SUPERIOR CHARTER TOWNSHIP PLANNING COMMISSION
SUPERIOR TOWNSHIP HALL
3040 N. PROSPECT, SUPERIOR TOWNSHIP, MI 48198
AGENDA
FEBRUARY 28, 2024
7:00 p.m.

1. CALL TO ORDER

2. ROLL CALL

3. DETERMINATION OF QUORUM

4. ADOPTION OF AGENDA

5. APPROVAL OF MINUTES

   A. Approval of the January 24, 2024 Regular Meeting Minutes

6. CITIZEN PARTICIPATION

7. CORRESPONDENCE

   A. Dixboro Design Review Board 2024 Meeting Schedule

8. PUBLIC HEARINGS, DELIBERATIONS AND ACTIONS

   A. 2023 Comprehensive Master Plan Draft

9. REPORTS

   A. Ordinance Officer Report
   B. Building Department Report

10. OLD BUSINESS

    A. STPC 23-05 Brookwood Superior Area Plan Amendment
       Resolution Recommending Approval

11. NEW BUSINESS

    A. STPC 22-04 Kinsley Development Final Site Plan

12. POLICY DISCUSSION

13. ADJOURNMENT

Thomas Brennan III, Commission Secretary
3040 N. Prospect, Ypsilanti, MI 48198

Laura Bennett, Planning & Zoning Administrator
734-482-6099

1. CALL TO ORDER

Chairman Gardner called the regular meeting to order at 7:00 p.m.

2. ROLL CALL

The following members were present: Brennan, Dabish-Yahkind, Findley, Gardner, McGill, Sanii-Yahyai, and Steele. Also present were Ben Carlisle, Carlisle Wortman and Claire Martin, OHM.

3. DETERMINATION OF QUORUM

A quorum was present.

4. ADOPTION OF AGENDA

A motion was made by Commissioner Brennan and supported by Commissioner McGill to adopt the agenda as presented. The motion carried.

5. APPROVAL OF MINUTES

A. Minutes of the November 15, 2023 Meeting

A motion was made by Commissioner Findley and supported by Commissioner Brennan to approve the minutes as presented. The motion carried.

6. CITIZEN PARTICIPATION

None.

7. CORRESPONDENCE

Motion by Commissioner Findley and supported by Commissioner Brennan to receive and file communication.

8. PUBLIC HEARINGS, DELIBERATIONS AND ACTIONS

None.

9. REPORTS

A. Ordinance Officer Report

A motion was made by Commissioner Brennan and supported by Commissioner Sanii-Yahyahi to receive the report. The motion carried.

B. Building Department Report

A motion was made by Commissioner Brennan and supported by Commissioner Sanii-Yahyahi to receive the report. The motion carried.

C. Zoning Administrator Report

A motion was made by Commissioner Brennan and supported by Commissioner Sanii-Yahyahi to receive the report. The motion carried.

10. OLD BUSINESS

A. STPC 23-05 Brookwood Superior Area Plan Amendment

Luke Bonner, Bonner Advisory Group, provided a summary of the Brookwood of Superior project.

Ben Carlisle, Carlisle Wortman reviewed the Planner's Report dated January 18, 2024.

Commissioner Garder asked if the plan is approved, is the applicant getting express approval to build 318 units.

Mr. Carlisle said Commissioner Gardner was correct. However, the Planning Commission needs to discuss if the applicant meets the density bonus criteria set forth in Section 7.301(E). If the Planning Commission recommends approval of the area plan with 318 units, that is the maximum number of units Brookwood can work with without coming back to the Planning Commission for an Area Plan Amendment.

Claire Martin, OHM, reviewed the Engineer's Report dated January 16, 2024.

Commissioner Gardner noted concerns with the density, height, and slope, as he mentioned in previous meetings. He asked the applicant to review the density bonus criteria in Section7.301(E) and tell the Planning Commission which three the applicant believes have been met.

Mr. Bonner noted the Zoning Ordinance allows for up to a 20% density bonus, however, based on the number of proposed units, the applicant is seeking a 13% density bonus. He went on to explain the applicant feels the following criteria have been met:

1. On-site or off-site pedestrian walkways and access improvements substantially above the minimum required by this Ordinance. He added the connection to the housing development north of the proposed development is an additional connection point as well.

2. An integrated mixture of housing types or lot sizes.

3. The recreation facilities are above what is required by the Zoning Ordinance, including a gazebo and pickleball court.

4. Additionally, the preservation of the woodland areas. He noted 51% of the woodland areas are being preserved on site and are accessible through connections and walkways.

5. Parts of the construction will be financed with PACE (property assessed clean energy) financing. Therefore, there will be sustainable elements to the construction of the development as part of the financing package.

Commissioner Gardner agreed that there is an integrated mix of housing types. He asked Mr. Carlisle if the applicant was substantially above what was required by the other criteria.

Mr. Carlisle noted the Zoning Ordinance requires a sidewalk is placed, and that is the bare minimum. In his opinion, the applicant has gone above and beyond based on the number and length of trails that connect the housing types and also to LeForge Road. Additionally, he noted the trails are a significant amenity as well as the preservation of open space.

Commissioner Steele finds the applicant has met at least three of the density bonus criteria. He noted the connection between the housing

types crosses a steep slope. He asked if the connection will be maintained.

Mr. Carlisle noted that because the housing types are owned by the same entity, he does not expect an issue with maintenance.

Commissioner Gardner asked the applicant if they thought the Ordinance was met regarding height of the buildings.

Mr. Bonner explained the height of the building (Building A) closest to LeForge Road was reduced considerably.

The architect noted that the building was previously a three-story stacked flat unit, and the height has now been reduced to a two-story unit. The height at the ridge is now 32 feet at grade, with the height at the midpoint being 28 feet.

The architect also noted additional access around the stacked flats was added to provide ladder access, to address concerns of the Fire Marshal.

Commissioner Gardner asked the applicant to address concerns about the steep slopes, including areas over 25% slope.

Andy Wakeland highlighted the steep slope areas over 25% on the plan.

Commissioner Gardner questioned the ability of the Planning Commission to offer flexibility regarding steep slopes.

Mr. Carlisle noted the steep slopes can be addressed through the site plan process and the number of units may ultimately need to be reduced in response to those steep slopes. Additionally, the applicant could ask the Zoning Board of Appeals for a variance.

Motion by Commissioner Findley, supported by Commissioner Brennan to direct staff to draft a Resolution of Approval for STPC 23-05 Brookwood Superior Area Plan Amendment.

Roll Call Vote:

Yes:	Brennan, Dabish-Yahkind, Findley, Gardner, McGill, Sanii-Yahyai, Steele.
No:	None.

Abstain: None.
Absent: None.

The motion carried.

11. NEW BUSINESS

A. STPC 23-03 Garrett's Space Preliminary Site Plan

Candice Briere, Midwestern Consulting presented site context and background of the project. Ms. Briere noted the applicant does not anticipate impacts to the creek or flood plain with the project. Additionally, grading activities will be minimized, and structures will be built on piers to minimize earth work.

Ms. Briere explained a tree survey was completed for the area of proposed development. Of the 383 trees surveyed, there were 28 landmark trees and one sovereign tree. Eighty-one trees will be removed including eight invasive species, three landmark trees, and five trees of species not requiring replacement. Overall, 144 trees will be planted to mitigate the trees being removed.

She also noted the following:

- A wetland determination was completed last year, identifying six wetland areas.
- The existing driveway will be widened to accommodate a fire truck.
- The applicant has met with the Fleming Creek Advisory Council.
- The Washtenaw County Road Commission has provided feedback on the site plan and have offered their technical approval.
- The applicant has discussed the plan with the Washtenaw County Water Resources Commissioner's Office and their office has witnessed infiltration testing.

Mr. Carlisle reviewed the Planner's Report dated January 11, 2024.

Ms. Martin reviewed the Engineer's Report dated January 11, 2024.

Commissioner Brennan asked if there would be an elevator in the two-story residential building.

Mr. Halpert confirmed there would be an elevator.

Commissioner Gardner inquired about the conservation easement process, noting Garrett's Space has submitted an application for a conservation easement.

Mr. Halpert confirmed Garrett's Space has submitted an application and noted the process for approval can take upwards of a year.

Mr. Carlisle asked the applicant to submit the conservation easement document to the Township so it can be reviewed by the Township and Township Attorney.

Mr. Carlisle stated he does not see why Washtenaw County would not accept the conservation easement, but if they won't there are other bodies that will accept it. If an issue arises where the conservation easement is not accepted, a deed restriction would be just as binding as a conservation easement. He also noted the site plan is a binding document, therefore the applicant can only do what is shown on an approved site plan.

Ms. Briere noted the boundary of the proposed conservation easement is shown on the preliminary site plan (existing conditions page) and it is the same area that was submitted to Washtenaw County for their approval.

Commissioner Findley suggested the Township review of the conservation easement be a condition of the Preliminary Site Plan approval.

Mr. Carlisle stated the Final Site Plan will not come back to the Planning Commission until the Township and Township Attorney are comfortable with the language of the conservation easement.

Brenda Baker, Ashton Court, reviewed the communication submitted to the Planning Commission from C. Grobbel of Grobbel Environmental & Planning Associates (on file with the Planning Department). She noted there are many concerns and deficiencies within the applicant's submittal. She questioned to what extent Washtenaw County was willing to take on these easements, in perpetuity.

She recommended the applicant be sent back to elaborate on more uncertain elements of the application before approving the site plan. She feels any applicant should receive fair consideration in a reasonable time. Additionally, "it would be irresponsible to fast track or give special treatment to any applicant at the expense of a substandard outcome."

Commissioner Gardner inquired about the author of the document and where they are located.

Ms. Baker replied he is located up north. It was noted the author is familiar with the area and the Fleming Creek.

Ms. Baker stated the applicant made no reference to the Township Wetlands Ordinance, which in some cases exceeds the requirements of Environment, Great Lakes, and Energy (EGLE).

Commissioner Gardner asked Ms. Martin to review the letter from C. Grobbel.

Ms. Martin stated wetlands will be reviewed by EGLE and wastewater is regulated entirely by the Washtenaw County Health Department. A private community wastewater system would not be permitted at the site because Garrett's Space is not a multi-family development, as required by the Private Community Wastewater Ordinance.

Mr. Carlisle stated he read Dr. Grobbel's report and noted some issues the author was incorrect about. Regarding the proper zoning district – this was discussed by the Planning Commission at the Area Plan stage, finding the PC (Planned Community) zoning district was appropriate and the Board of Trustees agreed with that finding. The Court and the judge also agreed with the finding. The limitations of the uses were a similar discussion – being approved by the Board of Trustees. He noted building height is not an issue. The author is incorrectly calculating it to the top of the roof when it is correctly measured to the mean of the roof. Additionally, parking is based on maximum employees *per shift*, not total. The only public right-of-way is along Dixboro Road, and the applicant will maintain the existing entrance point. Mr. Carlisle noted nothing in the letter concerns him as items that haven't already been addressed.

Commissioner Findley responded to Ms. Baker's comment about fast-tracking and giving special treatment to applicants. Commissioner Findley noted she has been on the Planning Commission since 2015 and during that time she has tried to be fair and equal at all times when making decisions, and she stated the Planning Commission has been doing that. She noted, "once you become inconsistent for one person you have to do the same for all."

Motion by Commissioner Findley, supported by Commissioner McGill to approve STPC 23-03 Garrett's Space Preliminary Site Plan with the following conditions:

1. Clarify timing of the phases. Combine parcels.
2. Submit a conservation easement with legal description for Township review.
3. Confirm if an EGLE permit is required. If required, obtain permit prior to final site plan approval.
4. Indicate any location where new development, grading, or other activity is proposed within a steep slope area as defined in the ordinance.
5. Confirm access and any necessary road improvements from the Road Commission.
6. Submit a lighting and photometric plan.
7. Submit a landscaping plan.
8. Provide a detailed narrative of the architectural concept for the site including materials details.
9. Address all items in the Township Engineers January 11, 2024 review.
10. Address all items in the Fire Marshal's December 18, 2023 review.

Roll Call Vote:

Yes:	Brennan, Dabish-Yahkind, Findley, Gardner, McGill, Sanii-Yahyai, Steele.
No:	None.
Abstain:	None.
Absent:	None.

The motion carried.

12. POLICY DISCUSSION

A. Election of Officers for 2024

Motion by Commissioner Brennan and supported by Commissioner Sanii-Yahyai to nominate Jay Gardner as Chair of the Planning Commission.

Motion by Commissioner Brennan and supported by Commissioner McGill to nominate Dr. Rob Steele as Vice-Chair of the Planning Commission.

Motion by Commissioner Sanii-Yahyai and supported by Commissioner to nominate Tom Brennan as the Secretary of the Planning Commission.

The nominations carried by voice vote.

B. Adoption of the 2024 Meeting Schedule

A motion was made by Commissioner Findley and supported by Commissioner Brennan to adopt the 2024 Planning Commission Meeting Schedule.

The motion carried.

13. ADJOURNMENT

Motion by Commissioner Brennan, supported by Commissioner Findley to adjourn.

Motion Carried.

The meeting was adjourned at 8:27 pm.

Respectfully submitted,
Thomas Brennan III, Planning Commission Secretary

Laura Bennett, Recording Secretary
Superior Charter Township
3040 N. Prospect Rd.
Ypsilanti, MI 48198 (734) 482-6099

TOWNSHIP HALL
3040 PROSPECT STREET
COR. PROSPECT & CHERRY HILL RDS.
YPSILANTI, MICHIGAN 48198
TELEPHONE: (734) 482-6099
FAX: (734) 482-3842

CHARTER TOWNSHIP OF SUPERIOR

WASHTENAW COUNTY, MICHIGAN

MEMORANDUM

TO: Jay Gardner, Chair
Superior Charter Township Planning Commission

FROM: Tom Freeman, Chair

DATE: January 25, 2024

RE: 2024 Meeting Dates for Dixboro Design Review Board

As you are aware, the Dixboro Design Review Board is required by Ordinance to hold meetings during April and October of each year:

> "...the Design Review Board shall meet in April and October of each year, and at other times as required by applicants or the Planning Commission..."

In compliance with the above requirement, the Dixboro Design Review Board has scheduled the following meeting dates during 2024:

April 4, 2024
October 3, 2024

Of course, the Dixboro Design Review Board will schedule any additional meetings needed to review projects submitted for our consideration.

I hope the above information is of assistance. If you have any questions, please feel free to contact me.

cc: Members, Dixboro Design Review Board.
Township Clerk

NOTICE OF HEARING

SUPERIOR CHARTER TOWNSHIP
PLANNING COMMISSION
SUPERIOR CHARTER TOWNSHIP HALL
3040 N. PROSPECT, YPSILANTI, MI 48198

Wednesday
February 28, 2024
7:00 p.m.

The Superior Township Planning Commission will hold a public hearing on Wednesday, February 28, 2024, at 7:00 p.m. at the Superior Township Hall, 3040 N. Prospect, Ypsilanti, MI 48198, to consider a comprehensive rewrite to the Master Plan.

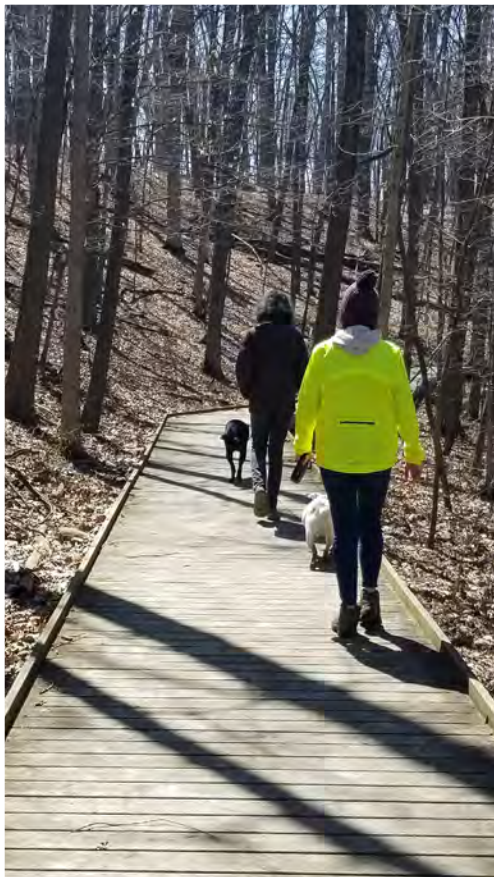
The 2023 Comprehensive Draft Master Plan can be viewed at: www.superiortownship.org/2023-master-plan. A hard copy may also be obtained by contacting Laura Bennett, Planning & Zoning Administrator at planning@superior-twp.org, or calling 734-482-6099 during regular business hours.

Persons wishing to express their views may do so in person at the public hearing, in writing addressed to the Planning Commission at the above address, or via email to planning@superior-twp.org by 4:00 p.m. the day of the hearing.

Superior Township will provide necessary reasonable auxiliary aids and services to individuals with disabilities upon four (4) business days notice to the Township. Individuals requiring auxiliary aids or services should contact Superior Charter Township by writing the Township Clerk.

Laura Bennett, Planning & Zoning Administrator
planning@superior-twp.org
734-482-6099

Superior Charter Township 2023 Comprehensive Master Plan



Adopted by Superior Charter Township Board of Trustees - XXXX
Adopted by Superior Charter Township Planning Commission - XXXX, 2023

Assisted by:

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Resolution of Adoption

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Acknowledgments

Township Board of Trustees

- Kenneth Schwartz - Supervisor
- Lynette Findley - Clerk / Liaison to Planning Commission
- Lisa Lewis - Treasurer / Liaison to Zoning Board of Appeals
- Nancy Caviston - Trustee / Liaison to Wetlands Board
- Bernice Lindke - Trustee / Liaison to Parks & Recreation Commission
- Bill Secrest - Trustee
- Rhonda McGill - Trustee

Staff

- Laura Bennett
- Rick Mayernik

Planning Commission

- Jay Gardner - Chair
- Dr. Robert Steele - Vice Chair
- Thomas Brennan, III - Secretary
- Lynette Findley - Board Representative
- Nahid Sanii-Yahyai - Commissioner
- Patrick McGill - Commissioner
- Emily Dabish-Yahkind - Commissioner

Master Plan Steering Committee

- Brenda Baker
- Lennetta Bentley
- Thomas Brennan, III
- Emily Dabish-Yahkind
- Lynette Findley
- Tom Freeman
- Jay Gardner
- Ross Gladwin
- Jack Goodnoe
- Bernice Lindke
- Bill Mathewson
- Michelle McIntyre
- Dave Raymond
- Nahid Sanii-Yahyai
- Bill Schikora
- Ken Schmidt
- Jack Smiley
- Jean Winborn

With assistance from

Carlisle Wortman

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Chapter 1: Introduction

Executive Summary

Superior Charter Township is a hidden gem in Washtenaw County. The Township is home to both new and historic neighborhoods, agricultural lands, hundreds of acres of protected natural resources, the historic Village of Dixboro, and high quality recreational and open space areas. Much has changed in the region and Township since the last master plan was adopted. Loss of agricultural land and activites as well as regional issues of declining housing condition are several of the issues that the Township faces. As a result, a review of community desires, recognition of demographic shifts, and a renewed awareness of land use challenges was required to assess and refine policies for preservation, investment, and controlled growth.

Major Issues facing Superior Township are summarized below and addressed subsequently in Policy Themes:

1. Preservation of natural features, biodiversity, and maintaining rural and natural character while promoting planned and sustainable growth.
2. Loss of agricultural land to development threatening open space and land preservation.
3. Insufficient housing to meet diverse needs and affordability challenges.
4. Ensuring that housing development is limited to the Urban Services District (south of Geddes Rd) due to limited capacity of publicly owned sewer and water

Recognizing the challenges, changes, and opportunities that face the community, the Township initiated a comprehensive process to update the Township Master Plan. To begin this Master Plan update, Superior Charter Township launched a community-based process to engage residents. This document is the resulting policy roadmap for land use, development, preservation, transportation, and housing, based on a shared community vision and in recognition of the current demographics and market conditions.

The Master Plan is organized as follows:

I. Introduction

The Introduction describes the purpose of a Master Plan, the process used to develop the plan, and a brief history of Superior Charter Township.

II. Community Profile and Planning Context

The Community Profile describes Superior Charter Township's role in the region, its people, housing stock, commuter patterns, transportation information, and natural features with the most up-to-date data available. The chapter shows the diversity of the Township in terms of people and land use, the impact of the Great Recession on housing, and transportation challenges.

III. Vision and Policies

This chapter provides the context of the Master Plan. By articulating a vision for the Township's future and presenting the policies which reflect this community's vision, this chapter is critical when evaluating proposals for future development within the Township.

IV. Growth Management and Future Land Use Plan

The Growth Management and Future Land Use Plan chapter provides the framework for future growth, redevelopment, preservation, and sustainability. Using an approach that identifies the different policies articulated in this Master Plan, this chapter applies strategies to the various sub-areas of the township based on their unique characteristics. The section also deals with broader topics that relate to the township but also may involve different approaches in individual sub areas. Ultimately, the Future Land Use Plan provides a land use designation that guides future development or preservation for each parcel of land in the township.

V. Strategies and Implementation

This chapter compiles the strategies for reaching the township's future vision and breaks down actions by sub-area and policy alignment. The chapter includes potential partners and funding sources. The chapter ends with a comprehensive implementation table.

VI. Dixboro Special Area Plan

Due to its unique historical significance, special attention was paid to the Dixboro area during the Master Planning development process. This chapter included information about the area and details of the focused planning efforts that were undertaken for study of this area. The plan for the Dixboro area includes a unique set of policies and strategies to achieve the community's vision for this area.

Policy Themes

Policies discussed in the Master Plan are organized around the five major themes:

1. Growth Management

A Growth Management strategy ensures that growth occurs in a planned and sustainable manner while preserving the township's character, natural resources, and quality of life for its residents. Key elements of a growth management strategy include comprehensive land use planning, zoning and development regulations, urban growth boundaries, infrastructure planning, environmental protection, smart growth principles, community engagement, and long-term monitoring and evaluation.

2. Open Space and Land Preservation

Open Space and Land Preservation policies establish a set of guiding principles that aim to protect and conserve natural areas, open spaces, and valuable land resources for the benefit of present and future generations. These principles provide a framework for decision-making and help to ensure sustainable land use practices.

3. Housing

Housing policies that enhance the existing housing stock and promote housing variety are important in order to meet diverse needs, address affordability challenges, support urban planning, promote environmental sustainability, and foster cultural diversity and vibrancy within communities.

4. Environmental Protection

Environmental Protection policies are crucial for long-term sustainability, the preservation of biodiversity, the mitigation of climate change, maintenance of rural and natural character, the protection of human health, the promotion of sustainable development, and the preservation of ecosystem services. By implementing and adhering to these policies, we can strive for a healthier, more resilient, and sustainable future.

5. Transportation

Transportation policies focus on enhancing efficiency, promoting environmental sustainability, improving accessibility and equity, enhancing resilience and reliability, providing economic benefits, and prioritizing safety. By considering the diverse needs of individuals and neighborhoods and integrating various transportation modes, the transportation system can be can well-rounded and sustainable.

What is a Master Plan?

The Master Plan is the Township's official statement of the goals and policies and a single, comprehensive view for the community's future. The Master Plan fills several roles:

- **Vision:** The Master Plan lays out the future vision of Superior Charter Township, as well as a roadmap - with goals, policies, strategies, and actions - to achieve that vision.
- **Aid in daily decision-making:** The Master Plan guides the Planning Commission, Township Board, and other Township bodies in their deliberations on zoning, land division, capital improvements, and matters related to land use and development. It provides a stable, long-term basis for decision-making.
- **Statutory Basis:** The Master Plan provides the statutory basis upon which zoning decisions are made. The Michigan Planning Enabling Act (P.A. 33 of 2008, as amended) requires that the Zoning Ordinance be based upon a plan designed to promote the public health, safety, and general welfare. The Master Plan and accompanying maps do not replace other Township Ordinances, specifically the Zoning Ordinance and Map.
- **Public/Private Coordination:** The Master Plan attempts to coordinate public improvements and private developments supported by a Capital Improvements Plan. The Master Plan helps to inform the elements to be included in the Capital Improvements Plan. For example, public investments such as road or sewer and water improvements should be located in areas identified in the Plan as resulting in the greatest benefit to the Township and its residents.
- **Educational Tool:** The Master Plan serves as an educational tool and gives citizens, property owners, developers, and adjacent communities a clear indication of the Township's direction for the future.

Connection Between Master Plan and Zoning Ordinance

MASTER PLAN

- Is a long-term guiding policy document
- Applies 5-20 years into the future
- Has goals and objectives based on community input
- Includes analysis and recommendations on economic development, housing, transportation, infrastructure, land use, etc.
- Must be reviewed once every 5 years by State Law
- Is not intended or expected to serve as law

ZONING ORDINANCE

- Is the law
- Applies now
- Is subject to Federal and State law, and Federal and State case law
- Regulates land use, building size, form, placement, parcel area, width, depth, parking, landscaping, etc.
- Must be based on a Master Plan, per State Law
- Is used to implement the Master Plan

FUTURE LAND USE PLAN

- Is a visual guide for future planning
- Applies now and up to 20 years in the future
- Has future land use categories, which describe what may be considered if zoning changes
- Provides descriptions on types of uses that are appropriate in particular areas and details on desired density, height, design, landscaping, etc.
- Shows possibilities, not guaranteed changes
- Changed as a Master Plan Update, which has extensive community input

ZONING MAP

- Is the law
- Applies now
- Has zoning districts, which state what land uses, building types can be built now
- Mandates land use, building size, form, placement, parcel area, width, depth, etc. for each zoning district
- Must be followed for all new development
- Can only be changed by a Rezoning or Zoning Map Amendment process, a multi-step approval process that includes a public hearing and recommendation by the Planning Commission, and two readings before the Township Board

Creation and Care of the Master Plan

The Superior Charter Township Planning Commission is the primary agency responsible for the preparation of the Master Plan. Supported by staff, consultants, and public involvement, it is the role of the Planning Commission to develop this Plan and encourage its implementation.

In a diverse community such as Superior Charter Township, however, the Planning Commission must broaden its planning process to go beyond conventional land use planning and explore a variety of topic areas which play a role in the preservation, development, and well-being of the community. This Plan was designed from the ground up to relate to a broad range of topics and build momentum for the future of Superior Charter Township.

Master Plan Implementation

The Master Plan is a document that should and must be embraced by the leadership of Superior Charter Township as much as possible. While ultimately the responsibility of the Planning Commission, the Master Plan must inspire consistent decision making throughout the community to live up to its potential. The Plan serves as a basis for the fundamental responsibilities of the Planning Commission, such as review of development proposals and maintenance of the Zoning Ordinance, but also serves a larger purpose to inspire informed, innovative community development. In that spirit, it is also the responsibility of the Planning Commission to advocate for the Master Plan outside of its own reach, to ensure that it is implemented community-wide.

How Will the Plan Be Used?

Day-To-Day

On a regular basis, the Township Staff will refer to the Master Plan when conducting the regular business of the Township. Whether discussing development options with a potential developer, working on drafting new Zoning Ordinance amendments, or making recommendations to the Planning Commission or Township Board, the Master Plan will inform and guide the policies of the Township's professionals. In addition, the Plan will serve as a reference for neighborhood groups, the local investment community, and for non-profit community organizations.

Month-To-Month

On a weekly or monthly basis, the elected and appointed officials of the Township will refer to the Master Plan when making decisions about land use development proposals, and in the setting of Township policies relating to community development and preservation. The improvement of infrastructure, development of regulations and ordinances, and budgeting of the Township will all be influenced by the goals and policies established by this Master Plan.

Year-To-Year

It is critical that the Master Plan be annually evaluated to ensure that it still represents the policy direction of the Township. The Township should audit its effort on a regular basis to reflect on the Plan and recognize the accomplishments it has made towards the execution of the goals and policies of the Plan. Revisions and updates to the Plan should be considered annually to make sure the Plan continues to enjoy widespread support.

Process

The Master Plan process was based on community engagement and current data. The process diagram in Figure 1 outlines the Superior Charter Township Master Planning process. The Master Plan update was a multi-step process that reached hundreds of Superior Charter Township residents, employees, employers, business owners, property owners, and other stakeholders through a steering committee, social media, a survey, open houses, community meetings, and presentations to appointed and elected officials. Every part of the Master Plan's vision, mission, goals, and strategies was influenced or can be directly attributed to community participants.

Figure 1. Master Plan Process

The development of a community's Master Plan must involve not only elected and appointed officials within the community, but also leaders within the community at large. The community participation measures taken throughout the process are essential in establishing public support for the policies within the document, and to ensure that the plan is indicative of the preferences of as broad a representation of the population as possible.

In the spring of 2022, Superior Charter Township began an update of the Master Plan. The last major update was done in 2015, although the Planning Commission has reviewed the Plan multiple times since then. Despite a global pandemic, the process reached the Superior Charter Township community as broadly as possible to create a community-based vision and plan. This document is the result of over a year of intensive community engagement, data analysis, and collaborative decision-making to create a vision for the Township with an actionable, realistic policy roadmap for implementation.

The community engagement component of the Master Plan process was started in 2021. Township staff, community stakeholders, and consultants adapted to the circumstances of the pandemic for the Superior community to contribute to the planning process in a safe and meaningful manner.

Steering Committee

A group representative of the Superior Charter Township community was appointed by the Township Board to become the Master Plan Steering Committee. The 16-person committee consisted of residents and community stakeholders representing the racial, economic, and geographic diversity of Superior Charter Township. The committee's role was to guide the community engagement process and build consensus around the Master Plan. The Steering Committee directed the Master Plan's vision, mission, goals, special area plans, and strategies. Overall, the Steering Committee met a total of five times.

2021 Community Survey

Over 275 residents responded to the survey conducted in the fall of 2021. Survey results are in the appendix and referred to throughout the Master Plan.

Dixboro Special Area Plan

Input for the Dixboro Special Area Plan was collected in three separate events spread out over 10 days, which included an open house, a stakeholder meeting, and a public workshop. Throughout the course of the three events, over 100 different stakeholders participated.

Township-wide Open House

The Township held a public open house to garner input on housing, open space preservation, motorized and non-motorized transportation improvements, recreational improvements, and conservation/environmental protection.

Planning Commission and Public Hearing

<to be inserted>

Public Review Period

<to be inserted>

Township Board Review

<to be inserted>

Chapter 2: Community Profile

Image Source: Ann Arbor District Library

Introduction

The Community Profile provides an inventory of existing conditions including the regional setting, population data, socio-economic characteristics, housing, development trends, commuter patterns, transportation information, and natural features. The Profile is intended to document current conditions as well as projected future trends for Superior Charter Township and the surrounding region. Decision-makers should use the information presented here as they apply the Township's policies during decision-making to achieve the community's vision and goals for the future.

The Community Profile is organized around categories of existing land use, demographics, housing, transportation, diversity, and geography.

Sources used include:

- The U.S. Census
- American Community Survey
- The Southeastern Michigan Council of Governments (SEMCOG)
- Superior Charter Township records
- Visual survey
- Additional information from these sources as well as neighborhood-specific demographic profiles can be found in the appendix.

The data has several implications for the Master Plan:

- Due to its diversity in population and land use, one-size-fits-all solutions for the Township are not feasible.
- The Township has a long-established policy of land protection and conservation. These policies are evident in land use patterns.
- When data are examined at a census tract block group level, they reveal that areas of the Township are very diverse, exhibiting differences in demographic and economic conditions.
- Investigation of different demographic and economic conditions indicates that housing, transportation, land use, service, and other needs vary in different parts of the Township.
- There is a lack of housing diversity compared to Washtenaw County as a whole.
- The Township, like all municipalities, has finite resources. As such, proper planning ensures the most efficient and impactful use of these resources.

