Acknowledgements

Master Plan

Grosse Ile Township

Wayne County, Michigan
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September, 2002

This Master Plan represents over a year of dedicated work by the elected and appointed officials of Grosse Ile Township, Township staff, and Township consultants. In addition, a number of citizens provided input at various public workshops.

Township Board

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PLANNING COMMISSION
GROSSE ILE TOWNSHIP
RESOLUTION OF ADOPTION
GROSSE ILE TOWNSHIP MASTER PLAN

WHEREAS, Michigan Public Act 168 of 1959, as amended, the Township Planning Act, provides for the preparation of plans by township planning commissions to promote public health, safety and general welfare; to encourage the use of resources in accordance with their character and adaptability; to avoid the overcrowding of land by buildings or people; to lessen congestion on public roads and streets; to facilitate provision for a system of transportation, sewage disposal, safe and adequate water supply, recreation and other public improvements; and to consider the character of the township and its suitability for particular uses judged in terms of such factors as the trend in land and population development; and,

WHEREAS, development of a future plan for land use within Grosse Ile Township is pivotal in accommodating development in an organized manner while retaining its unique characteristics and protecting fragile natural resources; and

WHEREAS, the new Master Plan is needed to address the documented public health, safety and welfare concerns with un-managed growth in the community; and

WHEREAS, the planning process involved analysis of existing conditions of population, natural features, transportation, land use and an analysis of the basic needs of the current and future population; and

WHEREAS, early in the planning process a public workshop was held, and such workshop was well-attended by residents that expressed the strong need for the Township to manage growth, protect residential character, protect the natural environment, and address traffic concerns; and

WHEREAS, the Planning Commission has prepared the Grosse Ile Township Master Plan, dated September, 2002 that contains recommendations for future housing and population density which can be supported by the community infrastructure, public services and natural environment, locations for commercial and industrial development, strategies for reinvestment in the Macomb Street Business District, recommendations for management of natural resources and recommendations for the provision of public services, which includes maps, charts, tables and text to support and describe recommendations and implementation strategies; and

WHEREAS, the document incorporates by reference other planning documents, including the Recreation Master Plan, Downtown Development Plan, and the Grosse Ile Municipal Airport Land Use Plan, which are considered successive parts corresponding with geographic areas of the Township or function subdivisions of the subject matter of the overall Township Comprehensive Plan; and

WHEREAS, a public hearing was held on the Master Plan on July 15, 2002 to formally receive community input.

NOW THEREFORE, BE IT RESOLVED, that the Grosse Ile Township Planning Commission adopts the Grosse Ile Township Master Plan, in accordance with Section 8 of Michigan Public Act 168 of 1959, as amended.

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Executive Summary

Grosse Ile Township, an island community nestled in the Detroit River in Wayne County, looks over the international border between the United States and Canada. This residential community faces the challenge of accommodating existing and future development while retaining its unique natural characteristics. This plan attempts to balance the various demands and interests to ensure future decision-making is consistent with the overall vision for the township.

Under the Township Planning Act, the analysis and recommendations in this plan provide the foundation for zoning, other township development ordinances, and capital improvements. With this in mind, the various recommendations in this plan will provide tools to help sustain both the quality built and natural environment, while it protects the features that create a sense of identity for Grosse Ile Township.

Goals, Objectives and Policies. Goals, objectives and policies in this plan form the foundation for the future. These policies respond to specific issues and ideas identified through the planning process from residents, landowners, the planning commission, the township board and the various other boards and commissions on the island. Ultimately, it is these aspirations for Grosse Ile Township that have become the principal basis for recommendations discussed in this master plan. The main overall goals are as follows:

- Preserve the established quality character of each distinct residential neighborhood to provide the highest quality of life for residents.
- Enhance the Macomb Street area as the center of the community by providing a mixture of uses and services within a traditional, walkable environment.
- Provide for the enhancement of the airport and redevelopment of the Airport/Commerce Park in a manner that is consistent with the surrounding residential areas.
- Protect the township's fragile natural features that contribute to the quality living environment of the community and the overall environmental health of the Detroit River.
- Provide for a transportation system that offers safe and efficient mobility for both motorized and "non-motorized" movement.
- Provide the highest quality public facilities and services for residents and business owners.

- Provide a wide variety of recreational opportunities that enhance the quality of life for township residents.

Demographic/Economic Conditions and Trends Analysis. Known as one of Wayne County's most upscale residential communities, the population of Grosse Ile Township has steadily increased since the early 1900's. There were a total of 10,894 persons and 4,122 households in 2000. Build-out of the community is expected to occur, sometime around 2020, with a population of 12,337 in 5,067 households. Over time the household size is expected to decrease from an average 2.64 persons per household in 2000 to 2.36 persons per household in 2020. Persons between the age of 45 and 54 are expected to remain the largest age group; however, there will be an increase in the percentage of the population over the age of 55 and a decrease in the percentage of the population 14 and under. These trends are indicative of the maturing of the "baby-boomer" population and are typical for an "empty nester" community.

Historical Setting. Grosse Ile is a distinctive island with a rich and colorful history. As such, the township has several significant historical areas, which add to the community charm. Established as a township in 1914, Grosse Ile first developed as a farming community and later a resort community where many prestigious families built vacation homes. These older estates are found along the waterfront on the island.

Existing Land Use. Single family residential and natural open space are the most predominant land uses and are dispersed throughout all areas of the township. The southern end of the township features the Grosse Ile Airport and Commerce Park. The majority of the commercial land uses are located along the Macomb Street, which serves as the mixed-use, central business district of the community.

Future Land Use. The existing land use patterns, transportation conditions, availability of public facilities, natural resource protection market trends, and community goals were all used in forming a future land use plan for the township. This plan supports maintaining the community with single family residential as the predominant land use. A mixture of commercial, single family and multiple family residential is planned for the area surrounding Macomb Street. Continued aviation, light industrial, administrative and other related used are planned for the Airport and Commerce Park.

Residential Neighborhoods. There is considerable variation in residential neighborhoods within Grosse Ile Township. Each of these areas has its own distinct character, which contributes to the value and desirability of the community.

- Mature residential areas have established neighborhood characteristics that need to be protected to maintain their integrity.

- Homes on larger lots with significant areas are maintained in a natural state need to be protected from over development.

- Infill development along the shores of the Detroit River and Trenton Channel needs to be consistent with the established historic character and maintain open views of the waterfront.

- At the southern end of the township there are a number of smaller islands developed with traditional residential neighborhoods. Infill development on

these islands needs to be compatible with the established traditional character of this area and not overbuild the smaller lots.

- Infill development along the Thorofare Canal needs to be compatible with the established character of this area and protect the canal from impacts.

Macomb Street Area. The plan provides a detailed guide to future development for the Macomb Street area. The plan provides recommendations for future land use and site design standards including parking, signs, landscaping, pedestrian circulation, and architecture.

Natural Features. Grosse Ile Township contains numerous natural features including the Detroit River, canals, streams, woodlands, wetlands and wildlife habitat. These features make an important contribution to the quality of life in the township and are critical components in the overall ecology of the Detroit River. The plan recommends a number of means to accommodate appropriate future development while protecting the valuable resources that are critical to the health of the environment and Grosse Ile Township.

Transportation Plan. A multi-modal transportation plan is provided to ensure safe and convenient travel by automobile, boat, plane, bicycle, and foot.

- Improve upon the existing transportation system through maintenance and a series of minor improvements or management techniques rather than new major road projects.

- The land use plan also takes into account the capacity of the two bridges leading to the island.

- The airport will be managed to ensure safe and efficient aviation with minimal impacts on surrounding residential areas.

- A system of pathways is proposed along major roads to provide for pedestrian and bicycle transportation.

Community Facilities, Recreation and Utilities Plan. To ensure the continuance of high quality community facilities and services, the township needs to adequately plan for future development patterns and ensure adequate public services for the entire community. This plan inventories current facilities and services, and makes recommendations for minor improvements to these amenities to add to the overall quality of life in the township.

Introduction

Description and Purpose of Master Plan

Generally, the master plan is a guide for the future that recommends how the township should develop in order to meet community goals. A sound master plan helps ensure a logical development pattern that will result in a highly desirable community in which to live or work. A plan allows residents, business owners and developers to make investments with a reasonable expectation of what will happen in the future. In essence, the plan represents a balance between the sometimes competing interests of the environment, individual landowners and the community overall.

The plan directs the intensity and arrangement of various types of land uses and promotes design that complements the character of the township. The plan will strive to provide a complementary mix of land uses intermingled with impressive natural features to create a sustainable, livable community.

The master plan goals and future land use plan will assist township leaders in decisions, which consider the long-term implications for the community. These community-wide implications may not be immediately apparent to the individual property owner or citizen, but the impacts of each decision are linked and become visible over time. Poor planning decisions are difficult to eliminate; most linger for a long time. The master plan can be viewed as a community blueprint for the future, a mechanism to help ensure each decision fits as part of the whole.

Among the many reasons for the master plan are the following:

- Present a future land use map that illustrates how the township should develop over time.
- Provide a legal basis for zoning and other regulations for the type, intensity and timing of development.
- Ensure that as development occurs, the most significant natural features are preserved.
- Outline specific strategies to address situations where one land use is not compatible with an adjacent land use.
- Recommend improvements to intersections and roadway sections needing attention due to rapidly increasing traffic volumes.
- Address the changing desires and needs of residents.
- Desire to provide a sustainable community and a land use pattern which translates into a diversified tax base to support the desired facilities and services.
- Provide specific recommendations for redevelopment along Macomb Street.
- Coordinate land use recommendations with anticipated land use changes and infrastructure improvements with the county.

Legal Basis for Plan

The Grosse Ile Township Plan is prepared under the authority of the Township Planning Act (P.A. 168 of 1959, as amended) which authorizes the planning commission to prepare a master plan. The purpose of this plan is set forth in section 2 of the act as follows:

> *The purpose of plans prepared pursuant to this act shall be to promote public health, safety and general welfare; to encourage the use of resources in accordance with their character and adaptability; to avoid the overcrowding of land by buildings or people; to lessen congestion on public roads and streets; to facilitate provision for a system of transportation, sewage disposal, safe and adequate water supply, recreation and other public improvements; and to consider the character of each township and its suitability for particular uses judged in terms of such factors as the trend in land and population development.*

The planning commission has the role to prepare the plan, and is holding public meetings and hearings to assure full opportunity for citizen participation in the preparation of the plan. Once fully drafted, this plan will be revised based upon comments received at public meetings, and adopted by resolution of the planning commission.

Comparison of Master Plan to Zoning

The master plan provides general direction on the future development pattern. Some of the master plan recommendations will be implemented through amendments to the zoning ordinance text and map. However, the master plan itself does not change the zoning ordinance or zoning of any property. Some of the differences between the master plan and the zoning ordinance are listed below:

MASTER PLAN	ZONING ORDINANCE
Provides general policies, a guide	Specific regulations, the law
Describes what should happen in the future over the next 5-20 years, not necessarily the recommended land use for today	Describes what is and what is not allowed today, based on existing conditions
Adopted under the Township Planning Act, Public Act 168 of 1959, as amended	Adopted under the Township Rural Zoning Act, Public Act 184 of 1943, as amended
Includes recommendations that involve other agencies and groups	Deals only with development related issues under Township control
Flexible to respond to changing conditions	Fairly rigid, requires formal amendment to change
Adopted by the Planning Commission	Adopted by the Township Board

Previous Planning Efforts

1969 Comprehensive Plan: Grosse Ile Township has a strong history of community planning. The first plan was adopted in 1969. This plan placed considerable emphasis on preserving natural open space and the waterfront character of the community. This plan set the framework for focusing on Macomb Street as the core of the community with higher density residential in that area and lower density residential maintained elsewhere.

1989 Master Plan: The township adopted the next comprehensive update to the plan in 1989. This document evaluated conditions that existed in the community during that time, including demographics, economic conditions, natural features, land use patterns, transportation, public facilities and infrastructure. Based upon an analysis of these elements, recommendations were made relative to future land use, roadway, utility and recreational facility improvements.

Grosse Ile DDA: In 1993, the Grosse Ile Township DDA completed an urban design plan and a tax increment financing plan for streetscape improvements along Macomb Street. These improvements included complete reconstruction of Macomb Street, drainage improvements, sidewalks, landscaping, ornamental street lighting and pocket parks. Construction of the roadway, drainage, sidewalk and street light improvements was completed in 1998.

Macomb Street Design Standards: In 1996, the township planning commission adopted a subarea master plan for the Macomb Street Area. This plan included detailed design standards for development in this area. The primary purpose of the plan was to develop a sense of compatibility with neighboring businesses and residential uses, creating a strong identity for the community. In addition, it was intended to establish continuity to the site features of each redevelopment/development project.

Open Space Greenways and Bikepath Plan: The township has developed a Greenways and Bike Path Plan that focuses on creating a network through the community to provide non-motorized circulation and enhance the ecological function of the natural environment. Grosse Ile Township has implemented a program for acquiring lands for the purpose of maintaining open space. Using funds generated through a millage, the Township has purchased over 400 acres of land for preservation as natural open space.

Grosse Ile Municipal Airport Land Use Plan: The plan for the township airport includes a brownfield redevelopment plan and a marketing plan that takes a proactive approach towards recommending future land uses, phasing options, key redevelopment opportunities and design objectives for the Grosse Ile Airport Commerce Park. The plan outlines an implementation strategy based on the existing opportunities and available economic development incentives for brownfield redevelopment.

Grosse Ile Township Recreation Master Plan 2001-2005: This plan serves to update the previous Recreation Plan produced by the township in 1995. The plan includes updated recreational goals and objectives, recreation inventory, and a 5-year capital improvements program, which includes recreational improvements to the Centennial Farm, Airport recreation area, and other small parks and construction of bike paths.

Build-Out Plan: An analysis of the residential build-out for the island was adopted in 1999. This build-out plan includes an analysis of the limitations of the public infrastructure to support additional development, including utilities and roadways.

Master Plan Process

The master plan represents an eleven-month effort by the planning commission, township officials, residents, community organizations and representatives of the business community. Development of the plan involved collection and analysis of data on land use, environmental, transportation, infrastructure and socioeconomic conditions. The recommendations of the plan are based upon this information and input from the public. The process is more specifically described as follows:

Existing Conditions Report: The first step in the planning process was to obtain a description of the area's physical and social features. The current conditions of the township provide an understanding of what the township's strengths and weaknesses are and serve as a base for future recommendations.

Public Participation: Public participation was conducted by inviting the general public to an evening workshop designed to identify issues, rank the importance of the planning-related issues, and suggest actions to address each of the issues. A summary of the key points raised at the workshop are discussed later in this chapter.

Analysis and Recommendations: Based on the data collected from the existing conditions report, public participation results and the experience of staff and consultants, information was then analyzed and recommendations were made for the future of the township. This information was presented to the township for review and comment.

Plan Completion and Adoption: Once consensus was reached amongst township officials, a public hearing was held to present the recommendations of the plan and to solicit public input prior to adoption. Based on public comments, the plan was revised and the document was adopted by the planning commission.

Public Participation

An essential component of any master plan is the success of the public participation process. Efforts were made by the township to involve the citizens of the community and other interested parties included a public workshop, numerous meetings with the township planning commission and township officials and a public hearing.

The public workshop was conducted on January 23, 2002 with township planning commissioners, elected officials and citizens of the township. Approximately 50 participants were in attendance. The public workshop had two goals, the first of which was to use public participation as an opportunity to orient participants to the master plan process. This was accomplished by explaining the planning process, the purpose of a master plan and the schedule for the plan preparation. The second goal was to ensure that participants had the opportunity to discuss issues that should be addressed in the plan and a vision for how the community should look in the future.

Participants were led through a series of exercises which helped to develop a vision for the future of Grosse Ile Township. First, participants were divided into small groups and asked to describe Grosse Ile as it is today and describe what they like about the community. Participants were then asked to describe what they would like Grosse Ile to be like in 20 years. Time was then spent generating strategies which would help accomplish this vision or resolve issues.

The prevalent themes that came out of the workshop were slowing down the pace of development and preserving the natural residential character of the township. The overall results of this visioning session are summarized below.

Natural Features and Character: The single quality that was identified most frequently in the workshop as to what makes Grosse Ile a great place to live was the prevalence of natural features which contribute to Grosse Ile Township's unique character. Nearly every workshop participant indicated that the water resources, natural setting and vast amount of open space were important factors in determining whether to live in Grosse Ile Township. Preservation and maintenance of these resources was one of the key issues discussed by the participants.

Future Development: Township residents recognize that there will be a demand for new development, most of which is likely to be residential in nature. Residents also realized that the township must plan for land uses other than residential, such as small-scale commercial and office and light industrial/research. In general, participants did not oppose new development in the township, as long as the growth is planned, environmentally sensitive, and does not adversely affect the township's natural character. Limits on the extent of new development in the township should be established and development should not be allowed to locate haphazardly. The most suitable locations for new development must be carefully considered to avoid or minimize any potential negative affects upon natural features.

Residential Neighborhoods: The residential neighborhoods within the township serve as the primary land use and are the source of pride for the residents. One of the top priorities discussed included maintaining the quality of life the residents have come to expect within the township. The existing neighborhoods consist of well-maintained homes situated on wooded lots. Efforts should be made to ensure that future development complements these existing neighborhoods and preserves both natural and historic resources.

Non-Residential Uses: The Macomb Street area was seen as the “town center” of Grosse Ile and participants expressed the desire to create a walkable environment that incorporates higher intensity mixed-uses and outdoor public areas such as a town square or gazebo, with successful neighborhood goods and services and multiple family residential. Macomb Street should incorporate a Main Street character with traditional design that fits Grosse Ile.

Light industrial and research uses where also desired near the airport in the southern region of the township. Participants felt that the township should actively market the research park and locate appropriate businesses that will supplement the tax base and provide jobs for residents.

Transportation: The input at the public workshop revealed a general satisfaction with the current roadway system in Grosse Ile Township. The participants appreciated that the township was isolated from high traffic volumes and congestion. The two bridges, both the county and toll, could benefit from improved streetscape and maintenance, and there was discussion of exploring the option of a third bridge.

Most of the discussions regarding transportation dealt with non-motorized travel. The participants expressed a strong desire to see continued expansion of the pathways. Bike paths were desired along key roadways, such as along East and West River Roads, as well as off-road through open space.

Community Facilities and Services: As a rural township, limited facilities and services can be offered. Residents were generally satisfied with existing community facilities and services and the quality school district was identified as one of the key assets to the community.

The need to provide additional recreational facilities was discussed. Participants expressed a desire to develop neighborhood parks, community pool, skating rink and a recreation center. In addition, public access to the water was identified as a priority for some of the participants.

Goals, Objectives and Policies

A community vision was formulated by the township and summarizes the aspirations of its residents for Grosse Ile Township's future. This section breaks this vision down into categories and provides more detailed descriptions for its implementation. For each category, a goal statement is provided, followed by specific objectives. For each objective there is a list of action policies that will assist in accomplishing the objectives, and ultimately the goal. The following set of goals, objectives and policies give the comprehensive plan the philosophical guidance it needs to address the present issues and advance the plan and community into the future.

Residential

Preserve the established quality character of each distinct residential neighborhood to provide the highest quality of life for residents.

Maintain an adequate amount of open space in all residential neighborhoods.

- Require a minimum lot size for the creation of all new lots that will not overcrowd the land or adversely impact natural features.
- Require the combination of nonconforming lots that do not meet current size requirements.
- Maintain adequate setbacks to ensure open spaces between homes and from the street.
- Ensure that new residential construction does not create an excessive amount of impermeable surface over the area of the lot.
- Require neighborhood parks as a part of all new residential development and ensure neighborhood associations are formed to maintain the parks.

Ensure the infill development is consistent with the established character of the neighborhood and compatible with surrounding homes.

- Adopt standards to ensure that new residences are consistent with the size, scale, setback and architectural character of other residences within established neighborhoods.
- Site buildings on lots to maintain consistent setbacks and proper relationship of yard spaces between residences.

Ensure all new development is properly integrated with surrounding neighborhoods.

- Require new subdivisions to be compatible with the established character of the township.
- Require all new residential streets to connect to the existing public road network so as to be integrated into the township as a part of the community.

- Ensure that new developments provide buffers to protect the privacy of existing surrounding residences.

Maintain and enhance the natural wooded character of township residential areas.

- Protect and enhance street trees and wooded buffers along roads.
- Require street trees and greenbelts with all new developments.
- Implement a tree planting program to encourage residents to plant trees in front yards and along neighborhood streets.

Protect views of open space and the waterfront.

