A transportation network is one of the most important elements of a community in the context of land use planning. A balanced and well thought-out transportation network can improve quality of life by facilitating economic development, increasing safety and providing an inviting corridor through which visitors and residents can experience the Township.

Transportation networks also link activities within the Township and throughout the region, connecting residents to employment opportunities, recreational activities and cultural resources. Locally, transportation networks have a significant impact on land use patterns that occur in a community. Not surprisingly, Muskegon Township contains a rather diverse transportation network, ranging from the busy interstate highway US-31 to scenic rural roads.

Another factor influencing land use patterns in a community is utilities. Reliable sources of clean drinking water and sanitary wastewater utilities are vital to any community and can positively impact the quality of life for residents. Public utilities can also be utilized to aid in the management of growth in a community by enabling greater development densities in certain locations, and their use also provides additional protection to the Township’s rivers, streams and groundwater.

This chapter examines the Township’s transportation networks and utility system and analyzes their importance in the context of an updated Master Plan.

Existing Road Network
Muskegon Township contains a variety of transportation options and experiences. Roadways vary significantly from the urban grid of streets in the southwest portion of the Township adjacent to the City of Muskegon to the rural feel of roads in other sparsely-developed portions of the community. North-south travel within the Township is severely limited due to the presence of the Muskegon River and its surrounding wetland areas.
The only river crossing in the Township is via US-31; there are no local streets that cross the river. Additionally, US-31, M-120 and Maple Island Road in Cedar Creek Township are the only Muskegon River Crossings in the County. Therefore, US-31 through Muskegon Township is a critical link in the region’s transportation network.

Roadways are broken down into several classifications based on the function they serve within the community. Roads in Muskegon Township can be broken down into the following categories:

- Limited Access Interstates and non-Interstates (US-31)
- State Highways (Holton Road, Apple Avenue)
- Principal Arterials - carry vehicles a long distance, handle through-travel movements. They also provide access to important traffic generators, such as major airports or regional shopping centers.
- Minor Arterials - similar to principal arterials, except they carry trips of shorter distance and to lesser traffic generators.
- Collectors - provide more access to property than arterials and funnel traffic from residential or rural areas to arterials.
- Non-Certified Roads

**Roadways & Traffic Volumes**

It is important to examine key transportation corridors in the Township in the context of a Master Plan. The Township’s identity is closely tied to views and experiences gained when utilizing the Township’s roadways, so a Master Plan that seeks to improve the overall transportation experience for residents and commuters may also positively affect the Township’s identity in the region.

With the exception of US-31, Holton Road, Apple Avenue and all primary roads, Muskegon Township maintains its own roadways in cooperation with the Muskegon County Road Commission. Roadway responsibilities includes maintenance of secondary roads and other aspects and is funded by property taxes.

US-31 is a key connection in the greater West Michigan region, as illustrated on Map 9.1. In Michigan, US-31 begins at the Indiana state line, 3 miles south of US-12 near White Pigeon, and terminates at I-75 near the Mackinac Bridge, just south of Mackinac City. US-31 has become an important route in Michigan, connecting many communities, including the Township, to many population centers in western Michigan including St. Joseph, Holland, Grand Haven and Muskegon. US-31 is heavily travelled, with segments in Muskegon Township experiencing between 40,000 and 60,000 vehicles per day.

Apple Avenue (M-46) is another key street segment in the Township running east and west through the southern portion of the community. It is the Township’s primary commercial corridor and
often experiences traffic volumes of 30,000 vehicles per day or more near the US-31 interchange. Beyond the Township boundaries, M-46 connects to downtown Muskegon a few miles to the west and can be followed east across the entire state.

Table 9.1 contains traffic count information for road segments in Muskegon Township based on information provided by the West Michigan Shoreline Regional Development Commission (WMSRDC).

