. According to the Bureau of Transportation Statistics (BTS) of the US Department of Transportation, in 2004, transportation accounted for 10.5 percent of GDP (Gross Domestic Product) (current dollars), supported 8.9 million transportation-related jobs, and contributed more than 11.9 percent of personal expenditures.

Figure 2 exhibits the trend of three indicators – the Transportation Services Index (TSI), manufacturing productivity, and Gross Domestic Product (GDP). TSI measures the month-to-month changes in the output of services provided by the for-hire transportation industry. From 1990 to 2005, GDP, TSI and the productivity index trend upwards together. This demonstrates that GDP, productivity, and transportation are positively correlated. As productivity and the demand for transportation services increase, GDP increases.

Figure 2: Transportation and the Economic Trend in US

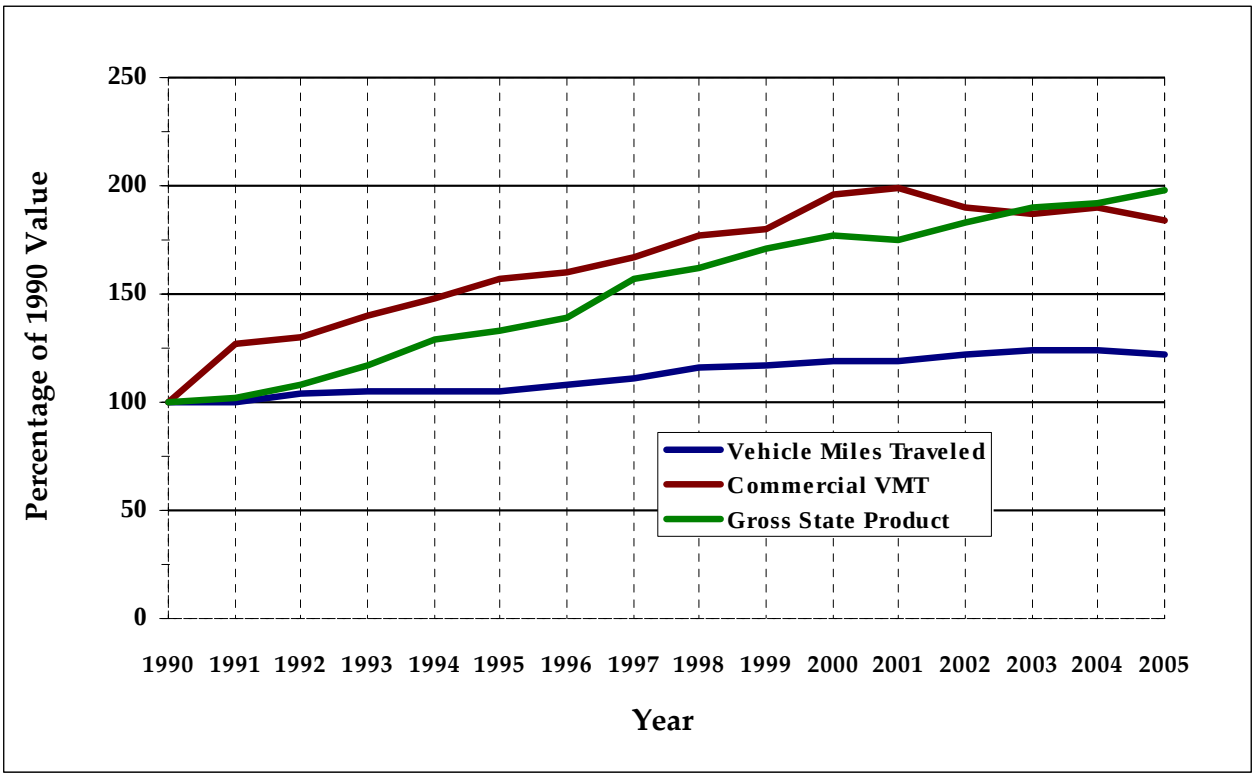


Source: Bureau of Transportation Statistics

Another way to look at the relationship between transportation and the economy is to examine the vehicle-miles traveled (VMT) and a key economic indicator such as GDP. **Figure 3** shows the changes in Michigan's total VMT, commercial VMT, and gross state product (GSP) from 1990 to 2005. GSP measures the economic output of a state in a manner similar to GDP.

Figure 3 shows the close relationship between transportation, especially freight transportation, and the economy in Michigan. Commercial VMT generally has grown at a faster rate than the economy as a whole (GSP), while overall VMT, including personal travel, has grown at a relatively slower rate. The important trend to note is that commercial VMT appears to be a leading indicator for the state's economy. As commercial VMT increases, the state's GDP expands, albeit with a lag. The same is true when commercial VMT decreases. The economy slows following a decline in commercial VMT. These positive relationships suggest that the state's capacity for economic growth is directly related to its ability to efficiently accommodate additional VMT on the state's transportation system.