- Enforce standards for maintaining open waterfront yards.
- Require consistent setbacks of residences along the waterfront.
- Require landscaping along the waterfront that does not obstruct open views of the waterfront.
- Limit the size, type and number of structures allowed along the waterfront that may block views.
- Prohibit construction of buildings between East River north of Manchester and West River Roads and the waterfront.

Macomb Street

Enhance the Macomb Street area as the center of the community by providing a mixture of uses and services within a traditional, walkable environment.

Maintain a healthy mixture of uses along Macomb Street that contribute to a strong and vibrant business district and meet the retail and housing needs of residents.

- Permit a range of commercial uses in the Macomb Street District needed to meet the retail shopping and service needs of township residents, but limit uses with an industrial character to the Commerce Park.
- Encourage a mixture of commercial, office and residential uses along Macomb Street to create more activity during a longer period of time.
- Locate groupings of commercial and service uses that complement each other and create a synergy of activity.
- Require landscape buffering between uses to allow a mixture of uses while still maintaining privacy between uses.

Maintain and enhance the comfortable, human scale environment of Macomb Street by creating a compact mixture of uses within a walkable environment typical of a traditional community center.

- Maintain building setbacks close to Macomb Street with pedestrian connections between the sidewalk and building entrances.
- Place parking to the side and rear of buildings and screen view of parking lots.
- Complete sidewalk connections between Macomb Street and surrounding areas.
- Allow for multiple family residential development along Macomb Street to place more residents within a mixed-use walkable environment.
- Create a town square and other public open space areas for public gathering and events.
- Create pocket parks for enjoyment of shoppers, residents and workers within the Macomb Street area.

Maintain a high quality character and image along Macomb Street through quality architecture, site design, landscaping and streetscape enhancements.

- Require design of new buildings and renovations of existing buildings to be consistent with the desired character of Macomb Street and the historic character of Grosse Ile.
- Encourage street tree plantings along Macomb Street and require landscaping within front yards.
- Maintain streetscape elements along Macomb Street.

Maintain and enhance the mixed-use character of Macomb Street by allowing residential infill development that is consistent with the desired traditional small-town character.

- Ensure residential development utilizes building and site design that is in keeping with a traditional small town.
- Require parking to be located on the side and rear of buildings to maintain the pedestrian oriented streetscape.
- Encourage site design that orients the buildings towards the street and provides small, well-landscaped front yards.

Airport/Commerce Park

Provide for the enhancement of the airport and redevelopment of the Airport/Commerce Park in a manner that is consistent with the surrounding residential areas.

Upgrade airport facilities to provide the highest quality service to airport users.

- Enhance aviation use of the airport property by strengthening existing users and improving airport services while still maintaining compatibility with surrounding residential areas.

- Reinvest in high priority improvements for the airport that improve the safety, efficiency and quality of the airport for aviation.

Upgrade Airport/Commerce Park facilities to encourage economic development and expansion of business opportunities.

- Create a consistent design theme around the airport that will make the area more attractive to future businesses.

- Support economic development of the Airport/Commerce Park by facilitating the attraction and retention of high quality tenants and the development of high quality sites.

- Promote the assets of the township which attract business owners and employees including high quality housing, recreational opportunities, schools and businesses.

Maintain compatibility of Airport/Commerce Park with surrounding residential areas.

- Ensure that all new development within the Commerce Park is constructed with high quality design and materials and is at a size and scale that is appropriate with the surrounding land uses.

- Incorporate strict development guidelines into the zoning ordinance that address standards for landscaping, screening/buffering, architecture, signage and overall site design.

- Identify low impact uses for those areas that contain significant natural features such as the woodlands at the northern edge of Commerce Park.

- Consider only clean, light industrial and research uses in the areas designated for light manufacturing/research to avoid future contamination of the property.

- Monitor Commerce Park developments to ensure uses continually uphold a high standard of facility operation that does not adversely impact surrounding uses.

Natural Features

Protect the township's fragile natural features that contribute to the quality living environment of the community and the overall environmental health of the Detroit River.

Protect woodlands including major woodland areas, landmark trees and woodlands along roadways.

- Ensure that new development limits the amount of tree clearing to the minimum area practical.

- Require limits of clearing be illustrated on site plans and installation of tree protection fencing prior to construction.

- Regulate the removal of trees within regulated woodlands.

- Work with Wayne County and utility companies to ensure that roadway construction and drainage improvements minimize the amount of tree clearing.

- Require landscaping with all new developments to restore woodland areas.

- Require new developments to complete a floristic quality assessment to evaluate the quality of the site's existing natural habitat and prescribe ways to minimize impact.

Protect the quality of wetland ecosystems and drainageways, which contribute to the environmental health of the township and the Detroit River.

- Prohibit/strictly limit the use or filling of wetlands and drainageways to minimize disturbance on the natural functions of the ecosystem.

- Protect wetlands during construction to prevent damage from erosion or siltation.

- Require new development to control and maintain proper drainage to wetlands to ensure maintenance of natural wetland hydrology.

- Maintain natural buffers around wetlands and along drainageways to minimize the impact of development on these natural features.

- Maintain the ecological functions of natural waterways and drainage networks in order to help minimize stormwater runoff from developed areas and provide natural filtration of runoff by vegetation and soil to improve surface water quality.

- Prevent the destruction of wetlands and their natural habitat in order to minimize the loss of wildlife, fish or other beneficial aquatic organisms that support the abundant fishery and waterfowl of the Detroit River.

Protect open views of the shoreline and the waterways throughout the township.

- Regulate the type, size and number of structures that may be constructed along the waterfront.

- Minimize disturbance to areas of natural waterfront.

Protect open space for enjoyment by residents, protection of the natural environment and maintenance of the quality community character.

- Continue program of acquiring open space for conservation.

- Provide linkages between residential areas and major recreation or civic destinations.

- Provide natural corridors of open space connecting many of the significant natural/open space, conservation and significant historical areas of the township.

- Enhance natural habitat and migration routes to increase the island's ability to support indigenous wildlife.

- Increase awareness and access to the system of greenways, bike paths and the Township's natural amenities.

- Develop criteria to select key parcels of land to create open space linkages and preserve key natural features.

- Develop a plan for managing the natural areas and providing for low impact passive recreational use.

Transportation

Provide for a transportation system that offers safe and efficient mobility for both motorized and "non-motorized" movement.

Provide for safe and efficient vehicle travel through the township.

- Ensure that both public and private roadways are well maintained and repaired/repaved when poor pavement conditions exist.

- Work with Wayne County to improve intersections that are operating at a poor level of service or where safety problems exist.

- Pave existing gravel roadways.

- Ensure all new roads are constructed to meet Wayne County Standards.

- Ensure paving or reconstruction of existing roadways fit into the context of the surrounding area and adjoining roadways.

- Ensure that all new roads are connected to the public road system and that the use of dead-end streets is minimized.

Manage increases in traffic levels consistent with the capacity of the road network and the two bridges leading to the island.

- Limit intensity of development based upon capacity of the road network and bridges to the island.

- Control access points to ensure that driveways and intersections along major roads minimize the disruption to safe and efficient traffic flow.

Ensure that public right-of-ways are safe for all modes of transportation including automobiles, bicycles and pedestrians.

- Design roads to incorporate bike paths, sidewalks or bike lanes.

- Implement neighborhood traffic calming techniques that are designed to minimize traffic impact on neighborhoods while ensuring that safe emergency vehicle access is maintained to all areas.

- Ensure crosswalks are incorporated into the design of major road crossings for bike paths and sidewalks.

Provide a network of non-motorized pathways for bicyclist and pedestrians to provide an alternative to automobile travel, improve safety and encourage recreational activity.

- Create a pathway network to provide the opportunity for pedestrian activity such as walking, jogging, and bicycling in a safe and comfortable environment.

- Develop bike lanes along certain roads where there is not sufficient right-of-way for separate paths.

- Designate bike routes throughout the township.

- Provide pathways that serve as linkages between residential areas and major recreation or community destinations.

- Provide non-motorized pathways as part of any bridge reconstruction.

Maintain access to waterways for boaters and ensure that canals and other waterways are passable for boat traffic.

- Regulate the placement of waterfront structures and the docking of boats that may obstruct navigable waterways.

- Maintain canals and waterways so that they are navigable for boats.

- Allow for access to the water for residents through parks and boat access, when compatible with surrounding land uses.

Maintain a safe and efficient airport for aviation traffic.

- Maintain safe and efficient airport facilities and runways.

- Develop and improve aviation storage and maintenance hangars to provide high quality service to airport users.

- Provide improvements to airport administrative facilities needed to continue support of safe and efficient operations.

- Ensure that changes to airport operations consider the noise impact on surrounding residential areas.

Public Facilities and Services

Provide the highest quality public facilities and services for residents and business owners.

Maintain a high quality township hall and provide quality administrative services.

- Maintain and enhance the township hall as an administrative building and a focus of activity for the airport.

Maintain a safe environment for residents, business owners and the general public.

- Continue to provide for police and fire protection.
- Maintain high quality police and fire fighting equipment.
- Ensure all existing and new residential areas are accessible to emergency equipment.

Provide quality of public services and utilities to the community in a manner that protects the natural environment.

- Continue improvements to the water and sewer system; to provide service to residents with minimal impact to the environment.
- Require all new development to connect to the public water and sewer system.
- Work with utility companies to provide service to residences with minimal disruption to neighborhood character.
- Place all new utilities underground and in rear yards and encourage the burying of existing utility lines where practical.
- Ensure that utility substations are located and designed to be compatible with surrounding land uses and minimize visual impacts on neighborhood aesthetics.

Recreation

Provide a wide variety of recreational opportunities that enhance the quality of life for township residents.

Provide a wide variety of recreational activities to residents.

- Expand township recreational programming to meet the needs of all age groups.
- Continue development of community-oriented equestrian activities and the development of a local 4-H Club or similar entity at the Centennial Farm.
- Utilize recreation as a catalyst to bring people together and foster a sense of community.

Provide public parks and recreational facilities to meet the recreational needs of residents.

- Seek opportunities to foster professional and private partnerships to better serve the recreational needs of the community.
- Work with neighboring communities to expand recreational opportunities for residents.
- Investigate possible locations for developing neighborhood parks and playgrounds.
- Continue to actively pursue alternative funding sources for the provision of high quality recreation facilities.

Demographic/Economic Conditions and Trends Analysis

Regional Setting

Grosse Ile Township is a 10.44 square mile island community that is located 12 mile south of the City of Detroit within Wayne County. The township consists of many islands positioned at the terminus of the Detroit River and the mouth of Lake Erie. The Detroit River surrounds the township forming the Trenton Channel west of the community and an international border with Canada on the east.

The islands that comprise Grosse Ile Township consist of Grosse Ile, Hennepin, Calf, Celeron, Swan, Round, Upper Hickory, Lower Hickory, Sugar, Elba, Fox, Mama Juda, Stony and Dynamite. Grosse Ile is the main island, which is actually two islands split by the Thorofare Canal that runs in a diagonal east/west direction. Other inhabited islands include Elba, Swan, and Upper and Lower Hickory.

The following is a demographic report of the Township of Grosse Ile which serves to depict some of the various characteristics of the community to gain a better understanding of Grosse Ile's unique qualities. Included is an analysis of the age, race and income characteristics of township residents; a description of the labor force; and an examination of key housing characteristics.

Map 1 Regional Setting

Existing Population and Households

Table 1 illustrates changes in population for Wayne County and the Township of Grosse Ile between 1980 and 2000. The township's population has climbed steadily over the past 40 years. In the past ten years, the township's population has grown by 11.4%. The county overall experienced a population decrease of -2.4% between 1990 and 2000, much of which is due to the trend of people moving away from the Detroit Metropolitan area in order to live in one of the many suburban communities that have developed in abutting counties.

The U.S. Census Bureau reported that there were 10,894 persons in Grosse Ile in 2000

Population change is only one of many factors that affects whether development will occur in a community and how much will occur. The average household size has generally declined in the past 20 years. This results in an increased number of households, relative to the size of the population, and a need for more housing. In the future, the number of households is expected to increase at a faster rate than the population.

Table 1
Historic Population and Household Trends

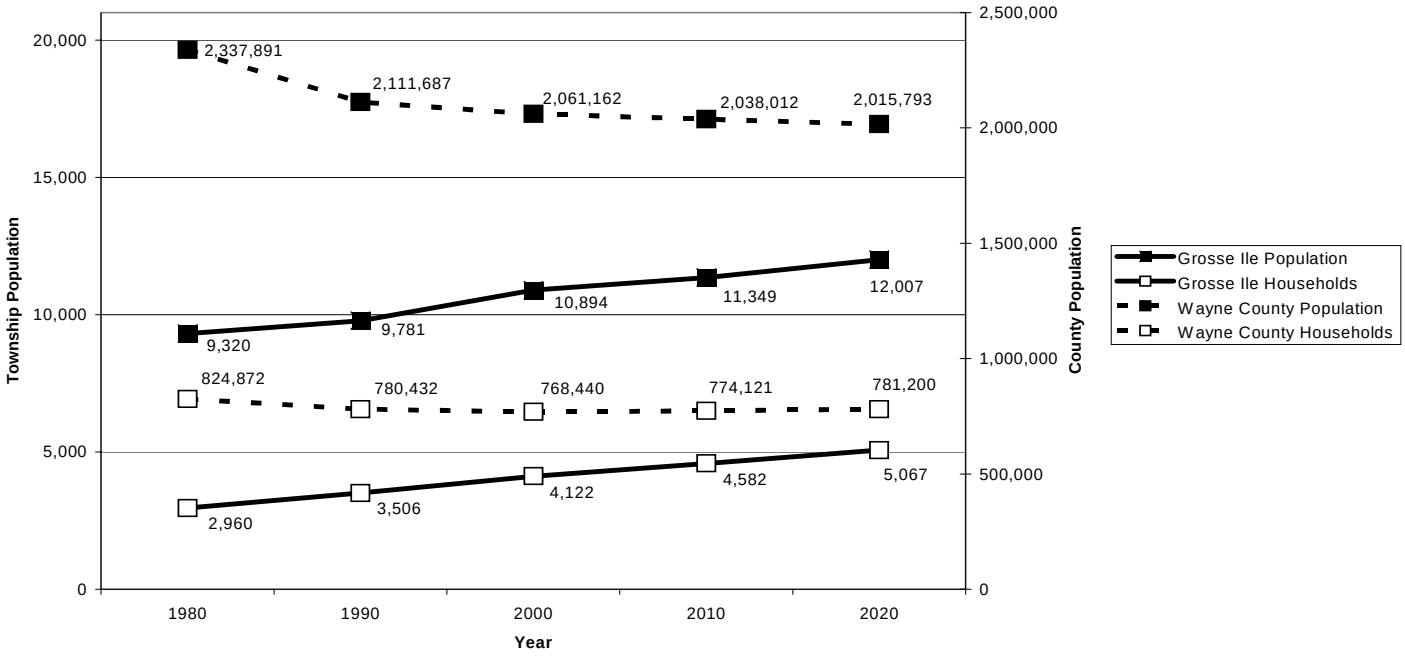
	1980	1990	2000	1960 - 2000 Change		1990 – 2000 Change	
Grosse Ile Twp.				#	%	#	%
Population	9,320	9,781	10,894	4,576	72.4%	1,113	11.4
Households	2,960	3,506	4,122	2,408	140.5%	616	17.5%
HH Size	3.15	2.79	2.64	N/A	N/A	-.15	-5.4%
Wayne County							
Population	2,337,891	2,111,687	2,061,162	-605,135	-22.7%	-50,525	-2.4%
Households	824,872	780,432	768,440	N/A	N/A	-11,992	-1.5%
HH Size		2.67	2.64	N/A	N/A	-.03	-1.1%

Source: U.S. Census Bureau 1980-2000

Projected Population and Households

Three factors which modify the population of a community are births, deaths, and migration (people moving in or out). Birth and death rate are factors beyond the township's control. However, in and out-migration are very much influenced by the local economy, transportation accessibility, development policies, local lending policies and quality of life.

Historic & Projected Population Trends



Source: U.S Census Bureau 1980-2000, SEMCOG

Inability to precisely predict population growth with pinpoint accuracy does not diminish the importance of projections as a guide to local decision-making. For purposes of this analysis, build-out projections are used to assess the affect of growth on current and desired conditions in the township. In this manner, population projections help set a desired level of growth the community can accommodate within its infrastructure and service capacity without disruption to the physical and social environment.

SEMCOG Projections: The Southeast Michigan Council of Governments (SEMCOG) is projecting a continued increase in Grosse Ile's population, as the township continues to be an attractive option for many seeking to live in this area and commute to employment centers such as metro Detroit. This is reflected in population figures for surrounding townships that indicate there is still a strong demand for suburban living and, as land continues to be available for residential development, the population in these areas will also continue to grow.

Table 2
Projected Population and Household Trends

	2000	2005	2010	2015	2020	Ave. Annual Change		2000 – 2020 Change	
Grosse Ile Twp.						#	%	#	%
Population	10,894	11,048	11,349	11,664	12,007	278.3	2.5%	1,113	10.2%
Households	4,122	4,362	4,582	4,821	5,067	236.3	5.3%	945	22.9%
HH Size	2.64	2.53	2.47	2.41	2.36	-0.07	-2.8%	-0.28	-10.6%
Wayne County									
Population	2,061,162	2,046,588	2,038,012	2,027,915	2,015,793	11,342.3	-0.6%	-45,369	-2.2%
Households	768,440	771,460	774,121	778,368	781,200	3,190	0.4%	12,760	1.7%
HH Size	2.64	2.61	2.59	2.56	2.53	-0.03	-1.1%	-0.11	-4.2%

Source: SEMCOG

Build-out Analysis: In addition to the SEMCOG projections, a buildout analysis was conducted for the township. The build-out analysis projects the number of dwelling units expected when the township is completely developed under planned land uses. Projections are made based upon planned land uses to accurately assess the impact and demand on public services at the time of build-out.

Existing residential is dispersed nearly uniformly, with undeveloped areas generally being wetlands, public lands, recreational land uses and non-residential zoning districts. Table 3 indicates the number of dwelling units and population based upon the 2000 census.

Table 3
2000 Population and Housing

Single Family Units*	3,742
Multiple Family Units*	593
Total Dwelling Units*	4,335
Population	10,894
Persons per Dwelling Unit	2.51

Source: U.S. Census Bureau 2000

* DUs include vacant dwelling units

Future growth of the township was projected based upon the amount of land available for future development multiplied by the density permitted for those areas. Land available for future development includes larger parcels that can be subdivided to meet township standards and existing undeveloped lots of record. Privately owned golf courses were counted as possible single family development sites, though it may be unlikely there would be full development of the golf courses as single family residential. Unbuildable areas such as wetlands were deducted from the build-out potential. Areas zoned "Airport/Light Industrial" or "Special Environmental" are not included. Publicly owned lands, including open space, are also deducted from the developable areas.

According to the Build-out study, Grosse Ile's population will be 12,377 when fully developed

Larger undeveloped parcels were analyzed to determine the extent they could be further subdivided. Such analysis was based upon current zoning and subdivision standards. The Township Wetlands Map was also considered in the analysis. While a portion of the new lots could include some wetland area, each would need to have a buildable upland area. Some wetland crossings for roads or driveways were assumed to access isolated buildable upland.

Existing undeveloped lots of record were inventoried. Totally undevelopable lots, such as those that were wetlands, were deducted. The possible number of dwelling units was derived based upon current zoning regulations. It was assumed that contiguous nonconforming lots under single ownership would be combined, except where variances have been approved.

Multiple family development was projected based upon the density allowed by the multiple family zoning districts for areas currently zoned or master planned multiple family. It was assumed that the Macomb Street District would be developed as mixed-use commercial and multiple family with the maximum number of apartments that are allowed on the same lot as commercial.

The number of additional housing units indicated in Table 4 were added to the existing number of housing units from Table 3 to derive the build-out's number of dwelling units. These are indicated in Table 4 by single family, multiple family and total housing units.

Table 4
Build-out Development

Existing Single Family Residences*	3,742
Vacant Lots of Record [a]	123
Additional Subdivision of Lots [a]	192
Build-out Single Family Units [b]	4,057
Existing Multiple Family Residences*	593
Additional Multiple Family Development [a]	275
Build-out Multiple Family Units [c]	868
Build-out Total Dwelling Units *	**4,925**

Source: a. Build-out Map
b. Sum of vacant lots of record, additional subdivision of lots and existing single family units in 2000.
c. Sum of additional multiple family development and existing multiple family units in 2000.

Based upon the additional housing units derived in Table 4, the total build-out population for the Township is projected on Table 5. The build-out population is derived by multiplying the total number of dwelling units by the persons per dwelling unit. The persons per dwelling unit used in Table 5 is the projected persons per household.