Table 9.1 24-hour Traffic Counts of Selected Roads

<table>
<thead>
<tr>
<th>Road Segment</th>
<th>Location</th>
<th>Count</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple Ave</td>
<td>From US-31 to Quarterline</td>
<td>31,700</td>
<td>2004</td>
</tr>
<tr>
<td>Apple Ave</td>
<td>From Quarterline to Maple Island</td>
<td>22,400</td>
<td>2004</td>
</tr>
<tr>
<td>BUS 31</td>
<td>From US-31 to Getty</td>
<td>18,200</td>
<td>2004</td>
</tr>
<tr>
<td>Giles</td>
<td>West of Holton</td>
<td>7,064</td>
<td>2004</td>
</tr>
<tr>
<td>M-120 Holton Rd</td>
<td>East of Whitehall</td>
<td>15,900</td>
<td>2004</td>
</tr>
<tr>
<td>M-120 Holton Rd</td>
<td>West of US-31</td>
<td>18,864</td>
<td>2003</td>
</tr>
<tr>
<td>MacArthur</td>
<td>East of Mill Iron</td>
<td>1,734</td>
<td>2004</td>
</tr>
<tr>
<td>MacArthur</td>
<td>East of Quarterline</td>
<td>2,119</td>
<td>2004</td>
</tr>
<tr>
<td>MacArthur</td>
<td>East of Sheridan</td>
<td>2,940</td>
<td>2004</td>
</tr>
<tr>
<td>Mill Iron</td>
<td>North of Apple</td>
<td>2,085</td>
<td>2005</td>
</tr>
<tr>
<td>Mill Iron</td>
<td>North of Apple</td>
<td>4,300</td>
<td>2009</td>
</tr>
<tr>
<td>Mill Iron</td>
<td>North of Hall</td>
<td>1,857</td>
<td>2005</td>
</tr>
<tr>
<td>Sheridan</td>
<td>North of Evanston</td>
<td>5,280</td>
<td>2004</td>
</tr>
<tr>
<td>Sherman</td>
<td>East of Roberts</td>
<td>19,448</td>
<td>2009</td>
</tr>
<tr>
<td>US-31</td>
<td>From Apple to BUS 31</td>
<td>49,900</td>
<td>2004</td>
</tr>
<tr>
<td>US-31</td>
<td>From BUS 31 to M-120</td>
<td>45,100</td>
<td>2004</td>
</tr>
<tr>
<td>US-31</td>
<td>From Laketon to Apple</td>
<td>56,400</td>
<td>2004</td>
</tr>
</tbody>
</table>

Commuting Patterns

Commuting patterns can offer an illuminating picture of transportation within a community and is impacted by two factors: (1) where Township residents work, and (2) where Township workers live. In Muskegon Township, some residents seek employment opportunities outside the Township’s boundaries, and similarly, much of the Township’s workforce lives outside Township boundaries. By geographically examining the flow of workers, a deeper understanding can be reached relative to the impact of the Township in the region.

Analysis of commuting patterns is significantly aided by Michigan worker flow files compiled by the U.S. Census Bureau. Worker flow files document where residents of one community are travelling to work, and where the workers of a community live. According to Michigan worker flow files, most Muskegon Township residents who work outside the home work within a few miles of the Township. Just over 28% of Township residents also work in the Township, while another 20% work in the City of Muskegon and nearly 10% work in Norton Shores. Map 9.3 illustrates the commuting patterns of Muskegon Township residents.
When the communities in which Township residents work are analyzed geographically, the importance of the regional transportation network comes clearly into focus. As illustrated by Map 9.3, most communities that employ a number of Township residents are located along a major state highway or interstate. Clearly, the location of US-31 in the Township exposes its residents to a wide variety of employment opportunities.

However, looking at the communities where the workers of Muskegon Township live, a slightly different trend is revealed. According to the data presented on Map 9.4, Muskegon Township draws workers from a larger area outside of the immediate Muskegon region, and workers do not necessarily live near a major road or highway.

Maps 9.3 and 9.4, therefore, offer a number of conclusions about employment patterns. As would be expected, the largest employment centers are located either in urban centers or in close proximity to a major transportation corridor, as illustrated in Map 9.3, which results in most workers utilizing these thoroughfares to commute to and from their jobs.

We can also conclude that the changes in the economy in one community, such as Muskegon Township, can have a wide ranging effect. Since Muskegon Township employers draw workers from a geographically large area (illustrated in Map 9.4), the effect of significant gains or losses in employment opportunities in the Township may be felt far beyond the Township’s municipal boundaries.

Clearly, Muskegon Township plays a crucial role in the region in terms of its transportation network and as a source of employment.