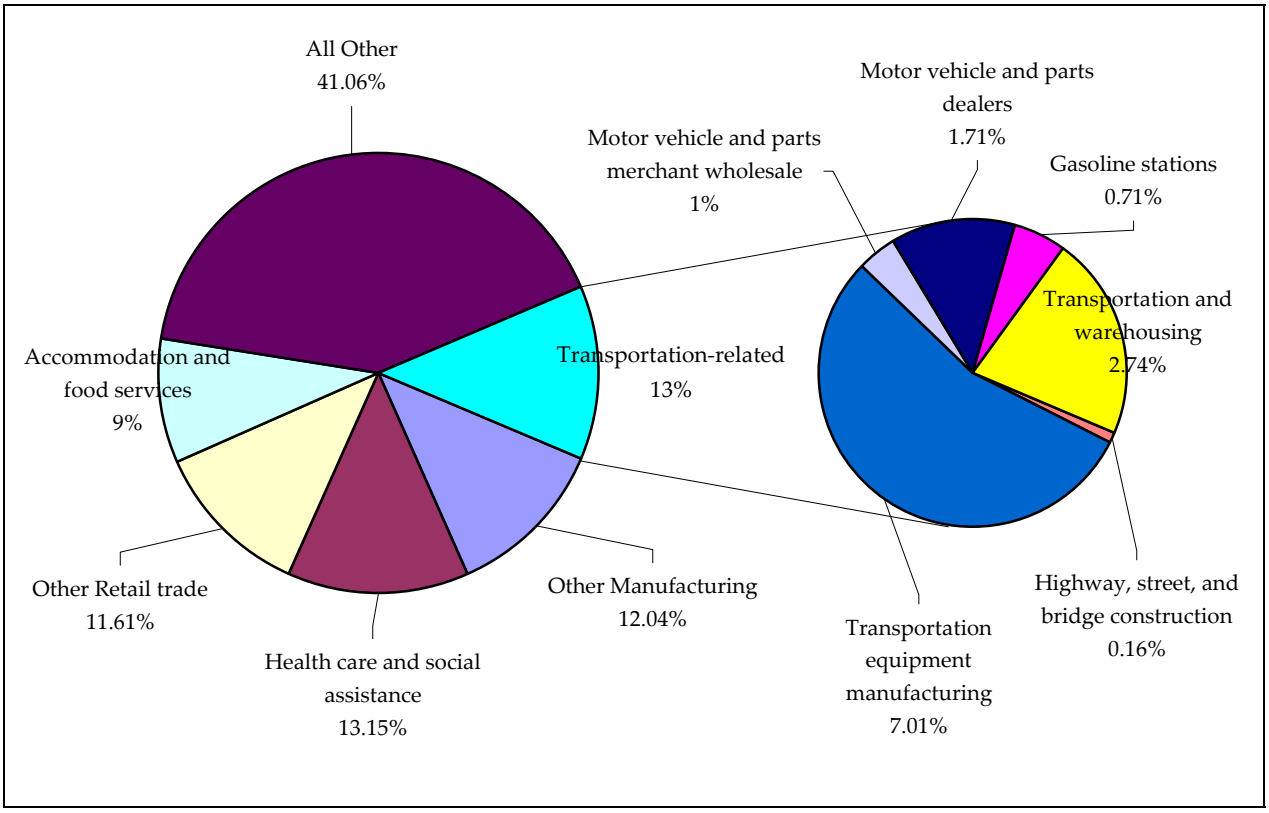
Figure 3: Transportation and the Economic Trend in Michigan



Source: MDOT-BTP, Statewide Model Unit

As the state's economy relies heavily on the transportation-intensive manufacturing industry and trade-related industries, transportation and the economy are more closely linked in Michigan than in many other states. **Figure 4** illustrates the relative employment in Michigan of selected transportation-related industries for 2004. Transportation equipment is Michigan's largest manufacturing industry group as measured by employment. It constitutes seven percent of the state's total employment in the private sector.

Figure 4: Transportation-related Employment Share in Michigan (2004)



Source: Michigan Bureau of Labor Market Information

Traditionally, manufacturing depended on transportation to receive raw materials and to deliver products to the marketplace. However, in an increasingly competitive market where domestic companies compete directly with low-cost foreign competitors, the role of transportation has shifted from being one of simply reaching markets to one of cost control and competition. This has been fueled by supply chain management and just-in-time manufacturing, which integrates information and transportation to manage inventories and cash flow. An efficient, timely, and dependable transportation system is now essential for lowering cost, enhancing competitiveness, and supporting just-in-time inventory control systems for business. To retain and attract manufacturing firms, Michigan must be able to meet these transportation requirements.

In the future, transportation investment can be an engine to drive growth in emerging and developing industries. This includes trade-related industries such as logistics and distribution, energy technologies and knowledge-based advanced manufacturing. In addition, it is expected that tourism and other related service sectors will increasingly compete for transportation capacity and services.

2.2. Key Elements in Michigan's Transportation System

In today's business environment, cost-effective and time-sensitive multi-modal transportation services have increasingly become part of the competitive advantage in manufacturing and service-oriented industries. The Michigan transportation system includes highway, rail, transit bus, intercity passenger rail and bus, airports, ferries and marine ports, and international border crossings. They all provide critical transportation services to Michigan residents and businesses.

The data collected from the MI Travel Counts and reported in the Travel Characteristics Technical Report, 2006 indicates that private vehicles serve as the primary mode of transportation in Michigan. Private vehicles account for 89.9 percent of all trips made within Michigan and 86.6 percent of all long-distance trips. The high dependence on personal vehicles in the state is not surprising given the concentration of the auto industry in Michigan.

Despite the overwhelming dependence on automobiles, other transport modes also play an important role in Michigan. For instance, also according to the *Travel Characteristics Technical Report*, 2006, 10.2 percent of long-distance trips (more than 100 miles) are made by air, 1.1 percent is made by bus, and 0.4 percent is made by train. Public transit and walking account for 1.2 and four percent, respectively, of all trips within the state.

In the following sections, we review and discuss the importance of several key elements that either serve as part of Michigan's transportation system or drive the demand for the transportation system. These elements include key corridors, multi-modal facilities, border crossings, and supply chains.