Privately owned golf courses were counted as possible single family development sites. If the golf courses remain as outdoor recreation and are not developed with residential, then the number of residential units will reach 4,798 at build-out, with a population of 12,058 persons.

Table 5
Build-out Development

	2000	2000-Build-out change	Build-out	2000-Build-out % change
Single Family Dwelling Units	3,742	315	4,057	8%
Multiple Family Dwelling Units	593	275	868	46%
Total Dwelling Units	4,335	590	4,925	14%
Persons per dwelling unit	2.51		2.51	
Population	10,894	1,483	12,377	14%

Source: U.S. Census Bureau 2000, SEMCOG

Time Frame For Buildout To Occur: This analysis provides a quantifiable number for the maximum number of housing units and an interpolation of the resulting population that will occur at build-out. The time frame for when this build-out will occur is less certain. To provide an approximation of the period that build-out is expected to occur, a variety of projection and trend extrapolation models can be utilized.

A few projection techniques were reviewed to determine which most accurately depicted expected build-out of the township. In addition to the SEMCOG projections, statistical extrapolations of historic population trends household building permit activity were analyzed. The following models were used:

- Linear regression: This model is used when the population of the township has exhibited a trend of uniform growth, and is anticipated to do so in the future. The results of this model indicate a trend that is slightly lower than SEMCOG projections and the recent trend in housing construction. This would be an indication that Grosse Ile Township is entering a stage of growth that will exceed historic growth rates.

- Modified exponential: This model represents a pattern of a declining rate of growth approaching an upper capacity limit. The build-out represents the capacity of undeveloped, buildable land under current zoning regulations. As the township approaches this limit, the rate of growth will begin to slow as developable land becomes more scarce, expensive and difficult to develop.

- Building permits: This method involved taking recent trends in housing construction and projecting this construction activity into the future to determine number of households. Then based upon average household size, future population can be approximated. While this method assumes that housing construction rates will remain constant, it provides a comparison of the township's recent development trends with the long range development of the community. Projections based upon housing construction rates yields a slightly higher result then the SEMCOG projections.

Based upon the results of these various population projections, build-out of the township would not occur until after 2010. With the exception of the build-out modified exponential model, projections assume continuation of historic and current trends with no upper limit. Because there is a finite capacity due to the amount of land available and allowed by current policies, the straight line population projection is not a trend that is expected to continue. Development that significantly increases population will be curtailed as the population gets closer to the build-out level. As the township becomes more developed and there are fewer parcels of available land to accommodate new development, the rate of population growth will begin to decline. The supply of vacant land will become scarce and the remaining parcels will often be those that are more difficult to develop.

It is important to note that there are other factors which can influence the growth rate including changes to the economy, such as a recession, demographics, such as number of persons per household, or land use policies, such as zoning, wetland regulations or public land acquisition. The current rate of new home construction is occurring under good economic conditions. A change in the region's economy could impede this growth rate.

Table 6
Population Projection Models

	1960	1970	1980	1990	2000	2010	2020
Historic Trend [a]	6,318	7,799	9,320	9,781	10,894		
SEMCOG [b]					10,894	11,349	12,007
Building Permits [c]					10,894	12,558	14,073
Linear Regression					10,894	12,007	13,121
Build-out Modified Exponential					10,894	11,575	11,881

Sources: a. U.S. Census Bureau 1960-2000
b. SEMCOG Regional Development Forecast
c. Based upon Building Department records

Age Characteristics

As expected in the previous Grosse Ile Community Development Plan, the median age has increased from 39.0 years in 1990 to 43.4 in 2000. A review of the age composition reveals that as a whole the township population is older than the populations of most nearby communities and of the county, which has a median age of 34.0.

Age characteristics of the township assist in indicating economic, transportation, recreational, education and other community needs. The information is useful when the

age groups are broken into three main categories: school age, labor force and seniors. As indicated in the following table, the largest population segment is comprised of those that are in the labor force between the ages of 20 and 59. Within this group, the majority falls between the ages of 35 and 54. This suggests there is a significant number of residents with needs such as improved recreation programming and increased community events matched to their age.

The percentage of residents in the 45 to 54, 55 to 59, 60 to 64 and 75 to 84 age groups increased between 1990 and 2000. The percentage of residents in the younger age groups either stayed the same or declined. It can be inferred that in the next few years the number of school age residents will likely decrease as the largest groups continue to age and have fewer children.

The changes in age distribution as a result of the anticipated projected population growth are summarized in the following Table 7. This table is projected for the year 2010. The method used for this projection on age distribution is commonly referred to as the Cohort Component Method. This model projects population by age group based upon birth rates, mortality rates, and migration rates. Birth and mortality rates are determined based upon an analysis of the 1990 to 2000 trends. Net migration can be estimated based upon the build-out projections for the township.

Persons between the ages of 45-54 were the largest age group in 2000

The largest percent increases in population are for people 65 and older. This can be attributed to the "baby-boomer" population. The largest decline between 2000 and 2010 will the age group between 35 and 44 with a corresponding decrease in children below the age of 15. This is also attributed to the younger portion of the "baby-boomer" population, as this generation was within this age group in 2000 and the generation that will be 35 to 44 in the year 2010 will make up a much smaller percent of the overall population.

The largest age groups will remain to be persons between 45 and 64. Persons between the ages of 25 and 34 will continue to be a relatively small group. This is an indication of type and cost of housing in Grosse Ile Township that appeals to older families and persons with greater financial resources.

The number of children below the age of 15 will only be 1,258 in 2010 based upon the cohort component model. Over time, the average number of children per household will decline as the community matures. This is a result of a number of factors, including a maturing population where there are more "empty nesters" and a change in the distribution of housing types within the community where the relative percent of multiple family households increases.

Table 7
Changes in Age Distribution Between 2000 and Build-out

Age	2000		Projected 2010		2000 to 2010 Change in Population
	Population	Percent of Total	Population	Percent of Total	
Under 5	527	5%	393	4%	(25%)
5-14	1,606	15%	865	8%	(46%)
15-24	1,131	10%	1412	12%	25%
25-34	719	6%	725	6%	1%
35-44	1,830	17%	1365	12%	(25%)
45-54	2,289	21%	2408	21%	5%
55-64	1,500	14%	2163	19%	44%
65-74	801	7%	1247	11%	56%
75-84	394	4%	539	5%	37%
85 and over	97	1%	231	2%	138%
Total	10,894	100%	11,349	100%	4%

Sources: U.S. Census Bureau 2000, Projections

Housing Characteristics

As of 2000, there were 4,335 housing units in the Township of Grosse Ile. This is a 39.3% increase from 1980 (3,111 units) and a 19.4% increase from 1990 (3,632 units). The increase in housing is apparent by the large number of new subdivisions in the township.

The township has a significantly higher percentage of owner-occupied homes (94%) than the Wayne County average (67%), and a lower percentage of renter occupied and vacant units. Additionally, the median household value is almost 2.5 times that of the county average.

Table 8
Housing Characteristics, 1990 & 2000

	Owner Occupied		Renter Occupied		Vacant		Median Value	
	1990	2000	1990	2000	1990	2000	1990	2000
Grosse Ile Twp.	88%	94%	7%	6%	3%	5%	$148,500	$248,800
Wayne County	59%	67%	33%	33%	6%	7%	$48,500	$99,400

Source: U.S. Census Bureau 1990 & 2000

Of the 4,335 homes reported by the census in 2000, 47.1% were built since 1970. Grosse Ile, like many Michigan townships situated near a large urban center, has experienced rapid residential growth in the last 30 years, the past 10 years has seen comparable

development to the 1970's and 1980's. This is largely due to the availability of land and the out-migration to the townships. As noted in the table above, the township has a very high median housing value. This can largely be attributed to the high percentage of modern, larger homes.

Table 9
Year Structure Built

Year	Number	Percentage
1990 – March 2000	706	16.3%
1980 – 1989	611	14.1%
1970 – 1979	726	16.7%
1960 – 1969	737	17.0%
1940 – 1959	996	23.0%
1939 or earlier	559	12.9%

Source: U.S. Census Bureau 2000

Ethnic Composition

Table 10
Ethnic Composition, 1990 & 2000

	Grosse Ile Twp.		Wayne County	
	1990	2000	1990	2000
White	95.8%	96.1%	57.4%	53.7%
Black or African American	0.0%	0.4%	40.2%	43.0%
American Indian	0.4%	0.8%	3.8%	1.0%
Asian or Pacific Islander	3.6%	3.1%	1.0%	2.2%
Other	0.2%	0.5%	1.0%	2.8%

Source: U.S. Census Bureau 1990 & 2000

The township has a small minority population with Blacks or African Americans and American Indians having similar minority segments. The largest minority group consists of Asian or Pacific Islander, which account for 3.6% of the population. Grosse Ile's ethnic composition changed very little between 1990 and 2000.

Educational Attainment

The educational attainment for Grosse Ile residents 25 years and older in 2000 was higher than county and state figures, with almost half of township residents obtaining a college degree and almost ninety-five percent (94.4%) having a high school diploma. This is a higher percentage than Wayne County or Michigan residents who have college degrees or high school diplomas.

Grosse Ile's educational attainment is significantly higher than county & state averages

Table 11
Educational Attainment of Residents
25 years or Older

	High School Diploma	College Degree
Grosse Ile Twp.	94.4%	45.1%
Wayne County	77.0%	17.2%
State of Michigan	83.4%	21.8%

Source: U.S. Census Bureau 2000

Employment Characteristics

There are two important factors to consider when evaluating the employment characteristics of the township. To begin with, it is important to review the employment by industry since this identifies the types of jobs available in the township. Second, it is useful to know the occupation breakdown of the population in order to establish the experience and employment specialization of township residents.

Table 12
Employment by Industrial Class

Industrial Class	1990	2000	90-00 % Change
Agriculture/Natural Resources	59 (1.1%)	21 (0.4%)	-64.4%
Construction	240 (4.7%)	299 (5.4%)	24.6%
Manufacturing	1,473 (28.6%)	1,398 (25.2%)	-5.1%
Telecommunication, Utilities	276 (5.4%)	359 (6.4%)	30.1%
Wholesale Trade	211 (4.1%)	175 (3.1%)	-17.1%
Retail Trade	618 (12.0%)	485 (8.7%)	-21.5%
Financial, Real Estate	349 (6.8%)	377 (6.8%)	8.0%
Services	1,863 (36.2%)	2,349 (65.6%)	26.1%
Public Administration	59 (1.1%)	95 (1.7%)	61.0%
Total Jobs	5,149	5,558	7.9%

Source: U.S. Census Bureau 1990 & 2000

Table 12 provides information relative to the types of employment that are available in the township. In 2000, there were a total of 5,558 jobs in the Township of Grosse Ile reported to the US Census Bureau, and increase of 7.9% since 1990. Service jobs have historically been the predominant employment base in Grosse Ile providing over half of all employment, with manufacturing being the second, making up just over 25%. Grosse Ile can expect to continue to show services as the leading job class, which typifies the nationwide trend over the last 20 years as the US evolves into a more service-oriented economy. Agriculture and natural resource, manufacturing, wholesale and retail trade jobs have all declined between 1990 and 2000.

Table 13
Occupation Breakdown, 1990

Occupation Type	Percent
Managerial & Professional	54.0%
Service Workers	9.3%
Sales & Office Workers	21.2%
Farming, Forestry & Fishing	0.0%
Construction, Crafts & Repair	7.9%
Operators, Fabricators & Laborers	7.6%

Source: U.S. Census Bureau 2000

Over half of residents have managerial & professional jobs

The occupational breakdown for the township provides insight into the skills, expertise and training of the township's residents. This can be useful in developing economic development programs because these strategies can draw upon the training of citizens. The highest-ranking categories are managerial & professional, and Sales & Office Workers. This reaffirms the township's high proportion of residents with advanced education and suggests that many of the township's residents are "white collar" workers who likely work in surrounding employment centers.

Income

Grosse Ile Township experienced a 39% increase in median household income between 1990 and 2000 while Wayne County experienced a decrease of 45.6% and Michigan experienced an increase of 30.6% in median household income. The median income in Grosse Ile is approximately double that of other communities in the area, making it one of Wayne County's more affluent communities. When compared to other affluent communities throughout southeast Michigan, Grosse Ile has seen a comparable increase in income.

Grosse Ile's median household income is almost twice that of the county & state

Table 14
Median Household Income

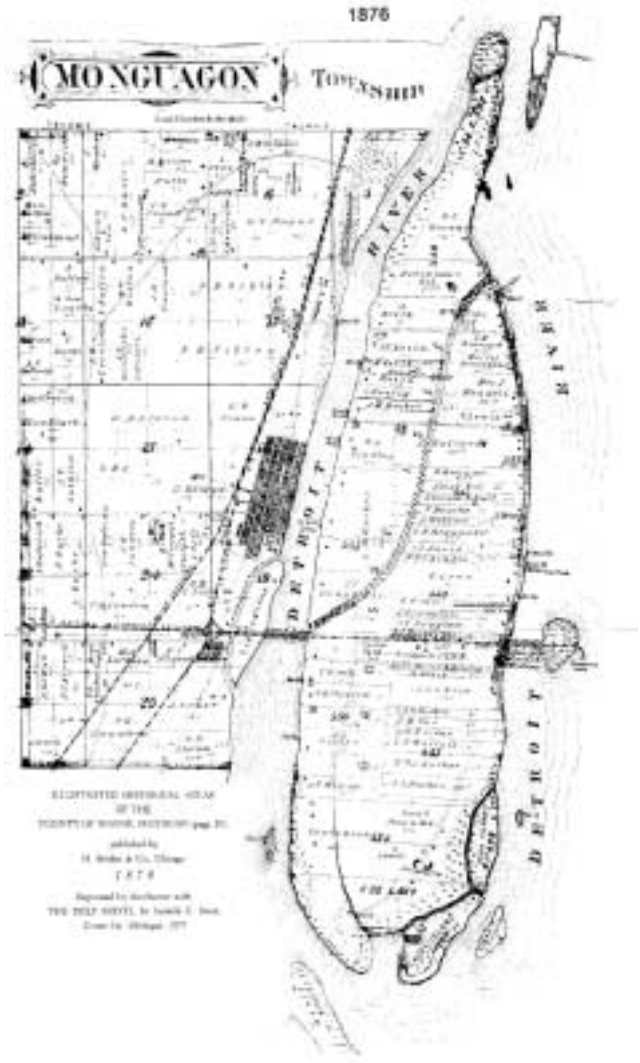
	1990	2000	90-00 % Change
Grosse Ile Twp.	$62,619	$87,062	39.0%
Wayne County	$27,997	$40,776	45.6%
State of Michigan	$31,020	$44,667	30.6%

Source: U.S. Census Bureau 1990 & 2000

Historical Setting

Grosse Ile is a distinctive island with a rich and colorful history. The Potowatomi Indians, who claimed the Detroit River area as their ancestral land, called the largest island at the base of the river, Kitcheminishen. Seventeenth century French explorers later marked the island La Grosse Ile, meaning the large island, which became its proper name.

The Iroquois Indians took over the Detroit River as their trade route in the 1600's and drove all persons away. It wasn't until the early 1700's that Cadillac, a French explorer, founded Fort Pontchartrain (Detroit) and encouraged the return of the Indians and the establishment of villages. Cadillac gave La Grosse Ile as a gift to his daughter. The King of France revoked many of the grants and lands that were awarded by Cadillac for the explorer had never been empowered to award such gifts.



In 1760 Grosse Ile came under British rule when the French surrendered Detroit to Major Robert Rogers and his Rangers. William and Alexander Macomb, prominent Detroit merchants, purchased the island on July 6, 1776. Development of the island was delayed however due to the Revolutionary War. William Macomb began development in 1783, beginning with his personal residence, and began renting plots to tenant farmers. Early settlers to the island were primarily farmers with farming, fishing and quarry stone as the principal industries. These farms were operated into the 20th Century.

Grosse Ile was established as a township in 1914. Throughout the early part of the 20th century, Grosse Ile became quite popular as a summer resort for Detroit families. Several prominent automotive pioneers such as R.E. Olds (Oldsmobile), Charles and William Fisher (Fisher Body) and William Knudsen (General Motors) developed large estates on the island.

Various means of transportation have been available to reach Grosse Ile, boats being historically the favored mode of transportation since the first humans plied the waters of the Detroit River. During the first half of this century, all the ships using the waterway between Grosse Ile and the Canadian shore, were guided by a series of lights including the Grosse Ile Lighthouse. Established in 1894 at the north end of the island, the structure was rebuilt in 1906. Although the light was turned off in the 1940s, the lighthouse stands today as a sentinel of the river and landmark for small boaters.

For about fifty years, access to Grosse Ile was available by train. From 1873 to about 1883, the Canada Southern Railroad carried both passengers and cargo from the mainland, over the railroad bridge (now the county bridge), across Grosse Ile (now Grosse Ile Parkway), and over a small bridge span which led to Stony Island. At that

point, the cars were transferred to a ferryboat and taken to Gordon, Ontario, where they were put back on track to continue the journey to Buffalo.

The Canada Southern went into receivership in the early 1800s and the Michigan Central Railroad took over. The route to Canada was discontinued, but many residents used the commuter service to Detroit where they worked or attended school. Vacationers came to Grosse Ile by train to enjoy summer cottages, camping, or a stay at the popular Island House Resort Hotel. The trains continued until the mid-1920s when the automobile became the preferred mode of travel.

The north end bridge is the privately owned Grosse Ile Toll Bridge which opened in 1913 to traffic which included sheep and horse drawn wagons as well as early versions of the automobile. The Wayne County bridge (a.k.a. “free bridge”) opened in the 1930’s to accommodate the rapidly expanding island population.

The U.S. Naval Air Station opened on the island in 1929 and was used as a training school, seaplane base and hanger. The site developed into a vital center for military flight training during World War II. In 1942, it was designated the U.S. Naval Air Station and expanded considerably to accommodate large numbers of American and British fliers who trained on the island. (President George Bush was stationed at the base about for two months shortly before the end of WWII.) Naval operations continued until the base was closed officially in 1969, at which time the Air Station was closed and turned over to the township. It now operates as the Grosse Ile Municipal Airport and houses a variety of functions including the township hall.

Areas of Historic Significance

Grosse Ile Township has several areas and structures that are of historic significance. These areas have been surveyed with the assistance of the Grosse Ile Historic Commission and are discussed Table 15. In addition, areas of historical significance have also been identified and are shown on Map 2. These areas should be carefully taken into consideration by the planning commission when future planning decisions are made within these areas.

Table 15
Historical Sites

Site	Built	Location	Registered	Established
East River Road National Historic District ▪ Dallas Norvell House ▪ Anderson House ▪ Littlecote ▪ Victorian Wedding Cake House ▪ 1871 U.S. Customs House ▪ Anthony Dudgeon House ▪ Michigan Central Railroad Depot ▪ St. James Episcopal Chapel	 1851 N/A 1859 1861 1871 1859 1904 1867	East River Rd between Littlecote & St. James Episcopal Chapel	National Register	1974
St. James Episcopal Chapel	1867	East River north of Bellevue	National Register, Michigan State Register	1971 1982
Angus Keith House	1863	Horsemill between Keith & West River	Michigan State Register	1989
Rucker-Stanton House	1848	West River south of Church	Michigan State Register	1985
1871 U.S. Customs House	1871	East River at Grosse Ile Parkway	Michigan State Register	1982
Michigan Central Railroad Depot	1904	East River at Grosse Ile Parkway	Michigan State Register	1982
Col. Brodhead's Office	1855	East River south of Horsemill	Michigan State Register	1978
Eighteenth Century Gristmill Marker	1787	Horsemill opposite Presbyterian Church	Michigan State Register	1965
Jewell Colony	1925-31	Area bounded by Meridian, West River, Island Dr and Lakewood	Michigan State Register (12 homes) Thematic State Register	1986
Survey Tree/Macomb Mansion House Marker	N/A	East River between Church and Horsemill	Michigan State Register	1964
Military Outpost (Stockade Marker)	1815	East River south of Bellevue	Michigan State Register	1962
World War I Gold Star (Memorial Trees)	N/A	Bridge Road		
World War II Blue Star (Memorial Marker)	1950	V.F.W. Post on Macomb		
Treaty Tree Monument	1906	East River north of Macomb		
Ballard House	1836	East River Rd between Church and Ferry		
Hilltop House	1850	West River Rd between Bellevue and Groh		
Miss Marian's House (today known as Hentig-Lowrie)	1832	East River Rd south of Bellevue		
Hawthorne Centennial Farm	N/A	East River Rd south of Bellevue, behind Miss Marian's House	Michigan Centennial Farm	1952
Westcroft Gardens	1700's	West River south of Church	Michigan Centennial Farm	
Fox-Rucker Cemetery	1845	West River Rd between Church and Ferry		

Source: Grosse Ile Historical Society

Existing Land Use

The analysis of existing land use patterns is a fundamental step in preparing a community master plan. The analysis not only examines the positive and negative aspects of past land use decisions in order to help avoid past mistakes but also to help predict future development trends and where development may occur and where potential conflicts may exist.