Regional Setting

Superior Charter Township was first settled in the early 19th century by farmers looking to capitalize on the fertile soils which gave the Township its name. Until World War II, the Village of Dixboro was the only concentrated development in the Township, due to the water provided by Fleming Creek and a primary access route between Ann Arbor and suburban Detroit communities along Plymouth-Ann Arbor Road. An economic shift precipitated by World War II and the construction of the Willow Run Bomber Plant in Ypsilanti Township brought thousands of residents to the southern portion of Superior Charter Township and with it, limited public water and sewer facilities. The swift shift from agrarian to urban economies lead to a unique mix of land uses in the Township. Highly developed urban/suburban style housing in the southern part of the Township and open, agrarian development in the north create entirely different living experiences.

Superior Charter Township is located along the eastern edge of Washtenaw County, approximately 15 miles west of Detroit, less than 1 mile east of the City of Ann Arbor, and immediately north of the City of Ypsilanti. M-14 cuts through the northwest corner of the Township, providing important connections to US-23, I-94, and I-96. Ford Road (M-153) is a busy east-west connector, providing access to shopping and other amenities in Canton Charter Township just across the Township border. Geddes Road, which forms the northern boundary of the dense housing on the south side, provides a secondary connection between Canton to the east and Ann Arbor to the west. Prospect Road forms the backbone of the community, running from Plymouth -Ann Arbor Road south to Ypsilanti Township, and providing important connections to Township Hall and the Superior Greenway.

Figure 2. Regional Setting

Community History

Hunting and Fishing Grounds

For centuries, Indigenous Peoples' trails crossed the landscape of Superior Charter Township and Washtenaw County. These paths connected Indigenous Peoples' villages to fertile hunting and fishing grounds in the Township and throughout Michigan. When settlers arrived during the early 19th century, these same trails were used to link growing communities. Eventually, some of these trails became part of the current road system.

As early as 1000 BC, the property where the Staebler Farm now stands was once a gathering place for Indigenous Peoples. Access to water and high, dry ground made this an ideal stopping point along a trail leading to the Detroit River. Today, Plymouth-Ann Arbor Road follows this former trail.

Another trail went south from this location along what is now Prospect Road to Indigenous villages along the Huron River in present-day Ypsilanti. This trail also intersected with the famed Sauk Trail, which is now followed by Michigan Avenue from Detroit to Chicago. These trails serve as a legacy of Indigenous Peoples in Superior Charter Township.

First Property Sold

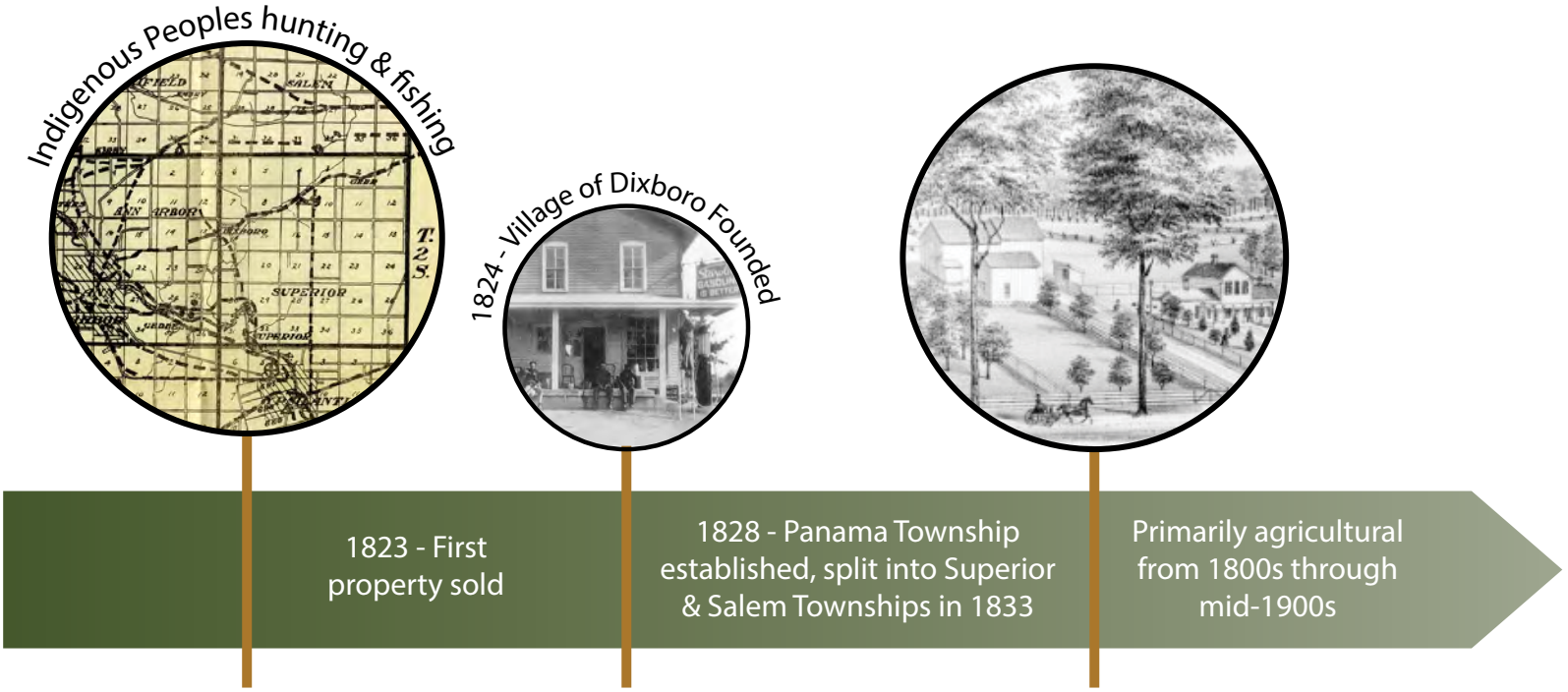
According to tax records reviewed by local historian, Karl Williams, the first purchase in what is now Superior Charter Township was made by Robert Fleming in September of 1823. By 1835 most of the land in Superior Charter Township had been sold, except for Section 16, which was to be retained by the State of Michigan for educational purposes. Most of the first land purchasers were land speculators. Section 16 was later sold during the 1840s.

Dixboro Founded

Captain John Dix, a retired sea captain, founded Dixboro in 1824 by purchasing 450 acres of land. The Dixboro post office was established by John Dix in 1825. It remained open with intermittent closures until 1905, when Rural Free Delivery started. In 1827, Dix filed a plat for 60 lots around the village square. Dix also founded a general store, barn, and grist mill. He sold his holdings and left for Texas in 1833. Although the community flourished and had its own post office for many years, it never incorporated to form a municipal government.

Community Named

On June 30, 1828, the Legislative Council of Washtenaw County created Panama Township, which consisted of the present-day townships of Salem and Superior. In 1833, Panama Township split to become what are now known as Salem Township and Superior Charter Township. Henry Kimmel, a prominent local landowner, gave Superior Charter Township its present name due to its superior soils for farming.



Agricultural Haven

From its founding, Superior Township was prime agricultural land. Until the early to mid-1900's, the Township was agro-based with large farm homesteads.

World War II

In 1941, construction of the Willow Run Bomber Plant and the Willow Run Airport began in Ypsilanti Township. Superior Township and surrounding communities experienced dramatic growth with the influx of war-time workers and their families. To accommodate additional housing, the Federal government constructed a sewer and water system in the area south of Geddes Road. When the wartime working housing stock was later demolished, new subdivisions and apartments were built in the area served by the sewer and water system.

Steady Growth

After a population decline in the 1950s following World War II, the Township population has slowly increased from the 1960s until today. This population increase led to the construction of single-family homes in planned subdivisions. Most of the new single-family home construction occurred south of Geddes Road.

Trinity Health - formerly St. Joseph Mercy Hospital

Moving from its location on Ingalls Street in Ann Arbor, Trinity Health Hospital, formerly St. Joseph Mercy Hospital, relocated to its present location on East Huron River Drive in Superior Charter Township in 1977.

Demographics

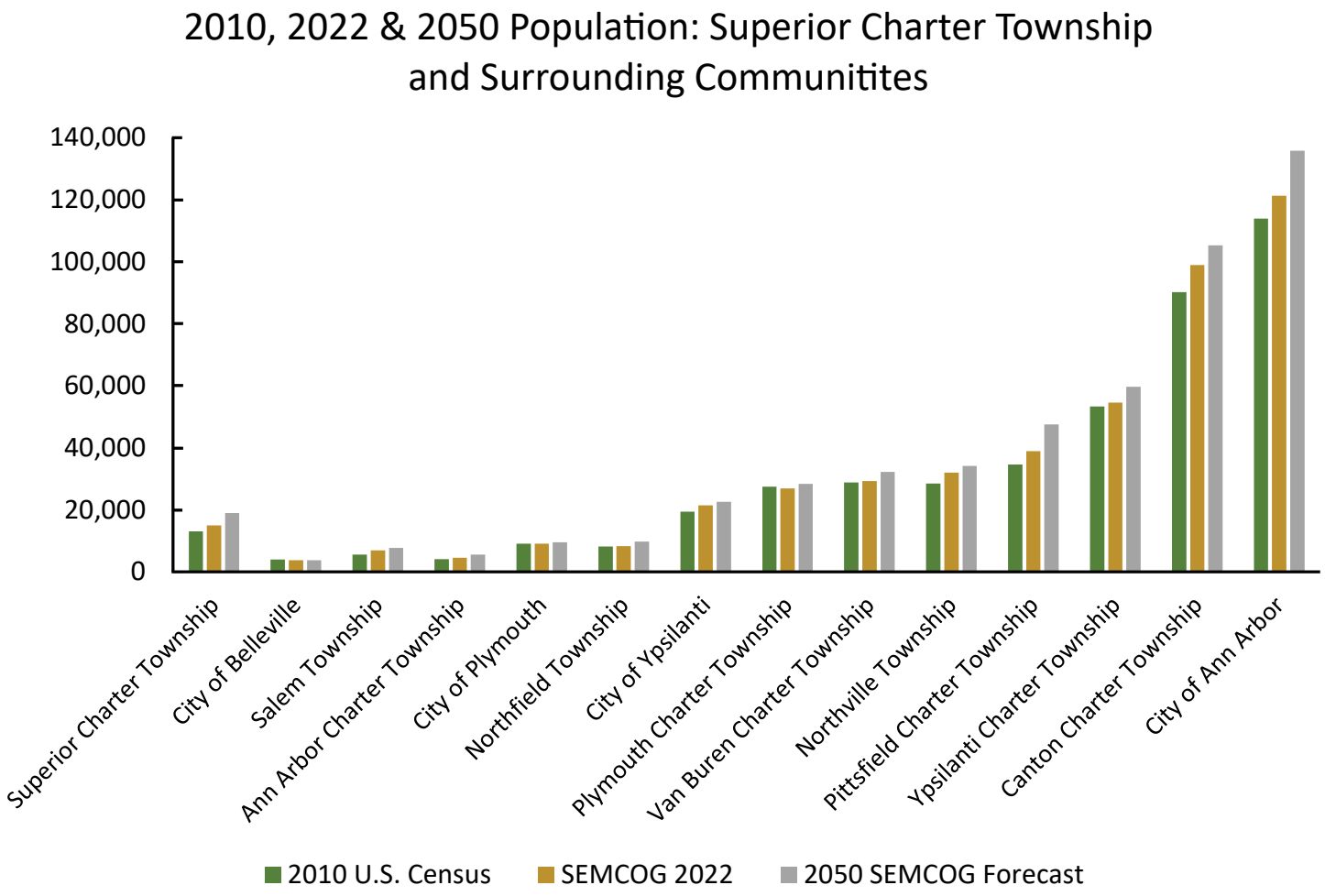
Population Trends

Superior Charter Township's population has been steadily growing. From 2010 to 2022, the Township's population increased by nearly 15%. The population is projected to grow a further 27% between 2022 and 2050. This growth reflects similar growth in other Washtenaw County communities. The growth in population of both Superior Charter Township and the adjacent communities will put demand on employment opportunities, businesses, housing, transportation, and services. Opportunities for commercial and residential expansion should be thoughtfully aligned with the Township's goals for growth management and open space preservation.

Table 1. 2010, 2022, & 2050 Population, Superior Charter Township

2010	2022	% change 2010 - 2022	SEMCOG 2050 estimate	% change 2022- 2050
13,058	14,976	14.7%	19,030	27.1%

Figure 3. 2010, 2022, & 2050 Population, Superior Charter Township & Surrounding Communities



Source: U.S. Census Bureau, 2010 Decennial Census, SEMCOG 2022 Estimates and 2050 Forecast

Superior Charter Township's population base primarily consists of families. Children under the age of 17 years and adults between 25 and 54 years old comprise the largest population cohorts. These cohorts are projected to continue growing through 2045 as the general population grows.

Furthermore, the older adult population is projected to grow, similarly to county-wide trends. The resident cohort over the age of 65 years is projected to increase by 91%, and the cohort over the age of 85 years is projected to increase by 400% between 2020 and 2045.

For the first time in the Township's history, between 2020 and 2045, the number of residents aged 55 years and over will be greater than the number of residents aged 17 years of age and younger. This change is also reflected in the projected number of people per household.

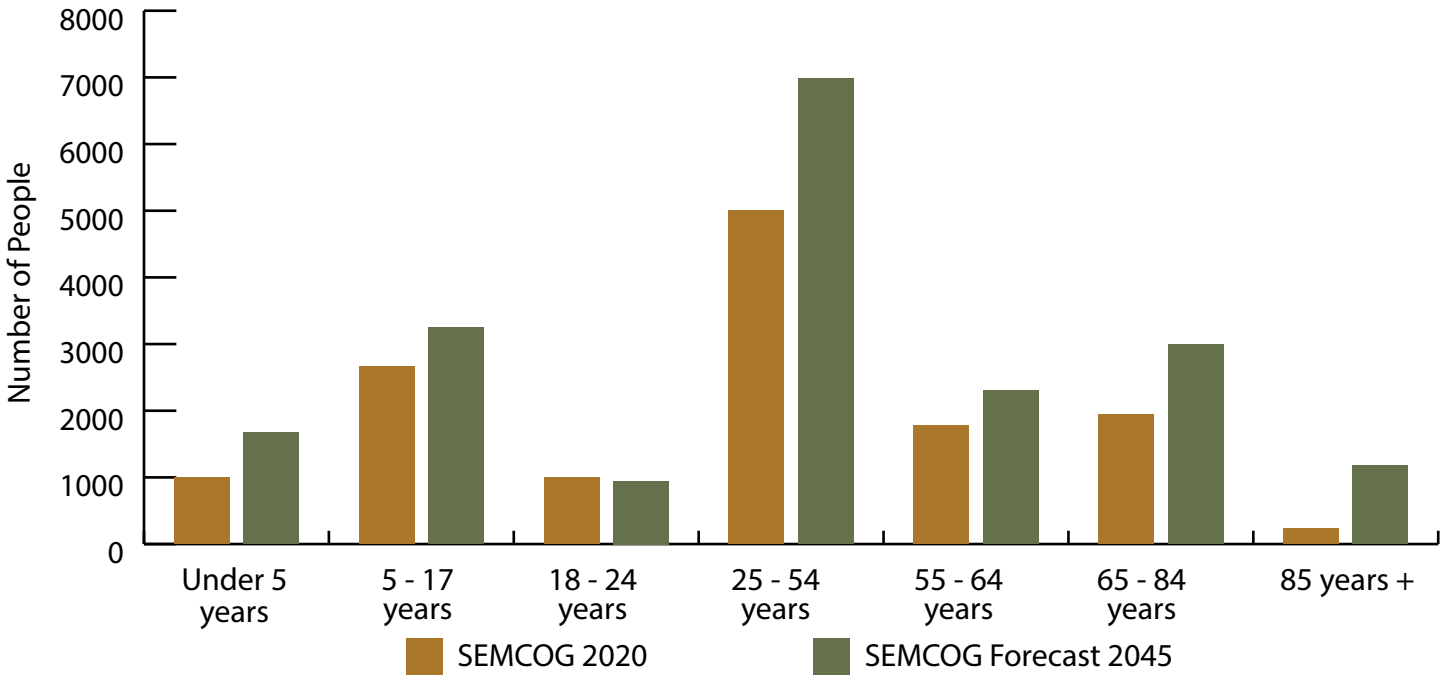
The aging of the Township population will place greater demand on services, housing, accessibility features, and transportation to support older adults. Additionally, the decline in household size coupled with a growing population will increase the demand for housing units that support smaller households, particularly senior households. Development of housing near services, especially medical and commercial services, will prove important.

Table 2. 2020 & 2045 Percent of Population by Age Bracket, Superior Charter Township

Age Bracket	2020		2045	
	Washtenaw	Superior	Washtenaw	Superior
17 years & younger	19%	27%	17%	25%
65 years & older	15%	13%	21%	22%

Source: SEMCOG 2020 Estimates, SEMCOG 2045 Forecast

Figure 4. 2020 & 2045 Population Forecast: Superior Charter Township



Source: SEMCOG 2015 and 2020 Estimates, SEMCOG 2045 Forecast

Household Income

Superior Charter Township's median household income is slightly ahead of the County-wide median household income. However, across specific neighborhoods in the Township, income varies significantly. Median household income in the neighborhoods south of Geddes Road and east of Harris Road are much lower than the median incomes of households in other Township neighborhoods.

Census tract 4074 within the southeast portion of the Township hosts a median income of around $35,000 – well below the Township's median income. This area also hosts the highest population density within the Township. Income disparity has Master Plan implications, as areas in lower income neighborhoods will benefit more from actions that increase the accessibility of public transit, both subsidized and unsubsidized affordable housing, employment opportunities, and access to public services. The income discrepancy also poses implications for how and where to target outreach efforts to promote Township policies.

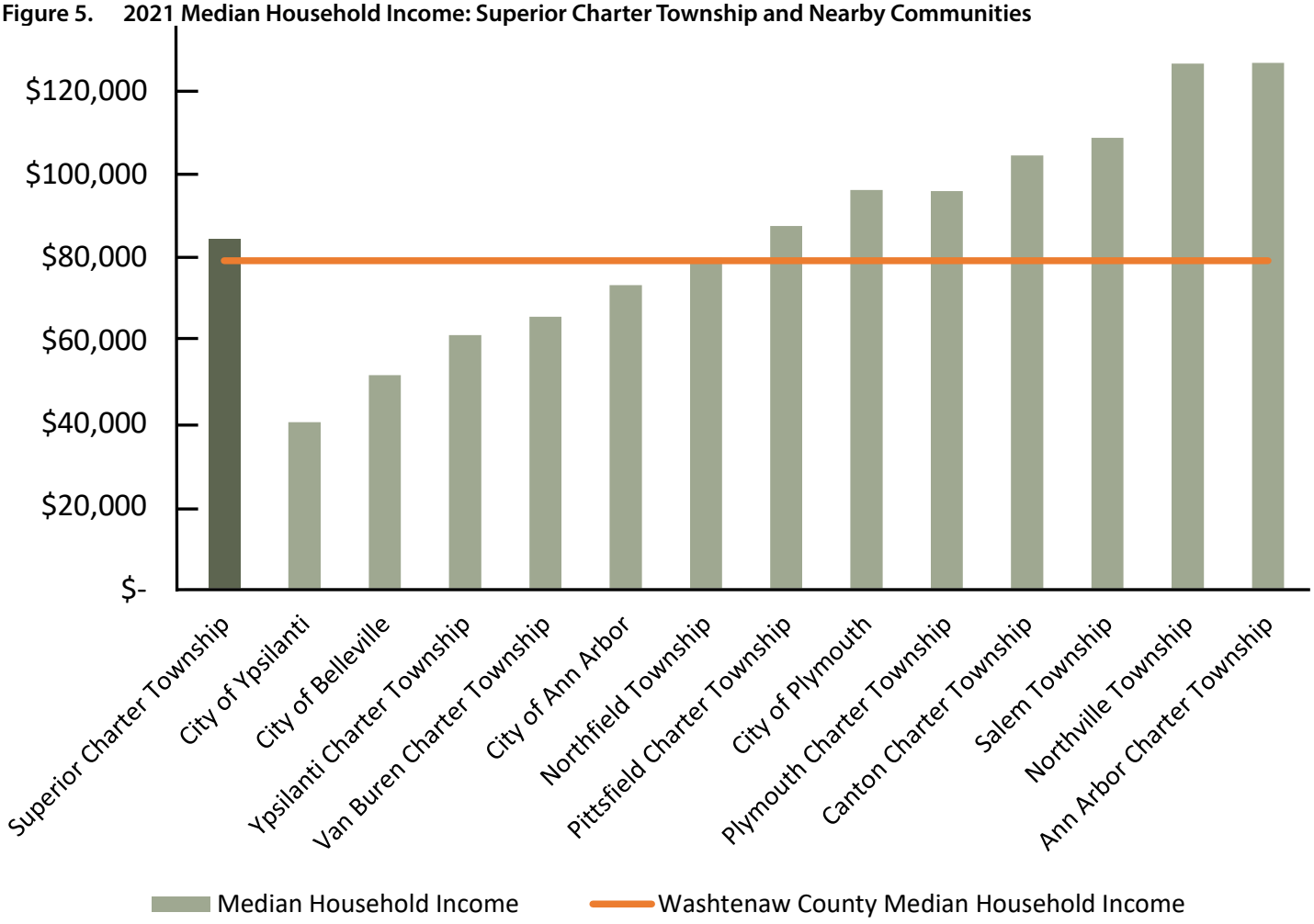
Table 3. 2022 & 2050 Average Persons per Household

	2022	2050
Superior Charter Township	2.67	2.55
Washtenaw County	2.35	2.32

Source: SEMCOG 2050 Regional Development Forecast

Race

Figure 5. 2021 Median Household Income: Superior Charter Township and Nearby Communities



Source: 2021 American Community Survey

Map 1. Census Block Map, Superior Charter Township

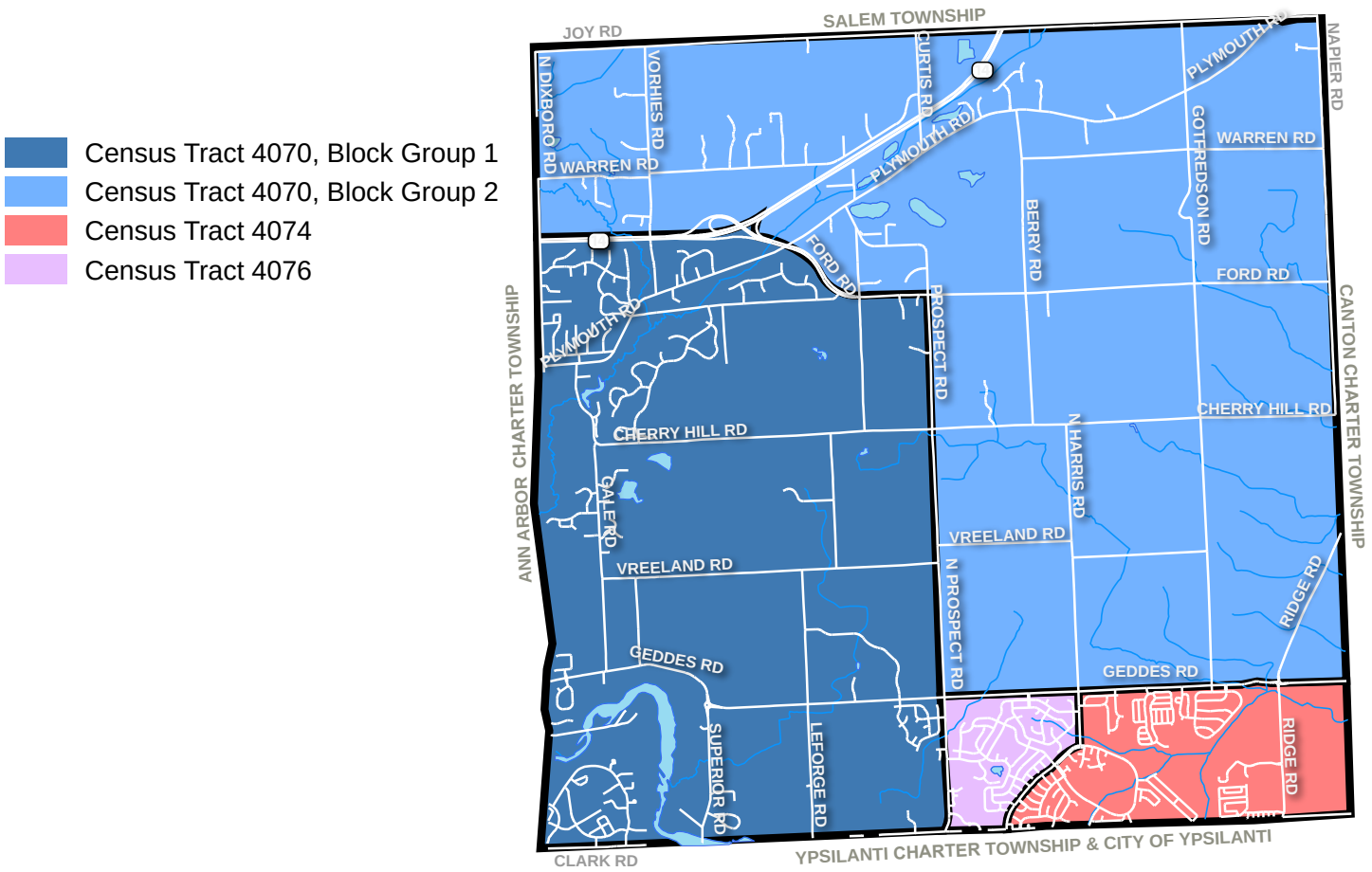
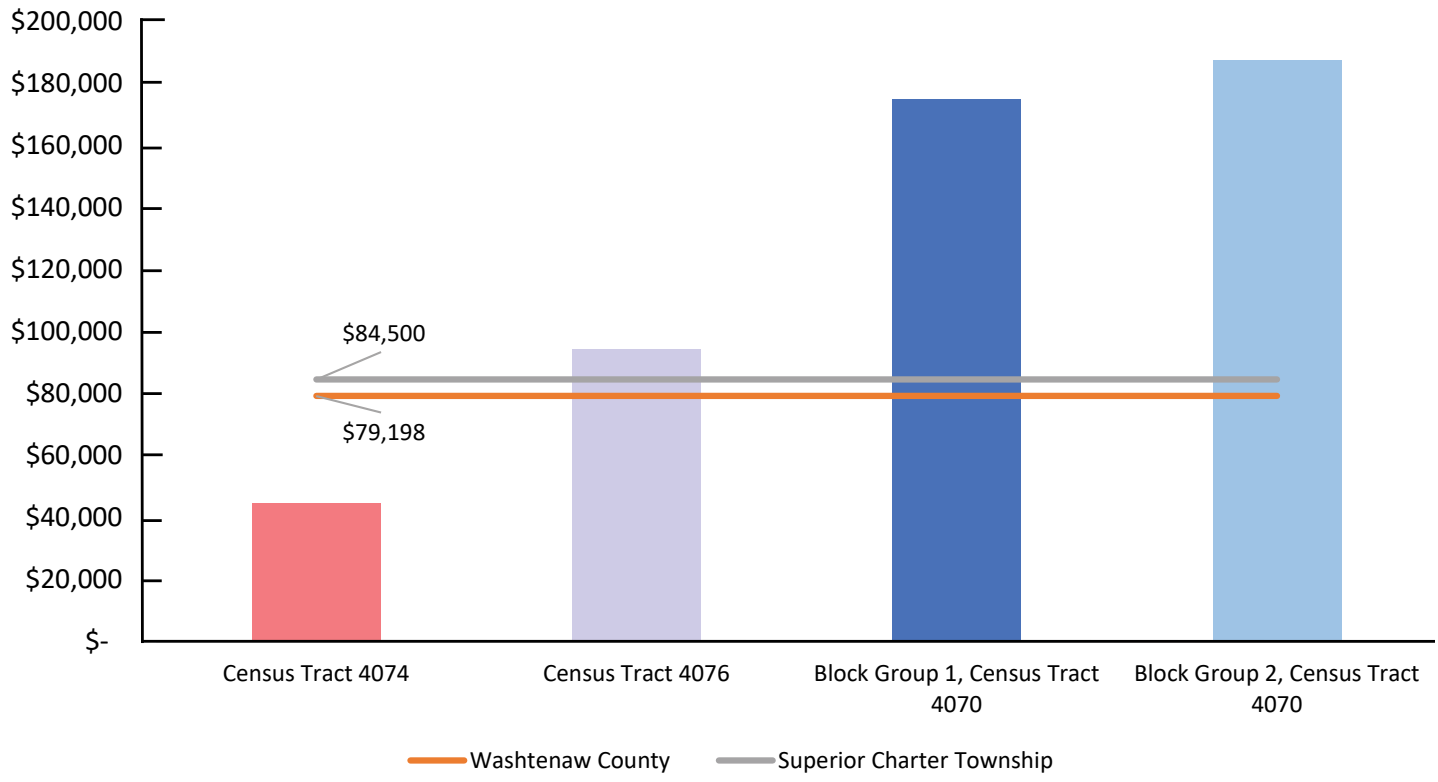


Figure 6. 2021 Median Household Income: Superior Charter Township Census Tracts & Block Groups

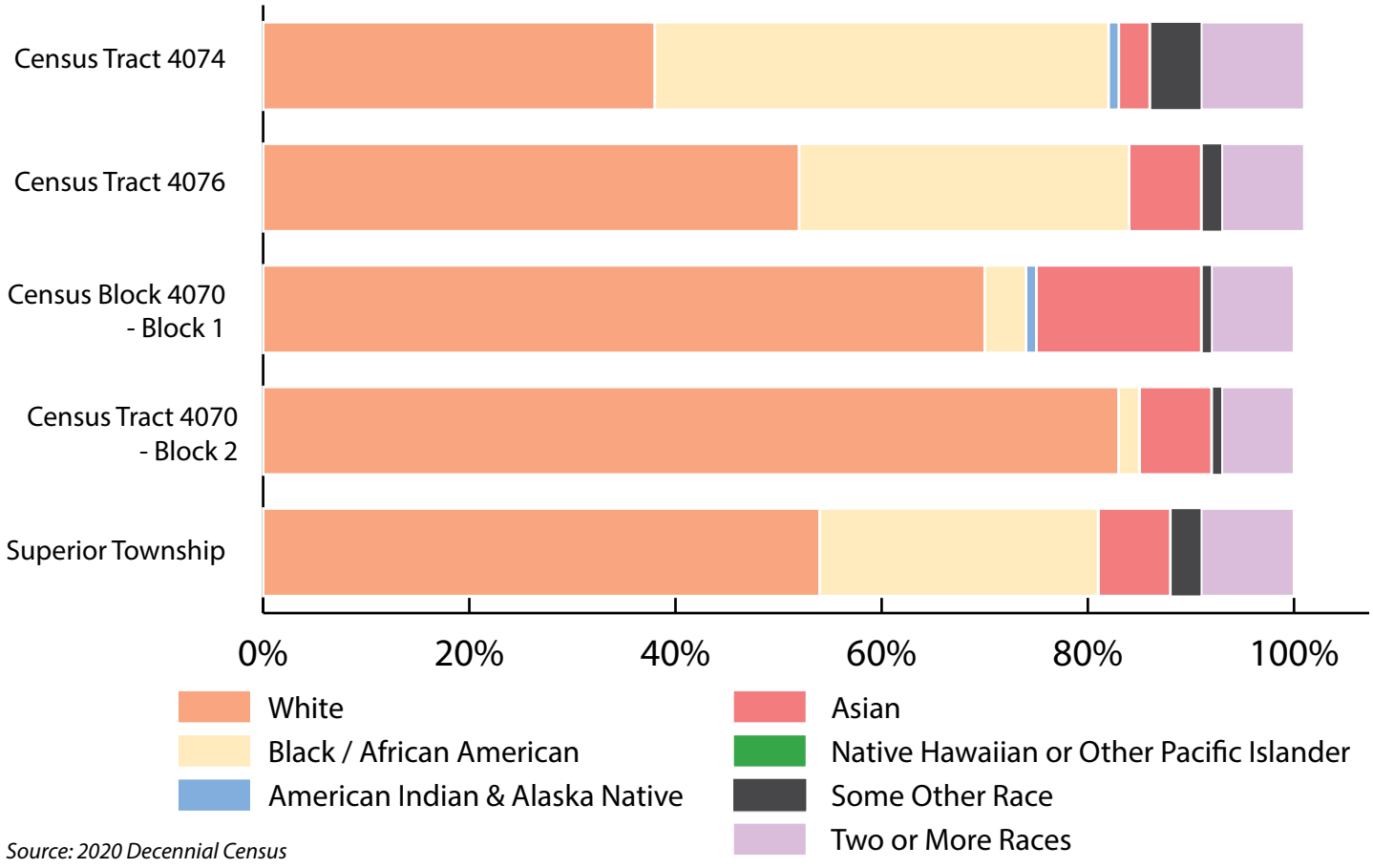


Source: U.S. Census Bureau, 2017-2021 American Community Survey 5-Year Estimates

As with household income, the race of Township residents varies between Township neighborhoods. Aforementioned census tract 4074 hosts a majority-minority racial makeup, with the largest racial group being Black or African American alone. The population of neighboring census tract 4076 hosts a nearly 50% minority population. To support the Township's population, Master Plan actions should increase visibility of the Township's diversity, enable equal opportunities and access to services, and promote community inclusion.