2.2.1. Key Economic Corridors

Certain corridors in the Michigan transportation system carry the highest value and volumes of goods and people. Those corridors are Michigan's most used and most valuable corridors in terms of facilitating commerce and economic activity. Recognizing the importance of these corridors, *MI Transportation Plan* identifies them as key economic corridors in the state transportation system, labeling them as Corridors of Highest Significance.

In the *Corridors and International Border Report*, Michigan's Corridors of Highest Significance are defined as:

An integrated, multi-modal system of transportation infrastructure along geographic corridors that provide a high level of support for the international, national, and state economies. These corridors connect activity centers within and outside Michigan and serve the movements of people, services, and goods vital to the economic prosperity of the state.

As shown in **Tables 1** and **2**, 11 corridors are identified as being of national/international significance and another eight corridors are identified as having statewide significance. The key economic corridors with national and statewide significance either serve a large percentage of Michigan's population or have a high volume of traffic. For instance, Corridor D

(Muskegon/Grand Rapids/Lansing/Detroit) serves 34 percent of Michigan's population by carrying traffic to and from Detroit along I-96. However, in terms of traffic volume, Corridor K (I-696) has the highest annual average daily traffic (AADT) in 2005, with more than 163,000 vehicles per day, which is nearly twice as much average traffic volume as Corridor D.

Tables 1 and **2** also present the number of activity centers each key economic corridor serves. In total, those key economic corridors connect the 51 existing and emerging activity centers. Activity centers are defined as areas with concentrations of people, jobs, educational and health service facilities, tourist attractions, or other similar economic-based facilities or services.

Although the key economic corridors with the highest significance include only 20 percent of the entire roadway system, they carry 60 percent of the state VMT. The key economic corridors also include the entire passenger rail system and 70 percent of the airports in the state.

Table 1: Summary of Corridors of National/International Significance

Corridors of National Significance					
Label	Corridor Name	% Population within 20 Mile Buffer Zone	# of Activity Centers Supported	2005 AADT	Beginning-and-Ending of Corridor
A	Mackinaw City-St. Ignace / Wisconsin	0.6	3	5,472	Starts in St. Ignace, follows US-2 to M-35 in Escanaba, follows M-35 to Menominee, and ends at Wisconsin border
B	Sault Ste. Marie / Bay City	3.0	6	11,875	Starts at Canada border in Sault Ste. Marie, follows I-75, and ends at Bay City
C	Bay City-Midland / Saginaw / Flint / Detroit	29.0	7	83,000	Starts in Bay City, and follows I-75 to Detroit
D	Muskegon / Grand Rapids / Lansing / Detroit	34.0	7	64,400	Starts in Muskegon, follows I-96, through Grand Rapids, Lansing, Livonia, and ends in Detroit
E	Detroit / Chicago	28.0	8	54,300	Starts in Detroit, follows I-94 through Ann Arbor, and ends at Indiana border
F	Grand Rapids / Chicago	8.0	5	32,000	Starts in Grand Rapids, follows I-196 through Holland to I-94, and ends at Indiana border
G	Port Huron / Detroit / Toledo	24.0	5	76,000	Starts at Canada border in Port Huron, follows I-94 to I-75 in Detroit, follows I-75, and ends at Ohio border
H	Port Huron / Lansing / Indianapolis	10.0	7	28,536	Starts at Canada border in Port Huron, follows I-69 through Lansing, and ends at Indiana border
J	Port Huron / Chicago	14.0	8	35,500	Starts at Canada border in Port Huron, follows I-69 through Lansing to I-94, follows I-94, and ends at Indiana border
K	I-696	23.0	2	163,852	Starts at I-96 in Farmington Hills, follows I-696, and ends at I-94
L	I-275	14.2	5	92,000	Starts at I-96/I-696 interchange in Farmington Hills, follows I-275, and ends at I-75

Table 2: Summary of Corridors of Statewide Significance

Corridors of Statewide Significance					
Label	Corridor Name	% Population within 20 Mile Buffer Zone	# of Activity Centers Supported	2005 AADT	Beginning-and-Ending of Corridor
M	Houghton / Marquette / Sault Ste. Marie	1.0	3	5,100	Starts in Houghton, follows US-41 to Marquette, follows M-28 to I-75, follows I-75, and ends at Canadian border
N	Petoskey / Grand Rapids / Indiana	10.4	7	21,000	Starts in Petoskey, follows US-131 through Grand Rapids, and ends at Indiana border
P	Mackinaw City-St. Ignace / Holland	6.0	6	14,035	Starts in Mackinaw City, follows US-31 through Petoskey, Traverse City, and Muskegon, and ends in Holland
Q	Benton Harbor / Indiana	1.4	1	13,000	Starts in Benton Harbor, follows US-31 through Niles, and ends at Indiana border
R	Flint / Toledo	9.0	4	50,100	Starts in Flint, follows US-23 through Ann Arbor, and ends at Ohio border
S	Mackinaw City-St. Ignace / Alpena / Standish	1.0	3	5,100	Starts in Mackinaw City, follows US-23 through Alpena, and ends at Standish
T	Grayling / Jackson	6.0	5	20,200	Starts in Grayling, follows I-75 to US-127, through Lansing, and ends in Jackson
U	Jackson / Toledo	2.0	3	16,000	Starts in Jackson, follows US-127 to US-223, through Adrian to US-23, follows US-23, and ends at Ohio border

2.2.2. Key Multi-modal Facilities

The rationale for developing and operating multi-modal or intermodal facilities includes:

Enhancing convenience for personal travel and smoothing transfer of passengers from one mode of travel to another;

- Reducing costs of commodity shipments when transferring from one mode to another;

- Increasing connectivity between different transportation modes;
- Eliminating conflicts between modal movements;
- Reducing congestion caused by mixed transportation modes;
- Encouraging ridership of transit bus and intercity bus and rail to reduce congestion on highways; and
- Improving the environment and quality of life.