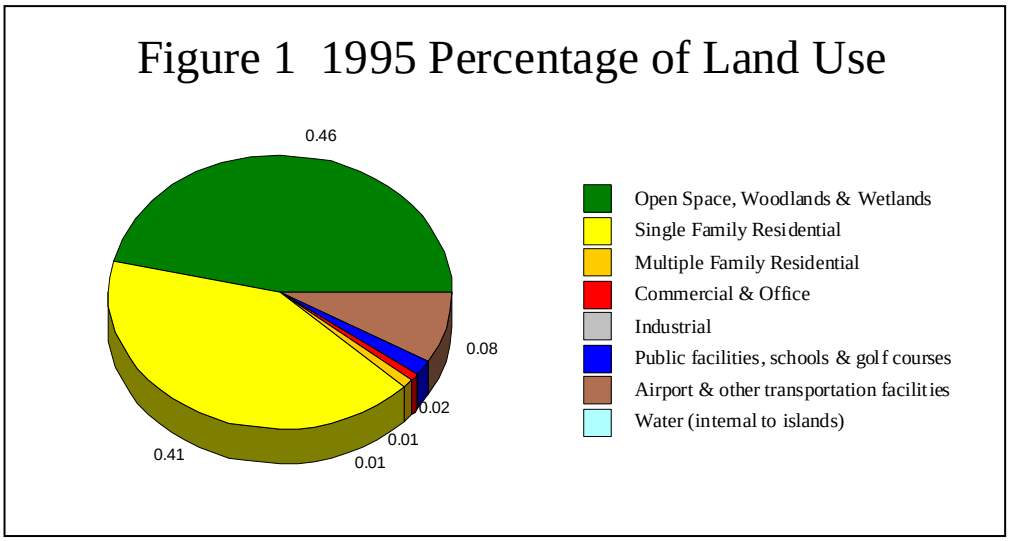
Open space, woodlands & wetlands account for nearly half of the township

Land use patterns develop according to geographic location, land use and zoning policies, and environmental, economic, social and cultural influences. The location of a building, the routing of a street or highway, construction of sanitary sewers, and many other factors affect, and have an effect on, the shape of existing and future land use patterns.

Documenting existing land use and looking at how uses have changed over time in a community is an important part of the planning process. It helps to answer questions such as, "Is land devoted to residential use increasing? Where is development occurring?"

This section discusses the types of current land uses that occupy Grosse Ile. Map 3, an existing land use map is located on the following page that directly corresponds with these categories. Figure 1 depicts the percentage of land use as of a 1995 SEMCOG study. A majority of the township is undeveloped and remains in its natural state. Of the developed land, single family residential accounts for nearly 80% of the uses, followed by airport uses which make up 15%. Multiple family residential, commercial & office, industrial and public uses combined represent 8% of the developed land.

Figure 1 1995 Percentage of Land Use



Existing Land Use Categories

Single Family Residential: Single family residential uses are the most dominant in Grosse Ile, as is typical for most townships, occupying approximately 2,498 acres. Housing densities are moderately low compared to surrounding areas, even in the newer subdivisions. The oldest neighborhoods were built throughout the 1800's and early 1900's with relatively small lots along the shoreline and later along the Thoroughfare Canal, leaving a green open space spine the length of the island. There are also a number of subdivisions on the islands at the southern portion of the township including Swan Island, Hickory Island, Meso Island and Elba Island.

Residential development occurred in a relatively steady fashion from the 1950's to the late 1990's, with development peaking in the 1950's. Since then, development has slightly declined with each decade. This is due in part to the township's aggressive stance towards preservation of open space and its desire to develop in an orderly fashion. This development has connected across the island, concentrating in the central area of the township between the two bridges that give access from the mainland and in the southern half of the township.

The most recent single family residential developments have been two single family subdivisions, one located north of Grays Dr., just east of Meridian Rd. ,and one located south of Ferry Rd. west of Meridian Rd. These newer subdivisions are characterized by large homes with large garages on large lots along curvilinear and cul-de-sac streets.

Multiple Family Residential: This category includes buildings that contain more than two dwelling units including converted homes, apartment buildings, townhouses and senior housing. The township has roughly 82 acres of multiple family residential uses, a majority of which are clustered around Macomb St. A handful of attached condominium developments are also scattered along the western portion of the township.

Commercial and Office: Commercial development occurs primarily along Macomb Street. The Macomb Street District is the heart of the township's business community and is bounded by the Detroit River to the east, Grays Dr. to the north, Meridian Rd. to the west, and Grosse Ile Parkway to the south. Most of the buildings are one and two stories and are setback from the public sidewalk. A significant portion of the commercial structures are converted single family residences. A wide spectrum of commercial and office uses are found in this District including, banks, convenience and comparison-shopping, restaurants, specialty shops, offices, and other businesses.

Outside of the Macomb Street District, there are two other locations that are currently used for commercial or office purposes. The Airport Inn, a local pub, is located on Groh Rd. east of Meridian Rd., Westcroft Gardens Nursery is a family owned nursery located off of West River Rd. that has been in the township for a number of decades.

Industrial: Industrial uses provide important employment opportunities and tax base to support improvements to capital facilities and municipal services. Grosse Ile only has 17 acres devoted to industrial uses. A 106-acre industrial park, Commerce Park, is located in the south part of the township immediately north of the airport. This brownfield redevelopment seeks to draw development that will supplement airport uses and has proven very successful in attracting businesses to Grosse Ile.

Airport: Grosse Ile Municipal Airport, consisting of 663.6 acres, is bounded by Groh Rd. on the north, East River Rd. on the east, Frenchman Creek on the west and Gibraltar Bay on the south. The airport consists primarily of the two main hangers and Seaway Aviation, which houses three fixed based operators. A variety of airport related uses such as hangers, tie downs, and fuel farms are located here as well as five non-aviation

businesses such as township offices and Grosse Ile Health and Racquet Club. Because of surrounding residential land uses, an important planning issue is the need to maintain compatibility between the airport and the surrounding area.

Public: This category includes township, state and federal buildings, schools, churches and other public or quasi-public buildings. Police and fire departments, the library, the U.S. Post Office, schools and several churches make up the 137 acres of public uses within the township. The Township Hall is located within the airport. The Department of Public Safety is located on Meridian Road, just south of Macomb Street. Schools are located throughout the township with the High School located just north of the Macomb Street business district. The Island Memorial Park Cemetery is located in the southern portion of the township, west of the Airport Industrial Park. These functions strengthen the focus of this district, both locally and regionally, and provide an important social need.

Recreation: The Township of Grosse Ile has a variety of sources for both private and public recreation. There are three golf courses located within the township West Shore Golf and Country Club, Grosse Ile Golf and Country Club and Water's Edge Country Club. In addition to these country clubs, Grosse Ile has a variety of private boat clubs scattered throughout the township such as the Grosse Ile Yacht Club, Ford Yacht Club, Elba-Mar Boat Club and the Gibraltar Bay Nature Area. There is a private park located on Hickory Island. The township operates the Centennial Farm, which provides a large number of community recreational opportunities on the 32-acre parcel. In addition, the township community playscape is located near Macomb Street behind the Post Office and a riverfront observation platform is located at the end of Macomb Street on the Detroit River.

Public Open Space: Over several years and through multiple millages, the Open Space Committee and township have purchased several hundred acres of land for the purpose of preservation and with the intention that they remain as natural woodlands and wetlands, habitats for both fauna and flora, and free from the impacts of intruding development. These sites were not acquired for recreational parkland except for the most passive uses. The township owns over 330 acres of dedicated open space.

Special Environmental: Stony Island is currently vacant and now contains significant wetland areas. Hennepin Island at the northern end of the township is owned by the BASF Corporation and was utilized for disposal of non-organic industrial wastes. This island is currently undergoing environmental remediation; however because of previous industrial activities future reuse of this island is highly unlikely.

Undeveloped: There are a number of vacant parcels of land throughout the township, but concentrated at the northern end of the township. There are a few large parcels that are available for further subdivision. Much land remains undeveloped at this time but is platted for single family residential uses and will likely become developed as such in future years.

There are a number of subdivisions within the township that were platted without road construction (commonly regarded to as "paper plats"). Within these paper plats there are numerous privately owned lots of record that do not have improved road frontage. As development of the township continues and un-subdivided land becomes scarce, demand for developing these old lots of record will become greater. Dealing with development in this situation is difficult because these lots are often developed on a lot by lot basis and what little road improvements that are constructed, are done so on a "piece-meal" basis.

A number of vacant islands are located around the main island of the township including Calf, Round, Mamajuda, Sugar, Dynamite, and Fox Islands. These islands all contain significant natural features, which are described in greater detail in the natural features section of this plan.

Future Land Use

The future land use plan establishes land use categories, illustrates the location of planned land uses and provides strategies for implementation. This section also provides a rationale for the placement of preferred land uses and the intensity of those uses. The plan serves as the primary policy guide for future land use decisions, investment in public improvements and coordination of public improvements and private development.

The plan presents an idealized future indicated by the growth patterns in the township. The plan, however, also provides the practical guidance local decision-makers need regarding today's issues. It is the intent of the plan to assist in the orderly development of the township, assist the community in maintaining and enhancing its pleasant natural environment and spark a vision for the future.

Factors Considered

Grosse Ile Township has a number of opportunities and limitations which will influence the future development of the township. A positive influence on growth is the existing natural character of the township. The pleasant atmosphere of the waterfront, along with the abundance of open space and woodlands, portray a quality residential ambiance that will continue to lure new residents seeking refuge from other areas of metro Detroit. A limitation on growth in the township is the limited amount of developable vacant land and the fragile natural features of the island.

It is important to consider a number of factors when locating future land uses. The future land use plan should guide the future development pattern of the community into a logical arrangement which maintains the character of the community, protects the environment and ensures adequate services and land for all types of land uses. These factors include:

- Consistency with existing land use patterns.
- Diminishing incompatible land use relationships.
- Preservation of natural features and consideration of the effects of development on the environment.
- Maintenance of aesthetic qualities that contribute to the community character and quality of life.
- Positive incorporation of natural amenities.
- Existing planning policies and zoning regulations.
- Availability of infrastructure including utilities, roads and community facilities.
- Market conditions for various land uses.
- The goals and objectives of the plan that express the community character desired by residents.

Future Land Use Categories

The land use plan can generally be described as having a few distinctive components that when viewed together form an overall vision for the township over the next 20 years. The residents of the township desire a mix of land uses to meet their daily needs, with a clear emphasis on open space, residential uses, and the protection of natural features. The future land use plan has been developed to accommodate the range of housing and

commercial services needed to serve residents, and to preserve the values held closely by township residents. Below is a description of each of the future land use categories found on Map 4:

Single Family Residential: The predominant land use within the township is single family residential. Due to the variable development patterns within the township, wide spectrum of history, variable character of different established neighborhoods and the many unique natural features, single family residential is divided into several different categories. Specific recommendations are provided for each distinct area in the Residential Neighborhoods Chapter that follows.

Future Land Use Categories:

- *Single Family Residential*
- *Multiple Family Residential*
- *Macomb Street*
- *Public/Semi Public*
- *Recreation*
- *Public Open Space*
- *Special Environmental*
- *Commerce Park*
- *Airport*
- *Outer Islands*

Multiple Family Residential: Areas designated in the future land use plan for multiple family residential development are found throughout the township. These include attached condominiums and apartments. Those areas currently developed as multiple family residential retain their designation. Future multiple family development will be focused in the area surrounding the Macomb Street mixed-use district and along the south side of Greys Drive. The Macomb Street mixed-use district is the center of the community. Consequently, there has been considerable public funding allocated towards improving the public infrastructure in this area, including roads, sidewalks, stormdrainage and utilities. Focusing future higher density residential development to this area will help support the business district as a vital and active community center.

Manufactured Housing Park: Manufactured home communities are considered to be a transitional land use between residential and industrial uses. While a specific location has not been indicated on the future land use map, any proposed manufactured home community would need to be located immediately adjacent to the Airport Commerce Park.

Macomb Street: The Macomb Street area is intended to create a distinct community center and focal point in the township. Macomb Street will include a complimentary and integrated mixture of residences, employment, shopping, and community uses which create a walkable "small town" environment with less reliance on automobile travel. Development and redevelopment consistent with the historic architecture of the township, mixture of uses and layout of a traditional small town is encouraged. Detailed design standards are provided for sites within the Macomb Street area.

Commercial uses include retail, office and service establishments whose primary market area covers the overall township. Commercial uses that are more industrial in nature should be located in the Commerce Park. These retail businesses, offices and services are intended to serve as the central business district for the township. Typical uses would include smaller general merchandising/retail establishments, professional offices banks, churches, bed and breakfast inns and other service uses. Larger retail establishments, gasoline service stations and other similar uses may also be allowed, but only with special land use approval. Larger non-residential development will require special land use review because of the close mixture of residential and commercial development within the Macomb Street area. Larger commercial operations will have greater effect due to traffic, infrastructure and noise, thereby having the potential for a much greater impact on the character of the area.

Along and surrounding Macomb Street will be a mixture of single family and multiple family residential including apartments, townhouses and senior housing. There will be a land use transition between the business district and the single family residential areas of the township to minimize impacts on residential neighborhoods.

The area considered as the Macomb Street business district needs to be limited. In order to develop the critical mass of activity and be pedestrian oriented, development should be within a walkable area. Based upon walkable distances, there are two distinct nodes along Macomb Street. The area to the west near Meridian Road tends to be more oriented towards general commercial uses. The area to the east near East River Road tends to be more oriented towards specialty shopping uses. The unique characteristics of these two distinct areas should be recognized and built-upon to strengthen the synergy between uses.

Residential development needs to be within walkable distance to shopping and recreation opportunities. Future commercial development should be contained to the Macomb Street frontage. This will encourage redevelopment of this commercial center and support existing commercial establishments with new commercial development.

The physical form of buildings, roadways, parking lots, lighting, sidewalks, site design elements, signs and landscaping help define the Macomb Street's and Grosse Ile's sense of place. These elements distinguish Grosse Ile Township from surrounding communities. A strong community center provides the citizens of Grosse Ile with an identity for their township. A well-designed commercial center also provides a quality shopping environment and strengthens the business district.

A separate chapter is provided for the Macomb Street Area which discusses specific design standards. These standards are intended to update the recommendations offered in the Macomb Street Subarea Plan developed in 1996. The Subarea Plan includes design standards that are intended to promote quality site design and building architecture consistent with the predominant residential character of the township and the strong historic heritage of Grosse Ile. These standards are also intended to facilitate development and redevelopment that has quality site design and relates to the surrounding Macomb Street area.

Public/Semi Public: Areas designated for public and semi-public include a variety of institutional uses, including schools, churches and government facilities. These areas are generally established and the institutional facilities are integrated into the surrounding neighborhoods. Any redevelopment or expansion for institutional uses within these areas will need to maintain the proper relationship with the surrounding residential areas. This will include landscape buffering, limitations on parking lot lighting, and preservation of site natural features.

Recreation: Locations are designated for active recreation facilities. These locations include the township-owned Centennial Farm, township golf course and marinas and other public recreational facilities. In addition to public facilities, there are several private recreational uses including boat clubs and golf course country clubs. The private recreational areas are planned to remain as recreational. If future development of private recreational lands is proposed, these areas should be developed at the lowest density single family residential designation to ensure that the natural features and open space are retained to the maximum extent practical.

Public Open Space: Areas that have been purchased by the township through the Open Space Millage, or other means, for the expressed purpose of preservation, are designated as open space. In addition, lands that have been acquired by the township and Grosse Ile Nature and Land Conservancy are included. Preservation of these public lands will enhance the quality of life in the community by preserving certain lands characterized by distinctive natural features as passive recreation areas for the enjoyment and benefit of all residents of the township. Distinctive natural features include woodlands, wildlife habitat, wetlands, or other ecologically significant lands. Uses in these areas will be limited to natural resources conservation, forest preservation, wildlife habitat and passive recreation activities which do not cause excessive noise or impact on the environment, including nature study, hiking, boating, fishing and cross-country skiing. Limited improvements such as nature trails would be allowed in this area based upon the Greenways Plan.

Special Environmental: Areas designated for special environmental include Hennepin Island and a portion of Stony Island. Both of these areas are currently undergoing environmental remediation. Because of previous industrial activities and current remediation, future reuse of these areas is highly unlikely within the time-frame of this plan. Any future use of these areas due to changes in conditions must be subject to further planning commission study to change the land use designation of the plan. Any uses considered should be low intensity uses such as residential or recreation uses. Industrial uses will not be permitted.

Commerce Park-Light Industrial & Recreational Mixed-Use: Industrial development is limited to the Commerce Park north of the airport. Development of this area would include a complementary mixture of light industrial, office, high-tech research and development and other uses that are consistent with the developmental goals of this area. A specific plan has been prepared for this area by the Airport Commission, which includes a wide range of uses. Light manufacturing, research and development and office uses are proposed for the southern half of the Commerce Park. The northern portion of the property is proposed for multi-purpose recreation and community facilities. There is a significant woodland area that bounds the northern portion of the Commerce Park, which will be preserved as a natural buffer. The area south of Groh Road and north of the airport will include other uses compatible to the primary aviation use of the airport, including the Township Hall, Township DPW, office, lodging/bed & breakfast, dining and indoor recreation.

There is a privately owned commercial lot on the northeast corner of Meridian and Groh Road. This small lot is zoned C-2 neighborhood business and is occupied by the Airport Inn. The plan contemplates continuation of this use. If the site were to be reused for another commercial use it would be limited by the relative small size of the site. Any additional use on this site needs to be compatible with the surrounding residential, should complement the Airport/Commerce Park and will need to be approved by the Township Board.

Airport: The airport will continue to function for a mixture of uses with aviation related uses being the predominant use. The Airport Commission has a specific plan for operation and maintenance of the Airport. The Airport is bounded on the southwest and southeast by water, with a significant area of

natural wetlands along the southeast edge of the Airport. This area is intended to remain in a natural state.

Outer Islands: Grosse Ile Township is made up of a series of several islands, some of which have been connected through construction of bridges to the main islands and ultimately the mainland. There are a number of smaller, privately owned islands that currently do not have roadway access and are in a natural, undeveloped state. Future use of these undeveloped islands is very limited due to their isolation, inaccessibility by roads and the lack of any utility service. Because of this, their intended future use would be limited to private recreation and conservation.

If single family residential use of these islands were contemplated, several obstacles would need to be overcome. The township has the responsibility of providing police and fire and emergency medical services to residents. In order to provide these services, all residences and businesses must be accessible by public roadways. In addition, all development within the township must be served by public water and sewer. Due to the nature of the subsurface hydrology of the islands, private septic systems would contribute contamination to the Detroit River and may not function properly during high water levels. Development of any outer islands would therefore require the construction of a bridge and extension of utilities.

Residential Neighborhoods

Grosse Ile Township is predominantly a residential community. There is considerable variation in residential neighborhoods within Grosse Ile Township. Each of these areas have their own distinct character, which contribute to the value and desirability of these established neighborhoods. Residential areas are divided into several different categories, which can be found on Map 5. Specific factors need to be considered for maintaining and enhancing the unique elements of each distinct area.

Residential Areas

- **Traditional Interior Residential:** These areas consist mainly of older subdivisions with moderate sized homes on smaller lots. These areas follow a traditional development pattern with interconnected streets following a grid pattern. These areas have established neighborhood characteristics that need to be protected to maintain their integrity. Infill development within these areas needs to be compatible with the established character of these areas.

- **Natural Interior Residential:** These areas consist of homes on larger lots and significant areas that are maintained in a natural state. These areas contain significant woodland and wetland areas that need to be protected. Development within these areas needs to be consistent with the larger lot character of this area and minimize impact to natural features.

- **Waterfront Residential:** Waterfront residential consists of homes that line the shores of the Detroit River and Trenton Channel. These homes tend to be larger and situated on large lots. There are many historic homes along East River and West River Roads. Infill development within these areas needs to be consistent with the established historic character and maintain open views of the waterfront.