Jobs & Industries

Figure 7. Racial Percentages by Census Tract and Block - 2020



Source: 2020 Decennial Census

Hospitals and associated medical facilities are the Township's largest employers, making up 72% of jobs within the Township. Master Planning efforts can work to develop housing and transportation opportunities for residents who both live and work within the Township.

Educational Status

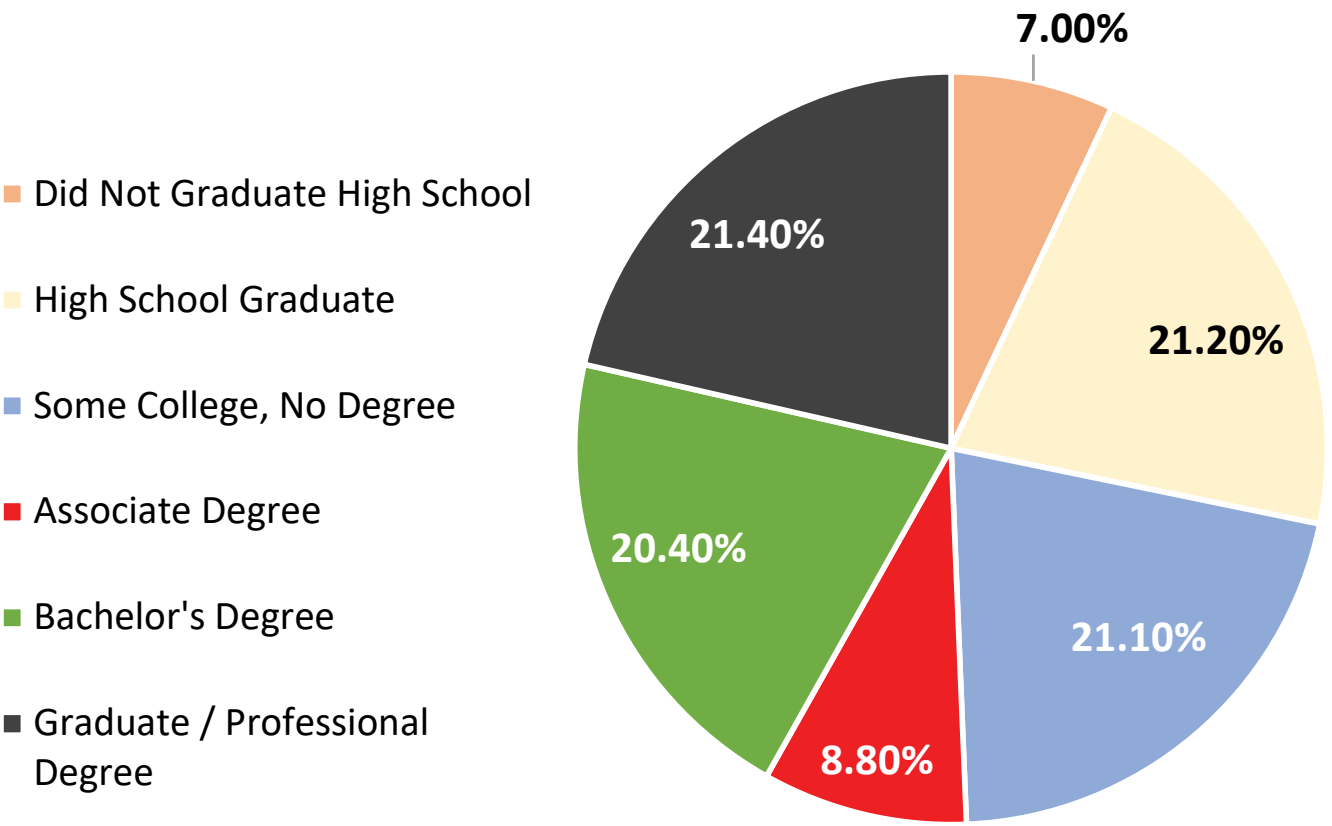
Approximately 25% of working age Township residents, those between 24 and 65 years, do not have an educational attainment beyond a high school degree. Planning efforts can incentivize the expansion of businesses with employment opportunities that support this workforce.

Housing

Table 4. 2020 & 2045Forecasted Jobs by Industry Sector

Forecasted Jobs by Industry Sector	Percent of Total Jobs in 2020	Percent of Total Jobs in 2045
Healthcare Services	71.25%	70.94%
Professional and Technical Services & Corporate HQ	6.26%	5.86%
Administrative, Support, & Waste Services	5.86%	6.69%
Information & Financial Activities	3.31%	3.06%
Leisure & Hospitality	2.74%	3.31%
Natural Resources, Mining, & Construction	2.50%	2.36%
Other Services	1.75%	1.53%
Education Services	1.68%	1.63%
Retail Trade	1.44%	1.07%
Manufacturing	1.01%	1.45%
Wholesale Trade	0.77%	0.74%
Public Administration	0.76%	0.75%
Transportation, Warehousing, & Utilities	0.68%	0.61%

Figure 8. 2021 Educational Attainment, Ages 24-65 Years



Source: SEMCOG 2020 Estimates, SEMCOG 2045 Forecast, U.S. Census Bureau, 2017-2021 American Community Survey 5-Year Estimates

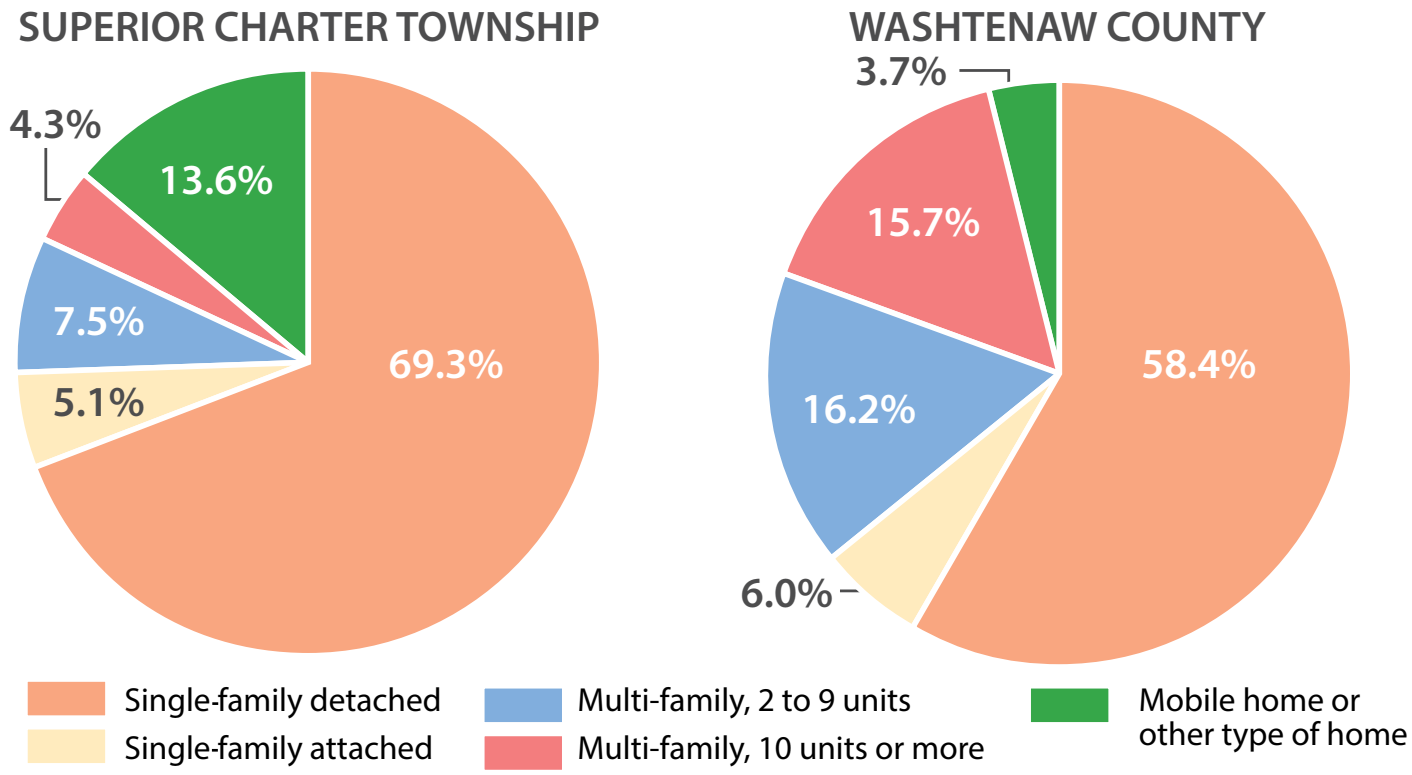
The predominant housing type within the Township is detached single-family housing units, which comprise almost 70% of all housing units in the Township. This value is higher than the County-wide housing stock. The second most common housing type is mobile home. Multi-family housing makes up less than 15% of total Township housing stock. This housing inventory reflects the Township's history and values but also poses challenges to residents in need of a more diverse housing stock.

The Township's housing inventory has increased by an average of nearly 50 new housing units every year between 2007 and 2021. Most of these units were detached single-family. SEMCOG estimates that this pattern of new housing construction will increase, with approximately 2,471 new units being built by 2045: approximately 99 units per year. However, Master Plan actions can influence the location and density of these project constructions.

The vacancy rate in the Township is exceptionally low, which reflects the demand for housing, at 3.9%. By comparison, the vacancy rate in Washtenaw County was approximately 5.7% in 2021, according to SEMCOG.

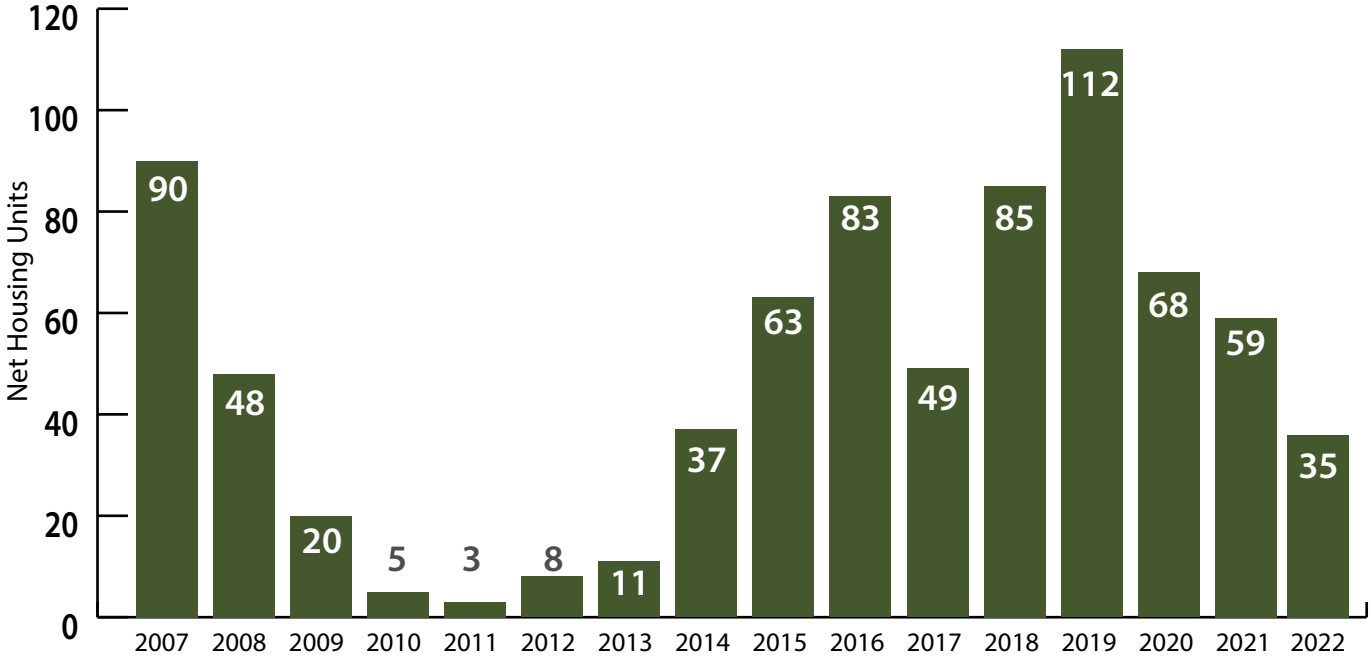
Housing costs in the Township are lower than the County median for homeowners and renters. Although housing costs are lower than neighboring Washtenaw County communities, Superior Charter Township residents are more cost-burdened than surrounding communities. Approximately 40% of all households in the Township pay 30% or more of their income towards monthly housing costs. Approximately 56% of renter households in the Township pay 30% or more of their income towards monthly housing costs. Several Master Plan strategies outlined in Chapter 5 aim to limit the burden of housing cost on Superior Charter Township residents.

Figure 9. 2021 Housing Types, Superior Charter Township



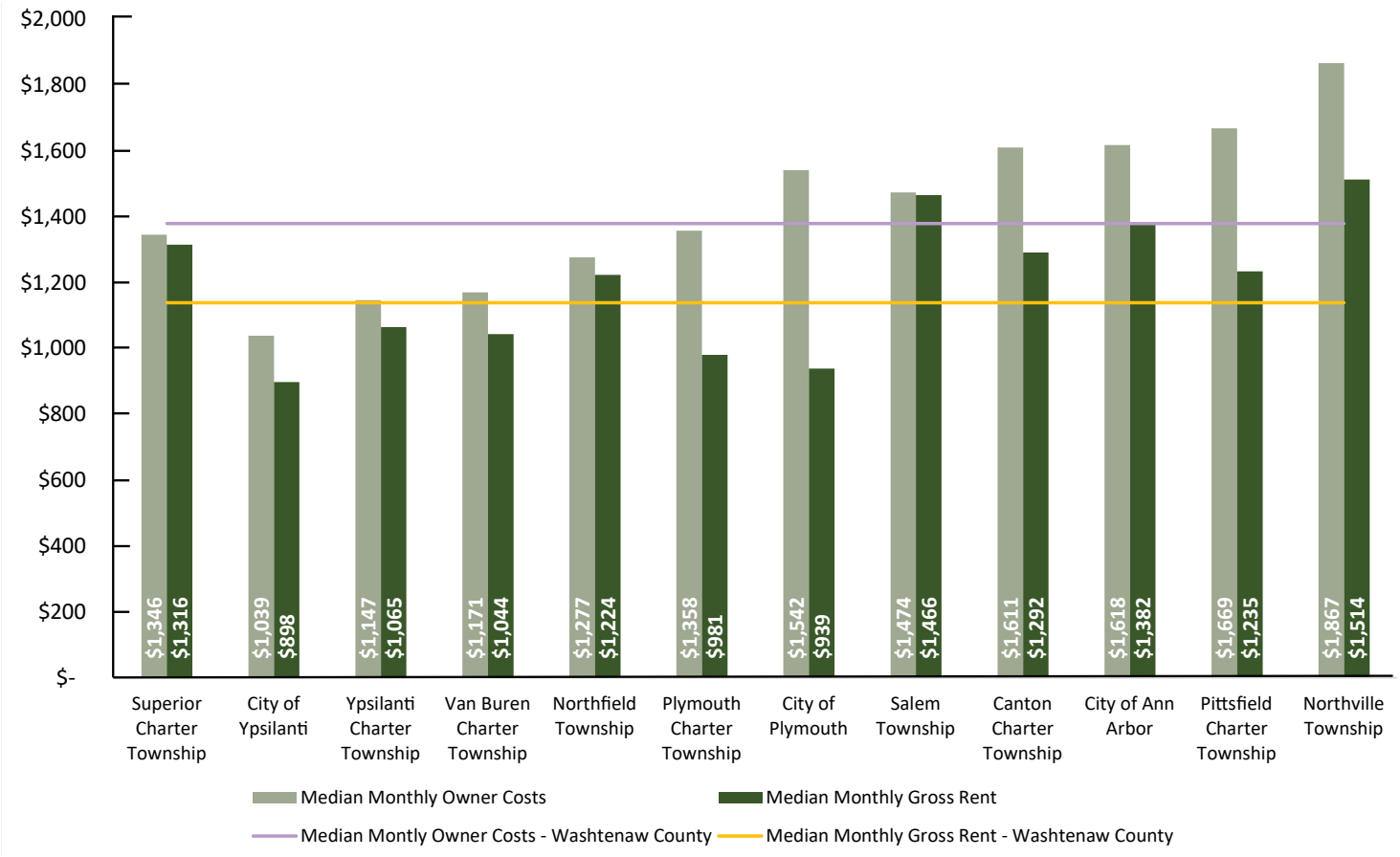
Source: U.S. Census Bureau, 2021 American Community Survey 5-Year Estimates

Figure 10. 2007 - 2022 Net New Total Housing Units per Year, Superior Charter Township



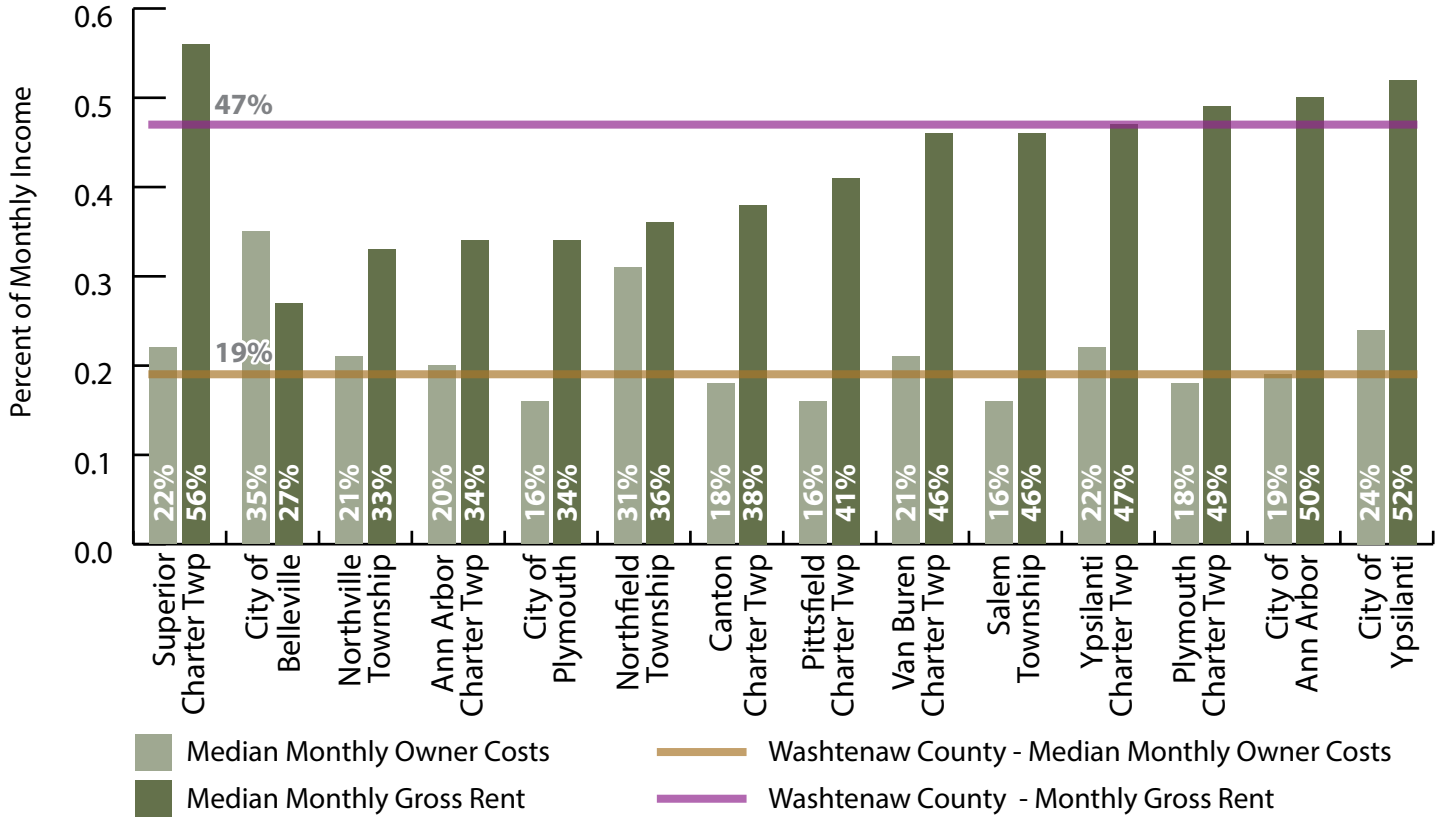
Source: SEMCOG 2022 Estimate

Figure 11. 2021 Median Monthly Housing Costs: Superior Charter Township & Surrounding Communities



Source: U.S. Census Bureau, 2017-2021 American Community Survey 5-Year Estimates

Figure 12. 2019 Percent of Households Paying 30% or Greater of Income in Monthly Housing Costs

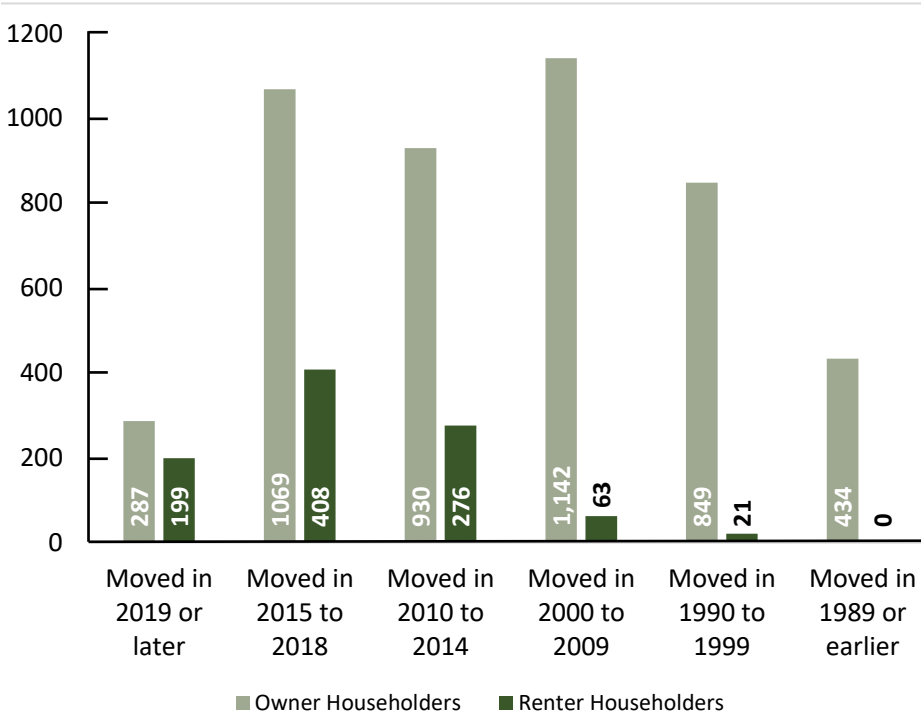


Source: U.S. Census Bureau, 2015-2019 American Community Survey 5-Year Estimates

The total influx of people into the Township has slowed in the last decade. However, while historic estimates of household tenure (people who rent or own) are less reliable, Census estimates suggest that the proportion of renter households in the Township has grown over the last decade. In the last five years, the proportion of renters moving into the Township has outpaced the proportion of homeowners.

Master Plan strategies can promote quality housing for all income levels and housing types, for both renters and homeowners, while supporting the Township's long-standing general development patterns.

Figure 13. Households by Year Householder Moved into Housing Unit, Superior Charter Township, 2021



Source: U.S. Census Bureau, 2017-2021 American Community Survey 5-Year Estimates

Commuter Patterns

Approximately 6,175 Township residents are part of the workforce and do not work from home, as measured from ACS 5-year estimates from 2017 to 2021.

Over half of workers who live in the Township travel less than 30 minutes to get to work. Roughly 35% of working residents commute for more than 30 minutes with roughly 7% of the working residents traveling for over an hour. Most of these commuters work in Ann Arbor, Scio Township, Pittsfield Township, and Ypsilanti Township. The remaining residents work along the I-275, I-96, and I-696 corridors north of the Township.

The 2015-2019 ACS 5-year estimates showed approximately 2,600 people who work within Superior Charter Township. About 5% of commuters drive over 50 miles to work in Superior Charter Township. The majority, roughly 80%, travel less than 25 miles, half of whom drive only 10 miles or less. Most workers commute from Ann Arbor and Ypsilanti Township. The COVID-19 pandemic may have impacted these values, but newer data is unavailable at the time of this writing.

Identifying commuter patterns within and beyond the Township can inform planning actions that serve to alleviate traffic, improve safety, and expand public transportation opportunities for Township residents and employees.

Table 5. Time Traveled to Work, Superior Charter Township Residents, 2021

	Count	Share
Total All Jobs	6,175	100.0%
Less than 15 minutes	863	13.9%
15 to 30 minutes	3,157	51.1%
30 to 60 minutes	1,739	28.2%
More than 60 minutes	416	6.7%

Source: U.S. Census Bureau, 2017-2021 American Community Survey 5-Year Estimates

Table 6. Distance Traveled to Work, Superior Charter Township Workers, 2019

	Count	Share
Total All Jobs	2,582	100.0%
Less than 10 miles	1,062	41.1%
10 to 24 miles	1,027	39.8%
25 to 50 miles	362	14.0%
Greater than 50 miles	131	5.1%

Source: U.S. Census Bureau, 2015-2019 American Community Survey 5-Year Estimates

Figure 14. Work Destinations for People Who Live in the Township, 15-Mile Radius, 2019

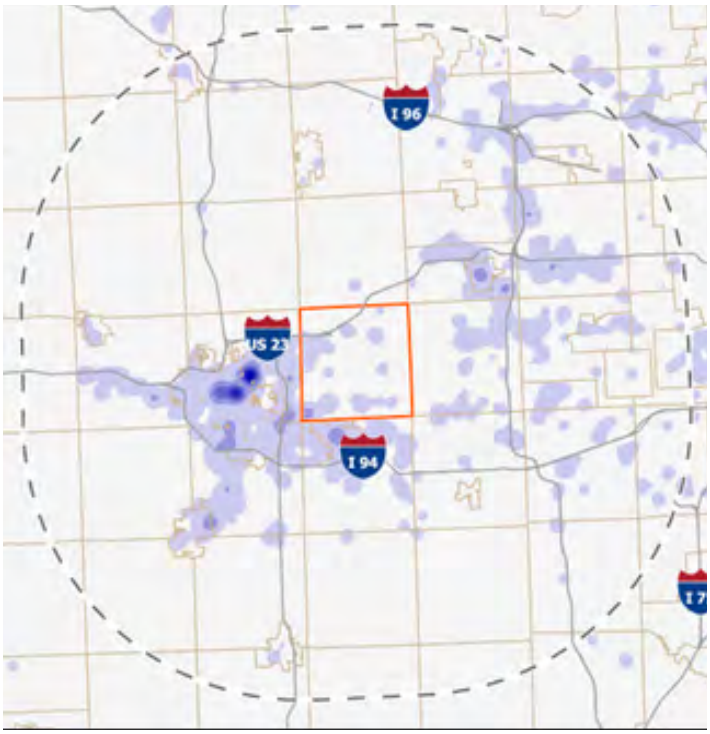
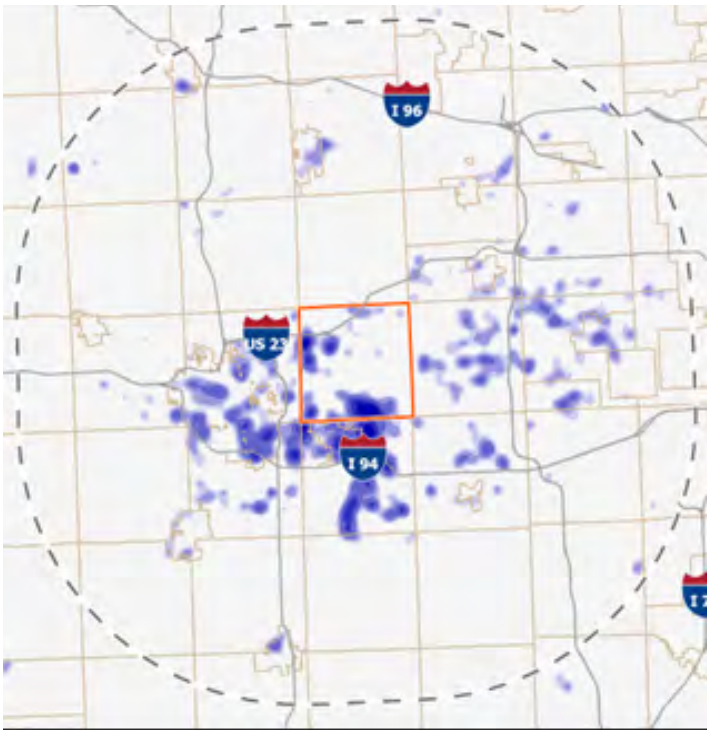


Figure 15. Home Destinations for People Who Work in the Township, 15-Mile Radius, 2019



Transportation

The principal arterial roads in the Township are Ford, Prospect, Plymouth-Ann Arbor, Geddes, and Clark Roads. Geddes and Prospect Roads are likely to increase in importance because of their roles in the area-wide road network.