Multi-modal facilities may provide services to several modes together. Each facility may have one or two primary modes for service and other modes in a supporting role. For instance, a multi-modal facility at an airport may include traffic management for passenger rail, bus, cars, trucks, taxis, and pedestrians. All those modes support the airport's passenger and air cargo services. Michigan has dedicated resources to advance the integration of all modes to create a seamless transportation system for personal travel and freight shipment. Currently, Michigan has 24 intermodal passenger facilities and seven intermodal freight terminals. (**Table 3** shows freight terminal facilities.)

Table *3*: Multi-modal Freight Terminal Facilities

Name of Facility	*County*	*Modes*	*Owner*
Norfolk Southern Triple Crown	Wayne	Highway, Rail	Norfolk Southern
APL Woodhaven	Wayne	Highway, Rail	American President Lines
Conrail Livernois	Wayne	Highway, Rail	Consolidated Rail Corp.
Norfolk Southern Delray	Wayne	Highway, Rail	Norfolk Southern
Canadian National Moterm	Oakland	Highway, Rail	Canadian National Railway
Canadian Pacific Oak Yard	Wayne	Highway, Rail	Canadian Pacific Railway
Canadian Pacific Expressway	Wayne	Highway, Rail	Canadian Pacific Expressway

In addition to intermodal facilities, other facilities that provide services to personal travel and freight transport include transit bus, intercity bus, AMTRAK, freight rail junctions, commercial marine ports, and airports. As summarized in **Table 4** all of these facilities can be reached by a large percentage of the population within a short time period. For instance, more than 44 percent of the population can reach an intermodal passenger facility within 15 minutes, while more than 94 percent of the population can reach a facility in an hour.

Table 4: Multi-modal Facilities in Michigan and Service Coverage

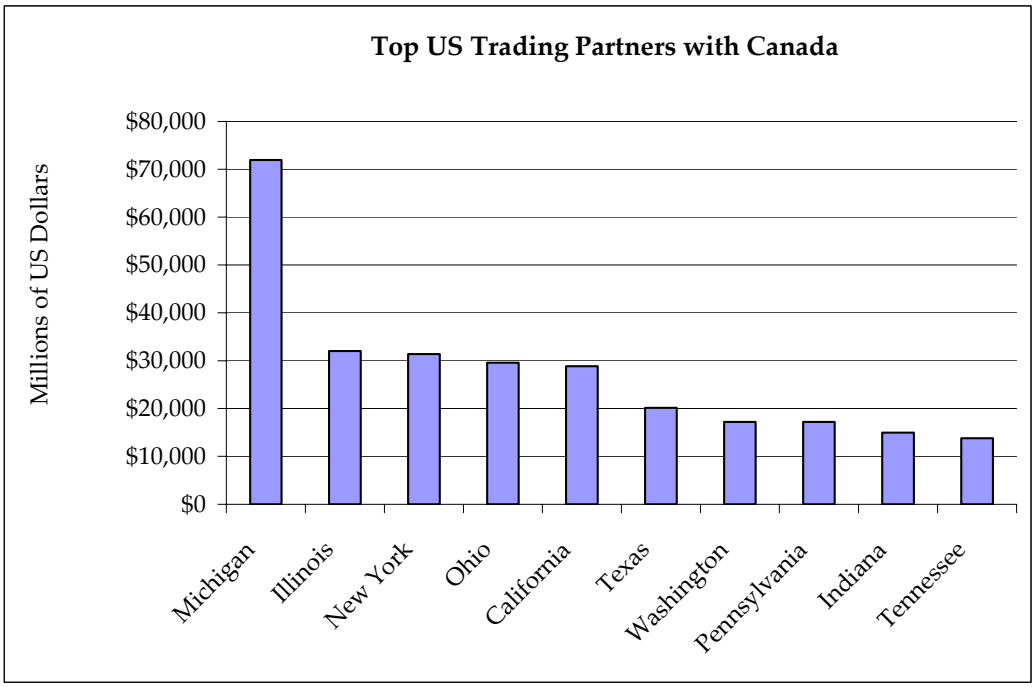
Type of Facilities	*Number of Facilities*	*% of Population can reach Facilities within 15 Minutes*	*60 Minutes*
Personal Travel			
Intermodal Passenger Facilities	24	44.7%	94.2%
Intercity Bus Terminals	46	44.0%	99.0%
Bus Stations	Many	66.9%	99.6%
AMTRAK Stations	22	58.1%	88.3%
Carpool Parking Lots	Many	74.9%	99.9%
Freight			
Intermodal Freight Terminals	7	20.2%	50.8%
Commercial Rail Junctions	Many	72.2%	99.9%
Commercial Maine Ports	Many	33.5%	87.5%
Mixed			
Airport's with Commercial Services	18	26.7%	94.9%

2.2.3. Border Crossings

January 2004 marked the 10th anniversary of the North American Free Trade Agreement (NAFTA) between the United States, Canada and Mexico. Over the past decade, trade between the US and Canada has grown by more than 75 percent, with trade between Michigan and Canada accounting for approximately 20 percent of the total. **Figure 5** shows that Michigan's trade value with Canada in 2005 is more than twice that of any other individual state. This trade and the border crossings that facilitate the trade have served as an economic engine for the state.