- **Traditional Island Residential:** At the southern end of the township there are a number of smaller islands that are developed with traditional residential neighborhoods. These include Hickory Island, Meso Island, Elba Island and Swan Island, as well as adjoining areas that are part of these neighborhoods. These islands contain moderately sized homes on smaller lots. Infill development on these islands needs to be compatible with the established traditional character of this area and not overbuild the smaller lots.

- **Canal Residential:** The main two islands of Grosse Ile are divided by the Thorofare Canal. The area along the canal is developed as residential on moderately sized lots. Infill development along the canal needs to be compatible with the established character of this area and protect the canal from impacts.

- **Multiple Family Residential:** There are several areas of multiple family residential throughout the township. Future multiple family development will be focused in the area surrounding the Macomb Street mixed-use district. It should be designed and developed in a form that is consistent with the small-town, walkable environment desired for the Macomb Street Area.

Residential Neighborhood Elements

To understand the elements that make up a quality neighborhood, it is important to realize the community context of which each neighborhood is a component. Each neighborhood will consist of physical components such as streets, lots, blocks, homes, community facilities (e.g. parks/schools) and the natural landscape. Within this physical environment exists the social component made up of individuals, families, children, neighbors and social/community groups. Each individual neighborhood is tied together as a part of the overall community through local institutions, such as schools, churches and parks, Macomb Street, the center of the community, natural features, such as open space and waterways, and the infrastructure network of streets and pathways. Because of these interrelated factors, each component of the neighborhood is important in the overall community framework that makes Grosse Ile a desirable place to live. These physical factors in residential neighborhoods can be broken down into the following elements:

- **Lot Size:** Each neighborhood is developed with somewhat typical lots. The dimensions of these lots will translate into a number of physical elements such as amount of open space on each lot, the relative size of homes and spacing between homes, all of which set up a pattern for that particular neighborhood. All infill housing should occur on lots that are at least as large as the median lot area and width of other lots within the surrounding neighborhood. This can be done through regulation of nonconforming lots and requiring the combination of contiguous nonconforming lots that are out of character with the surrounding neighborhood. With all new divisions, the township should ensure that newly created building sites are consistent with other residential lots in the surrounding area. One method to achieve this is through an overlay zone which ensures that lots are not created that are out of character with the surrounding development pattern.

- **Spacing between Homes:** The width of lots and the side yard setback prevalent within a neighborhood will determine the spacing between homes, which is another contributing factor to the overall neighborhood character. Proper spacing between homes can be ensured through requiring sufficient lot widths and requiring side yard setbacks.

- **Size of Homes:** The size of each individual home in relation to the lot and surrounding homes is another important factor. Each neighborhood has a predominant pattern in terms of the size of homes – footprint area, floor area and height. These are major factors contributing to the character of that neighborhood. Construction of an individual residence that is out of scale with other surrounding homes will disrupt the established character and create a discontinuity in the built environment. More directly, a home that has a mass and scale that overbuilds the lot and overshadows surrounding homes will have a negative impact in terms of impact to views and access to sunlight. Finally, the overbuilding of a lot will have an increased impact on natural features as a result of additional tree clearing required for the larger building envelope and increased impermeable surface impacting drainage

and the health of nearby wetland systems. To ensure new infill housing is consistent with the character of established neighborhoods, the floor area of a proposed residence should not be significantly larger than the floor area of other homes within the immediate neighborhood. In addition, the percentage of the lot that is covered by structures should be minimized.

- **Front and Rear Yard Setbacks:** Along most neighborhood streets, there will be a predominant setback from the road. This is also a contributing factor to the neighborhood character. The fronts of homes define an enclosed area that consists of the public neighborhood space along the road and the private area of each lot's front yard. The placement of the home on the lot will also influence the rear yard space in relation to the rear yard of adjacent lots. Setting a home closer to the road or further towards the rear lot line than adjacent lots can adversely impact views and access to sunlight within adjacent front and rear yards. New homes should be situated on a lot to be consistent with those on adjacent lots and contribute to the continuity of the streetscape and the continuity of rear yard open spaces.

- **Setbacks from Waterfront:** Because Grosse Ile is a series of islands with numerous waterfront areas, the setback of homes from the shoreline and maintaining open waterfront views is a critical factor in the overall character of the community. Principal buildings on each lot need to be situated along the predominant waterfront setback line to ensure consistent open views along the waterfront are maintained. In addition, the placement of accessory structures, location of boat mooring facilities and landscaping within the waterfront yard needs to ensure minimal impact to waterfront views.

- **Architecture:** There are a variety of architectural styles within Grosse Ile and the intent of the master plan is not to recommend specific architectural styles for residential development. However, there are certain criteria that can be used to ensure that infill residential development is consistent and properly relates to the scale and design features of surrounding homes and respects the local context of the neighborhood. Infill housing should be consistent in terms of the following:

  - Building height
  - Roof pitch
  - Roof material
  - Window proportions
  - Building materials (e.g. brick, wood siding)
  - Architectural detailing

In addition, other factors in the design of homes should be taken into consideration to enhance the appearance of the residence from the road. Side entry or recessed garages will minimize the dominance of the garage on the front façade of the home. This will allow other elements such as windows and front porches to be the dominant feature, thereby creating a more human scale relationship between the home and the public street.

- **Street Design:** The design of the roadway is another determining factor in the character of the various neighborhoods throughout the township. Many of the subdivisions have been developed with a traditional street cross-section following Wayne County standards. Wayne County requires new subdivision streets be 27 feet wide, which is sufficient to allow parking on one side of the road. There are a number of roads that are narrower with gravel shoulder and open ditch storm drainage along the side of the road. There are also gravel roads in a number of locations. Where existing residential streets are proposed to be paved, the design of the roadway should reflect the desire to preserve the neighborhood character and natural features along the road. More specific recommendations for residential streets are provided in the transportation plan chapter.

- **Sidewalks/Pathways:** Neighborhoods need an integrated pedestrian circulation system, which conveniently and safely links residents to other neighborhoods, public recreation/open space and key destination points within the township. A majority of the township was developed without sidewalks. The township has developed a bike path system that stretches most of the length of Meridian Road. There are also sidewalks in the Macomb Street area. To create a more pedestrian-friendly environment, any new residential development should include sidewalks that link to the Meridian Road bike path. Sidewalks could also be installed in existing subdivisions where petitioned by the residents.

- **Street Lighting:** In order to promote activity in the neighborhoods and to establish a safe environment for residents, street lighting should be provided at key road intersections. However, in order to preserve the natural character of the township, the installation of lighting should be limited to key intersections.

- **Woodlands and Natural Features:** In addition to the built environment, woodlands and natural features are major elements in all areas of the township. Some of the highest priority woodlands will include street trees along residential streets and the natural landscape buffers around the perimeter of subdivisions that back-up to major thoroughfares. With all residential development, preservation of woodlands should be a top priority. All new residential development needs to provide the landscaping required by ordinance including street trees and greenbelt buffers.

Macomb Street

The Macomb Street area is intended to be a distinct community center and focal point in the township with a complimentary and integrated mixture of uses that create a walkable "small town" environment. Development and redevelopment consistent with the historic architecture of the township, mixture of uses and layout of a traditional small town is encouraged for this area.

The Grosse Ile Downtown Development Authority (DDA) has implemented a number of public improvements along Macomb Street including, roadway reconstruction, stormwater improvements, sidewalks and ornamental street lighting. In addition, the DDA is developing the vacant lot at the southeast corner of Macomb Street and Meridian Road as a "town square." The DDA has also adopted specific design standards for commercial development along Macomb Street.

These public improvements in combination with the physical form of buildings, parking lots, site design elements, and landscaping on sites that line Macomb Street all contribute to creating a strong sense of place. These elements distinguish Grosse Ile Township from surrounding communities. A strong community center provides the citizens of Grosse Ile with an identity for their township. A well-designed commercial center also provides a quality shopping environment and strengthens the business district.

This Macomb Street chapter includes design standards that are intended to promote quality site design and building architecture consistent with the predominant residential character of the township and the strong historic heritage of Grosse Ile. A primary intent is to develop a sense of compatibility with neighboring businesses and residential uses and maintain a strong identity for the community.

Design Standards

Setbacks: Since there are a number of historic buildings along Macomb Street, many built well before zoning, building setbacks vary considerably. This variation in setbacks breaks up the unity of the facades and limits the creation of a defined streetscape. In order to enhance the "small-town" pedestrian-friendly environment, buildings should be constructed closer to the road with small, landscaped front yards and little or no front parking. Because of the existing situation with variable setbacks, each site plan needs to be considered in relation to adjacent sites to ensure proper relationship of buildings.

Pedestrian Oriented: A high-quality facade design can attract customers and contribute to the desired image. Generally, commercial buildings should relate to the dominant character in the township so businesses fit into the fabric of Macomb Street. Retail storefronts are encouraged to make extensive use of windows on the ground floor front facade. Pedestrian access is an important part of the neighborhood ambiance. All buildings have a pedestrian entry but each is articulated differently. Historically,

buildings used for retail businesses contained a recessed entry that offered the customer protection from the elements and a more intimate sense of entry off the sidewalk at the front door. In addition to attractive entrances and the use of windows, canopies and awnings can also add interest to a buildings front facade as well as provide unity of scale, texture, and color to abutting and adjacent buildings. Well designed windows, front doors, awnings can be inviting elements that distinguish Macomb Street buildings from more conventional strip commercial development and contribute to creating a strong sense of place.

Architecture: Architecture should relate to the surrounding natural and built environment in regard to texture, scale, mass, proportion, and color. A strong visual relationship between the building, site, streetscape and adjacent development is vital for overall design compatibility. The use of unusual shapes, colors, and other characteristics that cause developments to call excessive attention and create visual disharmony should be avoided.

- While it is not the intent of this plan to mandate a particular architectural style, new buildings need to complement the character of historic architecture that exists along Macomb Street. New buildings should be designed to be consistent with the strong historic heritage of Grosse Ile and the various historic districts throughout the township. The use of complementary classic or revival styles such as Colonial, Cape Cod, Federal, Georgian, Gothic, Italianate, Tutor and Victorian are preferred.

- High quality building materials with the appearance of permanence and substance should be used. Buildings should be constructed of or covered with brick, wood, vinyl siding, or similar materials. Metal panels, EIFS (dryvit), plastic, imitation brick or stone, and mirrored or reflective glass surfaces should be discouraged. Extensive use of wood or similar materials for molding is encouraged. Colors should be harmonious with other buildings in the area and the desired character of the township.

- Roofs should be peaked or have the appearance of being peaked. The roof shape and materials should be architecturally compatible with the rest of the building.

- The front facade of commercial buildings should contain a majority of windows to give the business an open and inviting feeling. The window should not be blocked by signs or neon lights. The number and spacing of windows and doors in a facade and along a streetscape should create a consistent rhythm from one building to another.

- For any new construction, the mass, scale and proportion of existing structures in the area need to be considered.

- With parking located in the rear of the building, the rear entrance should respond to the same needs as the front facade, only at a reduced scale. These include minimal identification signs and a pleasant entry. Rear entrance facades should be of finished quality and constructed of the same materials as the front facade. Because many of the commercial sites along Macomb Street

Elements of Design

- *Subtle colors*
- *Peaked roofs*
- *Rhythm of openings*
- *Ample windows*
- *Scale with surroundings*

back-up to residential, the appearance of the rear of the building needs to be considered in the design.

Parking: Parking lots must be designed to avoid conflicts between motorists and pedestrians while creating a visual attractiveness within and around the site. Off-street parking is generally required to be located at the side or rear of a building. If site characteristics require a parking lot to be constructed in the front yard, the amount of front yard parking should be minimized and the parking screened with a hedgerow. Parking lots should be designed to avoid large masses of paved surface and long rows of cars. Landscaped islands can be used to improve the appearance of a parking lot. Concrete curbing should be used throughout a parking lot for durability and protection of landscape areas.

Driveway Access: Currently, most commercial businesses along Macomb Street have one or more curb cuts. Excessive numbers of driveways confuse motorists, reduce the efficiency of the roadway, and contribute to traffic crashes. In order to mitigate these problems, curb cuts should be well-spaced from other driveways. In cases where good spacing is hard to achieve due to narrow lots, shared access may be an option. Access points should also be aligned or adequately offset with access points on the opposite side of the street. Driveway design and spacing requirements are contained in the township Roads and Driveways Ordinance. As an additional consideration, the reduction of curb cuts also reduces the amount of asphalt and allows for the installation of more landscaping.

Site Design Elements

- *Parking lot location*
- *Well designed and spaced access*
- *Efficient site circulation*
- *Accommodation for pedestrians*
- *Landscape parking lot*
- *Buildings close to the street*
- *Appropriate lighting*

Pedestrian Circulation: Sidewalks are currently provided along both sides of Macomb Street. With individual sites, a sidewalk should be provided from the public sidewalk to the front entrance of the building. In addition, pedestrian circulation systems should be insulated from vehicular flow in the parking lot.

Lighting: Macomb Street currently has traditional, decorative street lighting, which was installed by the DDA. In addition to street lighting, individual sites will have lighting for parking lots and other purposes. Lighting can be used to enhance site features and the overall appearance of the site. It can also be used to accent landscaped areas, emphasize building textures and architectural features, highlight pedestrian walkways and building entrances, and establish a special character. Overall lighting levels should be compatible with the neighborhood ambient light level. Area lighting should be predominantly down-directed and should be designed so that no light is directed off site. Landscape or landform screening should be used to control headlight glare into areas adjacent to parking lots. The height of lighting should also be limited to minimize off-site lighting impacts, particularly with adjacent residential uses.

Waste Receptacles: All waste receptacles should be located to the rear of the building where views from the street are minimized. While they need to be located to facilitate collection, they should also be located where they will not disturb adjacent uses and should not be the visual focal point of a driveway or parking

area. All waste receptacles are required to be screened with a decorative masonry wall. The wall should be of a material that is compatible with the main building.

Loading Areas: All loading areas should be located to the rear of the building so they are not the visual focal point of a driveway or a parking area. Loading/unloading areas should be located in a manner that does not conflict with automobile or pedestrian movements. Landscaping should be provided to screen loading areas from adjacent residential areas.

Mechanical Equipment: All mechanical equipment, utility meters, storage tanks, air conditioning equipment, and similar equipment should be screened from view by landscaping or attractive architectural features either integrated into the structure or constructed of the same materials as the building.

Signs: The location, size and lighting of signs should be as important as any other building component that is taken under consideration when a building or site is designed. Signs should be designed to enhance the building architecture and/or the site. Signs should be related to the building scale or style and use similar site building elements.

Every business requires identification of some type, be it the name of the establishment or merely the street address. In providing needed signs, businesses are encouraged to consider the broader impact on the appearance of the Macomb Street business district and on people's image of the community. Attractive, coordinated, well-designed signs have a positive impact on both local business and the community. To that end, the following guidelines are encouraged:

- Wall signs should be an integral design element of a building's architecture and compatible with the building's style in terms of location, scale, color and lettering. Wall signs should not project above or beyond the building.

- Monument signs should consist of materials and colors similar to the primary structure. Monument signs should be low, no more than 6 feet high, and integrated into the landscaping of the site.

Landscape Design: Site landscaping is an integral component in creating a sense of place for Macomb Street. Landscaping regulations are contained in Article 13 of the zoning ordinance. In order to promote high quality development, the following landscape guidelines should be adhered to:

- Existing landscape elements should be incorporated into the proposed landscape design. Mature trees and woodlands take years to establish and comparable replacement ones can be expensive. Mature trees also create a sense of permanence and continuity to a new or redeveloped site.

- Where sufficient planting width is available between the road and the front building line, trees should be planted in the front yard along Macomb Street. Canopy trees along site frontages will eventually create a tree lined canopy along Macomb Street,

enhancing the pedestrian environment and further improving the image of the business district.

- Landscaping in parking lots should be utilized to screen the parking from the road, improve and define traffic circulation, reduce solar heating of the parking surface and cars, and improve the overall appearance of the parking lot.

- In order to minimize the negative impact of conflicting adjacent land uses, particularly the residential areas that are adjacent to Macomb Street, a planted buffer strip should be utilized between uses. In addition to landscape buffers, on-site landscape screening is recommended to screen outside storage areas, mechanical equipment, loading areas, and similar operations.

Natural Features

The natural environment is a critical element of the physical basis upon which the community develops. The various components to the natural environment function, change, and interact as part of the ecosystem. These natural functions need to be maintained in a balanced state, while still allowing the community to grow in a controlled manner. Development within the township should be directed to areas that can best sustain the physical changes to the landscape without offsetting the community's natural balance. Those areas which are not well adapted to development, or if developed may have major impacts to other parts of the community should be protected. Key natural features have been indicated on Map 6.

Existing Conditions

Soils, Geology and Topography: The geology of Grosse Ile consists of glacial drift overlying dolomite bedrock. The glacial drift is a very thick layer of soil material that has been deposited by the advancement and retreat of the Wisconsin glacier during the last ice age. Since the last ice age, the soils on Grosse Ile have formed as a result of a number of soil forming factors. These include water drainage, wind, slopes, climate, biological activity, and human activity.

Water drainage has created distinct categories of soils on Grosse Ile. Well drained soils (Morley soil series) are found in steep slope areas. Somewhat poorly drained level soils (Blount soil series) occupy the majority of the township, which is predominantly flat. Very poorly drained soils (Pewamo soil series) are found in the low areas and natural drainageways. A goal of this plan is to maintain the ecological functions of natural waterways and drainage networks of Grosse Ile. Because the soil series which occupies the largest percentage of the Island, the Blount soil series, is relatively flat with drainage limitations, preserving and enhancing the natural drainageways of the township is vital.

Human activity has also altered the natural soil conditions through agriculture and the cutting and filling of soil associated with major construction activities. In some instances, extensive cut and fill operations have altered and disrupted the natural drainage pattern of the island.

Drains: Prior to its development, Grosse Ile contained a series of natural creeks and drainageways which drained to the Thorofare Canal, Frenchman's Creek and the Detroit River. At least 50 percent of these natural drainageways have been lost due to development.

Disruption of these natural drainageways has cause drainage problems such as flooding. As Grosse Ile has become developed, the amount of water infiltrating the surface has decreased and the surface runoff has increased. This has been caused by the clearing of natural vegetation and the addition of impervious material to the land (buildings and pavement). Artificial drains have been developed to overcome these problems. The installation of storm drains from developments has had the cumulative effect of increasing the peak discharge into the remaining natural drains while further reducing the amount of water infiltrating to ground water.

Floodplains: Floodplains associated with both the Detroit River and the drainage courses which cross Grosse Ile are vital to the ecosystem of these low lying areas. Periodic flooding of these drainageways is critical to the types of vegetation and animal species that live here. Floodplains also contain water during periods of high stream levels. Any alteration to the physical size of the floodplain will disrupt the drainage flow during high water periods and potentially cause increased flooding elsewhere.

Natural floodplains perform several important hydrological, geological, ecological, and environmental functions. Important hydrologic functions include stormwater conveyance, storage of stormwater, reduction of peak flow and groundwater recharge. Important geologic functions include storage of sediment from erosion and slowing the velocity of stormwater thereby reducing erosion of the channel and floodplain. Important ecologic functions include support of riparian vegetation, wildlife habitat and environmental corridors. Important environmental functions performed by the floodplain include filtration of storm water, absorption of excess nutrients and biological treatment of other pollutants in floodwaters. And finally, the open space maintained in floodplain areas provides attractive views that contribute to the waterfront community character.

Wetlands: Major wetland complexes associated with the natural drainageways are found throughout Grosse Ile. These wetlands are transitional areas between the aquatic ecosystems and the surrounding upland areas. They are low areas that are intermittently covered with shallow water and underlined by saturated soils. Vegetation that is adapted to wet soil conditions, fluctuation in water levels and the periodic flooding can be found in wetlands. Wetlands are interlinked with the hydrologic system and because of this, these wetland systems are vital to the environmental quality of Grosse Ile.

The Grosse Ile master plan identifies three types of wetlands predominate within the boundaries of Grosse Ile Township: (1) emergent wetlands with rooted cattails, bulrushes, and sedge grasses; (2) forested wetlands with an overstory of trees and an understory of shrubs; and (3) submersed aquatic plants (macrophyte beds) with wild celery and other species. As water levels rise and fall from year to year, some ecological succession may be occurring as the wetlands shift from emergent marsh to forested wetlands or submersed aquatic beds. All types of wetlands are interrelated with each other, providing numerous benefits to the community as a whole. The functions and benefits from each type of wetland are outlined below.

Scrub/shrub wetlands are a separate category of wetlands which has been mapped for the National Wetlands Inventory. Scrub/shrub wetlands are closely interconnected with emergent wetlands on Grosse Ile, and are considered as a single type of wetland for purposes of the master plan.