Excluding the arterial roads north of Geddes, most roads in the Township are gravel roads. Due to the low volume of traffic produced by the existing and planned development in this area, these roads are sufficient to provide for the transportation needs in those areas. In addition to passenger vehicles that use these roads to access the very low-density housing in this area, these roads are used to move farm equipment, transport farm products and are frequently used for recreation by walkers, bikers, and even equestrians. However, increased vehicle speeds on these roads make them less safe for farm use and recreation.

Traffic volume from development in adjoining jurisdictions will continue to put pressure on these arterials. Planning actions that work to retain the rural character of these areas, limit traffic, and reduce speeds align with the Township growth management and development goals.

Table 7. Road Type Inventory, Superior Charter Township

Road Type	Miles
County Local	68.96
County Primary	32.18
Non Act 51 Certified	32.42
State Trunkline	15.83
Total	149.39

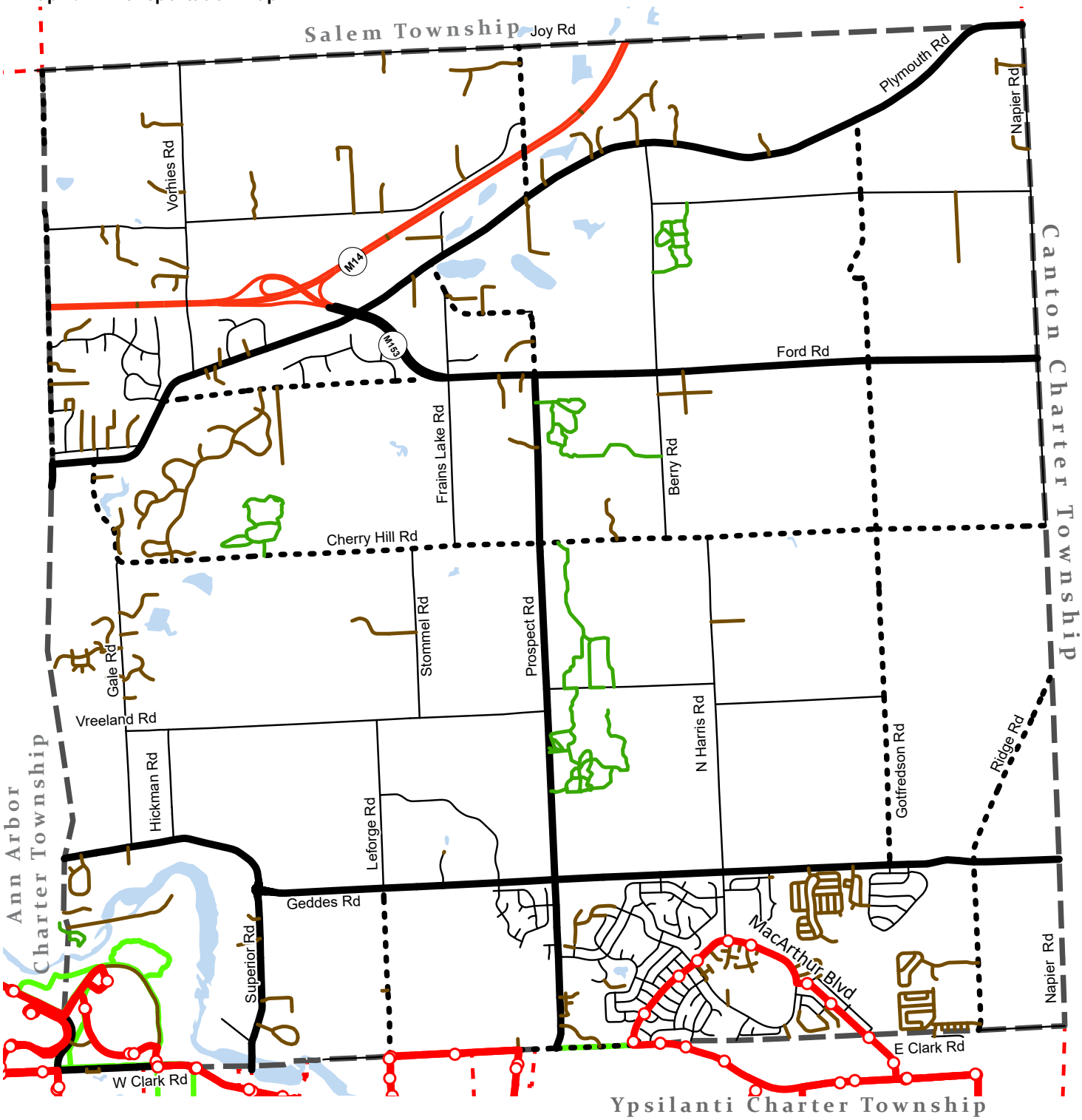
Geddes Road Corridor

One of the most significant east/west transportation routes in Superior Charter Township, north of the Ann Arbor-Ypsilanti urban area, is Geddes Road. Geddes Road has historically served as a regional arterial connector from rural areas to urban centers and other transportation networks. Within Superior Charter Township, Geddes Road passes through significant land holdings of the Ford Motor Company, highly productive farmlands, the Township's Technology/Research Village area anchored by the Hyundai-Kia Motors Technical Center, and notable residential areas. Farther to the west, within Ann Arbor Township, Geddes Road intersects with the Dixboro Road corridor, an area becoming increasingly urbanized, and with an interchange with US-23. The two-lane rural character of Geddes Road is enhanced as it passes through long stretches of flat agricultural lands in the eastern and central portions of the Township and then turns into a winding roadway over gentle hills in the western portion of the Township.

Geddes Road will continue to increase in importance because east/west transportation is restricted within the southern portion of the Township. The Huron River is located south of Geddes Road. University of Michigan properties, including Radrick Farms and Matthaei Botanical Gardens, are located west of Gale Road and north of Geddes Road. Other north/south roadways intersect with Geddes Road, thus directing additional traffic onto Geddes Road. Previous planning policies have recognized that Geddes Road is a logical physical barrier to buffer rural lands to the north from encroaching urban development from the south.

In recognition of the dynamic pressures that will be placed on Geddes Road in the future, policies in the Master Plan will be directed toward maintaining the unique rural character of Geddes Road and retaining it as a physical barrier to buffer land uses. This will include an initiative to plant trees along each side of the road, and to construct a separate non-motorized trail along the road.

Map 2. Transportation Map



Road National Functional Classification (NFC)
- Other Freeways
- Arterial Roads
- Collector Roads
- Local roads
- Private roads

- Border to Border Trail
- Superior Township Boundary
- Adjacent Community Boundaries
- Paths and Trails
- Waterways
- TheRide Stops
- TheRide Routes

N

0 0.5 1 Miles

0 2,500 5,000 Feet

Transportation

Superior Charter Township
Washtenaw County

Roads, Tax Parcel, and Rivers Data from Washtenaw County GIS

October 16, 2023
Carlisle/Wortman Associates, Inc.
Ann Arbor, Michigan

The M-14 Corridor

The M-14 freeway, opened to traffic in 1979, will continue to increase pressure for development in the area along the freeway and Plymouth-Ann Arbor Road, especially for rural housing. Fortunately for the preservation of agricultural land, the freeway corridor does not pass through the Township's best farmland. The freeway will also increase the importance of Ford Road east of the freeway. To a lesser extent it will also increase the importance of Plymouth and Prospect Roads. M-14 has become a preferred route for commuters traveling from north and west of Ann Arbor to work in the Metro Detroit region.As a result, it is becoming more frequently congested during peak hours, which results in vehicles diverting to Plymouth-Ann Arbor or Ford Roads.

Transit and Non-Motorized Transportation

An expanded public transportation system will also be an important issue in the next 20 years. The pattern and density of future development in the urban part of the Township should take this issue into account. In addition, the non-motorized circulation system must be increased. At a minimum, non-motorized trails or sidewalks are essential along existing arterials and collectors south of Geddes Road and on Prospect Road, as well as along all new streets in subdivisions and condominium developments.

Conservation efforts in the Township have resulted in a growing trail network. This Master Plan includes initiatives which seek to expand the growing trail network and improve non-motorized connections throughout the Township. A Non-Motorized Plan may facilitate greater progress toward a more robust non-motorized trail network in Superior Charter Township.

Transit accessibility and sidewalk coverage is limited and is concentrated in the southern part of the Township. Three AAATA TheRide bus routes travel through the Township. However, all three routes are concentrated in the southernmost portion of the Township and do not fully cover the residential communities south of Geddes Road. Increasing Township residents' accessibility to bus routes will require coordinated efforts with neighboring jurisdictions.

Natural Features

Geology & Topography

The existing terrain in and around Superior Charter Township was shaped by the Wisconsin ice sheet, which retreated from the region about 13,000 years ago. The substrate consists mainly of sandstone, limestone, shale, salt, and gypsum. Superior is characterized as flat to moderately hilly with bands of gently rolling topography from the southwest to the northeast corner of the Township. Elevation changes from a high of 938 feet in the far northwestern corner of the Township to 708 feet near the intersection of Ridge Road and Geddes Road. Fleming Creek, which roughly parallels Plymouth-Ann Arbor Road, forms a gentle valley running from the northeast to the southwest, before ultimately meeting with the Huron River south of Stark Strasse Street. Smaller tributaries including Fowler Creek flow southeast into Wayne County as part of the greater Rouge River watershed. Map 3 on page 28 provides a visual representation of topography in the Township.

Soils

Two major soil associations are identified in the Washtenaw County Soil Survey for Superior Charter Township: Morley-Blount and St. Clair-Nappanee-Hoytville. These soils are fine to medium texture loams and clay. They have a moderate water capacity and slow permeability. Around 75% of the soils are suitable for agriculture with the remaining composed of wetlands or steep slopes.

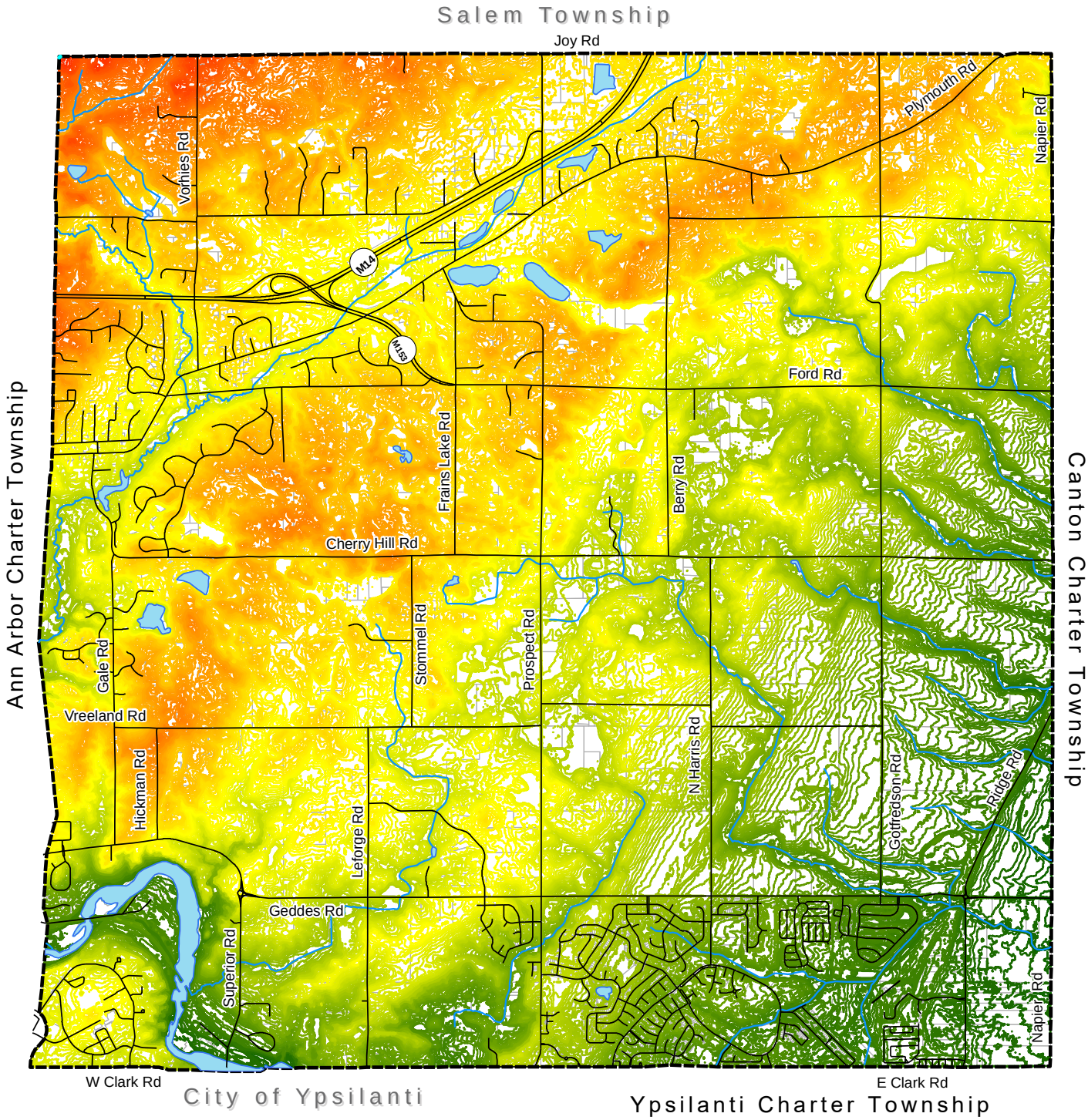
Water Resources

Superior Charter Township is within the Huron River and Rouge River basins. The Huron River basin captures flow from the western portion of the Township and the Rouge River basin captures flow from the eastern portion. The Huron River, specifically its tributary Fleming Creek, is the Township's largest waterway. Precipitation is the major source of groundwater recharge for the Huron River basin. The northeastern portion of the Township generally has adequate groundwater access, but the southeastern area is sometimes in low supply. Sensitive groundwater recharge areas exist near Fleming Creek, the Huron River, and the eastern edges of the Township. The exact location of underground aquifers is difficult to establish, and new development or uses may or may not adversely affect local water supplies.

Wetlands

Wetlands are prevalent throughout the community, particularly in the central and northern sections. The Michigan Department of Environment, Great Lakes, and Energy (EGLE) wetland maps show a widespread network of hydric soils and wetlands; Map 5 on page 30 highlights the location of confirmed wetlands only. Some of the largest examples can be found in the Matthaei Botanical Gardens, the northern portion of LeFurge Woods Nature Preserve, and in Harvest Moon Park. The composition of the wetlands varies from location to location, but scrub-shrub wetlands, wet prairies, and hardwood swamps are common. Superior Charter Township enacted a wetlands ordinance in 1998 to protect these delicate features of the Township.

Map 3. Topographic Map



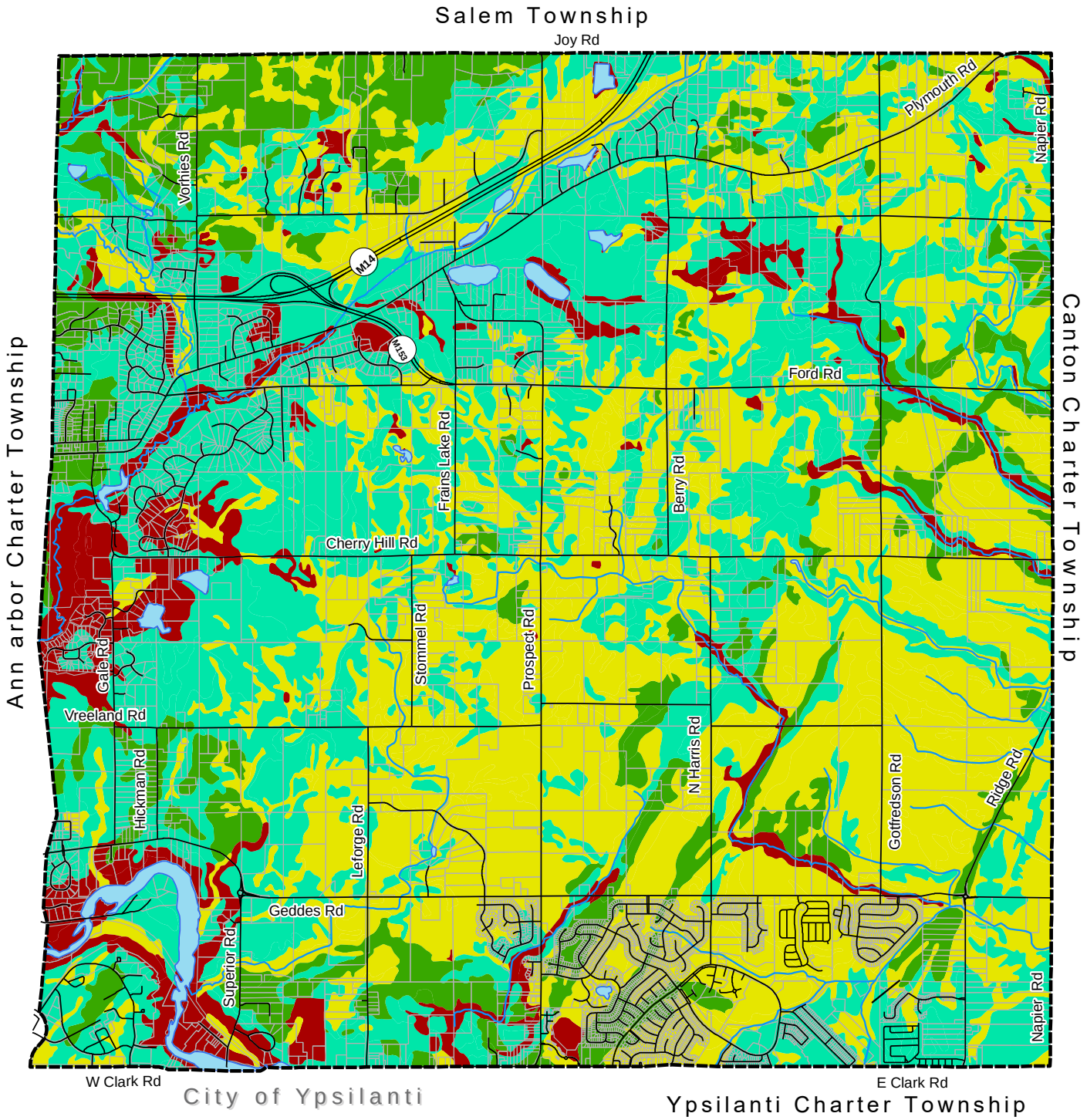
Elevation Map

Superior Charter Township
Washtenaw County

Roads, Tax Parcel, and Rivers Data from Washtenaw County GIS

January 5, 2022
Carlisle/Wortman Associates, Inc.
Ann Arbor, Michigan

Map 4. Soils Map



Prime Farmland

Land that has the best combination of physical and chemical characteristics for producing

Not Prime Farmland

Farmland of Local Importance

May be designated for agriculture by local ordinance

Prime Farmland (If Drained)

N

0 0.5 1 Miles

0 2,500 5,000 Feet

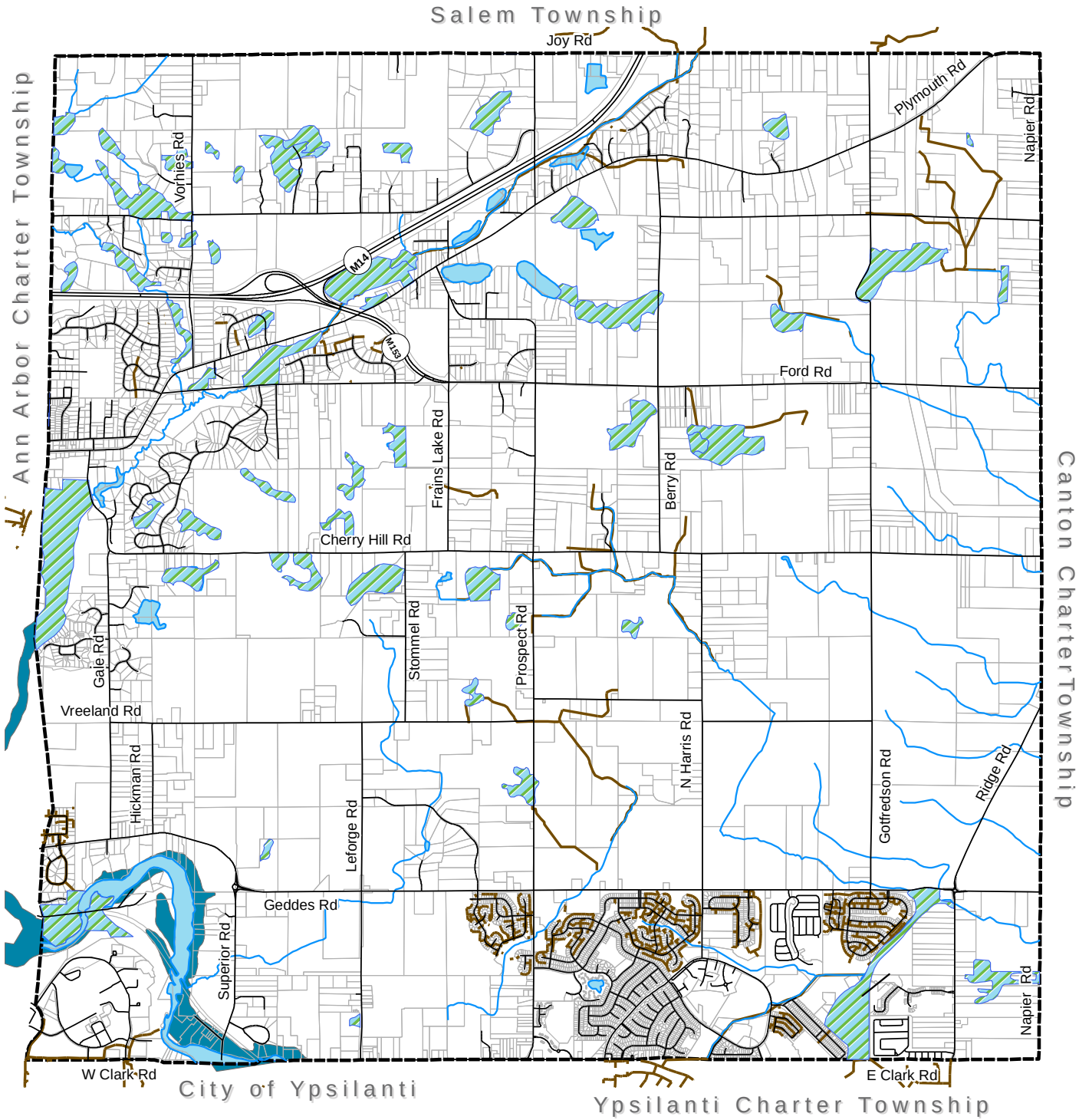
Agricultural Soils

Superior Charter Township
Washtenaw County

Roads, Tax Parcel, and Rivers Data from Washtenaw County GIS
Soils Data from USDA

February 9, 2022
Carlisle/Wortman Associates, Inc.
Ann Arbor, Michigan

Map 5. Wetlands and Water Bodies



Wetlands
Lakes/Ponds
Floodplains
Rivers/Streams
Drains

N

0 0.5 1 Miles

0 2,500 5,000 Feet

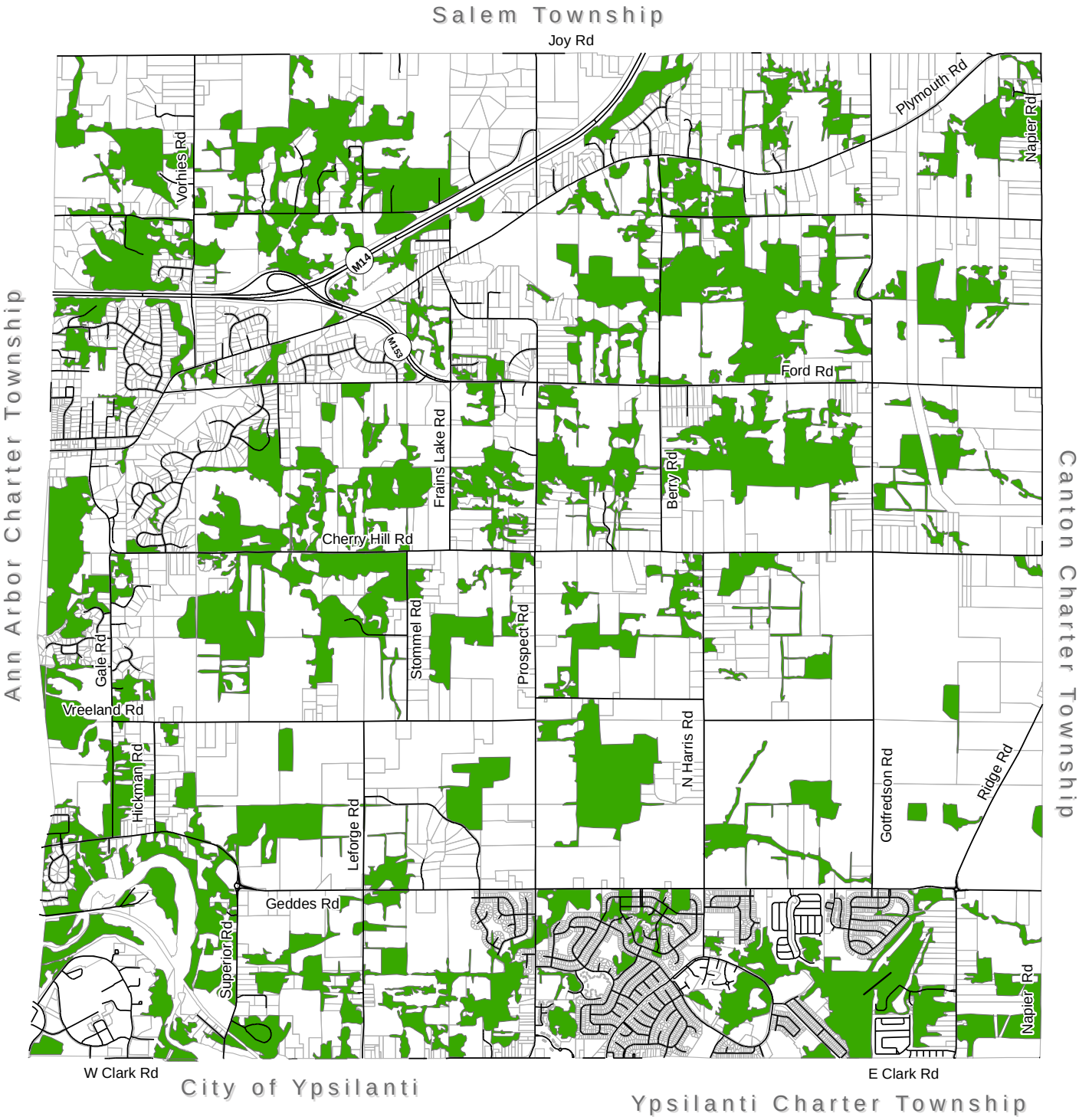
Natural Features - Water Bodies

Superior Charter Township
Washtenaw County

Roads, Tax Parcel, and Rivers Data from Washtenaw County GIS

June 30, 2023
Carlisle/Wortman Associates, Inc.
Ann Arbor, Michigan

Map 6. Woodland Areas



Woodlands

Natural Features - Woodlands

Superior Charter Township
Washtenaw County

Roads, Tax Parcel, and Rivers Data from Washtenaw County GIS

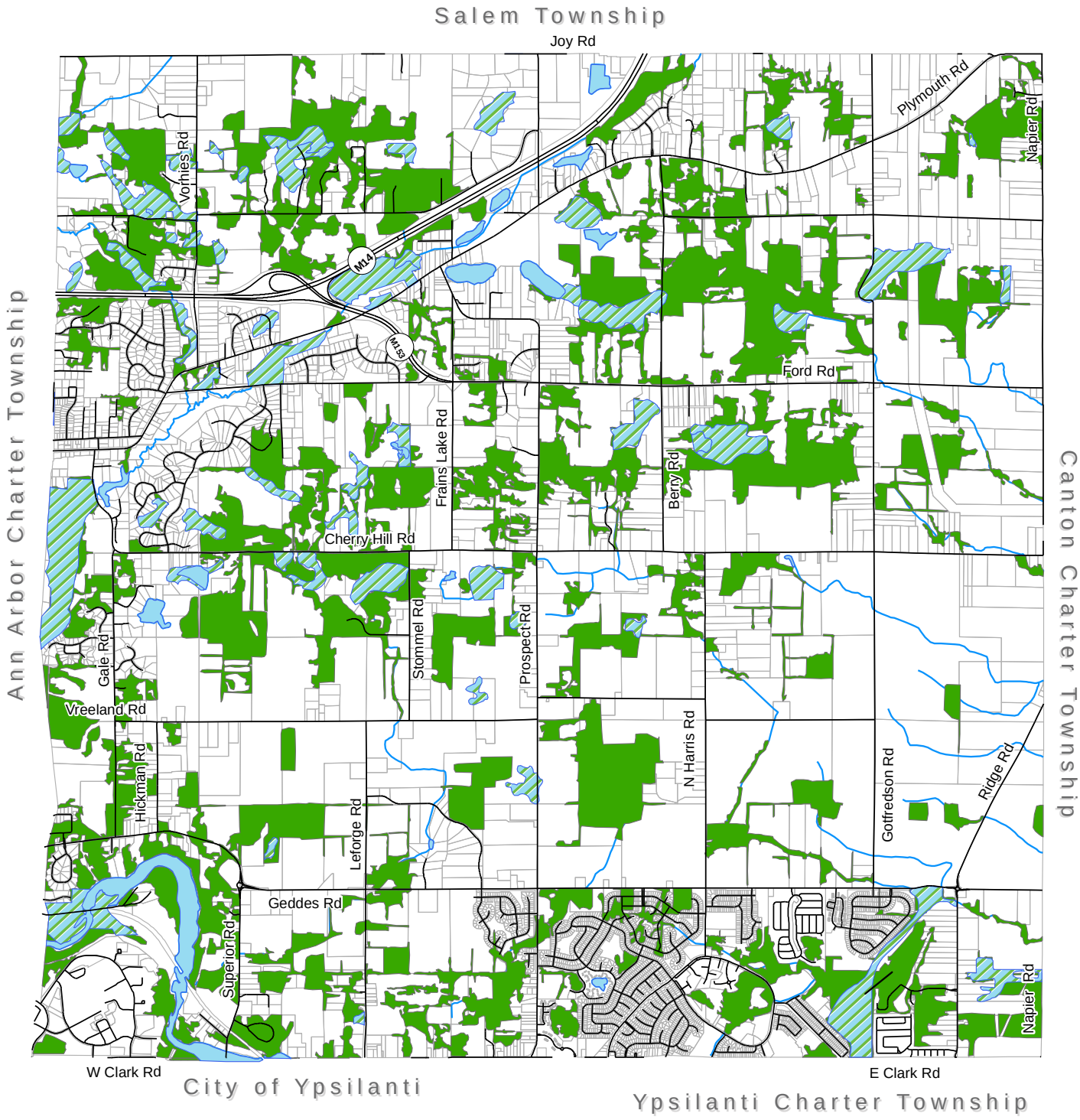
January 5, 2022
Carlisle/Wortman Associates, Inc.
Ann Arbor, Michigan

N

0 0.5 1 Miles

0 2,500 5,000 Feet

Map 7. Natural Features Map



Lakes/Ponds
Wetlands
Woodlands
Rivers/Streams

N

0 0.5 1 Miles

0 2,500 5,000 Feet

Natural Features

Superior Charter Township
Washtenaw County

Roads, Tax Parcel, and Rivers Data from Washtenaw County GIS

January 5, 2022
Carlisle/Wortman Associates, Inc.
Ann Arbor, Michigan

Environmentally Sensitive Areas

Environmentally sensitive areas (ESAs) are areas of natural features which are vital to the long-term maintenance of biological diversity, soil, water, or other natural resources both on the site and in a regional context. They include wildlife habitat areas, steep slopes, wetlands, watercourses, woodlands, and prime agricultural lands.