The strong growth in trade between Michigan and Canada began following the enactment of the Canada United States Free Trade Agreement in 1987. By the time NAFTA was enacted in 1994, trade between Michigan and Canada already exceeded $50 billion. Between 1994 and 2004, trade between Michigan and Canada grew an additional 32 percent. **Figure 6** illustrates the growth in trade between Michigan and Canada by all modes between 1994 and 2005. The province of Ontario imported nearly 97 percent of Michigan's total 2002 exports to Canada. In 2005, surface transportation trade between the US and Canada totaled $458 billion, up 12 percent from 2004.

Figure 5: Top US Trade Partners with Canada by Value in 2005 (million $)



Source: BTS Transborder Surface Freight Dataset, http://www.bts.gov/transborder/

Michigan has 10 surface border crossings that consist of three bridges and one tunnel for passenger and freight vehicle travel, one bridge and two tunnels for rail transport, and three ferries for marine transport.

Figure 6: Historical Trends in Surface Trade between Michigan and Canada

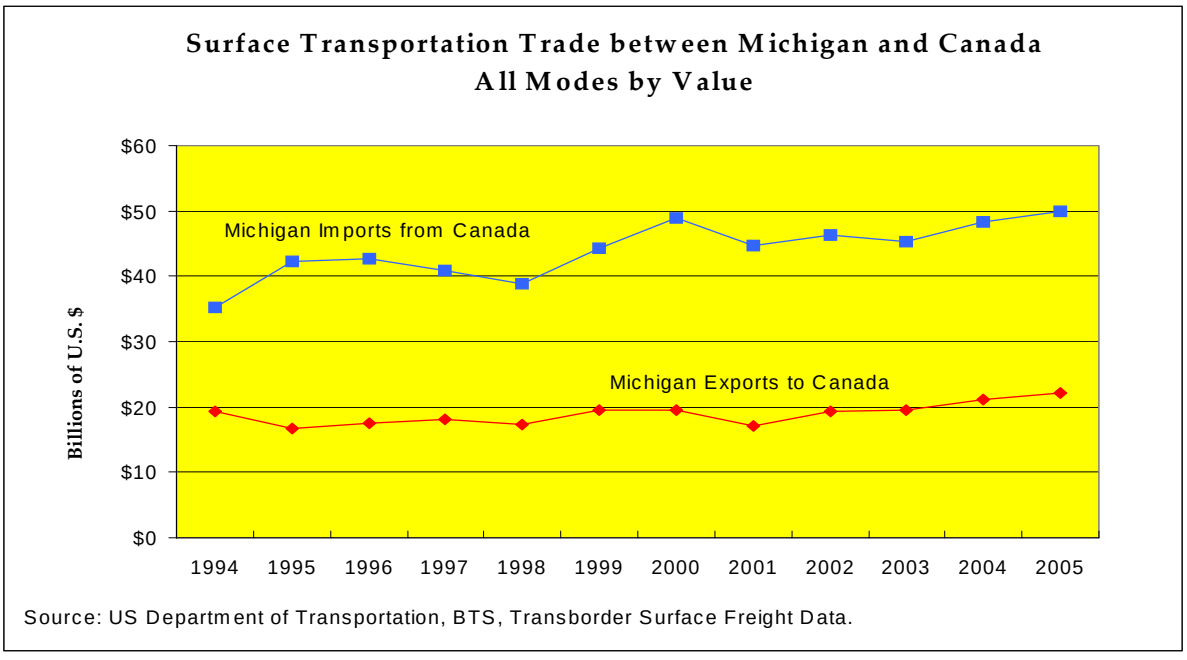


Table 5 summarizes all 10 border crossings in Michigan. Although the crossings serve as gateways for economic activity, the heavy transportation volume also creates travel problems. Delay at the international border crossings is a common problem due to increasing traffic congestion, longer border inspection time, and other reasons. The delay at border crossings has major implications for Michigan's economy because the delay represents inefficiency and lost productivity, which influences potential economic growth in Michigan. Because of continuous delay at border crossings, personal travel between Michigan and Canada may decrease and the cost of doing business for Michigan's industries will increase.

Table 5: List of International Border Crossings

Mode	*Crossing*	*Activity Center Location*
Vehicle	Ambassador Bridge	Detroit
	Detroit-Windsor Tunnel	Detroit
	Blue Water Bridge	Port Huron
	International Bridge	Sault Ste. Marie
Rail	Rail Bridge	Sault Ste. Marie
	Rail Tunnel	Port Huron
	Detroit-Windsor RR Tunnel	Detroit
Ferry	Blue Water Ferry	Port Huron
	Walpole-Algonac Ferry	Detroit
	Detroit-Windsor Truck Ferry	Detroit