Emergent wetlands are located along the shoreline of Grosse Ile, along the sheltered waterways of the Thorofare Canal and Frenchman's Creek, and on several small out islands within the boundaries of the township. The largest emergent wetland areas are located north of Gibraltar Bay, west of Gibraltar Bay on Round Island, on Celeron Island, Stony Island, and the northwest shore of Grosse Ile near the toll bridge.

Emergent wetlands on Grosse Ile are essential as habitat and as a food source for the abundant fishery of the Detroit River. As the wetland vegetation dies back each season, it breaks down into particles called detritus, which is eaten by insects as well as birds and small mammals. Insects, in turn, are eaten by the fish.

The shallow, sheltered wetlands connected with the Detroit River also provide protected spawning and nursery areas for fish. For example, northern pike, yellow perch, and carp spawn in the standing vegetation of wetlands.

Grosse Ile Township wetlands are habitat areas for the thousands of Canadian geese, diving ducks and dabbling ducks which frequent the Detroit River flyway during migration. Several flyways and corridors cross the Detroit River.

Emergent wetlands play a role in buffering the shoreline from high winds and waves. Wetlands have been termed "nature's sponges" because they help absorb stormwater and storm surges. The wetland grasses help stabilize the shoreline and minimize soil erosion.

Forested wetlands (sometimes called floodplain forests) are dominated by swamp oak, red ash, eastern cottonwood, hackberry, silver maple, black willow, and red maple trees.

In several cases, forested wetlands are located adjacent to emergent wetlands and open water; in other cases, they are located inland from the shore. The hydrologic connection of inland forested wetlands with the Detroit River ecosystem is not well known. Inland forested wetlands may have been created by road construction and development that blocked natural drainageways.

Forested wetlands near emergent wetlands and open waters are clearly linked to the biological productivity and wildlife support functions of the Detroit River. Because of the trees, they provide a different type of shelter and habitat for various bird species. Inland forested wetlands also provide habitat for birds and small animals, and help to prevent local flooding by absorbing stormwater.

The submersed aquatic beds found near shorelines and in the sheltered bays of Grosse Ile Township support fish and waterfowl. The aquatic plant beds are accessible to fish and produce quantities of food for fish and invertebrates.

Submersed aquatic plant bed species include wild celery (a favorite food of ducks), as well as pond weed, water weed, musk grass, water milfoil, and many others. Each bed is somewhat different, with varied mixtures of species of plants. The plants are rooted to the bottom of the Detroit River, often on a sand bar in shallow water. Invertebrates, including snails, live on their leaves. Fish enjoy the food and shelter provided by the aquatic plants, a fact well-known to area fishermen.

The extensive submersed aquatic beds and shoreline wetlands help to maintain the fish spawning areas located near Grosse Ile in the Detroit River.

In general, wetlands serve a variety of important functions which not only benefit the natural environment, but also the community. Some of the primary values which wetlands contribute are as follows:

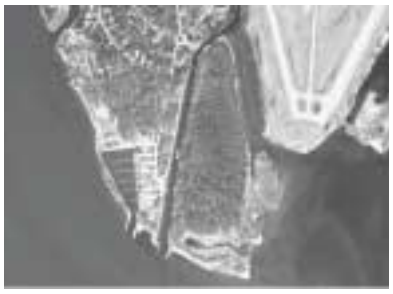
- Wetlands serve to mitigate flooding by detaining surface runoff.
- Wetlands control soil erosion and sedimentation loading in the river.
- Wetlands are often interlinked with groundwater.

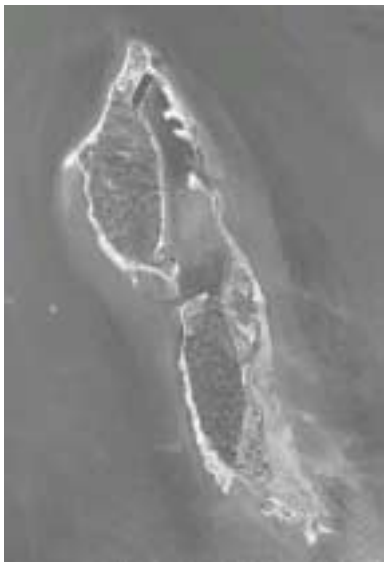
- Wetlands improve water quality which is degradated by such things as: nutrients and chemicals from fertilizers and pesticides used in landscaping/lawn care, polluted urban run off from automobile/transportation/parking facilities, and commercial activities and erosion and sedimentation resulting from construction activities.

- Wetlands are highly productive ecosystems in terms of wildlife habitat and vegetation.

- Wetlands also serve a variety of aesthetic and recreational functions.

Wetlands of Special Importance: All of Grosse Ile Township's wetlands function as fish and wildlife areas, water quality filters, and storm surge barriers. Several wetland areas; however, due to their size and location, dominate as very important high value areas for conservation:





- **Gibraltar Bay, Round Island and Nearby Wetlands:** Gibraltar Bay is a natural area of great value to the Detroit River fishery. The bay is sheltered but interconnected with the Detroit River. The bay has variable depths and abundant submersed aquatic plants that provide food and shelter for spawning fish. Water flow from under the East River Road Bridge transports relatively unpolluted water from the east side of the island westward into Gibraltar Bay. Field surveys by fish and wildlife biologists have emphasized the plant diversity and impressive primary productivity for nutrients.

- **Thorofare Canal:** The shoreline wetlands and submersed aquatic beds which are found in various locations along the Thorofare Canal are very important as fish and wildlife habitat. The waters are more sheltered than the main channels of the Detroit River and have a good flow-through of water. Shallow, protected backwater areas are abundant along the main canal, providing spawning, nursery and feeding areas for fish. Ducks and other waterfowl also depend on the sheltered waterway with its abundant food sources.

- **Shoreline Wetlands near the Toll Bridge:** This area is important to the Detroit River fishery because of its size and location. In the past, high water levels of the Detroit River have turned some of these shoreline wetlands into submersed aquatic beds, and has extended the wetland system farther inland. However, the low lake levels in recent years has had the effect of reducing the area influenced by the Detroit River's hydrology.

- **Celeron Island:** Celeron Island, owned by the Michigan Department of Natural Resources, is now almost entirely a wetland island. The island has very high value for fish and wildlife habitat, and is used extensively by sportsmen. In addition, the sand bar area extending between Celeron Island and Calf Island, the submersed aquatic beds northeast of Celeron Island, and the waters south of Celeron Island serve as important waterfowl feeding and nesting areas.

- **Stony Island:** Approximately 50 percent of Stony Island is now wetlands and submersed aquatic beds, according to the Michigan National Wetland Inventory and 1985 aerial photographs. It is possible that some of the interior wetlands on Stony Island were originally created by quarrying. Rising water levels have created wetlands in recent years. The north part of Stony Island has been reported as a nesting area for egrets, white swans, and other waterfowl. At least eight different types of threatened or endangered species of plants and animals are found on or near Stony Island.

- **Sugar Island:** Sugar Island is an upland Island with very little wetlands area. However, the sand bar off of Sugar Island supports wild celery, sago pond weed, and other submersed aquatic plants. These plants are a source of food for diving ducks. Threatened fish and animals found in the waters near Sugar Island and other small islands near Grosse Ile include the Lake Sturgeon (last seen in 1973) and the Common Tern (last seen in 1982). Sugar Island is privately owned and used primarily for recreational fishing and hunting.

- **Inland Wetlands:** There are a number of wetlands within the interior of the main island that play an important role. These are generally located along natural drainageways that traverse the island following the Pewamo soils conveying surface waters to the Thorofare Canal and Frenchman's Creek. While many of these natural drainageways have been severed by road construction and development, pockets of wetlands remain. Pre-settlement vegetation has been identified in some of these wetland areas indicating high quality natural areas that should be preserved. In addition to rare plants, these areas have also been identified as being important wildlife habitat.

Slopes: Above some of the drains and wetlands there are steep banks or bluffs, which separate the lowland and the upland. These will generally have steep slopes and be heavily vegetated. Disruption of the vegetative cover on these bluff areas may cause significant erosion problems and effect wetland and drain ecology.

Rivers: The Thorofare Canal and Detroit River provide a number of recreational opportunities such as boating, fishing, and swimming. The quality of these water features enhance the value of adjacent property for residential opportunities. This river provides vital functions to the region for drainage and water supply, fish and wildlife habitat, industry, and recreation.

Groundwater: Aquifers are water contained within the porous areas of soils and rock. Those higher level aquifers associated with the drainageways of Grosse Ile are capable of absorbing and storing water from precipitation, overland flow, flooding, and stream flow. Aquifers may either absorb water or release water to adjacent drainageways depending on relative water levels. Aquifers supply water for wetlands and riparian vegetation. They tend to be vulnerable to contamination. Important functions performed by riparian aquifers include:

- water quality

- sub-irrigation for riparian vegetation
- water storage
- maintaining a regulated level of stream flow

Woodlands: Grosse Ile Township trees and woodlands contribute substantially to the economic and psychological well being of township residents. The abundant woodlands and trees help create the peaceful, rural atmosphere that makes Grosse Ile a very special place to live. Trees provide a visual barrier between individual properties and neighboring properties, an essential factor for preserving the rural atmosphere and property values.

Woodlands provide the following community benefits:

- **Influence on micro-climate:** Woodlands play an important role in moderating ground-level temperatures. The tree canopy buffers the ground surface from the sun's heat and wind. Trees also help to moderate temperature extremes during winter months.
- **Reduction in air pollution:** Woodlands absorb carbon dioxide and return oxygen to the air. Tree leaves filter pollutants from the air, removing ozone, chlorine, hydrogen fluoride, sulfur dioxide, and other pollutants. Trees serve as a noise buffer as well.
- **Reduction in soil erosion:** Woodlands and other vegetation stabilize soils and help prevent soil erosion. The vegetation absorbs the energy of falling rain, and the web of roots help hold soil particles in place. Tree leaves reduce the impact of raindrops on the soil surface and give soil a chance to absorb water. Fallen leaves minimize the loss of soil moisture, help prevent erosion, and enrich the soil to support later plant growth. Wooded wetlands provide the additional benefit of trapping and holding stormwater runoff. Dense vegetation can help slow flood surges and flows.
- **Wildlife habitat:** Woodlands provide essential shelter and food for raccoon, rabbits, pheasants, and other birds and animals. The opportunity to observe wildlife in a natural setting has educational benefits for island residents.

Woodlands of Special Significance:

- **Climax Hardwood Forests:** Grosse Ile Township woodlands can be classified into two categories: (1) climax forest hardwoods which can reproduce themselves, and (2) early second growth vegetation, including hawthorn thickets. Climax hardwood forests are dominated by white oak, shagbark hickory, sugar maple, and green ash. Major climax hardwood forest areas have been identified by township resident Bruce Jones with advice and assistance from several forestry experts. Because many woodlands have already been destroyed, the proper management of the remaining stands is of great importance for the island.
- **Heritage and Champion Trees:** A heritage tree is a tree with high value because of its species, size, age, vigor, location, or historical significance. Although a number of

large heritage trees are present on Grosse Ile, the location of these important trees, for the most part, has not been mapped.

- **Round Island and Vicinity:** The most unique and important woodland site on Grosse Ile is Round Island, a forested wetland. The forest on Round Island is old growth, making it much more unique than many other woodlands on the Island. Red oak, burr oak, and white oak are the dominant species. The mature mesic (wet) oak forest is one of five uncut stands remaining in Michigan. The site is believed to be the last old growth oak forest remaining on the Lake Erie plain and the big trees are the largest in any tract in Monroe and Wayne Counties south of Dearborn. Because of the trees' great height, they may act as a beneficial buffer from storm winds off Lake Erie (June 1983 letter from K. Hosford, Michigan Department of Natural Resources).

  This tract probably represents the last example of presettlement forest on the Lake Erie Plain as described by French explorers. Its value as an historic natural area is comparable to that of Hartwick Pines. (Additional Information is provided by the Site Ecological Summary prepared by K. Chapman, Michigan Department of Natural Resources, June 1983).

  Round Island is approximately 13 acres in size. Because of its small size and location, it is vulnerable to the effects of high winds and storms. Protection of the entire tract and adjacent woodlands to the west will be essential in the future for protecting the 7-8 acre oak forest located in the heart of Round Island.

  Round Island is owned by the Ford Yacht Club, which has held the tract for many years without proposing development or alterations. The Yacht Club has placed Round Island on the Natural Features Registry of the Michigan Nature Conservancy. This is a voluntary registry without any agreements or legal obligations.

Drainageway Vegetation: Vegetation located along drainageways and wetlands is organized into corridors of varying lengths and widths. These corridors are valuable because they provide irrigation routes for animals and plants (as seeds carried by animals, wind, or water). Significant portions of the land surrounding Grosse Ile's drainageways have been developed and only a fraction of the natural vegetation and wildlife habitat remain. Those pieces of drainageway corridor which remain between development are isolated patches rather than parts of a larger landscape.

Wooded Rights-of-Way: Woodlands along roadways contribute to a natural/rural atmosphere in a number of ways. The impact of vegetation on the person within the public right-of-way will be greater because of the close proximity. A greater mass of vegetation will be within the forward view of the person within the public right-of-way. Other features outside of the public right-of-way, such as buildings, will have a less dominant impact on the streetscape because they fall behind the vegetative foreground. Taller trees provide a sense of enclosure, providing a very defined public space bounded by vegetation.

Habitat: Fish and wildlife habitat are areas that provide food, cover, and corridors for movement. For example, the wetlands on Grosse Ile are essential as habitat and as a food source for the abundant fishery of the Detroit River. As the wetland vegetation dies back each season, it breaks down into particles called detritus, which is eaten by insects as well

as birds and small mammals. Insects, in turn, are eaten by the fish. The shallow, sheltered wetlands connected with the Detroit River also provide protected spawning and nursery areas for fish.

It is important to provide areas of sufficient size to be useful to wildlife through either protection of existing habitat or creating new habitat. Reasonably continuous corridors must be provided for adequate movement of wildlife and plant seeds between isolated areas. Open space and greenway projects should preserve or enhance fish and wildlife habitat.

Wildlife Sanctuary: The Grosse Ile Township Garden Club is responsible for the management of the woodlands tract located just to the northeast of Horsemill and Thorofare Roads. The site is owned by Grosse Ile Township. Because of its location near the Thorofare Canal, the sanctuary is particularly important as wildlife habitat.

Natural Features: The Michigan Natural Features Inventory is maintained by the Michigan Department of Natural Resources as a service to citizens and local officials. Plants and animals which are (or are potentially) threatened or endangered are listed on the inventories. To avoid curiosity seekers, only the general locations of the features is mapped. The inventory is not a definitive statement about the presence, absence or condition of environmental features, since many of the sites listed have not been completely surveyed. Unfortunately, some features presented in the past may have already been destroyed by human factors and development. If developments are proposed on or near these areas the presence and importance of the plant or animal should be reviewed. For extremely rare or endangered species, a permit may be needed from the Michigan Department of Natural Resources.

Threatened and endangered species may have special value when located in a protected area or woodland. It may be the presence of woodlands which has protected the species and provided habitat.

Natural Features Management

This plan consistently emphasizes the importance of the natural resource base. The correlation of land use density in the future land use plan to natural resource capability will help promote preservation of natural amenities.

The master plan must address both the quality and the quantity of land use within the township. Protection of township resources requires the adoption of policies directed toward the specific resource issue including drainage, and groundwater quality, natural topography, and vegetation. Resource protection regulations can be incorporated in subdivision, zoning, and other special purpose regulations.

R-1-E Overlay Zoning District: The interrelation of the environmental component of the master plan with the land use component is most visible with the establishment of land use categories. Within areas identified as having significant and fragile natural resources, lower impact/density development is recommended.

Certain portions of the township are characterized by significant natural features such as woodlands, critical stream corridors, large wetland complexes, and extensive animal life

habitat. These, in combination with other factors such as existing land use patterns and transportation, dictate areas of lower development density and population.

The impact to these areas can be minimized through the R-1-E Overlay Zoning District, which limits the intensity of development and population, minimizing the disruption to these critical natural areas.

Natural Feature Setback: The township has enacted general zoning standards for setbacks from rivers, streams, canals, drains, and wetlands, which apply to all zoning districts. There is a strong basis for this type of requirement. Development surrounding water features, particularly streams and wetlands, affects the function of the water feature. Development immediately adjacent to a water feature may have the effect of increasing the disturbance to this natural ecosystem and reducing the water feature's ability to perform its natural function.

For example, wetlands are dependent on an interaction between the wetland and the surrounding upland. In terms of hydrology, water enters a wetland from the surrounding upland area in a number of ways - overland flow, through the upper layers of the soil and through groundwater. The upland soil and vegetation surrounding the wetland affect the amount, the means and the rate at which water enters the wetland following a storm or snow melt. Development of the surrounding upland will alter the relative balance between the overland (surface) flow and infiltration, resulting in a greater peak discharge to the wetland. In other instances, physical improvements such as structures, roads and storm sewer systems can intercept surface flow to the wetlands. These alterations to hydrology can result in much greater fluctuations in water levels between wet and dry seasons. The undisturbed soil between the site improvements and the wetlands acts as a buffer to maintain the natural upland/wetland interaction that existed prior to development.

In addition to the hydrologic function, waterways are natural open space corridors that serve as animal life habitat. Animals move along remaining undeveloped natural corridors, such as the drainage ways that cross the township. Development immediately adjacent to these natural features has a detrimental impact on animal life habitat by moving structures and disturbance further into natural corridors and increasing constriction of development on these habitats. Protection of areas that line natural features is important to animal life because this is the interface between the aquatic and terrestrial (upland) ecosystems. This interface is important to animals such as land mammals that need water or birds which perch on trees to hunt for fish.

Storm Water Management: Increased development activity places additional burden on existing natural drainage systems. The overtaxing of drainage systems leads to localized flooding, environmental damage and costly storm drainage improvements to be borne by taxpayers. Traditionally, drainage problems on Grosse Ile have been managed by installation and improvements to stormwater drainage systems. Another way to manage storm water is through preservation of natural drainage ways and providing onsite storm water detention with controlled discharge. Through these approaches, the impact of development on drainage systems can be minimized.

A comprehensive approach to storm water management should encourage the preservation of existing natural features that perform storm water management functions, minimization of impervious surface, direction of storm water discharge to open grassed

areas and careful design of erosion control mechanisms. Deep detention ponds with steep side slopes that require security fencing should not be permitted. These ponds have an unnatural appearance, do not blend into the landscape and are not consistent with the desired character of the township. Instead, wet ponds and storm water marsh systems should be used for detention. These should be landscaped with plantings adapted to hydric conditions to create a system that emulates the functions of natural wetlands and drainage ways both in terms of hydrology and natural habitat. These types of measures will be much more effective in pre-treatment of stormwater before it is discharged to the Detroit River.

Restoration of Wetlands: Prior to current wetland legislation and Grosse Ile Township's Wetland and Drainageways Protection Ordinance, many wetlands were filled, drained and/or otherwise altered for development or agricultural activity. Drains and agricultural tiles may have been installed to drain surface water from wetlands so the land could be farmed.

The location of these altered wetlands can be identified through analysis of soil conditions. Although the hydrology of the site has been altered, the native soils will still exhibit coloration and textures associated with hydric conditions. Also, the Michigan Department of Natural Resources has mapped pre-settlement land cover (vegetation) based on historic survey records. Maps are available for Grosse Ile Township that show the historic natural land cover.

Where development is proposed, wetlands can be restored as part of the drainage and open space design of the development. Hydrologic restoration may involve the removal of fill material and slowing discharge to man-made drainage ways. Restoration may also involve covering the soil surface with peat and re-establishing hydrophytes (wetland vegetation). Where damaged or filled wetlands exist within a proposed subdivision, a condition of approval may be the restoration of the natural system as part of the stormwater system for the development.

Boat Docking Regulations: Waterfront development in Grosse Ile Township places demands on the township waterways for boating and boat docking. Increased boat usage on the various channels can contribute to a number of problems, particularly from powerboats. The township currently regulates boat usage to help prevent problems associated with:

- Shore erosion
- Damage to river bottom and stirring-up sediment
- Oil and gas spills
- Noise
- Conflicts and safety problems between users (power boats, sail boats, personal water crafts, canoes and swimmers)

As the township continues to grow, problems associated with waterway overcrowding could worsen. Impacts to the safety and quality of the township's waterways are intensified by recreational use. Policies on water access and usage need to balance the rights of riparian owners with the right of the general public to have access to public

waters and with the need to protect the quality of the state's natural resources. The township should continue to carefully regulate development and usage of the waterfront through the waterfront regulations of the zoning ordinance.