ESAs have special environmental attributes worthy of retention or special care in order to:

a. Maintain habitat, open space, and wildlife corridors;

b. Provide stormwater management, filtration, and flood and erosion control benefits; and

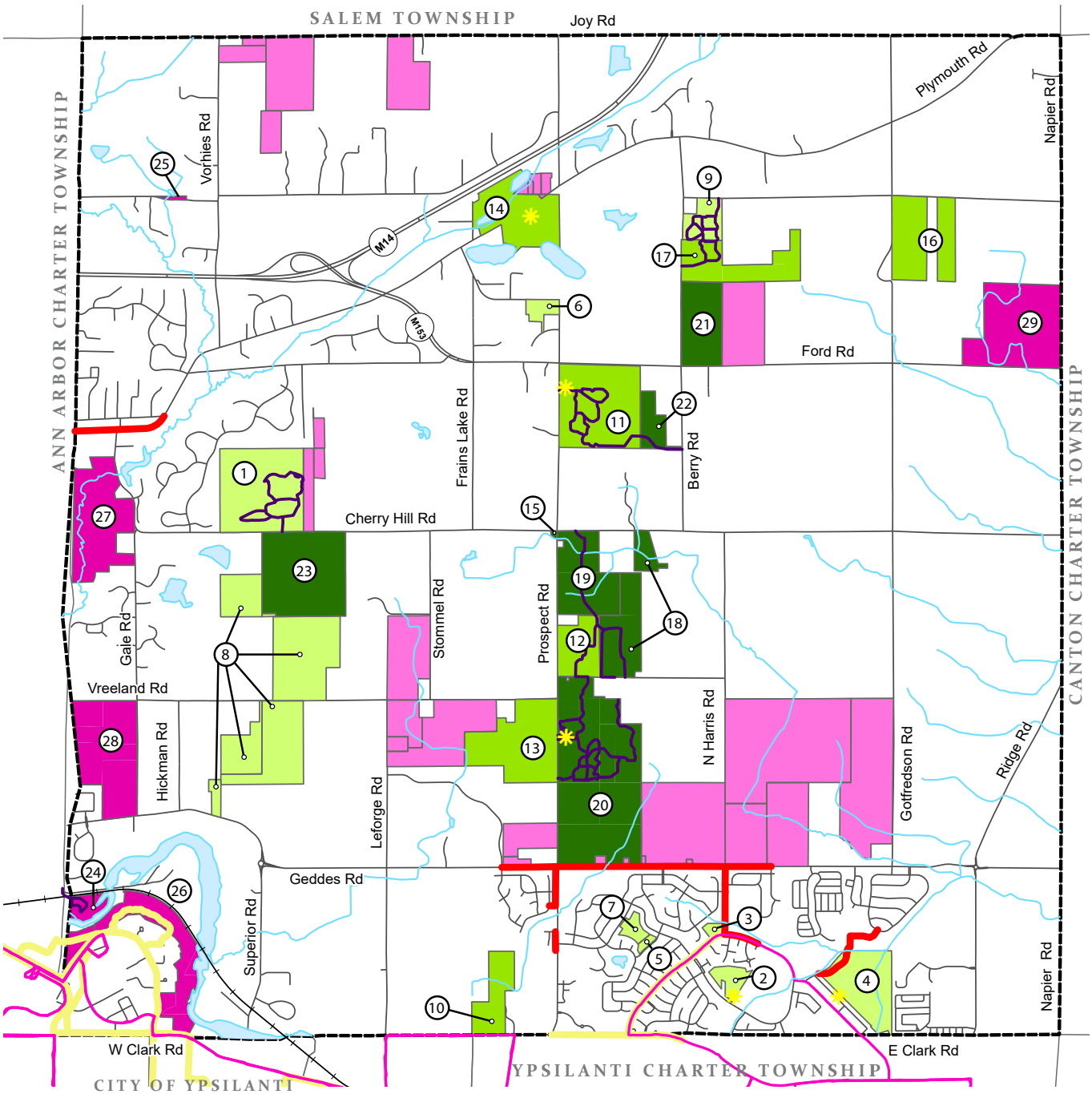
c. Protect surface and groundwater quality.

ESAs range in size from small patches to extensive landscape features. They can include rare or common habitats, plants, and animals.

When ESAs are interconnected, they can form greenway corridors consisting of networks of linked natural area elements that provide ecological, recreational, and cultural benefits to a community. By implication, the planning process which communities use in protecting ESAs can serve as a template for developing greenway corridors.

Strategies for protecting identified, environmentally sensitive areas are reflected in the Township policies, specifically in the future land use plan. The maps begining on page 28 and running through page 32 provide a high level view of the natural features that help to define ESAs. Map 8 on page 34 shows all of the local, county, and other recreational and preserved properties in the area which form the Superior Greenway and the overall network of protected properties in the Township.

Map 8. Recreation & Conservation Properties Map



- Superior Charter Township
- Washtenaw County Parks & Rec
- SE Michigan Land Conservancy
- Purchase of Development Rights
- Other Recreation / Conservation
- B2B Trail
- Superior Twp Trails
- Trails 2023
- Public Access Parking Lots
- Roads
- Lakes/Ponds
- Rivers/Streams
- AAATA Routes

SUPERIOR CHARTER TOWNSHIP
1. Cherry Hill Nature Preserve
2. Community Park
3. Fireman's Park
4. Harvest Moon Park
5. Norfolk Park
6. North Prospect Park
7. Oakbrook Park
8. Rock Superior Properties
9. Schroeter Park

WASHTENAW COUNTY
10. Highland Preserve
11. Kosch Headwaters Preserve
12. Myer Preserve East
13. Meyer Preserve West
14. Staebler Farm County Park
15. Superior Center County Park
16. Lost Wagon Lake Preserve
17. Weatherbee Woods Preserve

SE MICHIGAN LAND CONSERVANCY
18. Conservancy Farm
19. Jack R. Smiley Nature Preserve
20. LeFurge Woods Nature Preserve
21. Secrest Preserve
22. Springhill Nature Preserve
23. Unnamed Preserve

OTHER RECREATION / CONSERVATION
24. Forest Nature Area
25. Wing Nature Preserve
26. St. Joe's Nature Area
27. Matthaei Botanical Gardens
28. Radrick Farms Golf Course
29. Hickory Creek Golf Course

Recreation & Conservation Properties

Superior Charter Township

Washtenaw County, Michigan

Data: Superior Charter Township, Washtenaw County, State of Michigan
Carlisle/Wortman Associates
12/7/2023

N

0 0.5 1 Miles

Chapter 3: Vision & Policy Statements

Image Source: Detroit Free Press

A necessary element to the Superior Charter Township Master Plan is the articulation of a vision for the Township's future and the formulation of policies. The vision for the future is influenced by the challenges of the present, including loss of agricultural services and land, pressure from urban growth in surrounding communities, and the need for development that supports the current and future residents' needs and preferences. The vision, mission, goals, and strategies were crafted as part of the community-based process. The vision statement in this Master Plan represents the long-term aspirational vision of what the community desires to be. The vision is based on the existing community character, its assets, and how the residents and stakeholders would like the Township to look and function in the future. The vision is based on shared community ideals and represents a starting point for the policy direction in this plan. All policies, strategies and actions should be aligned to achieve this vision.

Vision

Superior Charter Township's community vision is rooted in strong neighborhoods, land preservation, sensible economic development, and environmental preservation to ensure a livable, sustainable community for all residents. In the context of the Master Plan, the Township defines sustainability as development that meets the needs of the present without compromising the ability of future generations to meet their own needs. The community envisions a future where housing needs of the community are met; various high quality efficient means of transportation are available that provide community members access to jobs and resources; open space, agricultural land, and natural features are preserved; and there is an appropriate level of commercial and industrial development that provides employment opportunities and financial benefits to the community.

Superior Charter Township strives to find the right balance between preservation and development and considers social, environmental, and economic impacts in guiding development while achieving carbon neutrality; preserving open space; protecting natural resources, including air, water, natural habitats, and public lands; and maintaining viable agricultural land and rural character.

Policies

Policies are a set of statements which are based on the community vision that can be used as tools to guide decision-makers such as Township staff, the Planning Commission, and the Township Board in their deliberations on zoning, land preservation, economic development, capital investment, and other matters relating to land use and development. This will provide a stable, long-term basis for decision-making. The policy statements attempt to balance the various interests and ensure that each decision is consistent with the overall vision for the Township. They articulate preferred development patterns and influence development strategies and means of preservation that are appropriate for the Township.

The policies presented in this chapter were developed with input from residents, property and business owners, the Planning Commission, the Township Board of Trustees, and other Township officials.

Policies are organized around five major themes including Growth Management, Open Space and Land Preservation, Housing, Environmental Protection, and Transportation.

Growth Management Policies

Growth management has been an effective strategy implemented by the Township since its inception. Growth management is an effective land use planning approach to implement where unrestrained development would impede natural and conserved areas, alter community character, and threaten to outpace the provision of adequate infrastructure. The Township recognizes that different growth management strategies are necessary in different portions of the Township. Historically, the Township has found that growth management tools are necessary because there has been pressure to convert agricultural lands and natural areas to other uses, which is contrary to community goals and desires. However, growth management doesn't mean no growth, rather it attempts a balanced approach to provide for appropriate and desired growth in areas that have the necessary infrastructure, are consistent with existing land uses, contribute to community character, and do not conflict with the Township vision.

Policy 1: Superior Charter Township supports the long-standing Township policies that have established the existing general development pattern in the Township.

Policy 2: The type and density of new development should remain consistent with existing types and densities of nearby land uses.

Policy 3: Maintaining the existing agricultural preservation and rural character of the community is essential to Superior Charter Township.

Policy 4: Superior Charter Township supports its robust and historical agricultural base.

Policy 5: Superior Charter Township supports existing and planned development that provides jobs in the community.

Policy 6: Superior Charter Township supports diverse land uses that provide residents convenient access to housing, goods, and services.

Policy 7: Superior Charter Township believes that any new development (Residential/Commercial/Industrial) should be focused within designated and planned areas.

Policy 8: Superior Charter Township believes that any new development (Residential/Commercial/Industrial) should be done in a sustainable manner.

Policy 9: Superior Charter Township strives to recognize and protect historic assets.

Policy 10: Superior Charter Township's land use goals support regional land use goals.

Open Space, Land Preservation, and Agricultural Preservation Policies

Superior Charter Township has a rich agricultural heritage that has yielded the rural landscape which we see today and that largely defines the Township. Protecting agricultural heritage is important to the community, and it is also important from a state and national perspective. Agriculture is Michigan's second-largest industry, and Michigan agriculture is the second most diverse in the nation, trailing only California. Protecting farmland enables farmers to continue their operations and maintain a viable local food system which reduces reliance on distant sources. Superior Charter Township's farmland is among the best in Michigan, and it is our responsibility to protect it for present and future generations.

Conserving farmland along with woods, meadows, and wetlands also provides habitat for wildlife, promotes biodiversity, and contributes to the overall health of ecosystems. Woodlands and fields permit greater groundwater recharge and maintain water quality. Streams, wetlands, and small lakes host buffer vegetation that protects and enhances water quality. Protecting farmland, fields, and woods can also mitigate the impacts of climate change by sequestering carbon dioxide and reducing greenhouse gas emissions. The coordinated retention of these natural and open space areas supports ecological corridors which enhance recreation opportunities and provide scenic views throughout the township.

Due to long-standing adopted Township policies, the most common landscape in Superior Charter Township north of Geddes Road continues to be a mix of woods, meadows, wetlands, and farmland. The central area of the Township remains largely undeveloped, and neighborhoods still retain a rural and natural character within all but the southern edge of the Township.

Policy 1: Natural features, land preservation, and open space are key components of Superior Charter Township's community character and quality of life.

Policy 2: Superior Charter Township actively strives to protect, preserve, and acquire additional open space and natural features.

Policy 3: Superior Charter Township actively strives to protect, preserve, and grow agricultural lands.

Policy 4: Superior Charter Township strives to strengthen zoning for agricultural land to protect the land base required for local food production.

Environmental Protection Policies

The Township is endowed with an abundance of significant natural features, which have been preserved due to long-standing Township policies. These natural features include wooded areas, streams, wetlands, and a varied topography. It is important that preservation of these features be integrated into the development pattern to ensure clean water, clean air, and maintenance of the rural and natural character within the Township. Actions which enhance the Township's long-term environmental resiliency are also of great importance.

Policy 1: Superior Charter Township actively strives to protect clean water.

Policy 2: Superior Charter Township actively strives to provide and incentivize renewable energy and energy efficiency.

Policy 3: Protection of natural features including rivers, streams/tributaries, wetlands, woodlands, groundwater recharge areas, areas of noted threatened and endangered species, steep slopes, natural areas, and wildlife habitat are of utmost importance in land use decisions and Township policies.

Policy 4: Superior Charter Township advances the improvement of natural features including rivers, streams/tributaries, wetlands, woodlands, groundwater recharge areas, areas of noted threatened and endangered species, steep slopes, natural areas, and wildlife habitat.

Housing Policies

The presence of a wide variety of housing options in Superior Charter Township encourages a vibrant community. Housing needs and desires are changing, and this change should be reflected by the housing options within the community. Since Superior Charter Township hosts a lower median household income and a lower housing vacancy rate than greater Washtenaw County, an affordable and attainable housing stock is in high demand and should be made available to community residents. Rather than concentrating more affordable and higher density housing in areas removed from the rest of the Township community, green spaces and neighborhood commercial land uses should be intermixed with these residential neighborhoods to increase connectivity and provide a greater sense of place for Superior Charter Township's most vulnerable residents.

Policy 1: Superior Charter Township recognizes that the existing neighborhoods and the existing housing stock are an essential part of the community's character.

Policy 2: Superior Charter Township recognizes the need for a diversity in housing stock to support the housing needs of all its residents, including young people, families, and seniors aging in place.

Policy 3: Superior Charter Township supports the development of senior housing options.

Policy 4: Superior Charter Township supports housing densities where additional population will not overburden the existing or planned infrastructure.

Policy 5: Superior Charter Township promotes residential development in a manner which will create, preserve, and enhance a quality living environment for existing and future Township residents and workers.

Policy 6: Superior Charter Township recognizes that the voices of all existing and even potential future residents are not always at the table and extra effort may be needed to consider all housing needs, not just existing property owners.

Policy 7: Superior Charter Township supports increased housing density in planned areas, where feasible, to promote maximum retention of open space and natural features in other portions of the Township and region.

Policy 8: Superior Charter Township supports neighborhood commercial development that provides higher density residential neighborhoods with convenient access to day-to-day businesses and employment.

Transportation Policies

Transportation policies for Superior Charter Township include motorized and non-motorized transportation networks. All improvements to the transportation system should be considered opportunities to improve safety, access, and mobility for all travelers within the Township and throughout the region. Future road improvements should include non-motorized transportation facilities to accommodate the needs of walkers, bicyclists, and public transportation riders of all ages and abilities. These facilities should be included during planning, programming, policy development, design, construction, reconstruction, retrofit, operations, and maintenance activities and during product selection. Future road improvements should be compatible with and supportive of the Township's land use policies. Too often land use policies must be adjusted to fit road improvement plans. Planning for traffic flows and necessary road improvements should be consistent with transportation policies of the County. Road improvements should respect natural features, especially trees and brush, and the natural character of road corridors. Existing residential areas should be protected from road widening and realignment.

Policy 1: Superior Charter Township supports safe and convenient transportation options for all uses and modes including pedestrians, bicyclists, motorists, and transit riders.

Policy 2: Superior Charter Township recognizes that transportation facilities must be contextually appropriate to the unique areas of the Township that they serve.

Policy 3: Superior Charter Township promotes the continued maintenance of roads.

Policy 4: Superior Charter Township supports traffic calming and the mitigation of traffic congestion.

Policy 5: Superior Charter Township believes both motorized and non-motorized transportation facilities must be enhanced within planned growth areas.

Policy 6: Superior Charter Township supports the enhancement and protection of opportunities for bicycling throughout the community.

Policy 7: Superior Charter Township promotes the enhancement of pedestrian facilities, including trails, sidewalks, and crosswalks.

Policy 8: Superior Charter Township promotes increased transit options, particularly to serve underserved populations, significant shopping areas, employment destinations, and regional coordination.

Policy 9: Superior Charter Township promotes increased safety of non-motorized transportation.

Chapter 4: Growth Management & Future Land Use

Image Source: CWA

Growth management includes multiple strategies used to guide the type, intensity, location, and timing of new development. The Growth Management Plan described herein lists the necessary strategies to manage development and future growth within the Township. Growth management goes beyond traditional land use planning and zoning. Other factors such as the protection of natural spaces, sufficient and affordable housing, delivery of utilities, preservation of buildings and places of historical value, and areas for employment and commerce are considered.

A major premise of this approach is to recognize that there are various areas within the Township that should be contextually planned based on their location, existing features, existing land use, and existing and intended character. These areas are identified as Planning sub-areas within the Township.

This chapter starts with an inventory of existing land use. Building off the existing land use, sub-areas are identified and described. The sub-area section draws connections between various policies and strategies identified in this plan that are appropriate to apply to each specific area. This chapter also includes a section on community infrastructure that directly affects the development potential of each area in the community. Finally, this chapter provides a future land use plan that depicts the future intended use for every parcel of land in the Township as is appropriate based on the policies and strategies in this Master Plan.

Map 9. Superior Charter Township Aerial Map

Superior Charter Township Boundary

2020 Aerial Map

Superior Charter Township
Washtenaw County, Michigan

N 0 3,000 6,000 Feet

This map is for reference only. Data layers that appear on this map may not be accurate. The information is provided with the understanding that the conclusions drawn from such information are solely the responsibility of the user. Any assumption of legal status of this data is herby disclaimed.

Data: Superior Charter Township, Washtenaw County, Michigan Department of Transportation (MDOT)
Prepared by: Carlisle/Wortman Associates, Inc. Date: March 22, 2023

Existing Land Use

When planning for the future it is critical to understand what currently exists. The future land use plan should be based on the existing land use patterns. Because of Superior Charter Township's history of planning and commitment to their plans, a clear development pattern based on sound planning principles is evident in the community.

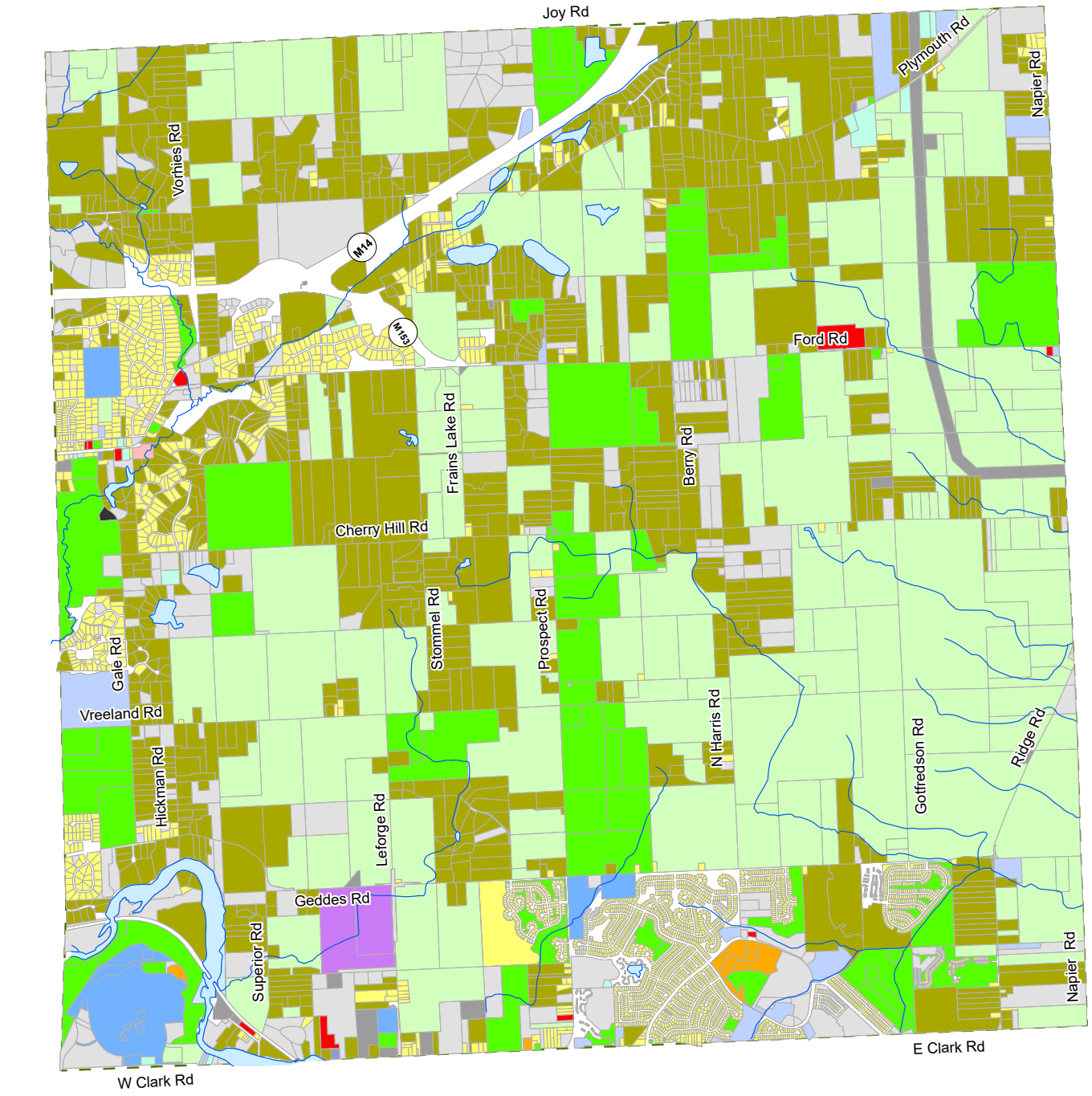
The predominant land uses in Superior Charter Township are agriculture and single-family dwellings, covering approximately 33% and 35% of land within the Township, respectively. Generally, more diversity and density in land use development has occurred south of Geddes Road and around the Dixboro area. Conservation efforts have resulted in the permanent protection of a significant amount of agricultural land and recreation/open space areas, particularly in the central portions of the Township.

Table 8. Existing Land Use, Superior Charter Township

Land Use	Acres	Percent
Agriculture	7,867	35.5%
Single-Family Housing	7,446	33.6%
Vacant	3,058	13.8%
Recreation/Open Space/ Cemetery	2,235	10.1%
Institutional	435	2.0%
Water	352	1.6%
Medical	298	1.3%
Industrial	68	0.3%
Multi-Family Housing	57	0.3%
Retail/Hospitality	53	0.2%
Office/Commercial	47	0.2%
Mixed use	4	0.0%
Total (approximate)	22,162	100.0%

Image Source: realtor.com

Map 10. Existing Land Use



- Agricultural
- Recreation / Conservation / Open Space
- Hospitality
- Industrial
- Institutional
- Medical
- Mixed Use
- Multi-Family Housing
- Office / Commercial
- Parking
- Retail
- Single Family Housing (Small Lot)
- Single Family Housing (Large Lot)
- Telecommunications / Utilities
- Vacant
- Water

Existing Land Use

Superior Charter Township
Washtenaw County

Roads, Tax Parcel, and Rivers Data from Washtenaw County GIS

N

0 0.5 1 Miles

July 24, 2023
Carlisle/Wortman Associates, Inc.
Ann Arbor, Michigan

Infrastructure

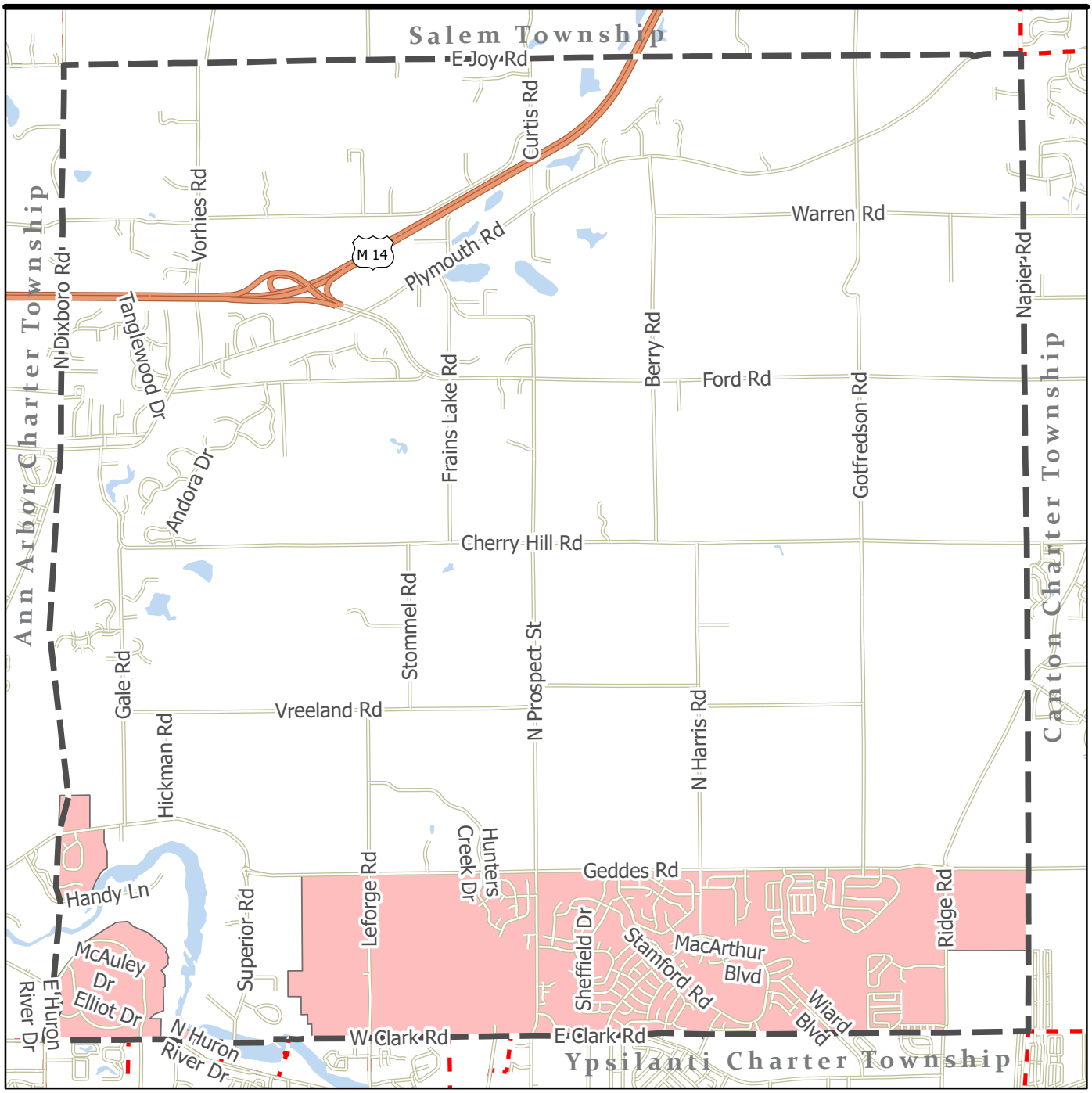
Infrastructure plays a critical role in the growth management and future land use designation of the Township. The community's infrastructure includes all transportation facilities (roads, sidewalks, pathways, transit routes, and transit stops), public utilities (sewer, water and storm water), public safety, parks and recreation facilities, schools, community institutions and facilities (post office, library, public and government buildings). The type, the quality, and the presence or lack of infrastructure has a tremendous effect on the community from quality of life to the type and intensity of development that can be supported in certain areas. Higher density and higher intensity uses need more sustainable infrastructure, such as public utilities to provide for the needs of residents and businesses on smaller lots, fiber optic and robust transit facilities to support industry, or parks, schools, and libraries to support neighborhoods. Conversely, areas that are not intended for higher density developments or more intense uses do not need public utilities or high-capacity roads. In fact, maintaining gravel roads and ensuring that municipal utilities are not provided in certain areas of the Township will help to maintain the intended rural character and desired intensity level in those areas of the Township. Historically, Superior Charter Township has done a good job of planning infrastructure to support the needs of the areas where growth is planned and avoiding the extension of infrastructure to areas where it is not needed.

Publicly Owned and Operated Sewer and Water:

The Urban Service Area has been planned to provide areas that have or are intended to have more intense development. The Township presently provides public sanitary sewer and public water services within designated service areas under contracts with the Ypsilanti Community Utilities Authority and Ann Arbor Township. These service areas cover several square miles in the area south of Geddes Road. There is a very limited capacity to extend such services to any other areas of the Township. The policies of this Master Plan and Township utility plans are based upon maintaining the designated Urban Service Area boundaries, as defined in Map 11 on page 47.

The majority of the land within the Township is served by private on-site well and septic for their water and sanitary needs. This is suitable for uses on larger lots. Due to the amount of natural open spaces and natural features such as woodlands and wetlands, groundwater in these areas should be safe and clean. The Washtenaw County Health Department is responsible for issuing well and septic permits and monitoring their activity.

Map 11. Urban Service Area



Superior Charter Township Boundary
Adjacent Community Boundaries
Highways
Roads
Waterways
Urban Service Area

Urban Service Area

Superior Charter Township
Washtenaw County, Michigan

N 0 3,000 6,000 Feet

Data: Superior Charter Township, Washtenaw County, Michigan Department of Transportation (MDOT)
Prepared by: Carlisle/Wortman Associates, Inc.
Date: December 6, 2023

Future Land Use Plan

The Future Land Use Plan is a basic element of the Master Plan, it designates the future use or reuse of the land within the community, and the policies and reasoning used in arriving at the decisions in the plan. The future land use plan is sometimes considered the most important part of a Master Plan because it serves as a guide to official decisions in regard to the proposed location and intensity of future land development for varying types of residential, commercial, industrial, agricultural, recreational, educational and other public and private purposes. The land use plan is intrinsically related to all other aspects of the plan including but not limited to transportation and other infrastructure, recreation and entertainment, economic development, and community character.

The land use strategy in this plan presents a development and land use pattern which is based on existing development patterns, existing infrastructure including especially utilities and roadways, environmental concerns, and the preservation of farmland and open space. Most importantly, however, the land use strategy aims to preserve the Township's community character and quality of life. These strategies rely on implementation via existing regulatory tools, specifically, the Superior Charter Township Zoning Ordinance. The Ordinance defines the regulations for development related to density, form, location, and type of use allowed.

The Future Land Use Strategy recognizes and encourages the continued use of the agricultural zoning designation in most of the Township while focusing higher density residential, commercial, and industrial development south of Geddes Road.

The Future Land Use Map in this plan has been updated using the latest technology in order to make the map a more accurate and useful tool. By including the Township base map and parcel lines it allows a more exact recognition of where proposed use categories are in relation to actual parcel delineations. While this map is a general policy guide for land use decision, accuracy is important when comparing various other mapped features such as utilities, farmland, or natural features.

The land use strategy identifies different future land use categories than those used in previous plans. These categories have been refined to be more consistent with existing zoning districts. However, there will be a need to update the Zoning Ordinance to reflect the direction of various components of this Master Plan specifically to make the zoning categories and zoning map more consistent with the planned future land use categories.