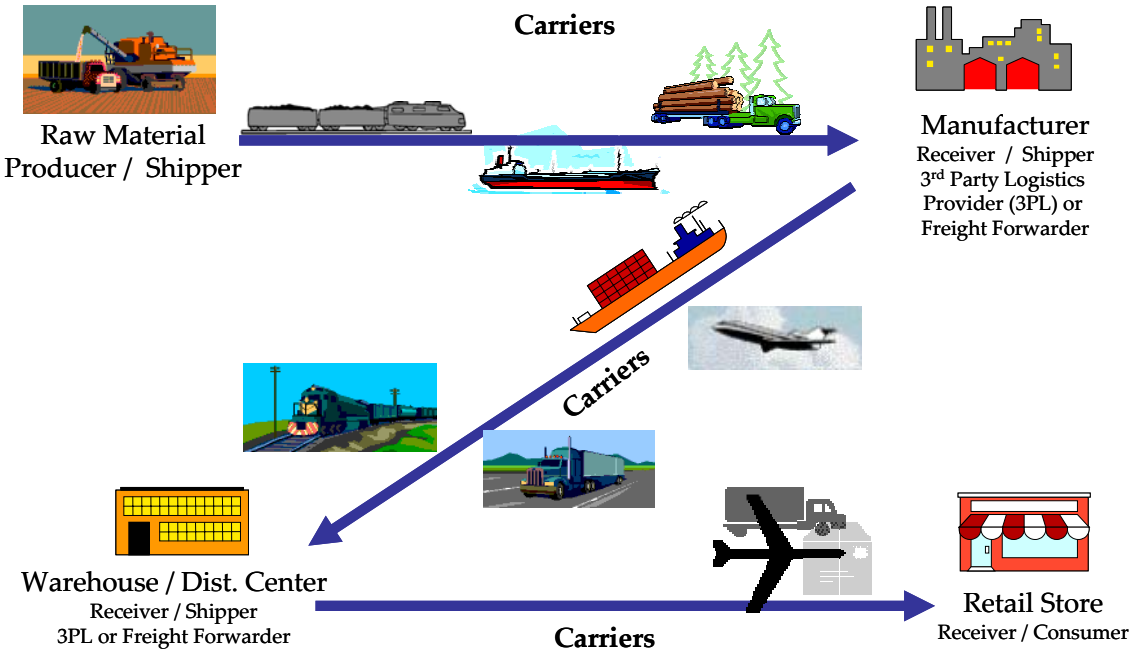
2.2.4. Supply Chain

A supply chain is a coordinated system of organizations, people, activities, information, and resources involved in moving a product or service from suppliers to customers in a cost-effective and time-efficient manner. In today's competitive business environment, supply chain innovation is increasingly a strategy for competitive advantage in manufacturing and service-based industries.

Figure 7 is an example of a basic supply chain. This supply chain illustration demonstrates the multiple parties that must be closely coordinated to make the system work smoothly and efficiently. Many companies now outsource coordination tasks to freight forwarders or third-party logistics (3PL) firms.

The supply chain has several objectives such as locating capable and low-cost suppliers around the world, delivering materials and parts on time as needed, reducing inventory levels, producing only what customers want, and creating a lean production process (i.e., point-of-use material delivery).

Figure 7: Illustrative Supply Chain Network



Source: Wilbur Smith Associates

Recent Trend

Over the past several decades, US industries have become less labor intensive and more capital intensive. "Today, US manufacturers, in general, tend to produce goods that require more amounts of capital, such as technology products, leaving labor intensive manufacturing to less developed countries."[1] As the economy becomes more service-oriented and US manufacturers produce more high-value, low-weight products that are expensive to stock as inventory, companies are adopting modern supply chain management techniques with the following attributes:

Customer-Focused Logistics: Tailoring the logistics system so that it responds to the needs and potential profitability of each specific group of customers.

Transportation Effectiveness: Leveraging the ability of integrated transportation to improve customer service and total supply chain cost performance.

Working Capital Management: Maximizing the productivity of inventory, accounts receivable, and accounts payable.[2]

Unlike the old inventory-based logistics model that focused on re-stocking the inventory warehouse, the integrated model of supply chain management views transportation as part of the product offering.

Ford Motor Company Logistics

Ford Motor Company reorganized it logistics by changing the way it distributes vehicles to its dealers. Traditionally, assembly plants would ship finished passenger vehicles directly to dealers, but only when a sufficient quantity of orders had been received to fill an entire railcar or truck. To shorten the average delivery time from the assembly plant to the dealer from 72 days to a goal of 15 days, Ford created what it calls "national mixing centers." These centers located in Chicago, IL; Shelbyville, KY; Kansas City MO; and Fostoria, OH act as distribution centers by receiving all types of vehicles from assembly plants and then re-shipping the correct number and type of vehicles to the dealer. The mixing center distributes vehicles by rail or truck to dealers. It is estimated that a vehicle will be held at a mixing center for less than 24 hours before being shipped to a dealer.

- USDOT, FHWA, *"The Freight Story"* January 2002.

To excel in a global marketplace, businesses are employing just in time and other precision-based inventory management approaches, where inventories tend to be reduced at all stages of the production and staging (distribution) cycle. Under these circumstances, enterprises tend to have minimal "emergency" stockpiles and hence any shortages in the inventory management system may lead to missed sales opportunities or a temporary plant shutdown. The freight, goods and services transport system is vital to regional mobility and productivity, and

[1] American Trucking Trends 2003, American Trucking Associations, Inc. pp. ii. 2003.
[2] LOGISTICS! *"Supply Chain Economics: Making Your Shots Count,"* Mercer Management Consulting. Winter/Spring 1998 pp. 3.