Preservation of Natural Topography and Vegetation: The land use densities proposed by the land use plan will promote the preservation of existing vegetation and topography. Specific standards can be applied to subdivision plat regulations and site plan review to require preservation of tree cover, the provision of landscaping and buffer strips and the minimization of site grading.

Woodland Protection: The preservation of woodlands as part of any development is vital to maintaining the natural community character. Continued development threatens the existence of significant patches of woodland in the township. Woodlands are protected through the Woodlands Protection Ordinance. This ordinance requires that existing woodlands be inventoried during the site plan review process. Developers should be required to make every effort to preserve significant wooded areas, and these areas should be protected during construction. Site inspections and other methods of enforcement from the township are necessary to ensure compliance with regulations and appropriate implementation. Significant woodlands need to continue to be protected including:

- Forested areas that create significant woodlands.
- Linkage strips where rows of trees create linear corridors and buffers between uses.
- Trees along roads, which help preserve the community character.
- Significant individual landmark trees.

Purchase of Open Space: The township has been aggressive in its attempts to preserve open space primarily through efforts to purchase the land under the open space program. This has been possible through a millage passed for the last several years by township residents. This program has been very successful and is used as a model elsewhere in the state. Grosse Ile Township should continue this program, which is one of the most effective means of preserving the natural features of the island.

Transportation Plan

Many of the transportation issues in Grosse Ile Township are unique due to the township's location on a series of islands in the Detroit River. Access to the island is limited by the two bridges: the Grosse Ile Parkway Bridge, which is owned by Wayne County and the Toll Bridge, which is privately-owned. This creates a limiting factor to growth on the island due to the limited capacity of the bridges to carry traffic on a daily basis but also the ability to evacuate the island if required due to an industrial, natural, or other disaster.

As a waterfront community, there are also unique issues related to transportation by watercraft. There are a number of navigable canals that run between the islands and make up the township that are used extensively by boaters. The township also contains a number of marinas and boat clubs that serve boaters that live both on and off the island.

The township also contains the Grosse Ile Municipal Airport, which provides facilities for general aviation.

These diverse modes of transportation all need to be planned for within the context of the overall community. Transportation facilities need to be considered in relation to traffic volumes and roadway congestion, safety, non-motorized transportation, land use relationship and intensities, impact on community character, environmental impacts, air quality, noise and fiscal constraints.

When addressing transportation issues, it is important to understand the characteristics of travel. Grosse Ile Township is predominantly a rural residential community. Therefore, much of the traffic in the township will be generated during the peak hours when residents are leaving for and returning from work. Because the township is predominantly residential, a majority of the trips generated by local residents for employment will be to destinations outside of the township.

A key goal of this master plan has been the preservation of the township's natural environment. Natural features such as the waterways not only present constraints to roadway construction, but are also major elements in defining the special context of the transportation network. In addition, other natural features such as woodlands contribute to the natural community character of Grosse Ile. In order to preserve the community character, future road improvements should balance traffic needs with consideration of natural features. Excessive road width leads to increased traffic speeds and a more suburbanized appearance. With a desire to preserve the rural character, natural features, and tree lined roads, creative transportation planning techniques may need to be implemented to meet demands on the road system.

Traffic Volumes

Traffic volume data is measured by average daily traffic counts (ADT), which is an estimate of typical daily traffic on a road. Information for the township's ADT was collected from 1998-2001 to help understand the current traffic patterns of the community. These traffic counts can be found on the Transportation System Map. All of the major roadways throughout the township are within road capacity. In order for a two-lane road to provide a level of service A, which describes roads with very low delays,

ADT should be under 9,500. All of the roads within the township are well beneath this figure with the exception of the Grosse Ile Parkway Bridge, which has over 17,000 ADT. During peak hours, this bridge will operate at a level of service F, which describes roadways with average delays of over one minute per vehicle, which is considered unacceptable to most drivers.

Bridge Traffic

Capacity: The hourly capacity of the two bridges is 1,500 vehicles each (total of both directions). The peak hour peak direction capacity will be a percentage of this based upon the direction distribution of traffic and bridge conditions. For Grosse Ile Township, the peak direction will be off the island during the AM peak hour and onto the island during the PM peak hour. The capacity of the bridge is further reduced by bridge openings. The bridge opens twice an hour, at quarter to and quarter after each hour for recreational boats and on demand for commercial crafts. The bridge openings are controlled by the Coast Guard.

- The peak hour directional split for the County Bridge is 67% peak direction and 33% opposite direction. This results in an 840-vehicle peak hour capacity in the peak direction, after factoring in a reduction of 16% to account for bridge openings. Based upon traffic counts taken in 2002 the current directional volume during the AM peak hour is 904 vehicles. Based upon a projection of these volumes, the projected peak hour, peak direction volume on the County Bridge will be 1,117 vehicles at build-out. The projected traffic volumes will exceed the 840 vehicles per hour in the peak direction capacity of the bridge by 33% once the township is built-out.

- The peak hour directional split for the Grosse Ile Bridge Co. Toll Bridge is 80% peak direction and 20% opposite direction. Assuming an average ten second delay per vehicle to collect tolls, this results in a 576-vehicle peak hour capacity in the peak direction. The directional split for the peak direction in the peak hour for the Toll Bridge is greater than the County Bridge because the on-island traffic on the Toll Bridge in the AM makes up a much smaller percentage of the total bridge traffic. Reducing this figure 16% to account for bridge openings, provides a 484-vehicle peak hour capacity in the peak direction. Based upon traffic counts taken in 2000, the current directional volume during the AM peak hour is 438 vehicles, which is 90% of the bridge peak direction capacity.

Because the County Bridge is operating at or above capacity, this will limit the amount of additional development that can occur on the island without creating serious congestion problems on the bridge. Not only does additional development lead to traffic delays, but also poses issues of public safety, such as the increase of accidents and impacts the overall quality of life for residents by leading to increases in noise and air pollution by overcrowding an already busy road.

Intersection Capacity: The ability of the bridges to carry traffic efficiently to and from the island will be largely dependant upon the operations and capacity at the intersections on either end of the bridges. Peak-hour intersection capacity analyses were completed for the intersections of Bridge/Jefferson, Bridge/Meridian, Grosse Ile/Jefferson, and Grosse Ile/Meridian. These analyses were based upon current lane configurations, traffic control (signalized or stop sign), and recent traffic counts.

The results of those analyses indicate that the four intersections are operating within acceptable levels during peak hours with the exception of a couple of specific movements at two of the intersections. The westbound left-turn at the unsignalized Bridge/Jefferson intersection is experiencing some afternoon peak hour delays (level of service (LoS) E on an A to F alpha scale) although the volume is very small. The eastbound through/left lane at the Grosse Ile/Meridian intersection is also experiencing significant delays during the afternoon peak hour (also LoS E).

Toll Booth: When looking at the capacity for the toll bridge, it is important to consider not only the bridge capacity but also the physical condition of the infrastructure at the end of the bridge, which tends to lead to traffic back-ups. The additional time it takes to pass through the toll booth on the Toll Bridge should also be incorporated into travel time. There are plans to relocate the toll booth from the center of the bridge to the "mainland" in Riverview. There is sufficient land area between the bridge and Jefferson Avenue to provide for queued vehicles at the toll booth.

However, any potential queue or delay issues could be addressed through various toll operations. All tolls are currently taken directly by an attendant (cash or token). One of several additional operations that could expedite the process would be card/code reader equipment with payment coming either prior to or after use as a pre-paid card or a card that is billed to the card holder. There are likely several other toll-taking improvements that could also help the service rate at this facility.

Evacuation of Island: With the heavy industrial uses along the Detroit River there is the potential for accidental chemical releases to the air, which with the prevailing winds, could cause an immediate health threat to island residents. This situation was experienced in 2001 when a chemical gas release from a chemical company in Riverview required the evacuation of the northern half of the island. Because of the threat of industrial, natural, or other disaster, the bridges need to have the ability to swiftly evacuate the residents of the community. This factor needs to be taken into account when planning for the full population build-out of the island.

The capacity of a typical roadway lane is based upon many factors – width, number of driveways, roadway grades, travel speed, and so on. For facilities such as these two bridge crossings where there is no "side friction" (i.e. driveways), a lane could potentially carry as much as 1,200-1,400 vehicles in an hour. If both lanes (eastbound and westbound) were to be used as westbound lanes, the bridge capacities could potentially be in the 2,400-2,800 vehicles per hour range. In the case of an emergency, vehicular access would take priority and the bridge openings would be adjusted to allow for the rapid evacuation of island residents in automobiles.

Unfortunately, the capacity of the bridge crossings will be far more predicated upon the operations and capacity at either end of the roadway section. In other words, for these crossings to process anywhere near the above volumes, the intersections at either end would need to provide free-flow conditions. That would require good emergency services control of the intersections, especially at the Jefferson Avenue side to ensure that there is a free-flow of traffic into Jefferson Avenue.

Relationship Between Transportation and Land Use

A well-developed master plan must consider plans for land use in the context of transportation planning. Future traffic patterns within the road network will be closely related to specific land use. The intensity of land uses should, in part, be considered in relationship to the suitability of the transportation system. Future traffic volumes will be dependent upon the amount, type and intensity of development. Table 16 provides the estimated traffic generated by various land uses. The figures represent averages and are given for the peak hour and a typical weekday. The peak hour represents the hour during the AM or PM where traffic is greatest (i.e. rush hour); typically from 7-8 AM and 5-6 PM. The fractional numbers represent an average (e.g. .75 of single family homes will have someone leaving during the AM peak hour).

Table 16
Traffic Volumes
Comparison of Trip Generation Rates

	Trips In Peak Hour	Trips In Weekday
Residential (per unit)		
Single Family	0.75 (AM)	9.57
Apartment	0.51 (AM)	6.63
Condominium	0.44 (AM)	5.86
Office (per 1,000 sq. ft. gross floor area)		
General Office Building	1.56 (AM)	11.01
Medical Office Building	2.43 (AM)	36.13
Commercial (per 1,000 sq. ft. gross floor area)		
Shopping Center	3.74 (PM)	42.92
Supermarket	11.51 (PM)	111.51
Quality Sit-down Restaurant	7.49 (PM)	89.95
Service Station (per pump)	14.56 (PM)	168.56
Convenience Store	53.73 (PM)	737.99
Drive-in Bank	54.77 (PM)	265.21
Industrial (per 1,000 sq. ft. gross floor area)		
Light Industrial	0.92 (AM)	6.97

Note: A trip is a one-way movement, 10 trips = 5 in, 5 out
Source: Institute of Transportation Engineers, Trip Generation Manual, 6th Ed.

Functional Classification

Management of the roadway system in Grosse Ile Township can be improved through the establishment of a classification of roads and planning and designing these facilities for their specific purpose. A functional system or hierarchy of roads provides for movement of traffic as well as access to specific sites. This hierarchy will range from major arterials, which primarily provides for travel to areas outside of the township, to local subdivision streets, which serve to access individual homes. The roadway system in Grosse Ile Township consists of four different road classifications which are depicted on Map 7 and described briefly below.

- **Arterials:** Arterials provide access to important traffic generators, such as airports and shopping centers and to areas outside of the township. The primary function of

these roads is to move large volumes of traffic, therefore, access to these roads must be properly managed in order to maintain safe and effective movement. Arterials in the township consist of Meridian Road, Grosse Ile Parkway and Bridge Road both west of Meridian.

- **Collectors:** The collectors serve to gather traffic from local roads and subdivision streets of residential neighborhoods and deliver it to arterial roads. Collectors also serve to provide access to abutting properties. Collectors designated by Wayne County include Groh Road, Bridge Road, East River Road and West River Road.

- **Local Collectors:** In addition to the above collectors designated by Wayne County, there are also a few local streets that function as collectors. These include Macomb Street, Ferry Road, Church Road and Parke Lane.

- **Local Streets:** Local streets serve primarily to provide access to individual property and homes. These roadways are generally short, and provide connection to collector streets. Examples of local streets include Bellevue Road, Manchester Boulevard and Thoroughfare Road.

Roadway Improvements

One challenge for the township is to manage growth and road improvements to provide a safe and efficient roadway system without compromising the natural features that give the township its character. Over time, traffic levels will increase creating capacity deficiencies. While the need for roadway improvements will be limited, maintaining the capacity of the network through transportation management is preferable to roadway widenings. Transportation management practices described later in this chapter, such as access management, can be used to maintain the efficiency of the transportation network and minimize the need for roadway widenings. The approach of managing the system combined with targeted improvements limits costs and minimizes impacts to the community character. Existing road conditions are shown on Map 8.

- Throughout the township, roads are expected to remain two lanes, with turn lanes added at key locations, such as intersections, to improve efficiency and safety. In order to preserve the natural character of Grosse Ile Township, any future road widening to add additional lanes should balance traffic needs with consideration of natural features. Any road widening can lead to a more suburbanized appearance. Periodic congestion may be preferred over additional lanes to accommodate traffic during peak hours.

- There are a number of roads within the township that do not meet current standards for lane width. Some older roads do not have sufficient width to accommodate traffic safely. When these roads are reconstructed, they will need to be widened to provide sufficient lane width. In some instances there may be insufficient right-of-way. In these areas additional right-of-way will need to be acquired for roadway improvements.

- Selected intersection improvements should be made at locations that have irregular geometrics, sight distance problems or poor level of service. Improvements can include turn lanes, sight distance improvements, pavement improvements, signalization or roundabouts.

- Because Grosse Ile Parkway is the primary entrance to the community and Meridian Road is the main north-south arterial, the intersection of these two roads is a critical intersection from both a traffic flow and community image standpoint. This intersection is currently signalized, but as traffic levels increase other improvements may be needed at this key intersection. The poor afternoon peak hour conditions for eastbound traffic at the Grosse Ile Parkway and Meridian intersection was noted earlier. One potential solution to revising the operations and/or geometrics at that location would be to reconstruct the intersection as a modern roundabout. Significant gains have been documented relative to crash rates (safety) and efficiency (capacity) when replacing a standard intersection with a roundabout.

  Roundabouts are becoming more widely used for the primary purpose of improving safety and operations at intersections. With conventional types of traffic controls, only alternating streams of vehicles are permitted to proceed through the intersection at one time, causing a loss of capacity to occur when the intersection clears between phases. In contrast, the only restriction on entering a roundabout is the availability of gaps in the circulating flow. The slow speeds within the circle allow drivers to safely select a gap that is relatively small. By allowing vehicles to enter simultaneously from multiple approaches using short headways, a possible advantage in capacity can be achieved with a roundabout. This advantage becomes more predominant when the volumes of left or right turning-movements are relatively high. Roundabouts are not the answer at all locations but can prove very successful when properly reviewed and designed.

- The majority of major roadways in the township were reported in good or very good condition by Wayne County in 1999. West River Road, however, was reported in poor condition and has a substandard road width for a two lane road. This roadway has been programmed for resurfacing and widening between Groh and Parkway in the summer of 2002.

- There are a number of gravel roads within the township. The township should work towards paving these roads through establishment of special assessment districts.

- With all roadway improvements consideration will need to be given to the design of the roadway to ensure it fits into the context of the community. Selected major roadways within the township should include bike paths and informal landscaping.

Residential Roads

The typical pavement width for local residential streets within a subdivision is 27 feet, back to back of curb. This width allows for two travel lanes with parking on one side of the road. At limited locations where there are two cars parked across the street from one another there will be a single lane in the center of the road requiring two on-coming cars to slow down and yield for one another. While this helps to keep speeds low it should only be allowed on local residential streets where volumes are lowest.

With any new roadway development, roads should be required to tie into the existing road network. This maintains a system of interconnected streets, which maintains the efficiency of the overall road network. The use of cul-de-sacs and other dead end streets should be discouraged except in areas where natural features such as wetlands or existing adjacent development patterns precludes through streets. With a connected street system, motorists are provided with multiple routes, which helps to reduce driving distances and diffuse traffic. Providing road connections between adjacent subdivisions allows for the movement between neighborhoods without the need to access major roads. It also provides alternative means for residents within the subdivisions to access the major road network at locations that are most efficient for traveling to their destination, shortening trips and thereby minimizing traffic impacts to the major road network. Connected streets also provide continuous routes that enhance non-motorized transportation. With connected streets, special consideration needs to be given to network design to discourage use by through traffic that does not have an origin or destination within the local neighborhood.

Traffic Calming

In neighborhoods where there are concerns with cut-through traffic and vehicle speeds, traffic calming techniques can be implemented to keep traffic speeds down and increase safety for pedestrians. Traffic calming is the combination of mainly physical measures that reduce the negative effects of motor vehicle use, alter driver behavior and improve conditions for non-motorized street users. Traffic calming measures are regulatory features and/or design of a street that causes drivers to slowdown and be more attentive. The intent is to reduce crashes, air pollution, congestion levels and noise pollution, and generally improve the environment of the street. Any traffic calming designs need to be coordinated with the Fire Department to ensure that emergency response times are not impacted. Some of the most common traffic calming devices are as follows:

- **Street Narrowing, Slow Points, or Chokers:** Features that narrow the street to a minimum safe width including curb modifications, channelization, and landscaping.

- **Angle Points or Chicanes:** Curbed horizontal deflections in the path of vehicle travel that are built along the edge of travel-way similar to street narrowing treatments.

- **Median Slow Points or Channelization:** Include center located islands that divide the opposing travel lanes at intersections or at mid-blocks, pedestrian refuge treatments and the other standard forms of intersection traffic control islands.

- **Intersection Diverters:** Features that partially close an intersection to limit the allowable turning movements and divert traffic.

- **Roundabouts:** Raised, center rotary islands that are used as a replacement for traffic signals and stop signs at intersections.

- **Getaways or Perimeter Treatments:** Visual and physical treatments used to communicate a message to drivers entering a residential neighborhood such as traffic signs, intersection narrowing, medians and textured pavement surfaces such as brick and landscaping features.

Traffic Impact Analysis

Increases in traffic may over time begin to place a strain on the local road system. One procedure to help ensure that traffic impacts are properly evaluated during the development process is to require a traffic impact study. A traffic impact study allows for the evaluation of a development's potential impact on the local road system and the identification of roadway improvements needed to mitigate the traffic impact, such as adding additional turn lanes or re-timing a traffic signal. Traffic impact studies would only be required for uses that have the potential to generate a large volume of additional traffic, such as restaurants and automobile service stations.

Access Management

Control of the location and spacing of driveways or access points along the main roads within the township will improve safety and help preserve the roadway's ability to carry traffic. Access management guidelines have two functions, to protect the public investment in the roadway by minimizing congestion and crash potential and to provide property owners with reasonable access to property. The goal of access management is to provide standards that will facilitate traffic operations and improve public safety along major roads. Access management looks at the following factors:

- **Number of Access Points:** Because the number of driveways allowed along major roads will affect traffic flow, ease of driving, and crash potential, the number of driveways on a major road should be limited. Alternative access should be provided from side streets wherever possible.

- **Sight Distance:** Proper sight distance needs to be provided at driveways and intersections to ensure a vehicle can safely enter or exit the traffic stream.

- **Driveway Spacing:** Driveways need to be adequately spaced from intersections and other driveways to assist in the reduction of turning movement conflicts.

Natural Beauty Roads

The Natural Beauty Road Act (Part 357, Natural Beauty Roads, of the Natural Resources and Environmental Protection Act, P.A. 451 of 1994, as amended) empowers the county to dedicate county roads as Michigan Natural Beauty Roads. The goal of the Natural Beauty Roads program is to identify and preserve in a natural, essentially undisturbed condition, certain county roads having unusual or outstanding natural beauty by virtue of native vegetation or other natural features within or associated with the right-of-way, for the use and enjoyment of local residents and the public in general. There are a number of roads within Grosse Ile that may qualify for this due to natural wooded conditions or scenic views of the Detroit River.

To initiate the process of designating a Natural Beauty Road, at least twenty-five residents must initiate a petition for designation of a road. Within six months after the petition is received, Wayne County will hold a public hearing to consider the described road as a natural beauty road. Within 30 days after the public hearing, the county announces its decision as to whether the road will be designated as a natural beauty road. The township should work with the county on designating roadways with pristine natural features as natural beauty roads.

Based upon the guidelines prepared by the Department of Natural Resources, the objectives of the Natural Beauty Roads program are:

- To officially recognize and designate roads in the county system which meet the natural beauty criteria.
- To keep these roadsides as they presently exist insofar as possible.
- To maintain and administer these roads so that they will continue to meet the criteria and at the same time provide safe public travel.
- To mark such roads for the information of the public.

This designation will assist in ensuring that the scenic quality of these roads is protected.