Non-motorized Transportation and Trails

When planning for roadway improvements, it is important to consider transportation options other than automobile trips, as bicyclists and pedestrians are also important transportation considerations. While the private automobile is still the preferred method of transportation in the Township, there is a growing segment of the population that is opting to walk or bicycle to their destination. Non-motorized transportation options reduce the impact of automobiles on the environment and provide numerous health benefits to residents.

According to the WMSDRC 2035 Long Range Transportation Plan, there are currently few opportunities for non-motorized transportation in the Township. Currently, bike paths do not exist along Apple Avenue and Holton Road, but sidewalks are available in parts of...
the developed areas of the Township. Some of these trails and pathways are localized, while others connect residents to trails that run throughout the region.

**Mass Transit**

Mass transportation provides a crucial service in communities where it is implemented. It connects residents to employment and recreational opportunities, fosters economic development and provides significant cost savings to residents. According to the American Public Transportation Association, people who use public transit and have one less car in the household save an average of $724 per month. Muskegon Township residents are served with fixed-route public transit service through the Muskegon Area Transit System (MATS).

Operated by Muskegon County, MATS offers nine fixed routes system-wide, three of which travel through Muskegon Township. Routes A and B (Apple #1 and Apple #2, respectively) travel along Apple Avenue, Quarterline and Sheridan, serving several institutions such as Mercy Health Partners, Baker College and Muskegon Community College. Route D (Getty-Wood) runs primarily along Getty and Marquette along the Township’s western border, serving portions of Muskegon Heights as well as the Township.

The local transit system is insufficient for today’s community patterns. The system is not available on evenings or weekends, which places a serious limitation for students, the elderly and commuters who work later hours or on weekends. Changes should be made to make mass transit a viable option for commuters in the Township.

Regionally, there is not currently a mass transit system that can connect workers to employment centers in Grand Rapids, Holland or Grand Haven. Such a system could provide increased employment opportunities for workers, as well as opportunities for recreation and living. If such a regional system is contemplated in the coming years, the Township ought to actively participate in its planning, development and implementation.

**Other Existing Plans and Studies**

**M-120 Corridor Study**

In 2000, the M-120 Corridor Study was completed in coordination with the West Michigan Shoreline Development and Regional Planning Commission (WMSRDC) and the city of North Muskegon, and the Townships of Cedar Creek, Dalton, Holton, and Muskegon, as well as the Muskegon County Road Commission and the Michigan Department of Transportation.

The plan recommended standard access management measures, such as limiting the number of curb-cuts, improving internal site circulation and traffic calming. The executive summary of the document is included in the appendix of this Master Plan. Some specific recommendations include:

1. Create site development standards with shared site plan review with state and county transportation agencies.
2. Include provisions for landscaping, signage, driveways and curb cuts in zoning ordinance.
3. Specific to the Zephyr site, attention should be placed on site access and layout to ensure adequate traffic movements for vehicles and trucks.
4. The creation of a service drive or public access road across from where River Road enters M-120 from the north. The drive would provide access to these businesses and Reigler Road and provide a means for residents living south of M-120 to access the businesses without entering M-120.
5. Realign Reigler Road to provide a more direct access to the flashing signal at Old Orchard and River and the signal at Old Orchard and M-120. Also, work with the Road Commission to
evaluate the signalization currently being used at Old Orchard and River for maximum vehicular efficiency.

6. On the north side of the corridor (Dalton Township), the continuation of Old Orchard north away from M-120 and curving to the south and west behind businesses (eventually linking up with River Road) would provide for future development possibilities and promote internal circulation among the businesses that have developed in that area.

**Water Distribution**

A clean and safe source of drinking water is crucial to the growth and development of a community. Municipal water systems are critical infrastructure components since they provide clean, potable water, protect groundwater supplies and play a significant role in public safety by aiding in fire suppression. In Muskegon Township, residents who are connected to the public water system receive water from a water plant operated by the City of Muskegon, which also serves other communities in the region. This water plant draws its water from Lake Michigan and has a capacity of about 40 million gallons per day.

However, not all residents are connected to the public water system; some utilize private wells for drinking water. Most of the urbanized areas in the Township have water available along main streets, and subdivisions are served where residents have elected by special assessment to receive public water. However, not all residents on streets where public water is available are connected to the system; reliance on well water is still prevalent throughout the community.