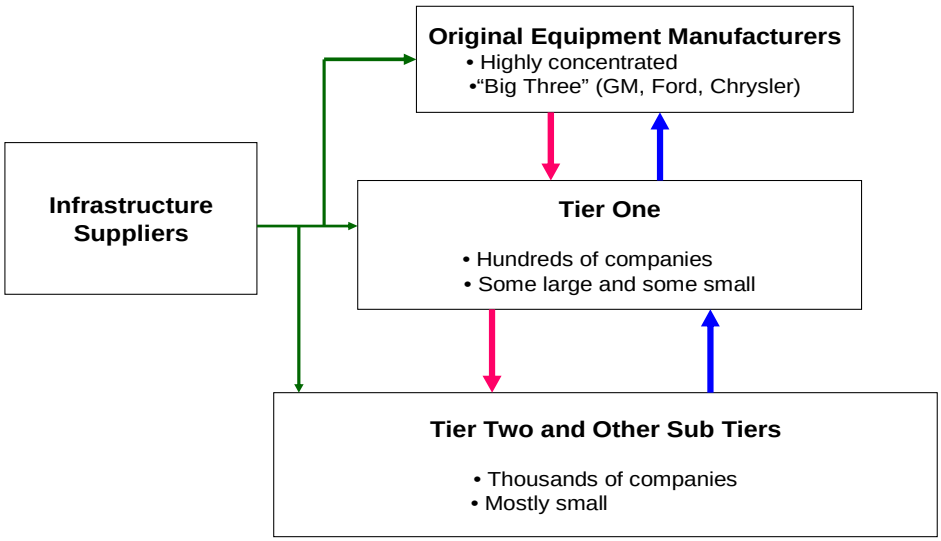
ultimately economic development. Therefore, an efficient and cost-effective transport system is vital to the competitive position of businesses and industries competing in a world market.

Supply Chains Related to Michigan's Auto Industry

In general, the key participants of the supply chain for the auto industry include original equipment manufacturers (OEM), Tier One, and sub-tier suppliers. The OEMs include General Motors, Ford and Chrysler (the "Big Three" in the domestic automotive industry.) If a company directly supplies the OEMs, it is a Tier One supplier; a sub-tier company supplies to Tier One, and so on (see **Figure 8**). The OEMs are highly specialized and concentrated in Michigan, and they form the backbone of the Michigan economy.

The OEMs design and produce only some of auto parts used in automobiles and they procure others from the Tier One suppliers. The Tier One suppliers in turn either produce or outsource to second or other sub-tier suppliers. The infrastructure suppliers provide hardware, tooling, robots, and software to OEMs and their sub-tier suppliers and are an important component in the supply chain. In reality, the supply chain does not operate as explained in theory. The same company can act as a Tier One supplier on one project but act as a sub-tier supplier on another project.

Figure 8: Supply Chain for the Auto Industry



Source: "99-1 Planning Report," NIST, US DOC

The US automobile manufacturing industry has been facing increasing competition pressure from foreign competitors. Challenges such as global over-capacity and shorter model lifecycles push automakers and their suppliers to reduce costs and add value while operating under increasingly thin profit margins.

This pressure has led to OEMs allowing Tier One suppliers to source more products from low-cost countries, especially China. This has led to increasingly far-flung supply chains and a greater dependence on a seamless and efficient multi-modal transportation system.

2.3. Summary of Michigan Transportation Services Provided

As described in previous sections and summarized in other technical reports, the Michigan transportation system includes significant transportation corridors, other roadways, multi-modal facilities, border crossings, rail, airports, and water ports. The system services Michigan residents, business, tourism, and international trade. **Table 6** summarizes some key statistics reported in other technical reports for *MI Transportation Plan*.

The summary statistics highlight the reliance on the system by Michigan's residents and businesses. Specifically, the state trunkline carries 103 billion annual VMT; more than 11 million cars and trucks pass the Michigan international border crossing points and entered the US each year; and Michigan's transit and intercity transportation system carries more than 86 million passengers.

Table 6: Summary of Transportation Services Provided in Michigan

Transportation Service Item	*Value and Unit of Measure*	*Year of Data Reported*	*Data Source*
State Trunkline	103,200 million annual-vehicle-miles traveled	2005	Highway/Bridge Report
Freight Transportation			
By Truck	474 million tons	2003	Freight Profile Report
By Rail	120 million tons	2003	Freight Profile Report
By Water	78 million tons	2003	Freight Profile Report
By air (cargo and mail)	0.33 million tons	2003	Freight Profile Report
Transit			
Urban Area	78,600 thousand passengers	2004	Transit Report
Non-urban Area	6,500 thousand passengers	2004	Transit Report
Intercity Passenger Services			
Rail	615 thousand passengers	2005	Intercity Passenger Report
Bus	85 thousand passengers	2005	Intercity Passenger Report
International Border Crossing			
Auto (To the US)	9,152 thousand cars	2005	BTS(*)
Truck (To the US)	2,737 thousand trucks	2005	BTS

Chapter 3. Michigan's Long-Term Trends and Transportation Implications

Four long-term trends have significant impacts on Michigan's economic outlook, as well as future demand for the state's transportation network. These trends are; the decline of automobile and other manufacturing, aging of the state's population, workforce availability, and migration and population growth. Key economic indicators as well as transportation systems detailing Michigan's economic health are influenced by these important factors. The following is a review of these trends and brief discussions of their transportation implications. More detailed transportation implications of these long-term trends are available in the *MI Transportation Plan Socioeconomics Technical Report*, 2006.

3.1. Decline of Automobile and Other Manufacturing

During the years between World War I and the late 1960's the United States automobile industry was the most powerful economic engine on the planet, and it was centered in Detroit and other parts of Michigan. It generated unprecedented levels of investment, productivity, wages and profit. The resulting explosive growth in employment attracted in-migration from the rest of the country. Wages that were markedly higher than in other industries and other regions helped drive these trends. There was no effective competition for American vehicle manufacturers until the early 1970's. The result was sustained high profits and wages for decades.

Michigan is now roughly 30 years into a period of adjustment following a 50-year boom that was an extraordinary feat in the annals of world history. Since the 1970's, competitors for the United States and world vehicle sales have emerged that have placed pressure on Michigan manufacturers, suppliers, and workers. Even after three decades of cutbacks, we are now entering a wrenching period of readjustment. From 1977 to 1997, Michigan's share of the total value added in vehicle manufacturing dropped from 43 to 25 percent.