The Future Land Use Plan reflects future land patterns at an area-wide scale. The map (Map 12 on page 50) uses color-coded sub-area land uses to express public policy on future land patterns - it is not a zoning map. It is built around the concept of sub-areas, that have established characteristic development patterns that recognize the context of each area but also provide guidance on desired improvements. Sub-areas identify desired uses, design concepts and considerations to guide the relationships and physical improvements needed to create the types of places that are part of Superior Charter Township's long-range vision. Historically, the Township has recognized six major sub-areas for planning purposes. Each has distinct characteristics that make planning for each area appropriate.

Sub-areas have been assigned to areas based upon the context of existing build form, physical conditions, environmental conditions, land uses, development patterns, and community input, goals, and strategies. The intent of the Future Land Use Map is not to predetermine land uses or zoning on a specific parcel or at specific locations. Rather, individual properties or projects can be considered within the context of the location and surrounding properties, and not by a strict set of land use categories.

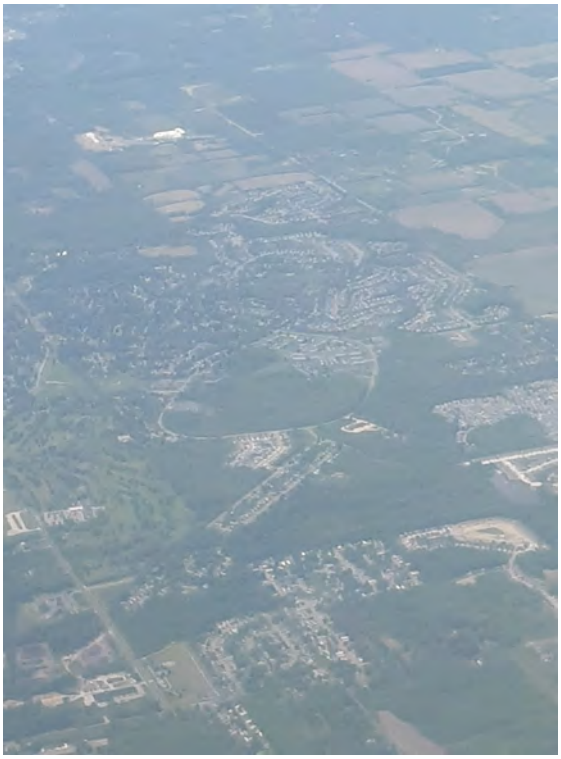
What is the purpose of the future land use map?

- A place-based development strategy tailored to Superior Charter Township's unique strengths, challenges, and opportunities.
- Clearly articulates the Township's vision of environmental preservation, open space protection, and maintaining neighborhood and community character.
- Serves as a guide for future decisions about zoning, development, and infrastructure investments.
- Describes intended use and character attributes for future development throughout the Township.
- Is related to zoning, but serves a different purpose.

Future Land Use Map

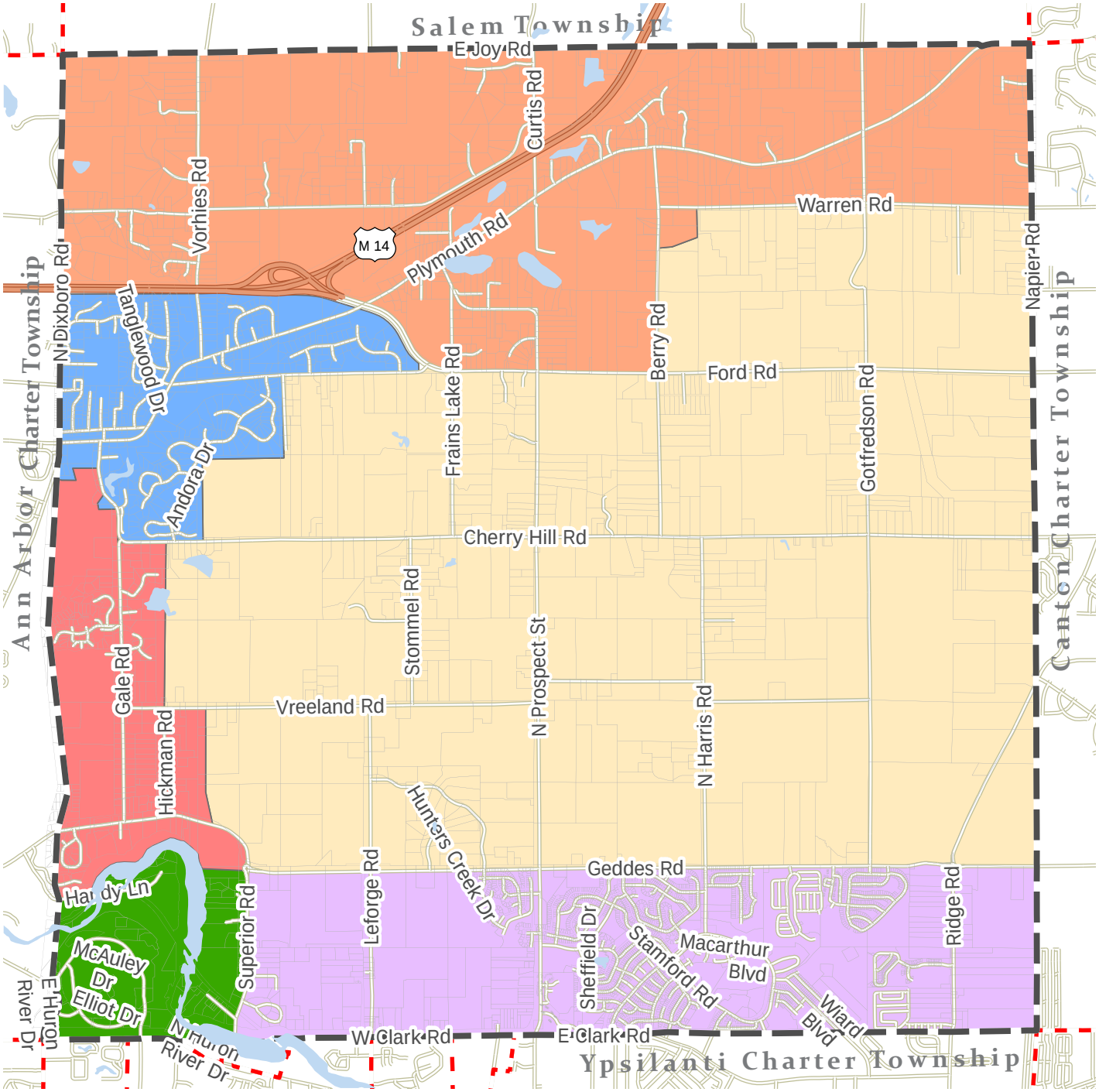
Each sub-area has been identified based on the common geographic and land use characteristics. The character of each of the sub-areas has been long established and maintained through careful planning and growth management. The Growth Management Strategy uses these sub-areas to outline future land use strategies and planned public improvements. Each sub-area is described in detail with associated growth management strategies. While many general polices and strategies apply thoughout the Township, those that are more specific to each sub-area are identified here.

- Geddes Road Urban Sub-area
- Hospital Sub-area
- Gale Road Sub-area
- Dixboro Sub-area
- Rural Plymouth Road/M-14 Sub-area
- Central Sub-area



Aerial view of Superior Township.
Photo Credit: Thomas Brennan, III

Map 12. Future Land Use Map



Sub-Areas

- Central Sub-Area
- Dixboro Sub-Area
- Geddes Rd. Urban Sub-Area
- Hospital Sub-Area
- Gale Road Sub-Area
- Rural Plymouth Road/M-14 Sub-Area

- Superior Charter Township Boundary
- Adjacent Community Boundaries
- Highways
- Roads
- Waterways

Future Land Use Map

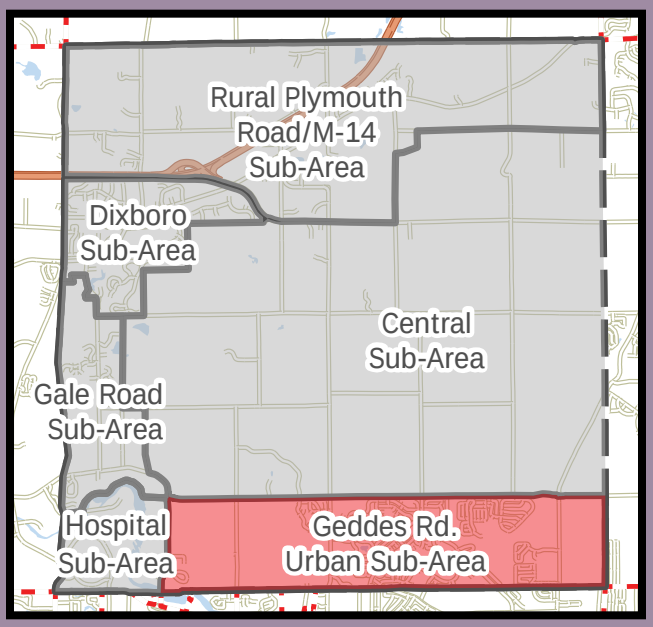
Superior Charter Township
Washtenaw County, Michigan

N 0 3,000 6,000 Feet

This map is for reference only. Data layers that appear on this map may not be accurate. The information is provided with the understanding that the conclusions drawn from such information are solely the responsibility of the user. Any assumption of legal status of this data is herby disclaimed.

Data: Superior Charter Township, Washtenaw County, Michigan Department of Transportation (MDOT)
Prepared by: Carlisle/Wortman Associates, Inc. Date: February 21, 2023

GEDDES ROAD URBAN SUB-AREA



Area: 4.8 square miles

Estimated Population*: 10,452 residents

Density: 2,178/sq mile

Key Amenities:

- **Ypsilanti District Library - Superior**
- **Superior Charter Township Fire Department**
- **Community, Fireman's, Harvest Moon, Norfolk, and Oakbrook Parks**
- **Approximately 5.2 miles of trails**
- **Highland Preserve**
- **Former Cheney School Property (possible community center location)**
- **South Point Scholars Charter School**
- **Dense single-family and multi-family housing**

**Estimate developed from Census 2020 block data and Washtenaw County parcel information*

Geddes Road Urban Sub-Area

This area of about one mile by four and one-half miles is located on the southern boundary of the Township. The southern border of this sub-area abuts both the City of Ypsilanti and Ypsilanti Township. The north side of the sub-area is bound by Geddes Road. This is the most densely and intensely developed area within the Township, containing about 65% of the Township population. The development and land use patterns in this area is reflected by the fact that this area is served with public utilities. The established public utility boundary south of Geddes Road is long standing policy and planned to continue into the future.

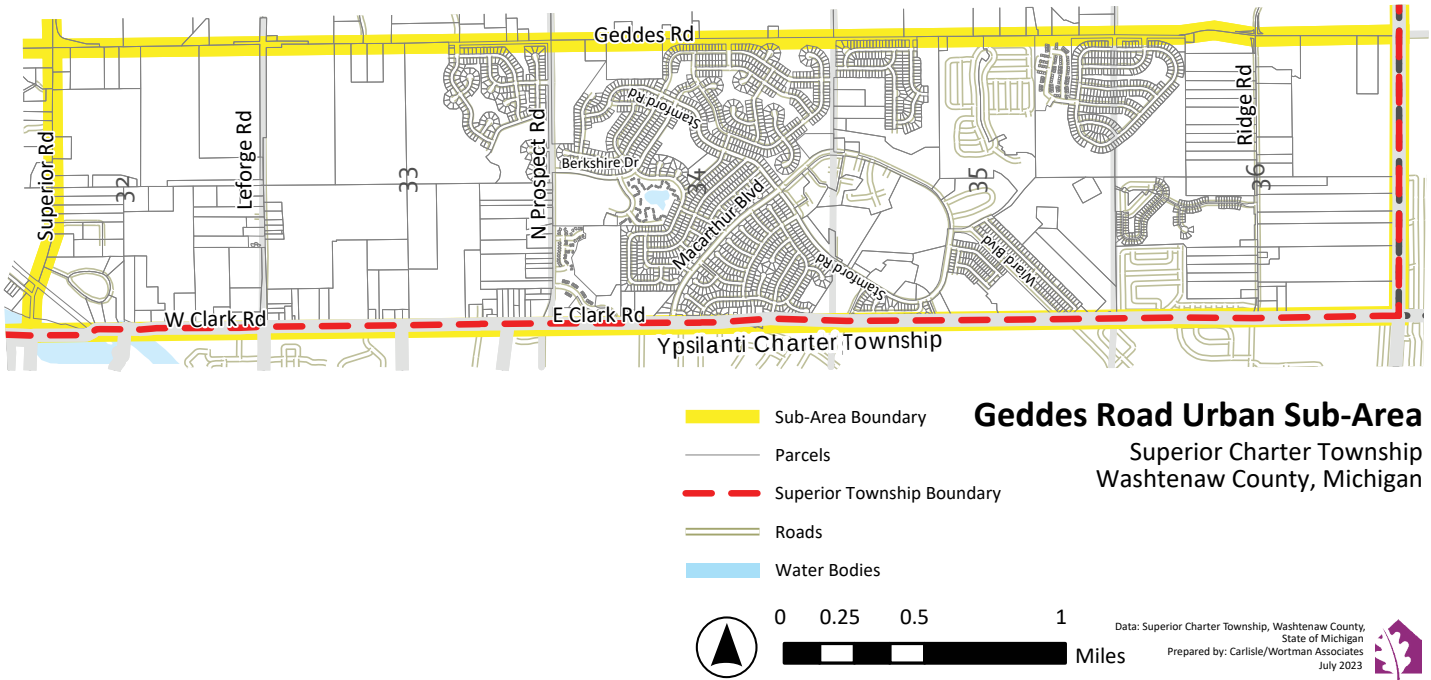
This area also has the beginning of a planned employment center with the development of the Hyundai-Kia America Technical Center at the southwest corner of Geddes and LeForge Roads. Scattered throughout this area there are also several community/institutional uses including churches, parks, the library, and municipal facilities. This sub area currently contains a range of zoning designations including several that are unique to this area: Planned Manufactured, Neighborhood Commercial, and Multi-Family Residential.

This sub-area provides a wide range of housing types and affordability. There is a mix of well-established and new single-family neighborhoods, multi-family developments, and manufactured neighborhoods. Existing housing ranges in age from many decades old to new construction and varies in size from small apartment units to large homes. This sub-area includes designated affordable, assisted living, and co-op housing all of which help to support the community's more vulnerable residents.

In recent years, stalled or partially completed housing developments in this sub-area, which had previously received preliminary or final approval from the Township, have received updated approvals and construction has once again begun. Additionally, undeveloped land in this sub-area has received interest in new residential development. This sub-area is very important to the Township as it provides a variety of housing types at densities that would not be possible without the availability of a municipal sewer and water system.

This sub-area includes the majority of land designated as the Urban Service Area of the Township (see Map 13 on page 52). There is still undeveloped land within this sub-area which represents much of the major development opportunity within the Township because utilities are not available or planned for other areas of the Township. In addition to areas planned for housing, there are also some existing and planned employment centers in the sub-area. In order to implement other development policies and strategies such as natural feature preservation, rural housing provision, and open space preservation in other portions of the Township, this sub-area is designed for the most density in the Township.

Map 13. Geddes Road Urban Sub-Area



Technology Center Development Potential

The portion of the Urban Service Area south of Geddes Road and centered around the LeForge Road intersection is the Township's "Technology Center," and is intended to serve as an "employment center" for the Township (See Map 12. Future Land Use Map on page 50). The Hyundai-Kia Motors North American Technical Center occupies 55 acres on the west side of LeForge Road, with additional land reserved for future expansion of this facility. Future development of this Technology Center is intended to establish an integrated, campus-like development pattern consistent with the desired character of the Urban Service Area. Development of this area will take place in a coordinated manner, with preservation of significant natural features in accordance with Township Zoning Ordinance requirements, provision of an integrated road network, pedestrian and vehicular connections between sites, and extension of public utilities only in accordance with Township utility plans and the "Urban Service Area" section of this Master Plan. Planned future land uses include research and development (R & D) operations, high technology operations, light manufacturing associated with R & D, and accessory support businesses intended to serve the needs of employees in the area. Such support businesses are intended to be subordinate to the principal "Technology Center" operations and should be clustered and arranged to support such operations. This portion of the Urban Service Area is not intended to become a principal commercial center.

Residential Development Potential

A large amount of land remains to be developed in this designated Urban Service Area (See Map 11 on page 47). East of Prospect Road and south of Geddes Road, the undeveloped land could be used for multiple-family residential developments. Some approved residential projects have multi-year buildout plans. The diverse population in this area will benefit from diverse housing options. This is the most developed area within the Township, but there are still wooded lots, wetlands, and other natural resources which warrant protection. A special effort will be made to ensure preservation of open space and significant natural features in this area as it is developed. In addition to housing, commercial projects which offer area residents convenient access to goods and services and increase the neighborhood vibrancy will be prioritized. Concentrating new development on vacant lots with minimal or no wooded areas and preserving heavily wooded areas will ensure that residents enjoy the natural character that is a key component of Superior Charter Township's identity. The average density of new development in this area will vary between developments to ensure a diverse availability of housing types.

Image Source: Hyundai

Uses

- Single-family residential developed in a traditional neighborhood pattern.
- Public and institutional facilities such as schools, places of worship, police stations, and community centers, that support the surrounding residential properties.
- Attached residential and multiple-family residential along neighborhood edges and adjacent to arterial corridors.
- General and medical office.
- Day-to-day neighborhood scale retail and services such as grocery and convenience stores, dry cleaners, pharmacies, banks, and beauty services.
- Restaurants and cafes that offer various food options.
- Mixed-use that includes uses noted above.
- Public parks and open space.

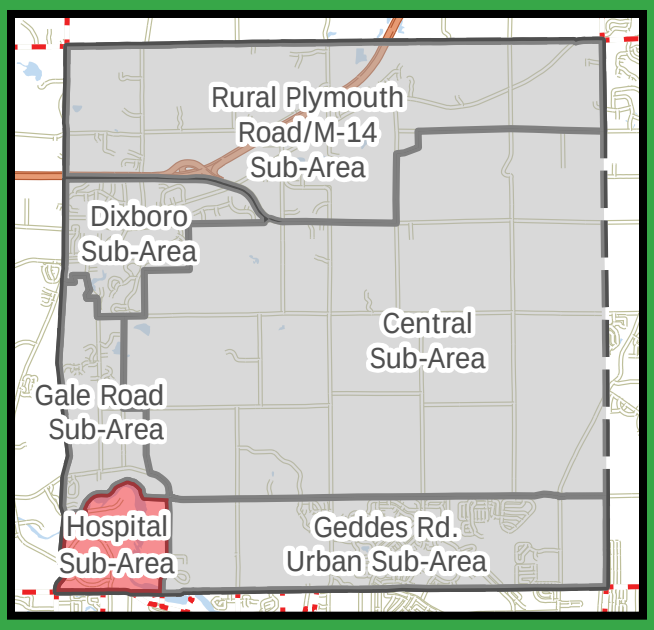
Design Characteristics

- New development shall be reviewed on a case-by-case basis to respect the existing scale and character of the surrounding area.
- Maintain traditional neighborhood development pattern.
- Each individual neighborhood has a unique character that must be respected and preserved.
- Walkability and non-motorized connections are essential to maintain neighborhood character and access to daily needs and services.
- Ensure appropriate transition of intensity of uses and scale to adjacent single-family neighborhoods.
- Peripheral attached residential and multiple-family residential along neighborhood edges and arterial corridors should be at a scale and density consistent with the surrounding area.
- Non-residential buildings in neighborhoods can be adaptively re-used when the use and design are assets to the surrounding neighborhood.
- Ensure appropriate transition of intensity of uses and scale to adjacent single-family neighborhoods.
- Varied mix of uses is encouraged.
- Single and lower multi-story structures oriented toward the street.
- Parking should be located at the side and rear of buildings.
- Architectural design must create an interesting visual experience for both sidewalk users and automobiles.
- Infill development should be encouraged to support existing infrastructure.
- Public transit amenities should be considered including shelters, signage, benches, and route information.

Attached residences that place parking in the rear instead of the front allow homes to be more directly connected to the sidewalk and community. Design features inspired by agricultural buildings can pay homage to Superior Charter Township's rural character.

Infill development concentrates new buildings within existing neighborhoods rather than on the exterior perimeters. *Image Source: City Koh*

HOSPITAL SUB-AREA



Area: 1.2 square miles

Estimated Population*: 106 residents

Density: 88/sq mile

Key Amenities:

- **Trinity Health Hospital**
- **Huron River**
- **Forest Nature Area**
- **Trinity Health Nature Area**
- **Portions of Border-to-Border Trail**

**Estimate developed from Census 2020 block data and Washtenaw County parcel information*

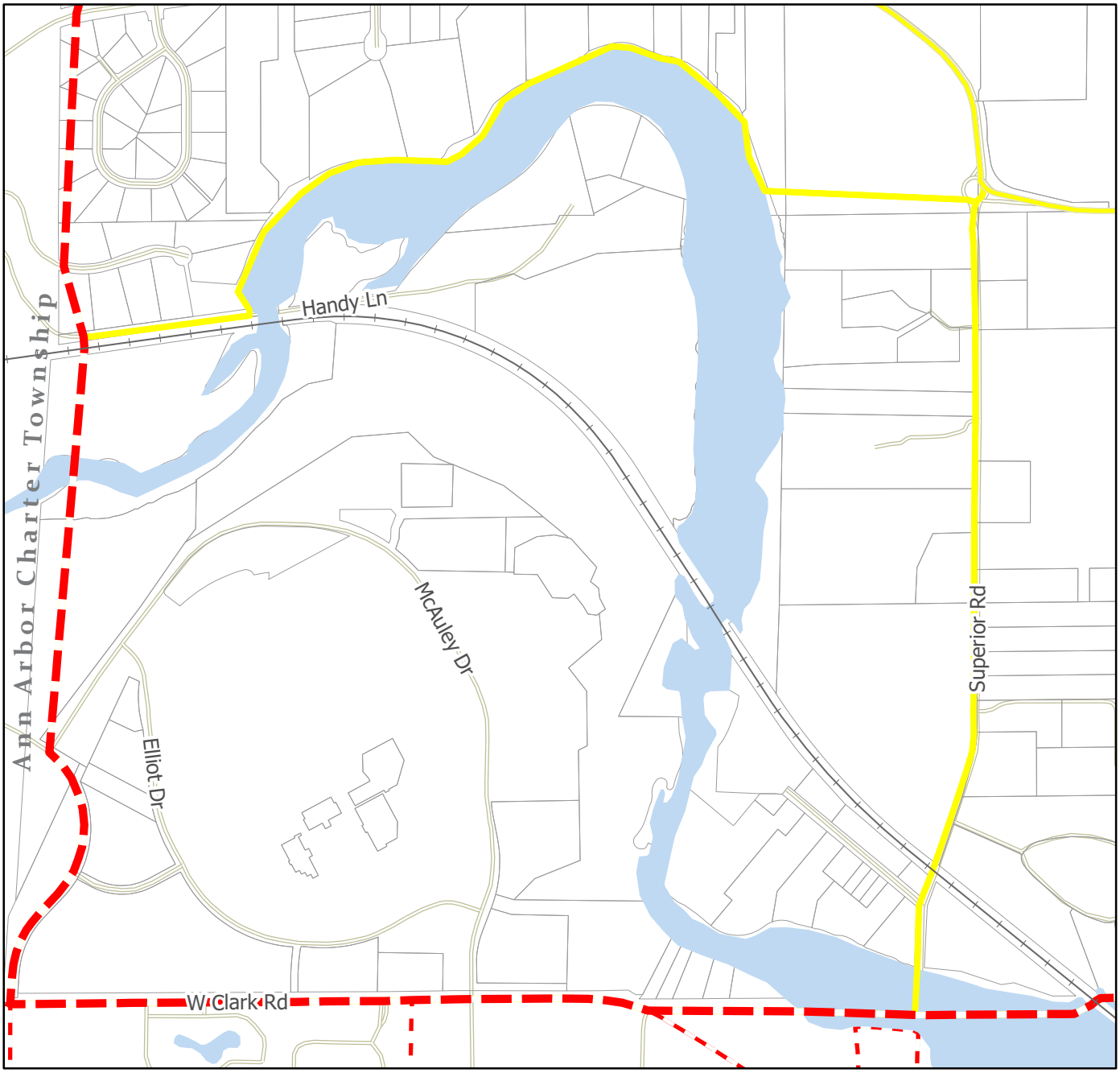
Hospital Sub-Area

This is the southwestern corner of Superior Charter Township, which is generally shaped by the Huron River. Amtrak railroad tracks bisect the area, crossing the Huron River twice. North of the railroad and east of the river are rural residential lots that are not within the Urban Service Area. The majority of this area, however, is characterized by the Trinity Health hospital campus. This area is adjacent to Washtenaw Community College located just to the west in Ann Arbor Township. The hospital area has full urban services and is intensively developed with most development in a campus-like setting with lots of green landscaping. There is a substantial nature area that surrounds the hospital between the developed area and the river and railroad, and portions of the Border-to-Border Trail travel through this area.

This sub-area around the hospital includes a number of undeveloped parcels that present future development opportunity. Additionally, some of the existing facilities surrounding the hospital may be prime for new uses or redevelopment. Careful consideration will be necessary to ensure that future uses within this area are compatible with surrounding land uses, with landscape and sign design to minimize visual impact, and access managed to reduce congestion and automobile and pedestrian conflicts. Additionally, this area is serviced by bus lines.

The existing uses in this sub-area and adjacent uses in neighboring communities, the presence of urban services, and access to transportation make this area suitable for development for a variety of complementary land uses that could be compatible with the existing development. This could include senior living facilities, multiple family dwellings or small-scale commercial uses intended to serve the needs of the medical center, associated office uses, and Washtenaw Community College employees and students. Commercial uses would be of a scale and intensity appropriate to serve the day-to-day convenience needs of a localized market, generally consisting of employees and visitors from the hospital and adjacent medical offices, along with students and faculty at Washtenaw Community College, and commuters who travel from Ypsilanti to Ann Arbor along AAATA TheRide bus route 3. Future development in this area should not have adverse impacts on other areas in the Township because it is buffered from the balance of the community by the river.

Map 14. Hospital Sub-Area



Parcels
Superior Charter Township Boundary
Roads
Waterbodies
Railroads
Hospital Sub-Area

Hospital Sub-Area
Superior Charter Township
Washtenaw County, Michigan

Miles
0 0.1 0.2 0.3 0.4

Data: Superior Charter Township, Washtenaw County, Michigan Department of Transportation (MDOT)
Prepared by: Carlisle/Wortman Associates, Inc.
Date: December 6, 2023

Uses

- Hospital and associated uses
- General and medical office.
- Senior living facilities
- Day-to-day neighborhood scale retail and services such as grocery and convenience stores, dry cleaners, pharmacies, banks, and beauty services.
- Restaurants and cafes that offer various food options.
- Attached residential and multiple-family residential adjacent to Clark Road / Huron River Drive.

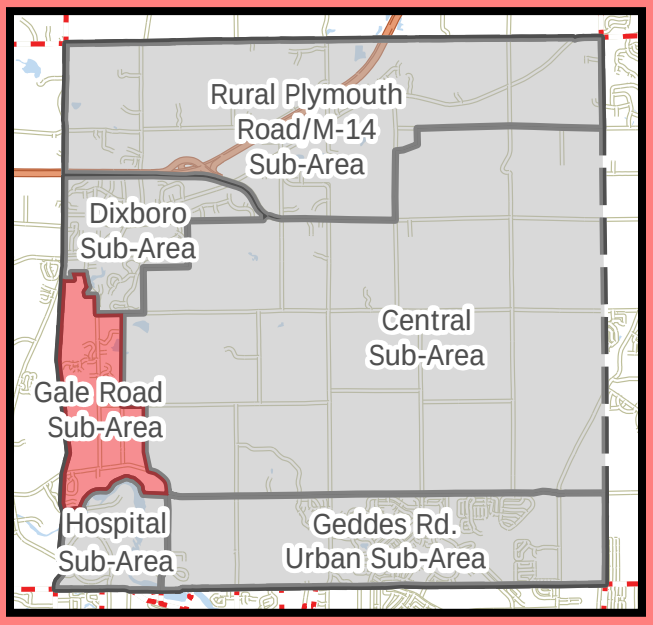
Design Characteristics

- Large single and multi-story structures that may be freestanding or integrated as part of a connected retail or campus pattern.
- Buildings may be set back to allow room for on-site parking and automobile access from the street.
- Large parking lots shall be screened, landscaped, and provided with pedestrian connections and other design amenities to break up excessive pavement and reduce visual impact of parking areas.
- Architectural design must create an interesting visual experience for both sidewalk users and automobiles.
- Ensure appropriate transition to adjacent neighborhoods.
- Infill development should be encouraged to support existing infrastructure.
- Design creativity with regards to materials is encouraged, although low quality materials or building designs that inhibit activity on Clark Road and Huron River Drive will not be permitted.
- Public transit amenities should be considered including shelters, signage, benches, and route information.
- Walkability and non-motorized connections within and to Clark Road and Huron River Drive is essential to create character and access for all residents and visitors.

Rendering which shows how busy streets can accomodate multiple modes of traffic.
Image Source: Randy Garbin

Transitional areas can encourage a mixture of compatible uses including residential, retail, and office in appropriate areas as determined by the rezoning decision-making criteria from the Future Land Use map.
Image Source: William P. Wright

GALE ROAD SUB-AREA



Area: 1.7 square miles

Estimated Population*: 720 residents

Density: 424/sq mile

Key Amenities:

- **Matthaei Botanical Gardens**
- **Radrick Farms Golf Course**

**Estimate developed from Census 2020 block data and Washtenaw County parcel information*

Gale Road Sub-Area

This sub-area is located along the western side of the Township adjacent to Ann Arbor Township between the Hospital sub-area and Dixboro sub-area. This sub-area is unique in that it is nearly fully developed. Large land uses in this area include the Radrick Farms Golf Course, and Matthaei Botanical Gardens owned by the University of Michigan, which are not expected to change. The balance of the area is already fragmented by single-family homes, and therefore there is limited development opportunity.

Generally, homes are single-family on large lots but there are a few newer suburban neighborhood developments within the area with lots that are generally ½ acre in size or larger. This sub-area provides a transition between the denser residential development and the business park style development along North Dixboro Road in Ann Arbor Township and the central sub-area within Superior Charter Township.

The Gale Road corridor, an unpaved road, lined with mature trees and underbrush, has a very rural feel, completing the transition between golf course and subdivisions to the west and large lot residential and farmland to the east. In order for the Gale Road sub-area to retain its natural beauty, traffic volumes must remain low as higher volumes would require road improvements that would spoil the character of the area. It is also important to ensure that the road and roadside vegetation are maintained in their present state. Along the eastern edge of this sub-area is an extensive groundwater recharge area within the Central sub-area. These factors strongly support retention of a very low-density rural character to this area. This area is not intended to change.