The Township does not require a property owner to connect to the public system unless a home or business sells or the well fails. Furthermore, new construction projects that abut public water must connect, and new developments within 1/2 mile of public water must connect as well.

Existing wells in the Township pump groundwater, generally from a depth ranging from 30 to 70 feet. However, groundwater in certain areas of the Township contains high iron levels and other undesirable characteristics, and there are also three major pollution plumes around old refineries. Therefore, the effect on groundwater and potential for pollution should be a consideration as the Township enacts policies pertaining to land use, development and expansion of the water system.

Until recently, the Muskegon Township water distribution system was operated by the City of Muskegon, but this has changed and now the Township is part of the Muskegon County Regional Water System, an Authority involving three other communities. Currently, about 60% of the Township has access to this system, which is managed by the Authority. The Authority contracts with Muskegon to operate and maintain the system, with the Authority controlling all expansions to the system, and is responsible for regional lines 12” in diameter or larger. Construction of lines under 12”, however, are the responsibility of the local municipality, and the Authority assumes ownership and operations upon completion.

The water system is financed by user fees, connection charges that are paid by individual customers and a special assessment that affects all properties within 1,000 feet of the watermains, referred to as a Hydrant District, which includes about 60 percent of the Township. However, a more equitable financing arrangement, such as a reduced millage levied on the entire Township, may also be feasible. Such a millage would require a vote of the residents.

**Wastewater Collection**

A wastewater collection system can also have a significant impact on growth and development in a community. Areas that are served by an effective wastewater collection system can support higher residential densities and more intense land uses than
A wastewater collection system can have a significant impact on growth. Additionally, when used in cooperation with a Master Plan, plans for extending wastewater collection systems can be an effective growth management tool.

The system that collects wastewater in Muskegon Township is owned by the Township and operated under contract with the City of Muskegon. Raw wastewater is sent to the Muskegon County Wastewater Management System for treatment, and recent expansion to this system now provides service to most of the Township. While there are few households that use a private septic system, connection to this system is mandatory when available.

The Muskegon County Wastewater Management System, which treats wastewater from Muskegon Township and thirteen other communities in the region, is one of the most advanced systems in the nation, and occupies about 11,000 acres in the eastern portion of Muskegon County. The system is owned and operated by the County, and the units of government involved have advisory input through a Board of appointed officials representing each unit of government. Contracts between the individual government and the County will expire in 2010, and new drafts are currently being reviewed.

The Muskegon County Wastewater Management System currently treats an average of 15 million gallons of wastewater per day and occasionally reaches as high as 28 million gallons. The total capacity of the plant is about 42 million gallons. Water treatment at the plant involves three steps. First, the raw wastewater is pumped into an extended aeration lagoon where bacteria break down most impurities. Secondly, the wastewater is pumped into a settling lagoon where most of the solids are filtered. Finally, the water is distributed onto field crops, such as soybeans and corn. This water percolates through the soil, which further improves the water’s quality to nearly that of drinking water, before it is discharged into the Muskegon River or Black Creek.

The cost of treatment for each community is divided based on the volume being treated. However, the recent closure of the paper mill and other businesses results in higher costs for each user. Current county-wide efforts to search for and attract new users is ongoing and is an important part of the economic vitality of our community.

Current data suggests that the wastewater infrastructure in the Township is adequate to meet current needs, and the treatment plant operates at about 30% capacity on an average daily basis. However, the availability and maintenance of utilities should be one of the factors the Township takes into account when making planning decisions.

**Conclusion**

By maintaining an effective transportation network that provides access to employment opportunities, recreation and living, Muskegon Township plays a key role in contributing to the quality of life enjoyed by its residents. However, mass transit and non-motorized transportation opportunities are limited, and these services should be expanded in the Township.

Residents also benefit from a high-quality public water supply and a state-of-the-art wastewater treatment plant that aids in protecting the surface water and groundwater supplies in the Township. Since the presence of utilities can significantly impact land uses in the Township, the updated Plan should provide guidance relative to the extension and maintenance of the infrastructure and the revenue sources required to best meet the needs of the community.