Michigan's non-manufacturing sectors have also been impacted by activity in the motor-vehicle sector. Michigan wages and employment levels are being forced to respond to worldwide trends. Declining employment or declining profits in the motor-vehicle sector result in economic downturns that are transmitted and multiplied throughout the Michigan economy. A shrinking manufacturing sector and expanding service sector in Michigan will change the demand on its transportation system from manufacturing commuting patterns to service-oriented commuting patterns. On average, wages are higher in the transportation equipment manufacturing area than the service sector. The impacts include more people with less income to make purchases in the national or local economies.

3.2. Aging of State's Population

It is clear that the state's population is aging. Some age groups will demonstrate "growth spurts" over the 30-year period. All age groups less than 45 years will decrease between now and 2030, while the groups over 45 years of age will grow. Michigan must prepare now to meet the needs of a growing population 65 years and over. Forecast show that 96 percent (1.16 million) of the 1.2 million population increase from 2005 to 2030 in the state will be in the 65 and older age group.

Additionally, while the population is getting older, work can also start on preparing to meet the expectations of the younger workers. They will also be a part of the dynamic change-taking place as we move toward 2030. As discussed in the *MI Transportation Plan Socioeconomic Technical Report*, 2006, the following are key demographic changes that will have an impact on decision-making for transportation planning, transportation finance, and transportation facilities design:

The age distribution will significantly change from 2005 to 2030:

- The senior population (age 65 and over) will dramatically increase to over 20 percent of the population;
- The prime working age population (25-64) will shrink from 55 percent to 47 percent; and
- The under-25 population will slightly decrease from approximately 35 percent to 32 percent.

The dominant socioeconomic change in Michigan is expected to be the increase in retired populations. Transport to health, recreational, and other activities will increase in importance as the retirees transition from the daily commute to different travel patterns characteristic of older travelers.

The senior population will remain in the labor force longer, thereby contributing to a greater midday peak, increased vehicle-miles of travel (VMT) on the system, and possibly increased congestion.

Consequently, the aging population will have an impact on the state's transportation system and will require changes in transportation system planning and design activities to assure health and recreational activities, special safety needs, and alternative modes are provided for aging travelers. Failure to address this core transportation need could result in negative economic implications for the state as citizens seek to live in locations that better suit their respective transportation needs.

3.3. Workforce Availability

Companies must attract a skilled workforce to compete globally in today's knowledge-driven economy. In order to be competitive, employers must have a sufficient number of properly trained workers. Preparation for the world of work is a life-long task, requiring workers to

continually upgrade their skills. In Michigan's economy, manufacturing will remain an important sector. Manufacturing makes up 21 percent of the states employment. Due to the retirements expected in manufacturing, many workers will have to be replaced.

Higher skill levels are required in the remaining manufacturing jobs. In jobs ranging from management, through information technology, to skilled-trades and operators, requirements for higher education and training levels are rising.

Going forward in the 21st century, actions must be taken to avoid a labor supply/demand gap that could impede the recovery of Michigan's economy. These actions could include life-long access to the right training and education, replacing retirees with new employees who have skills required by employers, and adding to the workforce entirely new employees whose skills meet employer needs.

This trend likely has limited impacts on the state's integrated transportation system. However, it is important to note that with the overall tightening of the work force, it is possible for employers to relocate for better proximity to localized labor pools and thus likely altering regional VMT patterns and levels. Therefore, it is imperative that good access and mobility be provided to educational facilities, localized labor pools and specialized development clusters (i.e., Automation Alley, technology parks, etc.) to assure the state has a competitive advantage in our global economy.

3.4. Migration and Population Growth

A critical assumption for Michigan has to do with the amount of migration to and from other states. Current thinking takes into account Michigan's migration patterns over the 25 years prior to 2000. Michigan's out-migration to other states was high in the late 1970's, extremely high in the early 1980's, and low in the 1990's.

During the late 1970's and early 1980's a number of negative factors took effect at the same time. These included: a larger gap in unemployment rates between Michigan and other states than exists today, a significant out-migration of young baby boomers, a large return-migration of people who had moved to Michigan in previous decades, and repeated out-migration of people from the city of Detroit.

The Census Bureau projected improvement in Michigan's migration rate before 2005. This assumption proved to be optimistic. The projections gradually become quite pessimistic after 2005. There actually was somewhat more migration to other states after 2000, but not as much as in the 1970's or 1980's because the international in-migration is offsetting the out-migration of the work force-age population. Projections that are more recent assume that Michigan's net migration to other states will gradually return to the 1975-2000 rates by 2025. Further, out migration will continue through 2030.

Geographic and group shifts in population will change the demand on Michigan's transportation system. A larger international population will increase diversity of

transportation markets in terms of the accessibility, awareness, and safety across modes. Certainly, overall population growth will place stress on congestion.

More detailed transportation implications of these long-term trends are available in the *MI Transportation Plan Socioeconomics Technical Report*, 2006.

Chapter 4. Conclusions

Transportation plays an important role in stimulating Michigan's recovery. The economy depends on transportation to move goods and people around in a safe, secure, efficient and reliable environment. A more flexible, efficient transportation system can speed up the economic recovery rate, increase productivity and promote economic growth. For Michigan and its local economies, transportation is also a significant factor for retaining current business and attracting new business and new industries. Better transportation infrastructure makes Michigan a better place to live for its citizens. Michigan's developed transportation system will also result in competitive advantages for the state's businesses, especially in the transportation-intensive manufacturing industries.

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