Non-Motorized Paths

Non-motorized pathways add to the overall quality of life for residents. Non-motorized pathways provide a variety of benefits for township residents including:

- Providing multi-modal access throughout the community to key destinations including neighborhoods, commercial areas, civic uses, parks and open space
- Providing a source of recreation for residents that bike, jog, walk, and other activities for recreation and exercise.
- Increased social interaction between residents leading to an improved sense of community

There are a number of user groups for the pathway system including pedestrians, bicyclists, recreational/health walkers and joggers, rollerbladers and persons with disabilities. The pathway system should be designed to accommodate all of these users.

The township has developed some key pathways along Meridian and Groh Roads. The plan is to extend the path system the entire north-south length of the township and to provide east-west connections across the township at key locations. The master plan for the bike path system is shown on Map 9. The pathways system will ultimately provide connections between homes and neighborhood schools, recreation, Macomb Street and other activity centers.

When a specific segment of the pathway is being designed, the following major considerations for planning the specific pathway alignment need to be considered:

- Availability of right-of-way.
- A design that produces a minimum impact on the land and nearby landowners.
- A design that minimizes the amount of tree removal and drainageway impact along the road.
- Minimizing impact on adjacent wildlife habitat and wetlands.
- An alignment that is visually pleasing and provides a variety of views and experiences and takes advantage of the natural terrain and vegetation.

A pathway should be designed with curves that appear to have a purpose, not be placed haphazardly or regularly throughout the pathway length. An alignment which has long curves and short tangents will flow gracefully through the landscape. Environmentally sensitive areas require a careful balance between the need for the pathway and the

protection of natural resources. Occasional viewing, and seating areas can be provided along the path for resting and passive recreation activities.

Residential neighborhoods require a design that is sensitive to the community character. Nearby residents should be closely involved in the design process. Consider carefully the character of the public/private interface.

The design of pathways will need to meet standards for American Association of State Highway Transportation Officials (AASHTO). In addition, because Transportation Enhancement Grants are being used for a portion of the pathway construction, pathways will need to meet the design standards of the Michigan Department of Transportation (MDOT).

The township standards for non-motorized pathways require a width of 8 feet. Current MDOT standards require pathways to be 10 feet wide along major roadways. The widths will vary in each case depending on the width of right-of-way, natural features, drainage ditches, and other constraints. They will be constructed of 2-inch thick bituminous paving material on a 3½-inch compacted aggregate base. A minimum 2-foot wide graded area, clear from obstructions, should be maintained on both sides of the pavement. The vertical clearance to obstructions should be a minimum of 8 feet.

To provide adequate drainage, while maintaining ease of maneuverability, the path pavement super elevation should be between 2 and 5 percent. Likewise, path grades should not exceed 5 percent. Where terrain dictates, grades over 5 percent are acceptable for distances of under 500 feet.

Bicycle lanes should also be developed along East and West River Roads. These additions should be incorporated into future improvements along the corridors. These lanes will provide a safe venue for bicyclists on the pavement by offering a separate lane devoted specifically to bicycle use that is out of the stream of automobile traffic. The bicycle lanes should be a minimum of 4 feet wide.

In addition to the bike path system, there is also a sidewalk system along Macomb Street with connections planned to the adjoining residential areas. This sidewalk system contributes to the pedestrian-friendly environment desired in the Macomb Street area. There are also a few other subdivisions within the township that include sidewalks. The township subdivision ordinance now requires that all new residential development provide sidewalks.

Waterways

As an island in the Detroit River, watercraft transportation is a major mode of transit for Grosse Ile. Boat usage in Grosse Ile Township is by and large for recreational purposes. There is a township marina at the Water's Edge County Club in addition to several other private boat clubs.

Grosse Ile is bordered by the Detroit River to the east and the Trenton Channel to the west. In addition, there are a number of navigable waterways within the interior of the township. The Thorofare Canal is the main internal waterway, which traverses much of the central portion of the township. In addition, there are several waterways between the smaller islands at the southern portion of the township. These waterways are used

primarily for boat docking and access to the Detroit River by residents. Maintaining these waterways so they are open for navigation is a key concern. Construction of boat docking structures needs to be reviewed to ensure that they will not constitute an obstruction to the navigable channel.

Airport

The Grosse Ile Municipal Airport is managed under the direction of the Airport Commission, appointed by the Township Board. The airport is a former naval air base, which was transferred from the U.S. government to the Township of Grosse Ile on December 3rd 1970 via a quit claims deed. The airport serves private aviation users. A separate airport layout plan was adopted for the airport in 1997. The plan is a graphic presentation of existing and proposed airport facilities, and the pertinent clearance and dimensional information required to show conformance with applicable standards.

The airport has two runways, nine taxiways, three commercial hangers and 65 T-Hangers. Runway 4/22 is a non-precision instrument runway and is 4978 feet long and 100 feet wide. Runway 17/35 is a visual runway and is 3750 feet long and 75 feet wide. In 1994 there were a total of 63,700 annual operations with 350 operations on the busiest day. Total annual operations are projected to increase to 81,500 in 2015. The majority of aircraft are single engine propeller with a seating capacity of nine or fewer.

Map 10 illustrates the airport approach plan for the runways what establishes horizontal and angled slopes surrounding the airport. Structures or objects above these surfaces, such as towers or tall trees, constitute a hazard to aviation. There is a primary surface immediately surrounding each runway, and the angled approach surface for each runway approach. The slope of the approach varies between 20:1 and 34:1 depending on the classification of the runway. Surrounding the airport for 5000 feet is a horizontal surface 150 feet above the established airport elevation. Between the primary surface and the horizontal surface there is a transitional zone with a slope of 7:1. Surrounding the horizontal surface is a conical surface that extends upward in all directions at a slope of 20:1 extending between 150 feet and 200 feet above the established airport elevation.

Community Facilities, Recreation and Utilities Plan

To ensure the continuance of high quality community facilities and services, the township needs to adequately plan for future development patterns and ensure adequate public services for the entire community. Responsible planning of the community's land uses and residential densities requires an accurate assessment of community facilities. This process establishes whether the appropriate infrastructure is available to support the demands of new development.

Educational Facilities

It is important to provide adequate educational services to ensure quality education for existing and future students. Planning the future development of the township should involve an understanding of the need for educational services for residents of all ages.

The Grosse Ile School District serves approximately 86% of the children within the community, with the remaining portion of children attending private schools in other communities. The school district consists of two elementary schools, one middle school and one high school.

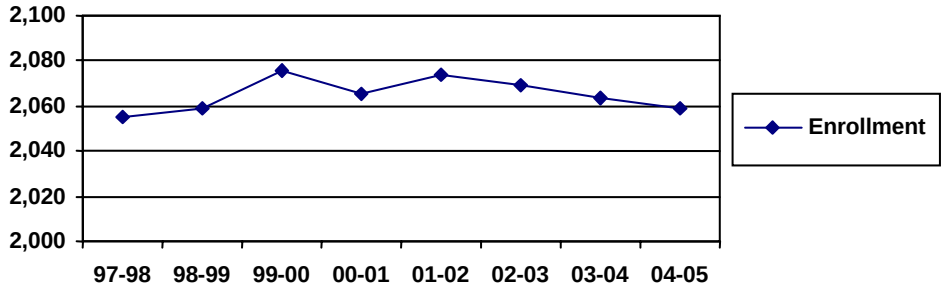
Table 17
School Enrollment

School	2000-01 School Year
Grosse Ile High School	691
Grosse Ile Middle School	512
Meridian Elementary School	434
Parke Lane Elementary School	428

Source: Michigan Department of Education

As illustrated below, school enrollment has remained fairly consistent during the past few years, but is expected to steadily decline in the future. The school district is anticipating losing five students per year during the next five years. This decrease in enrollment can be accounted for due to the aging population and the lack of young families who are raising children in the township.

Historic & Projected School Enrollment



Source: Grosse Ile School District

Table 18
Grosse Ile School District Projected Enrollment

	2000	2005
U.S. Census Number of Children Below Age 19	2,925 [a]	
Percent Children Enrolled	71% [d]	
Grosse Ile Schools Total Enrollment	2,065 [b]	2,059 [c]

Sources:
a. U.S. Census Bureau
b. Grosse Ile Schools Enrollment
c. Grosse Ile Schools Enrollment Projection
d. Based upon Census data and Grosse Ile Schools enrollment records

The recent build-out study which was completed for the township shows the impact future development will have on the school district, based upon the increase in number of households.

Table 19 summarizes the projected number of children based upon the build-out population and compares this with Grosse Ile Schools projections for enrollment. The number of children based upon the two methods used in this report are shown.

The two projection methods result in numbers that are both above and below Grosse Ile Township School's projected maximum enrollment. Projected enrollment based upon the average children per household predicts enrollment to be over 2,500 students at build-out. However, based on the current age structure and the aging population of the township a more accurate projection depicts slightly under 2,000 students at build-out, which is consistent with the school district's long-term projections

Table 19
Grosse Ile Schools Projected Enrollment and Build-out Projected Enrollment

		2005	Build-out
Grosse Ile Schools Projected Total Enrollment		2,059 [a]	- -
Average Children per Household Method	Children Below Age 19	- -	3,600
	Grosse Ile Schools Total Enrollment (71%)	- -	**2,556**
Cohort Component Method	Children Below Age 19	- -	2,745
	Grosse Ile Schools Total Enrollment (71%)	- -	**1,949**

Sources: a. Grosse Ile Schools Projected Enrollment

The school district has been very active in upgrading and remodeling existing school buildings to ensure high quality facilities that meet the needs of the community. During the past few years a variety of improvements have been made including renovations to

Meridian and Parke Lane Elementary Schools, the replacement of the school on East River and various improvements to the high school.

Police Protection

Police protection is provided to the township through the Grosse Ile Police Department. Providing a safe community is essential and residents within the township must be provided a safe environment and should be able to continue to rely on the existing level of service.

The police facility, located on Meridian Road in the center of the township, was built in 1991. Although no major renovations or expansions are necessary at this time, the building could benefit from minor remodeling and updating. The police department budget is primarily funded through a special millage and the general township fund.

The current staff of the police department consists of 25 employees, including detectives, sergeants and dispatchers. In addition to the on-going staff, a reserve police department which consists of volunteers aids the department in times of need and during special events. This reserve team works along side the police department, but cannot take the place of police officers and cannot make arrests.

The department responded to over 16,000 calls for service in 2000. In addition, the department was active in educating residents through its community policing program in areas such as traffic safety, crime prevention and child safety. The department was also involved in various programs such as the "Operation Chill" safe bicyclist and motorist campaign, "Click it or Ticket," and D.A.R.E.

Wayne County is the main law enforcement agency for the waterways surrounding the community. The township police department also has the ability to patrol the waterways, but due to a lack of equipment and manpower, the department tends to respond to emergency calls and carries out only seasonal patrols when necessary.

Fire Protection

The Grosse Ile Township Fire Department is a 24-hour volunteer department. Their responsibilities include fire fighting, fire prevention, code enforcement, emergency medical training as well as community education. The fire station, located on Meridian Road, services the township.

The fire department is also charged with enforcing fire code standards on existing buildings. When existing buildings that do not comply with existing fire codes are altered or expanded, a condition of the building permit needs to be that they will be brought up to the existing fire code standards.

The current staff of the fire department consists of 36 people, including the chief, administration, and volunteers. The volunteers have completed a variety of coursework in classes such as EMS, hazardous materials and trench rescue, and train year round, once a week.

There is concern that the department may have to change to a part-time, staff department within the next ten years, as the existing volunteers begin to retire. With the aging population and little new development, there is a shortage of able volunteers.

An important tool in determining the effectiveness and quality of fire protection services is the response time to calls. The response time throughout the township is roughly five to six minutes, measured from the time the call comes in to the time of arrival to the scene. During 2000, the department responded to over 500 calls.

Library Services

Grosse Ile has contracted with the City of Trenton for library services. The Veterans Memorial Library, a part of the Wayne-Oakland Library Federation, serves Trenton and Grosse Ile as well as the communities of Brownstown, Gibraltar and Woodhaven. Constructed in 1998, the 21,000sq. ft. building holds nearly 100,000 books and features internet access and a variety of programs and classes for residents.

Recreation

Grosse Ile Township has approximately 550 acres of public parkland and open space located throughout the community. Over half of this, 330 acres, have been purchased by the township for the purpose of conserving natural open space for passive recreational uses including hiking and nature study.

In addition to provided open space, a substantial opportunity for recreation exists at a variety of public and private facilities throughout the township. Home to 3 golf courses, 4 yacht/boat clubs, and surrounded by natural water bodies, recreational opportunities in Grosse Ile abound. Public recreational facilities include:

- **Centennial Farm and Woods:** This 32-acre property is home to the recreation department offices, playground, nature pond, animal shelter and the township equestrian center and is used for a variety of township events.

- **Water's Edge:** Located on 75 acres at the intersection of Bellevue and West River, this facility provides golfing, swimming and boating.

- **Macomb Street Observation Deck:** Located along the east shoreline at the foot of Macomb Street, the deck is used as a lookout point to enjoy the views of the waterfront.

- **Community Playscape:** Constructed in 1991, and the first public community playground in the township, the park is located on the south side of Macomb Street and contains a play structure and picnic area.

- **Commerce Park:** Located near the airport, Commerce Park consists of a mixture of uses, the northern portion of which contains soccer fields. Future

plans include the development of additional soccer fields, picnic pavilion and pathways.

- **Bird Sanctuary:** This 13-acre natural area, bordered by the Thorofare Canal and Horsemill Road, is being preserved as a bird and wildlife habitat with a walking trail.

A Parks and Recreation Master Plan was prepared in 2001 that provides information relative to the projected needs of the township as it relates to parks and recreation. The overall Parks and Recreation Master Plan focuses on parkland acreage and location of parks. The plan recommends the continuance of land acquisition by the township for new parkland in addition to natural open space.

Recreation programming is provided to residents by the Grosse Ile Recreation Department, whose mission is to provide leisure opportunities that contribute to the social, physical, educational, cultural and general well being of the community and its people. Headquartered at Centennial Farm, the department has been active in providing a wide variety of programs, athletic leagues, trips and special events for people of all ages.

Community Utilities

Municipal water and sanitary sewer services are essential components that contribute to the overall quality of life. The entire township is provided public water, public sanitary sewer and solid waste removal through the Grosse Ile Public Works Department. The condition and standing of these facilities is a key component in the managed and healthy growth of the township. Maps 11 and 12 depict the location of current sewer and water lines located throughout the township.

Sanitary Sewer: The growth of the sewer and water system has increased from a handful of customers to its current state, serving nearly 11,000 customers. The capacity of the wastewater treatment plant allows for treating roughly 10 million gallons of wastewater a day. The system was originally designed to support a population of 17,500 with an average flow of 100 gallons per day per person. With the 1,113 increase in population projected over the next 20 years this will result in a 1.7% increase in wastewater flow to the plant.

However, there are capacity problems with the wastewater treatment plant during wet weather when storm overflows result from stormwater infiltration into sanitary sewer lines. Leaks in older sewer lines and older manholes allow stormwater to infiltrate the system. In addition, there are numerous instances where storm drainage facilities and sump pumps have been connected to the sanitary sewer system. This stormwater infiltration creates surges in flow to the wastewater treatment plan that exceed the current capacity. To address this problem, the township is undertaking the following emergency corrections:

- A 6.5-million gallon storage retention basin is proposed to hold excess volumes following a storm event. This retention basin will have a capacity to hold the

amount of water flowing through the system following a 25-year storm event of 3.9 inches of precipitation during a 24-hour period. Following the storm event, the overflow water would be retained until it can be treated by the wastewater treatment plant at a controlled rate.

- A manhole rehabilitation program will be undertaken that will seal and waterproof existing manholes to ensure there is no additional infiltration of stormwater from this source.

- A cured in place lining program will be undertaken where liners are placed within older sewer lines that have leakage problems. This process is accomplished by inserting a felt/resin liner into the sewers creating a new pipe within the existing line after curing.

- Point repairs will be made to joints and certain problem sections. This will involve bursting the existing line and installing a new segment or joint.

- Replacement will be made to certain sewer lines. A total of 64 runs of pipe are proposed to be replaced.

Water: The water system currently is operating below capacity, it has enough capacity to serve the build-out population. The City of Detroit supplies water for the township through two main lines that are situated along the two bridges that connect the island to the mainland. There is a 24-inch line leading across the Grosse Ile Parkway Bridge and a 16-inch line leading across the Toll Bridge. The maximum capacity varies depending on pressure and velocity in the pipe, but exceeds the current average consumption of 1.2 million gallons per day. These lines are sufficient to serve the anticipated future needs of the township.

Maintenance of both of the systems has increased due to greater use and age. The township should plan to devote adequate funds to the ongoing maintenance that is required to help ensure that the systems continue to run smoothly.

Telecommunications/Electricity

The entire township is provided both telecommunication and electrical services. Substations for these services are located in Trenton. All homes and businesses have access to broadband internet access and can choose from a variety of servers. DTE Energy is the predominant supplier of electrical services for the community. While these services are consistently available, the north end of the township seems to experience a higher rate of brownouts than other areas.

As new development occurs, or as the need for maintenance or upgrading calls for, any new electrical lines should be buried underground. This allows for the lines to be out of sight and helps protect the natural viewsheds on the island by minimizing electrical poles and wires.

Township Hall

The township hall is located on Groh Road in historic hangar number 1 within the Grosse Ile Naval Air Station. The hall, which was dedicated in November, 2000, contains the administrative, treasurer and clerks offices, as well as assessor, planning and community development departments for the township.

Department of Public Works Garage and Yard

The Department of Public Works facility is located on the south side of Groh Road on airport property. The department serves to provide for the sewer, water and solid waste needs of the residents. The sewer and water systems have previously been discussed in this chapter.

The removal of solid waste began as a homeowner initiated operation that has progressed to year round, curbside pickup that includes a recycling program. Additionally, the department seasonally picks up yard waste to be taken to a compost facility where it will be decomposed and used for topsoil.

Airport Administration

The airport administration operates the Grosse Ile Municipal Airport, a former naval air base, which was transferred from the U.S. government to the Township on December 3rd 1970 via a quit claims deed. This is a general utility airport as a public benefit to local communities and the flying public by offering a facility for the use of small propeller aircraft. In addition, the administration is responsible for Commerce Air Park, which was donated to the township from the U.S. government as a revenue enhancement area. The airport operations are discussed in greater detail in the transportation chapter of this plan.

Implementation

This plan contains a number of strategies and recommendations that will work towards meeting the community's goals. These ideas, however, will remain as such without systematic and consistent implementation. The program outlined in this Chapter demonstrates methods which will turn this plan into reality.

There are a number of policies recommended in this plan that have already been incorporated into the recently completed zoning ordinance update. These completed ordinance amendments have not been listed in this chapter. This chapter specifically focuses on policies that have not yet been incorporated into the township ordinances. The recommendations summarize the recommendations contained throughout the plan.

Development Regulation

- Ensure nonconforming lots are developed to be consistent with the development pattern of the surrounding neighborhood.
- Ensure infill residential is consistent with the established character of existing residences in the surrounding neighborhood.
- Require consistent front yard setbacks in residential districts.
- Create a more unified building line along Macomb Street.
- Provide parking to the side and rear of buildings and screen view of parking lots along Macomb Street.
- Limit the amount of woodland clearing associated with development.
- Protect landmark trees, linkage strips and woodlands along road frontage.
- Require tree replacement where regulated woodlands are impacted.
- Evaluate the quality of a development site's existing natural habitat and prescribe ways to minimize impact resulting from development.
- Require new development to assess the impact of proposed development and evaluate alternative designs that will minimize impact.
- Require new development to control and maintain proper drainage to wetlands to ensure maintenance of natural wetland hydrology.
- Where detention ponds are necessary, require them to be shallow with gradual side slopes without fencing and be landscaped to create a natural appearance.

Township Initiatives

- Implement a tree-planting program to encourage residents to plant trees in front yards and along neighborhood streets.
- Develop pocket parks along Macomb Street for enjoyment of shoppers, residents and workers within the Macomb Street area.
- Support economic development of the Airport and Commerce Park.
- Ensure that roadway construction and drainage improvements minimize the amount of tree clearing.
- Provide pedestrian and bicycle linkages between residential areas and major recreation or civic destinations.
- Provide natural corridors of open space connecting many of the significant natural/open space, conservation and significant historical areas of the township.
- Improve upon recreation programs to meet the needs of township residents.

Transportation

- Ensure that roadways are well maintained and repaired/repaved when poor pavement conditions exist.
- Improve intersections that are operating at a poor level of service or where safety problems exist.
- Encourage the paving existing gravel roadways.
- Support neighborhood traffic calming techniques.