Map 15. Gale Road Sub-Area

Image Source: Matthaei Botanical Gardens

Gale Road Sub-Area

Superior Charter Township
Washtenaw County, Michigan

- Sub-Area Boundary
- Parcels
- Superior Charter Township Boundary
- Roads
- Water Bodies

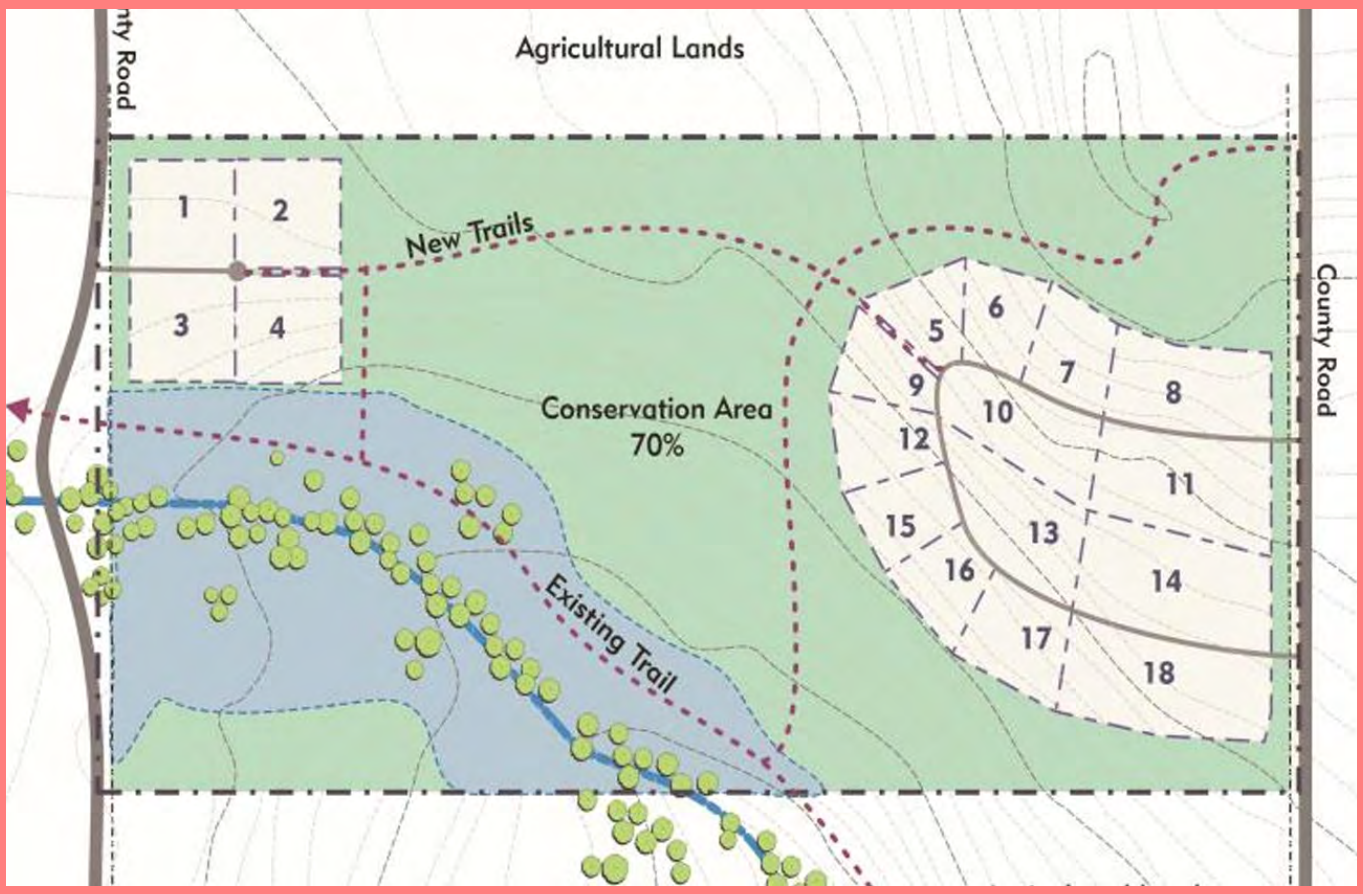
Data: Superior Charter Township, Washtenaw County, State of Michigan
Prepared by: Carlisle/Wortman Associates
June 30, 2023

Uses

- Single-family residential developed in a traditional neighborhood pattern.
- Single-family cluster residential that preserves open space and natural features.
- Rural residential
- Open space and natural areas that preserve the natural landscape and help mitigate the effects of agricultural uses and development including soil erosion and stormwater runoff.
- Public and institutional facilities such as schools, places of worship, police stations, community centers, that support the surrounding residential properties.

Design Characteristics

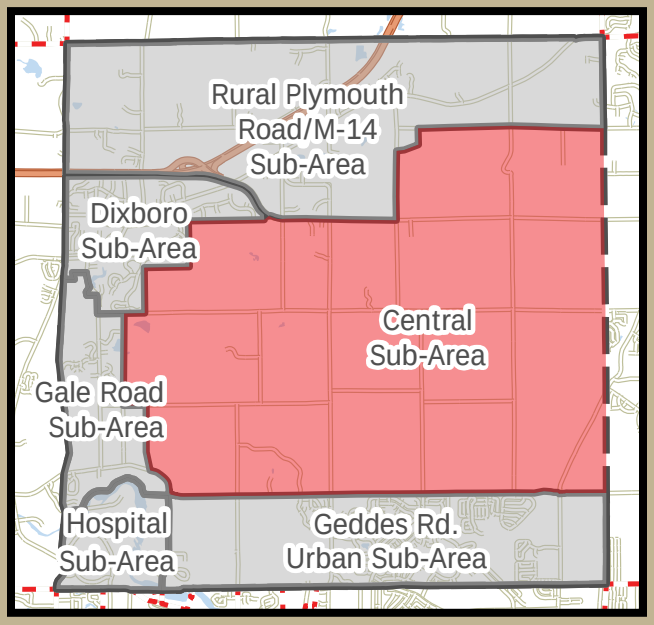
- Large single and multi-story structures that may be freestanding or integrated as part of a connected retail or campus pattern.
- Buildings may be set back to allow room for on-site parking and automobile access from the street.
- Large parking lots shall be screened, landscaped, and provided with pedestrian connections and other design amenities to break up excessive pavement and reduce visual impact of parking areas.
- Architectural design must create an interesting visual experience for both sidewalk users and automobiles.
- Ensure appropriate transition to adjacent neighborhoods.
- Infill development should be encouraged to support existing infrastructure.
- Design creativity with regards to materials is encouraged, although low quality materials or building designs that inhibit activity on the corridor will not be permitted.
- Public transit amenities should be considered including shelters, signage, benches, and route information.
- Walkability and non-motorized connections within and to corridors is essential to create character and access for all residents and visitors.



Clustering single-family residences in new developments and having dedicated open spaces for conservation aligns with the Township's housing, preservation, and environmental goals. *Source: Clarion Associates*

Parking lot screening can provide opportunities to create visually-appealing features and landscape design that benefits both vehicle and adjacent-sidewalk users. *Source: Clarion Associates*

CENTRAL SUB-AREA



Area: 17.3 square miles

Estimated Population*: 620 residents

Density: 36/sq mile

Key Amenities:

- **Township Hall**
- **Cherry Hill Nature Preserve, Rock Superior Properties (future park)**
- **Kosch Headwaters and Meyer Preserves, Superior Center County Park**
- **Secrest Nature Preserve, Conservancy Farm, Jack R. Smiley, LeFurge Woods, and Springhill Nature Preserves, and a still unnamed nature preserve south of Cherry Hill Road**

**Estimate developed from Census 2020 block data and Washtenaw County parcel information*

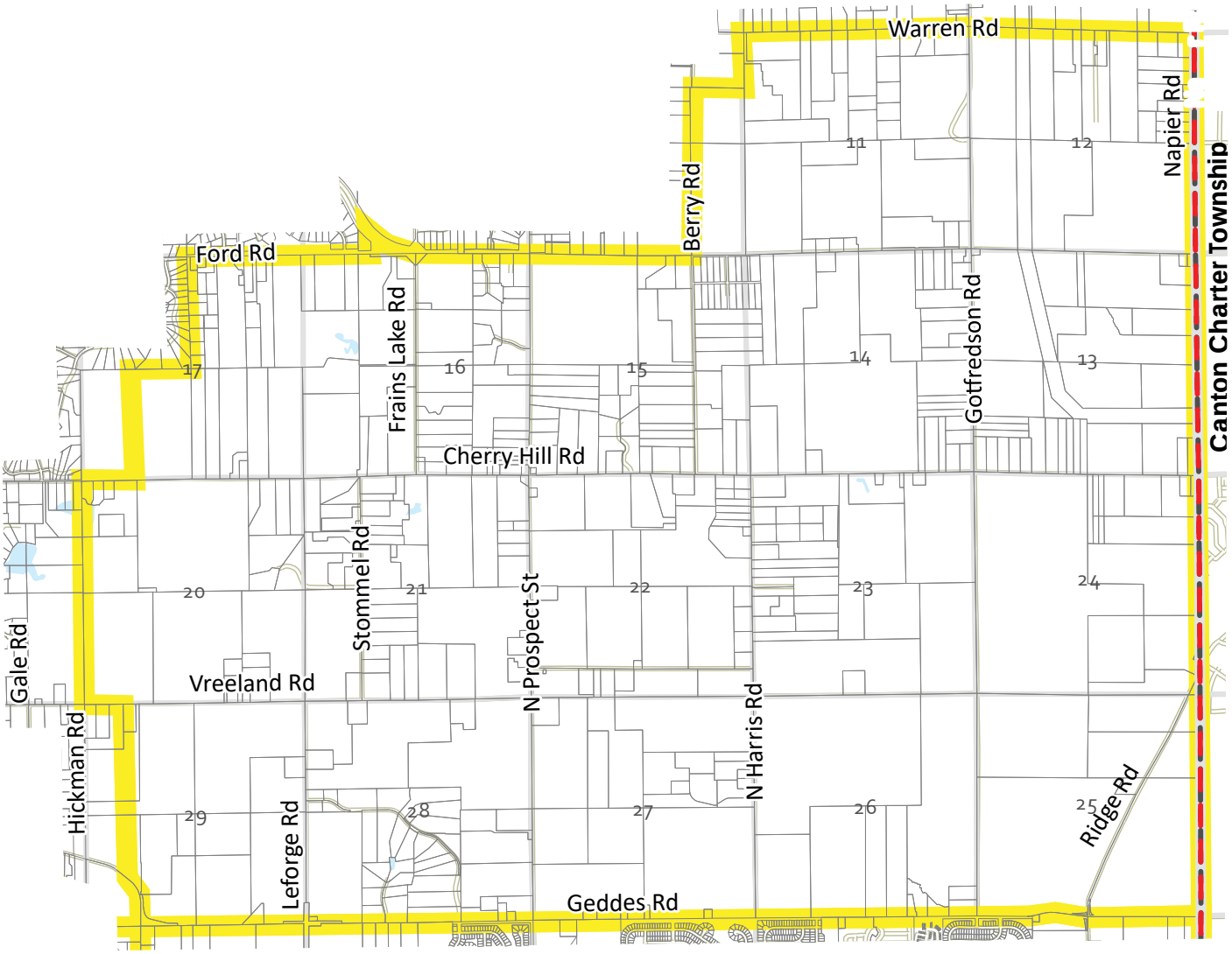
Central Sub-Area

This area makes up the majority of Superior Charter Township. This area is identified by its rural/agricultural character. The area is characterized by its open space which includes active farmland and preserved natural features. Many of the primary roads in the Township cut through or border this sub area; however, most roads in this area remain unpaved. The Central area has the lowest population density of the Township, and it is proposed to remain that way, permanently.

The sub-area is primarily a farming area, although rural homes on large lots are scattered throughout. Landscape nurseries, private stables and riding arenas, wetlands, woodlands, and permanently preserved open space are also found within this sub area. The southern and eastern part of this area is generally flat, with many farm fields, pastures, and woodlots. Small creeks flow from north to south in this area, dividing between the Rouge River and Huron River watersheds. The northern and western parts of this area are more rolling and there are more woods and rural homes on five- to twenty-acre lots. This area also contains about a half dozen historic homes.

There is roughly 3,000 acres of farms and natural areas that have been permanently protected in the Township, the majority of which are located in this sub-area. The majority of this preserved land is identified on the Township's Official Zoning Map as part of the Open Space Preservation Overlay District (OSP). The Township will continue to protect farming and open spaces in the center of the Township, leaving this area with a natural character, viable wildlife habitat, and relatively undeveloped.

Map 16. Central Sub-Area



Sub-Area Boundary
Parcels
Superior Charter Township Boundary
Roads
Water Bodies

0 0.25 0.5 1
Miles

Central Sub-Area

Superior Charter Township
Washtenaw County, Michigan

Data: Superior Charter Township, Washtenaw County, State of Michigan
Prepared by: Carlisle/Wortman Associates
June 30, 2023

Uses

- Rural residential
- Single-family cluster residential that preserves open space and natural features.
- Production farms and nurseries.
- Accessory retail uses in conjunction with an agricultural operation. Examples of accessory retail uses may include farmers' markets, roadside stands, nurseries and greenhouses, wineries with sales and tasting rooms, and other similar uses.
- Open space and natural areas that preserve the natural landscape and help mitigate the effects of agricultural uses and development including soil erosion and stormwater runoff.
- Public and institutional facilities such as schools, places of worship, police stations, community centers, that support the surrounding residential properties.

Design Characteristics

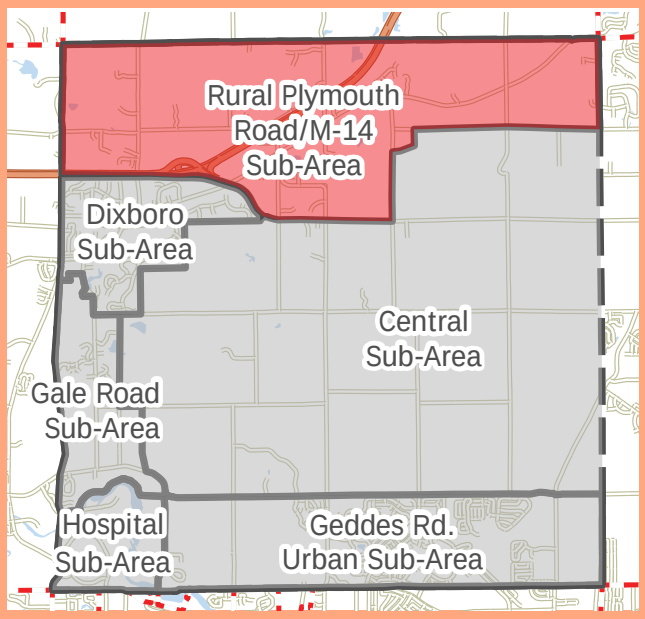
- Farming operations between 10 and 30 acres are desired.
- New development shall reduce conflicts between farm and non-farm uses.
- Buildings should be agricultural or residential in character.
- Non-motorized connections should be provided as necessary to connect the township's agricultural land, and open and green spaces to other residential and recreational areas in the township.
- Future development of single-family cluster density should be no more than 0.5 units per acre.
- Ensure new development can be served by infrastructure including roads, well, and septic.
- New development shall respect existing open space and natural areas.

Image Source: AllTrails,Cherry Hill Nature Preserve

Small agricultural operations with accessory retail uses preserve the agricultural landscape while providing greater economic and amusement opportunities for Township residents.

Maintaining trails in the open space and natural areas preserves the surrounding ecosystem while encouraging trail use and enjoyment.

RURAL PLYMOUTH ROAD / M-14 SUB-AREA



Area: 8.3 square miles

Estimated Population*: 1,404 residents

Density: 169/sq mile

Key Amenities:

- **M-14 and Ford Road**
- **Plymouth Orchards and Cider Mill**
- **English Gardens**
- **North Prospect and Schroeter Parks (Township-owned)**
- **Staebler Farm**
- **Wing Nature Preserve (Washtenaw Audubon)**

**Estimate developed from Census 2020 block data and Washtenaw County parcel information*

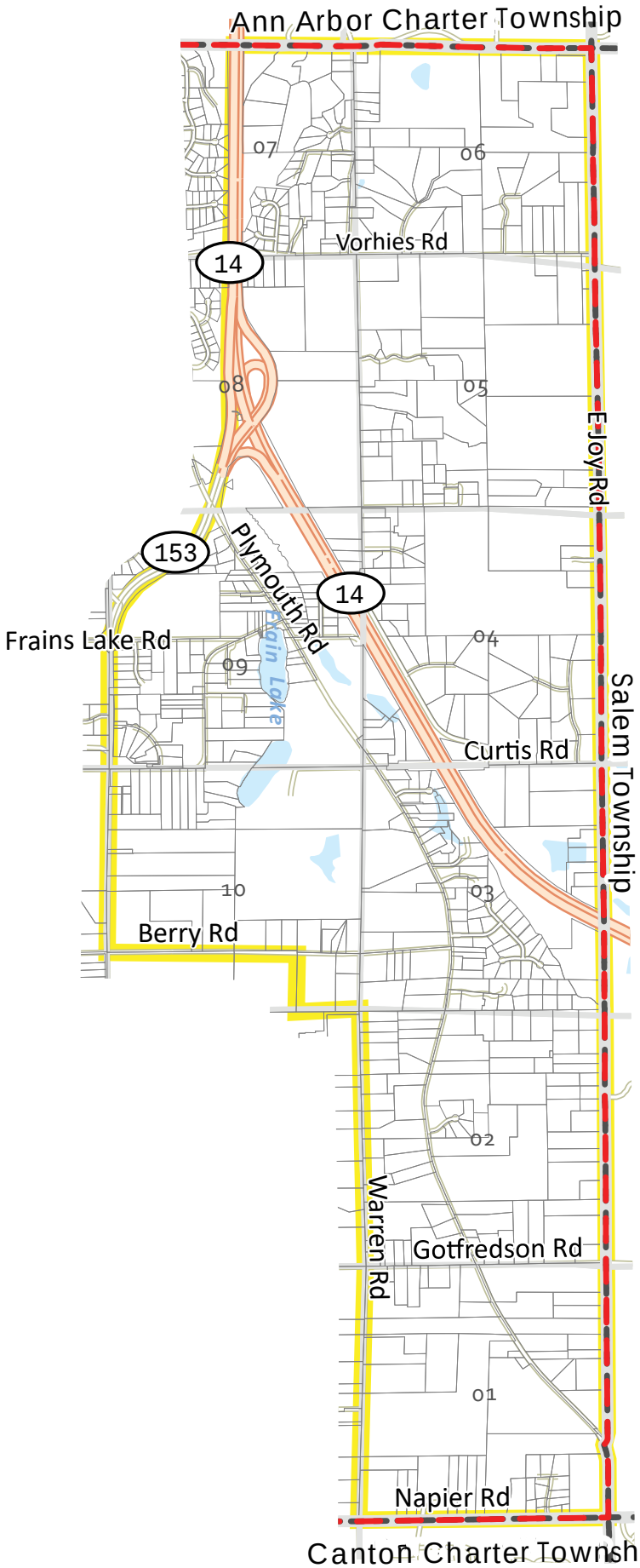
Rural Plymouth Road/M14 Sub-Area

This sub-area has scattered homes on parcels carved from former farms. Among these homes are several historic houses on Plymouth-Ann Arbor Road. Many of the lots are five to ten acres in size although there are larger parcels and a few small platted, subdivisions and site condominium developments. There is a small residential hamlet at Frains Lake.

While portions of this area have open, active farm fields or grassy pastures that are no longer actively farmed, there are also many wooded areas. A few ponds, small lakes, and wetlands dot the area. Additionally, this area has a considerable amount of publicly owned recreation land and preserved land. The northeast part of this sub-area predominantly consists of large lot residential dwellings along Plymouth-Ann Arbor, Ford, and Gotfredson Roads north of Plymouth-Ann Arbor Road that may be impacted by additional traffic from potential future development of Salem Township's Urban Services District on Gotfredson Road at the M-14 interchange. Some parcels around the Plymouth-Ann Arbor Road and Gotfredson Road intersection are planned and zoned for commercial and office land uses.

Image Source: MichiganHauntedHouses.com

Map 17. Rural Plymouth Road/M-14 Sub-Area



Rural Plymouth Road / M-14 Road Sub-Area

Superior Charter Township
Washtenaw County, Michigan

- Sub-Area Boundary
- Parcels
- Superior Charter Township Boundary
- Roads
- Water Bodies

0 0.25 0.5 1 Miles

Data: Superior Charter Township, Washtenaw County, State of Michigan
Prepared by: Carlisle/Wortman Associates
September 21, 2022

Uses

- Rural residential
- Single-family cluster residential that preserves open space and natural features.
- Production farms and nurseries.
- Accessory retail uses in conjunction with an agricultural operation. Examples of accessory retail uses may include farmers' markets, roadside stands, nurseries and greenhouses, wineries with sales and tasting rooms, and other similar uses.
- Open space and natural areas that preserve the natural landscape and help mitigate the effects of agricultural uses and development including soil erosion and stormwater runoff.
- Public and institutional facilities such as schools, places of worship, police stations, community centers, that support the surrounding residential properties.

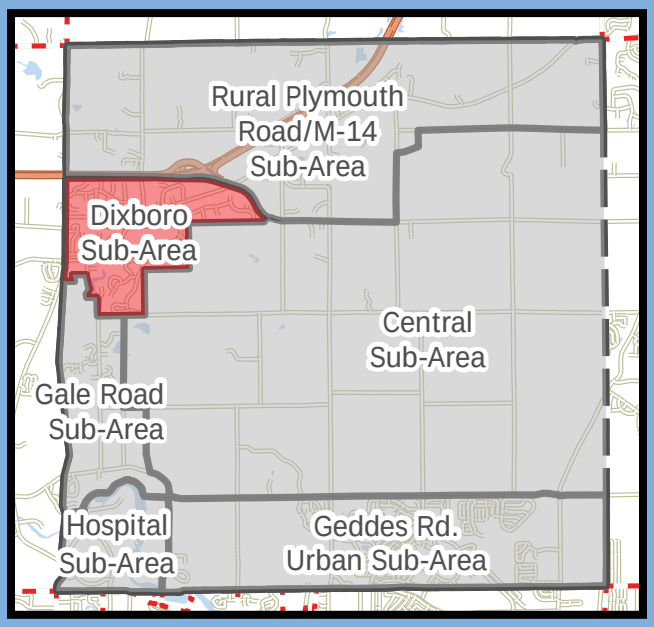
Design Characteristics

- Farming operations between 10 to 30 acres are desired.
- New development shall reduce conflicts between farm and non-farm uses.
- Buildings should be agricultural or residential in character.
- Non-motorized connections should be provided as necessary to connect the township's agricultural land, and open and green spaces to other residential and recreational areas in the township.
- Future development of single-family cluster density should be no more than 0.5 units per acre.
- Ensure new development can be served by infrastructure including roads, well, and septic.
- New development shall respect existing open space and natural areas.

Image Source: AnnArbor.org

Non-motorized pathways through rural residential areas can connect the Township's agricultural landscape to the more-developed areas. *Image Source: Pat & Chuck Blackley*

DIXBORO SUB-AREA



Area: 2.0 square miles

Estimated Population*: 1,515 residents

Density: 758/sq mile

Key Amenities:

- **Village of Dixboro**
- **Historic Dixboro United Methodist Church and schoolhouse**
- **Dixboro Village Green**
- **Dixboro Farmers' Market**
- **Huron Valley Tennis Club**
- **Fleming Creek**
- **Humane Society of Huron Valley**

**Estimate developed from Census 2020 block data and Washtenaw County parcel information*

Dixboro Sub-Area

The centerpiece of this sub-area is the historic settlement of Dixboro along Plymouth-Ann Arbor Road between Dixboro Road and Ford Road. It has houses dating to the 1830's.

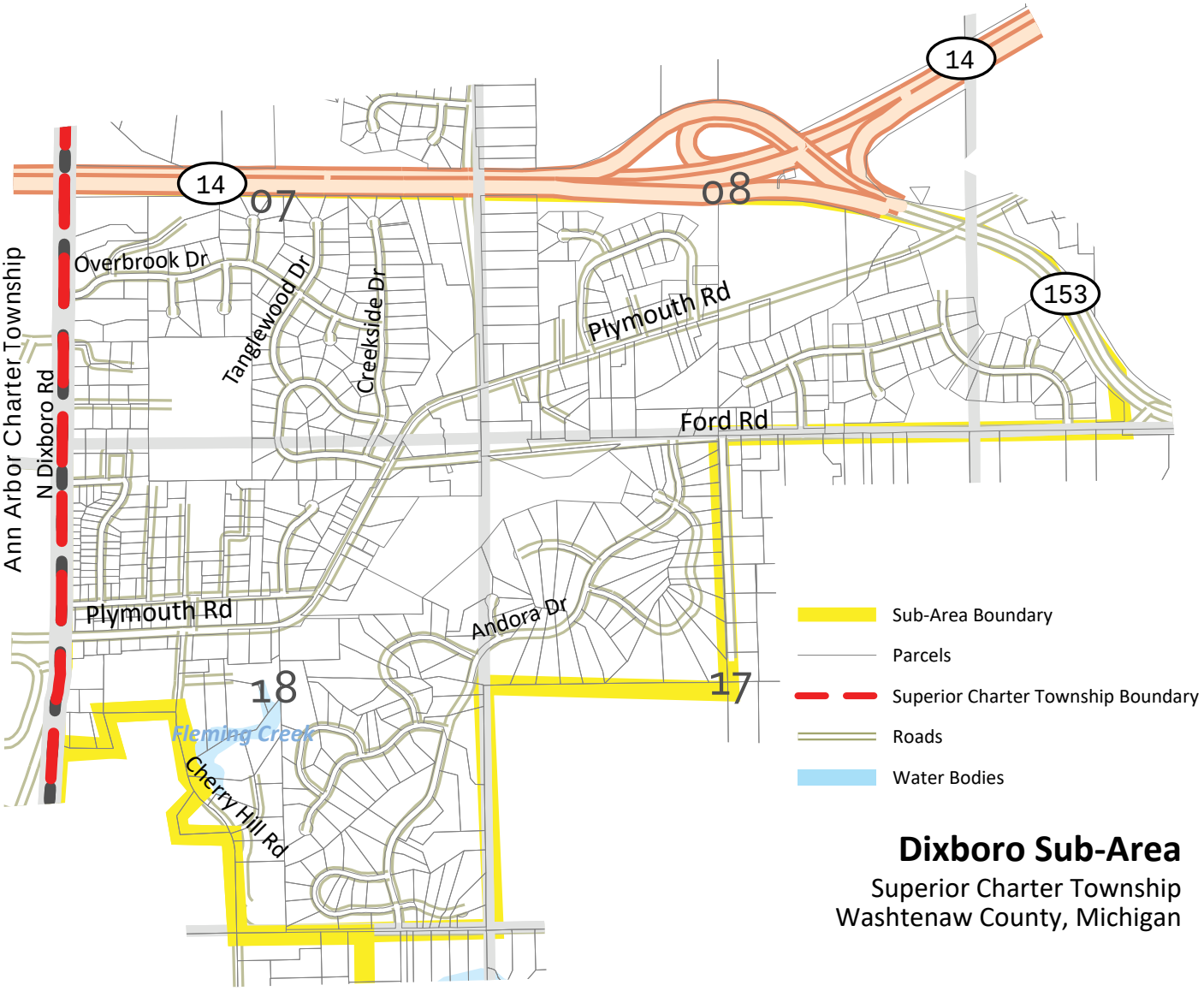
There are a few commercial establishments and offices on Plymouth and at the Plymouth-Ann Arbor and Ford Roads intersection. The settlement is on a grid pattern with a "village green" and an adjacent church as the focus. Surrounding Dixboro are two large subdivisions of late 20th century and very early 21st century vintage. The adjacent subdivisions are more spread out on curvilinear streets with large lots. Fleming Creek parallels Plymouth-Ann Arbor Road in this area, flowing northeast to southwest, just to the south of Dixboro. Bordering the southeast part of this sub-area is the Cherry Hill Nature Preserve: a 160-acre Township-owned parcel. The Township has a separate sub-area plan detailing future development parameters in the Dixboro sub-area. The general thrust of that sub-area plan is:

- Preservation of the water quality of the Fleming Creek and the natural character of abutting lands;
- Preservation of the historic character of Dixboro; and
- Traffic calming on Plymouth Road as it goes through Dixboro.

For more details see Dixboro Special Area Plan on page 83.

Image Source: Sue Pais

Map 18. Dixboro Sub-Area



Zoning Plan Table

The Zoning Plan Table shows what zoning districts in the Superior Charter Township Zoning Ordinance, in effect at the time of this plan's adoption, relate to the future land categories described in this chapter. A Comprehensive Rewrite to the Zoning Ordinance is a catalyst project, expected to be completed within one year of the adoption of this plan. The revised zoning ordinance is expected to revise, replace and streamline the zoning districts in Superior Charter Township.

Table 9. Zoning Plan Table

Future Land Use Area	Zoning Equivalent
Geddes Road Urban Sub-area	R1 - Single-Family Residential District, R2 - Single-Family Residential District, R3 - Single-Family Residential District, R4 - Single-Family Residential District, R6 - Manufactured Housing Park District, R7 - Multiple-Family Residential District, C1 - Neighborhood Commercial District, C2 - General Commercial District, A2 - Agricultural District
Hospital Sub-area	R7 - Multiple-Family Residential District, C1 - Neighborhood Commercial District, C2 - General Commercial District, O1 - Office District
Gale Road Sub-area	R-C Recreation-Conservation District, R-1 Single-Family Residential District, PSP - Public/ Semi Public Services District
Dixboro Sub-area	See Dixboro Plan
Rural Plymouth Road/M-14 Sub-area	R-C Recreation-Conservation District, A-1 Agricultural District, A-2 Agricultural District, R-1 Single-Family Residential District
Central Sub-area	R-C Recreation-Conservation District, A-1 Agricultural District, A-2 Agricultural District, R-1 Single-Family Residential District

Chapter 5: Strategies & Implementation

Achieving the vision of Superior Charter Township's Master Plan will take significant time, effort, and in many cases, funding to achieve. Township government will not be able do it alone. An engaged community – that works together, combines resources and shares success – and committed partners are essential for Superior Charter Township to be a thriving community of healthy and sustaining neighborhoods, lasting livelihoods, and great places. This chapter outlines actions for Township officials and staff as well as partners and the community.

The purpose of this chapter is to identify strategies that the Township can initiate or continue to use that will achieve the community's vision for the future of the Township articulated in this Master Plan. Each strategy has been developed to support the policies established in the Plan. Each strategy supports one or more of the policy statements and is intended to achieve ends that are consistent with the Township's vision. The strategies are a set of tools and initiatives that include existing efforts, best practices, and unique approaches that have been conceived specifically for Superior Charter Township.

The success of the Township's plan will depend heavily on citizens' understanding of the planning process and the plan's specific vision and policies. An engaged population that endorses the future vision for the Township and has ownership of the community policies will be more likely to support zoning decisions, development proposals, preservation initiatives and even advocate for bond proposals or special assessments that are consistent with the identified strategies. The Township must effectively communicate the importance of long-range planning and encourage citizen participation in ongoing planning efforts.

Strong Partnerships

Partnerships, formal and informal, are critical to successful implementation of this plan. The Township will continue to strengthen existing partnerships, pursue new partnerships, and maintain open lines of communication. Existing and potential partners are listed on this page. As new opportunities arise, the Township should not hesitate to engage organizations, groups or businesses not included here to achieve the vision of Superior Charter Township 2040.

POTENTIAL PARTNERS

- **Local Government:** Washtenaw County Road Commission, Washtenaw County Water Resources Commissioner, Washtenaw County Office of Economic and Community Development, Washtenaw County Parks and Recreation Commission, Washtenaw County Sheriff, Ypsilanti Community Utilities Authority, Ann Arbor Area Transportation Authority.
- **State Government:** Michigan Department of Transportation; Michigan Department of Environment, Great Lakes, and Energy; Michigan Economic Development Corporation; Michigan State Housing Development Authority.
- **School Districts:** Ypsilanti Community Schools, Ann Arbor Public Schools, Plymouth-Canton Community Schools, Washtenaw Intermediate School District.
- **Neighborhood Organizations:** Neighborhood Watch Groups, Homeowners' Associations.
- **Community Partners:** Ypsilanti District Library, Places of Worship, SPARK, Washtenaw Community College Entrepreneurship Center, Small Business Development Center at Washtenaw Community College; local nonprofits.
- **Major Employers:** Trinity Health System and Hyundai-Kia.
- **Local Institutions:** Eastern Michigan University, University of Michigan, Washtenaw Community College, Concordia University, Matthaei Botanical Gardens & Nichols Arboretum, Radrick Farms Golf Course.
- **Development Community:** local builders, developers, architects, planners, landscape architects, engineers and financing institutions.

Funding Sources

The Township will need to pursue multiple and creative sources of funding to implement this plan. These funding sources may change over time. The Township must continually investigate and pursue new sources of funding.

Funding sources fall into four categories:

1. **Township Funded**
    a. General Fund
    b. Special Assessment
2. **Economic Programs**
    a. Brownfield Tax Increment Financing
    b. Community Development Block Grant (CDBG)
    c. Michigan Community Revitalization Program (MCRP)
    d. Public Spaces Community Places (PSCP)
    e. Redevelopment Ready Communities (RRC)
    f. SmartZones
    g. Transformational Brownfield Plans (TBP)
    h. Opportunity Zone
    i. Corridor Improvement Authority
3. **Transportation and Non-Motorized Infrastructure**
    a. Transportation Alternative Programs (TAP) Grants
    b. Stormwater, Asset Management, and Wastewater (SAW) Grants
    c. Washtenaw County Connecting Communities Grants
    d. Transportation Economic Development Fund (TEDF) Grants
    e. Michigan Department of Natural Resources Grants - Land & Water Conservation Fund, Michigan Natural Resources Trust Fund, and Recreation Passport
    f. Southeast Michigan Council of Governments (SEMCOG)
4. **Parks, Trails, and Open Spaces**
    a. Land and Water Conservation Fund
    b. Michigan Natural Resources Trust Fund
    c. Recreation Passport Grants
    d. Forestry Grants
    e. Recreation Improvement Grants
    f. Recreational Trails Program Grants
    g. Washtenaw County Natural Areas Preservation Program
    h. Ann Arbor Greenbelt Program
    i. Legacy Land Conservacy
    j. Southeast Michigan Land Conservancy

Implementation Matrix

The following implementation matrix includes actions for implementation. The table is grouped around overarching topics of Growth Management (GM); Open Space and Land Preservation (OP); Environmental Protection (EP); Housing (H); and Transportation (T). For additional information, each action relates directly to the associated policy outlined Chapter 3, Vision and Policies.

The code in the Related Policy column indicates the policy topic and policy number from chapter 3.

Time Frame Guide:

- Immediate: 0-2 Years
- Mid: 2-5 years
- Long: 5 years +

Table 10. Implementation Matrix

Growth Management / Environmental Protection / Open Space and Land Preservation		
Action	**Related Policy**	**Time Frame**
Update Zoning Ordinance to ensure implementation of the Master Plan.	All	Immediate
Review all new development to ensure that it is consistent with adopted Growth Management Plan and Future Land Use Plan.	GM-1, GM-2	Immediate
Utilize the policies in the Master Plan to review zoning petitions and zoning policies to implement the growth management plan and future land use plan	GM-1, GM-2	Immediate
Maintain the long-identified Urban Service Area boundary to support the distinction between urban and rural areas, and to protect the designated rural area from intrusion by urban development.	GM-3, GM-9, H-4, OP-1	Immediate
Update township codes and ordinances to preserve and enhance the existing streams, water bodies, watersheds and wetlands to be used as part of the drainage system of the Township.	OP-1, OP-2, EP-3	Immediate
Update township codes and ordinances to require development reviews to determine detailed information about environmental impact including steep slopes, woodlands, stream corridors, wetlands, groundwater recharge areas, and any other identified natural feature.	OP-2, EP-1, EP-3, GM-8	Immediate
Update township codes and ordinances to require protective buffer strips within new developments along stream corridors and wetlands.	EP-1, EP-3	Immediate
Update township codes and ordinances to enact surface run-off rate restrictions to prevent overloading of streams and prevent erosion.	EP-1, EP-3	Immediate
Update and enforce Tree Preservation Ordinance to minimize lot clearing, focus farmland on existing farm lots, minimize development impacts, and enhance the natural character of the township.	OP-1, EP-3	Immediate
Update township codes and ordinances to require that natural features will be utilized as boundaries between different use areas or to separate development areas from agricultural areas.	OP-3, GM-4, GM-7	Immediate
Update township codes and ordinances to limit development in areas that are unsuitable for development: a. Lands that cannot be developed in their natural state, such as flood plains and wetlands. b. Lands that are essential to the continuity and preservation of natural systems. c. Lands on which development would result in environmental destruction of a larger natural system or create hazards to the environment or the public.	EP-1, EP-3, GM-4, GM-9, GM-10	Immediate

Identify important wildlife corridors to minimize impact on animal habitats and adopt necessary policies and ordinances to protect them.	EP-3, EP-4, OP-1	Mid
Inventory and identify sensitive environmental areas for potential purchase or enhanced protection .	EP-3, EP-4, OP-1	Mid
Explore the establishment of a zoning district that permits renewable energy development while preserving the rural character of the Township.	EP-2, GM-10	Mid
Amend existing codes and ordinances to allow for installation of energy generation systems as a permitted or conditional use in all zoning districts.	EP-2	Mid
Participate in and support the Washtenaw Metro Alliance document "Green Places: Open Spaces - A Plan for Coordinated Parkland and Open Space."	GM-10, OP-2	Mid
Work with Washtenaw County Water Resources Commissioner and update township codes and ordinances to require greater use of green infrastructure and limit impervious surfaces.	EP-1, GM-8, GM-9	Long
Work with large property owners to educate and regulate the use of phosphorus fertilizers, increased use of native landscaping, and awareness about watersheds, wetlands, and other natural features.	EP-1, EP-3	Long
Continue to work with township policy makers and legal representation to protect the long-established growth management plan and Urban Service Area boundary.	EP-1, GM-8, GM-9	Long

Housing

Action	Related Policy	Time Frame
Update Zoning Ordinance to allow for a variety of housing types consistent with adopted growth management plan and future land use plan.	GM-7, GM-8, H-2, H-6	Immediate
Update Zoning Ordinance to buffer existing neighborhoods from inconsistent uses and to thoughtfully integrate neighborhood commercial development into residential communities through design and development standards.	H-1, H-2, GM-6, H-8	Immediate
Create standards that allow for and regulate creative "missing middle" housing types.	H-1	Immediate
Create design standards that require duplexes and multiple family buildings to match the existing architectural style and scale of the surrounding housing stock.	H-1, H-5	Immediate
Monitor changing demographics and ensure policies and zoning which permit housing to meet those needs.	GM-2, H-4, H-6	Mid
Provide information to residents and builders on Universal Design and aging in place concepts.	H-1	Mid
Establish program to market the community assets to potential investors, new businesses, residents, and visitors to establish more commercial opportunities within the higher-density portions of the Township.	H-6, H-7, H-8	Mid
Establish program to provide incentives to encourage redevelopment and higher intensity of development in vacant areas within higher-density portions of the Township.	H-7, H-8	Mid
Identify areas and draft regulations to support senior housing.	H-2, H-3	Mid
Establish program to encourage and assist in home ownership and home improvements especially for specific neighborhoods.	H-1, H-2	Mid
Establish neighborhood improvement program that works directly with neighborhoods to identity needed improvements such as programming needs, community gardens, blight reduction, and infrastructure updates.	H-1, H-2	Mid
Establish a rental inspection program.	H-1, H-5	Mid
Encourage or incentivize housing types for seniors, lower-income families, and young people in areas with convenient access to services, businesses, and transit.	H-2, H-3, H-6, H-8, T-2, T-8, GM-2	Mid
Develop building regulations that permit expansion and modernization of structures while at the same time preserving the established character of neighborhoods.	H-1, H-5	Mid
Establish benchmarks that permit regular review of the quality of service and infrastructure provided. Services and infrastructure that should be reviewed include: a. Utilities (sewer, water, and rubbish) b. Public safety (police, fire, E-911 dispatch) c. Transportation (roads, pathways, sidewalks) d. Parks and Recreation e. Wireless and fiber optic communications and internet	H-4, GM-2	Long
Maintain and upgrade existing utilities in areas that are currently developed as or planned for higher intensity land uses.	H-4, GM-2, H-7	Long
Review neighborhoods to determine infrastructure improvements such as sidewalks, paths, and parks.	H-5, T-5	Long

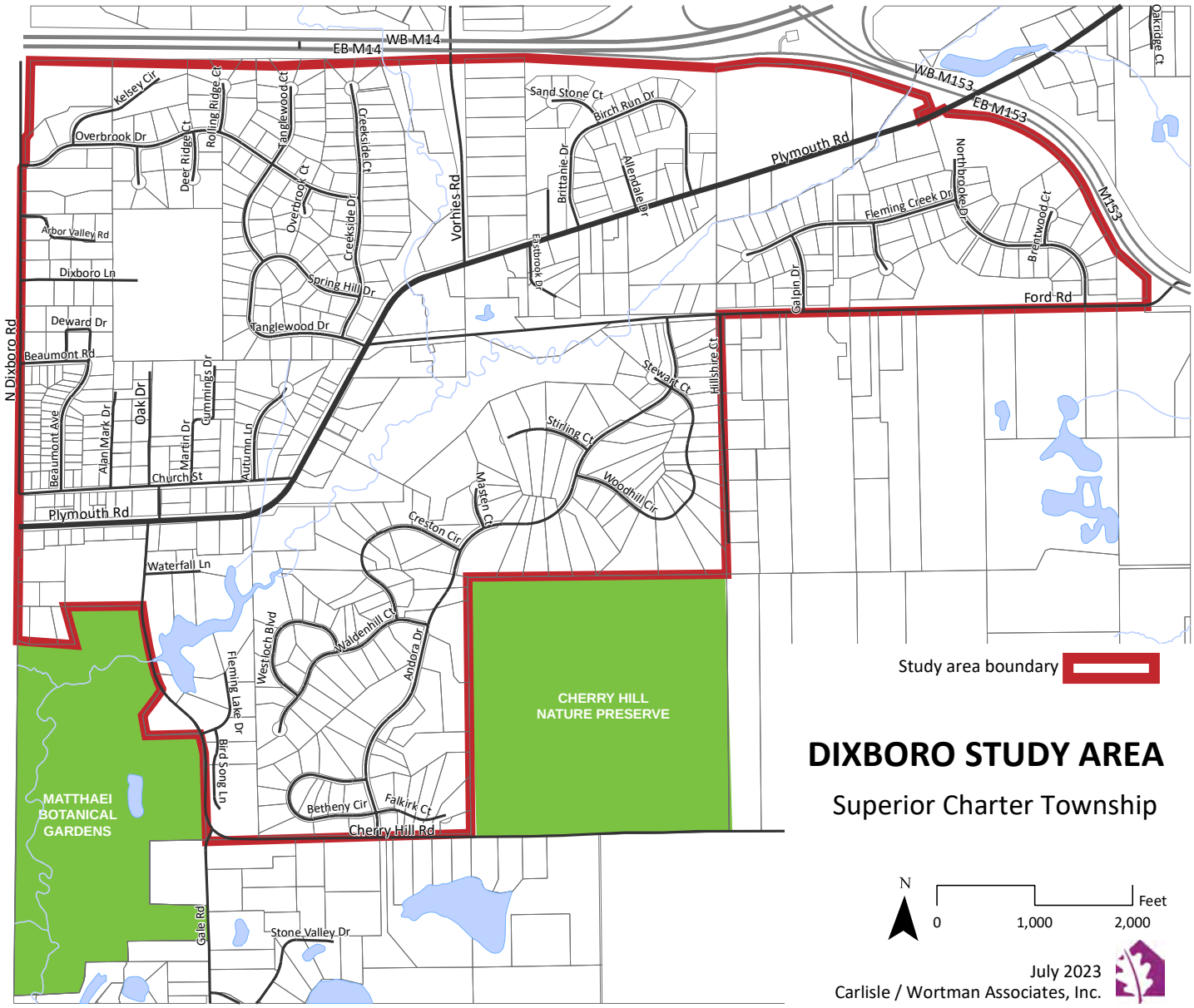
Transportation		
Action	**Related Policy**	**Time Frame**
Adopt recreation and non-motorized plans that require new developments along major roadways to install a non-motorized pathway.	T-1, T-7, T-9	Immediate
Adopt recreation and non-motorized plans that identifies gaps between existing trails and sidewalks.	T-1, T-7, T-9	Immediate
Enhance Geddes Road as a buffer between agricultural/open space to the north and new development to the south by planting or preserving trees along the roadway and expanding the non-motorized trailway alongside it.	GM-1, T-6, T-7, T-9	Immediate
Work with Washtenaw County Road Commission to improve safety for bicyclists along roadways in areas of high need, where a designated non-motorized pathway is not readily available.	T-6, T-9	Mid
Encourage expanded AAATA bus service from Ypsilanti Township and Ann Arbor Township into high-density areas in Superior Charter Township.	T-1, T-2, T-8	Mid
Work with AAATA to review bus routes to ensure they most efficiently link neighborhoods to shopping areas and employment areas.	T-8, H-8	Mid
Work with DTE to improve and maintain streetlights in residential neighborhoods.	T-9	Mid
Establish program to fill gaps between existing trails and sidewalks.		Mid
Support the "Ten Minute Walk" initiative by expanding sidewalks and non-motorized pathways in more developed areas of the Township.	T-5, T-7, GM-6	Mid
Update township codes and ordinances to require shared access among adjoining property.	EP-1, OP-1, GM-8, H-7	Mid
Work with Washtenaw County Road Commission to establish local road improvement plan.	T-3	Long
Implement traffic-calming and traffic alleviation measures in the Dixboro Special Area.	T-4, T-6, T-7, T-9	Long

Chapter 6: Dixboro Special Area Plan

Dixboro is a special area within Superior Charter Township. It is often unofficially referred to as the Dixboro Village or the Dixboro Hamlet. Dixboro is a neighborhood with a long history supported by a strong sense of community. This is perpetuated by its notable character and the community members that call it home. The area consists of well-established residential neighborhoods with mature trees and small, local commercial establishments along Plymouth Road which runs through the heart of the area.

While there are no official borders to the area, and there are many community members who identify with Dixboro, a study area has been designated for the purposes of this special area plan. This area includes the small mixed-use corridor along Plymouth Road and the immediate surrounding neighborhoods. This area is generally bound by North Dixboro Road to the west, M-14 to Ford Road to the north, Cherry Hill to the south, and the edge of the adjacent neighborhoods to the southeast.

Map 19. Dixboro Planning Area



Community Engagement

During the Master Planning development process, special attention was paid to the Dixboro area, as it has been long recognized as a special planning area within the Township. To receive input on the future plan for this area, a series of three meetings was held. The first was an open house with activity stations designed to garner feedback on preferred community character, general land use, housing, and transportation. This activity was open to the public. A second meeting was held with Dixboro community stakeholders where the feedback from the open house was shared and ideas were refined. Finally, a presentation, which was open to the public, was given to provide findings and direction from the input that was received. There appears to be a consensus on the vision for the future for the Dixboro area.

Vision

Character

Generally, people in Dixboro like the area as it is. Any future growth or development in the area should be consistent with the current character and scale of the area. The following character elements focus on commercial uses or mixed commercial/residential uses along Plymouth-Ann Arbor Road. This is the most outward facing area in Dixboro. Any new commercial development should be focused along the Plymouth Road corridor, from the area where commercial uses currently start on the west end to the intersection of Tanglewood Drive and Ford Road. Such commercial development should be small scale and designed to serve the needs of the local neighborhoods. The following elements are identified as being consistent with the vision for the area's community character:

1. Buildings on the corridor should be no taller than 2.5 to 3 stories.
2. Commercial or mixed-use buildings may be in converted houses.
3. New buildings should be designed to look like village commercial style buildings. There are existing commercial buildings in Dixboro that people recognize as being consistent with the style and scale that is desired for any new development.
4. Well-defined outdoor seating areas are desired.
5. The streetscape should include sidewalks, buffers between pedestrian space and vehicular lanes, street trees, traditional style benches, and streetlights.

Housing

The bulk of the Dixboro area consists of single-family neighborhoods. While the area is generally built out, there are still areas that could be developed for new housing. It is recognized that the large undeveloped area close to M-14/M-153 interchange will likely be developed as a suburban-style neighborhood consistent with the surrounding neighborhoods. There may be smaller parcels that have some infill potential. There is desire to see availability of smaller, more affordable housing options. These could be duplexes within existing neighborhoods whose designs are consistent with the neighboring single-family homes. Townhomes or second-floor flats could be developed along the Plymouth-Ann Arbor Road corridor if their design and scale could complement the neighboring village commercial uses. Additionally, if space is available along the corridor, slightly larger parcels could be developed as bungalow courts.

Transportation

Like the rest of the Township, Dixboro was designed to accommodate vehicular traffic, with little if any consideration to non-motorized or pedestrian traffic. Plymouth-Ann Arbor Road's 45-mph speed limit is a relic of the road's status as a trunk line, although that status was discontinued after completion of M-14 in 1979. The road has been under the control of the Washtenaw County Road Commission (WCRC) since that time. Traffic is heavy along the Plymouth Road corridor, especially during morning and evening rush hours. It is common to see drivers cutting through surrounding neighborhoods to bypass traffic, frequently traveling at speeds well above the posted limits.

Residents expressed a strong desire to change this auto-centric character and focus instead on walkability and non-motorized transportation alternatives. Reduction of the speed limit is key: residents hope to see the speed limit lowered to 35 mph or less. Pedestrian amenities such as sidewalks, pathways, and new street lighting were commonly-requested features, and traffic calming devices such as on-street parking, bump-outs, and mid-block crossings were viewed favorably for the downtown Dixboro corridor. These features provide visual cues for drivers to reduce speeds, ultimately making it easier for the County to officially lower the posted limit. The alignment concept preferred by the Dixboro session participants is shown in Figure 16.

An eight-foot-wide pathway is currently in the final design stages. The route will start at the Dixboro/Plymouth Road intersection, connecting with the recently completed

A duplex is a two-unit house that can be designed to match the style and scale of other houses within a neighborhood.

Second story apartments in commercial buildings provide additional housing options within the context of neighborhood commercial use.

A bungalow court is a style of development featuring smaller single family housing units arranged around a central garden or courtyard.

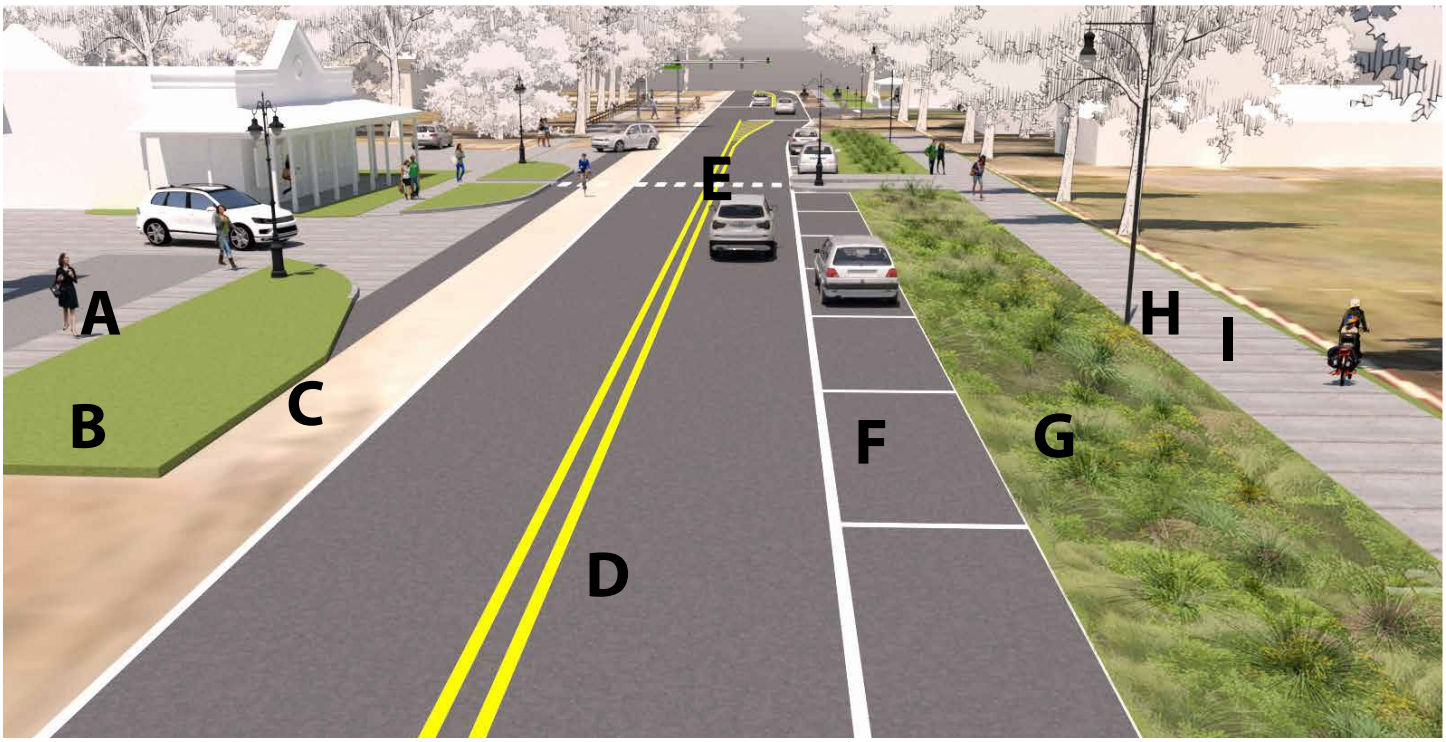
pathway south to Matthaei Botanical Gardens, and travel approximately 2,500 feet east along the south side of Plymouth-Ann Arbor Road to the Dixboro Project Restaurant at the first bend in the road. While this segment does not incorporate all of the traffic calming and street design features desired by residents, it represents an important first step in development of the sub-area. As the region develops, this pathway will begin to form a connection to existing trails in the Northbrooke/Fleming Creek subdivision, creating a loop which returns to the hamlet, and greatly improves walkability and safety.

Full-scale implementation of non-motorized amenities and traffic calming devices will require buy-in from and cooperation with the Washtenaw County Road Commission (WCRC). It is critical that Township officials continue to communicate their vision with WCRC and regional transportation planning authorities so the project can be incorporated into long-term planning efforts. Inclusion of traffic calming options such as mini-roundabouts in the Tanglewood neighborhood should also be considered to discourage cut-through drivers.

Working with the WCRC on road development also offers opportunities for achieving economies of scale. By carefully phasing activities and incorporating improvements with other planned road activities, the Township can realize their ambitions while remaining fiscally prudent. Coordination with regional authorities also ensures that trails have the broadest possible reach, and form a network that connects neighborhoods and adjacent communities. In the Village, priority should be placed on developing the segment along Plymouth between North Dixboro and Church Street, building on current trail activities and expanding to incorporate the placemaking features desired by residents.

Finally, several residents expressed a desire to see bus service extended into Dixboro, with connections west to the Park-and-Ride at US-23 and Plymouth-Ann Arbor Road. The Ann Arbor Area Transportation Authority (AAATA) currently does not offer service around the village. Communities that desire service outside of AAATA's core area negotiate a fee to create the route and stops. It may be desirable for Superior Charter Township to coordinate with Ann Arbor Township to create a route from the Park-and-Ride east to Dixboro Road, and south to Geddes, with stops at the Matthaei Botanical Gardens and downtown Dixboro.

Figure 16. Preferred Configuration for Plymouth-Ann Arbor Road



A. Sidewalk widened to 6-foot
B. Buffer remains intact except to accommodate expanded sidewalk and lighting
C. Existing shoulder left intact
D. 11-foot travel lanes
E. New mid-block crosswalks with bump-out
F. On-street parking
G. Bioswale with native plantings
H. New lighting
I. 8-foot multi-use safety path shared by cyclists and pedestrians.

Figure 17. Cross-Section of Multi-Use Roadway

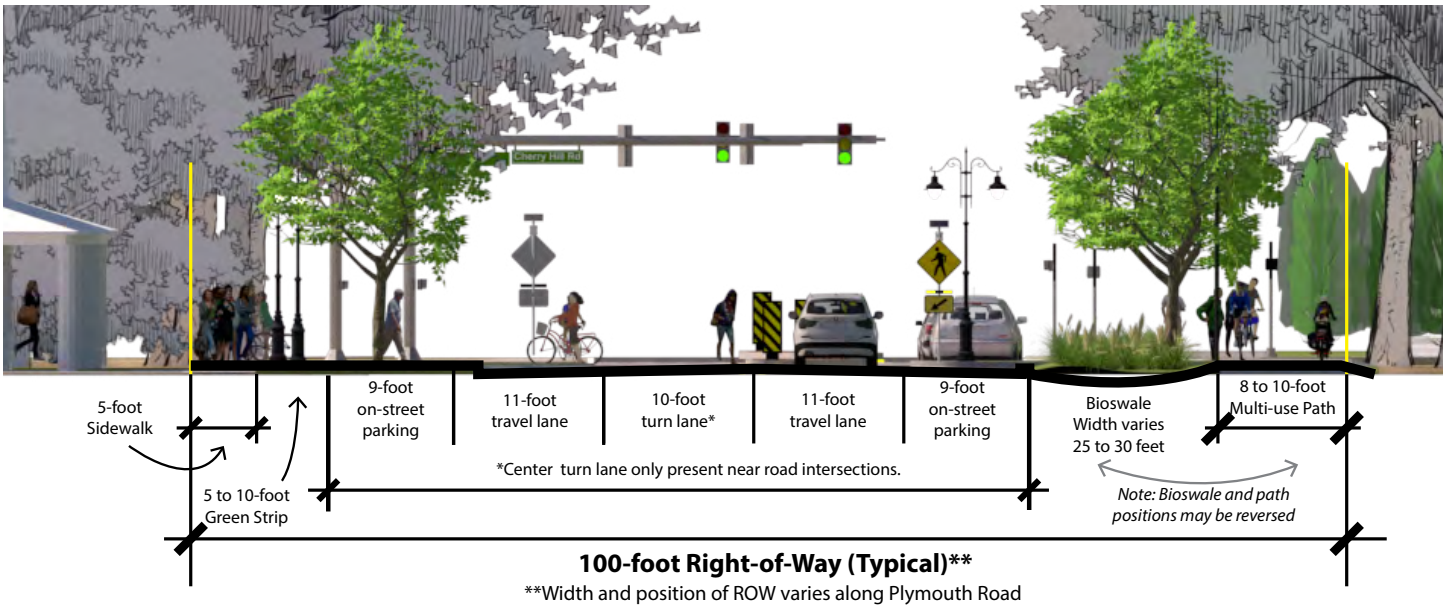


Figure 18. Non-Motorized Transportation Development Phasing

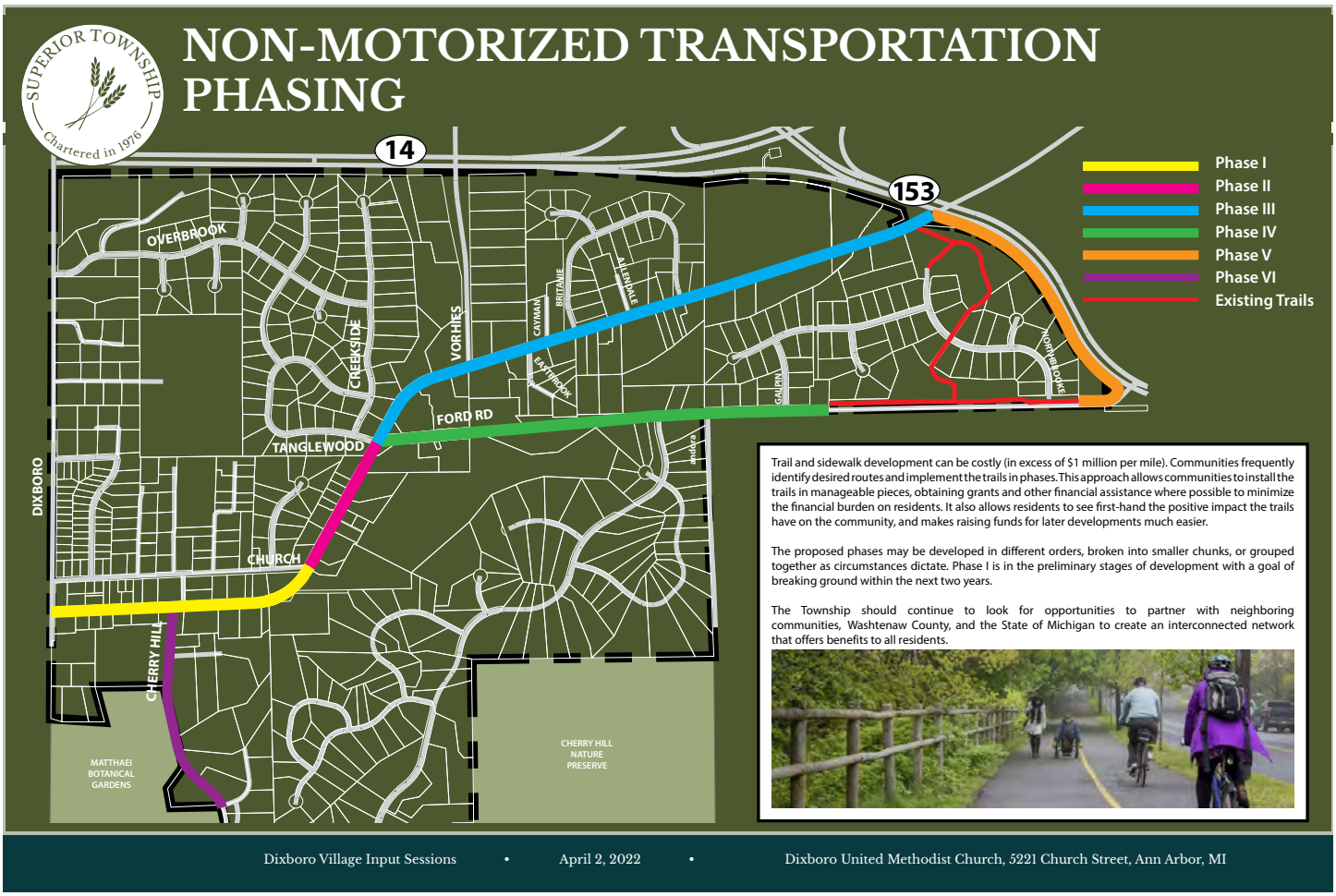


Figure 19. Desired Streetscape and Traffic Calming Elements

Roundabouts

Raised islands placed at unsignalized intersections around which traffic circulates. Acts to slow traffic while allowing unimpeded circulation.

Bump-outs / Chokers

A narrowing of a roadway through the use of curb extensions or roadside islands. Chokers are considered appropriate for arterials, collectors, or local streets.

Mid-block Crossings

Sometimes used in conjunction with traffic islands, mid-block crossings shorten travel distances and increase safety for pedestrians between signaled intersections.

On-street Parking

On-street parking narrows road travel lanes and increases side friction to traffic flow. Can be used on alternating sides of the road for a "chicane effect."

Sidewalks

Typically five to six feet in width, sidewalks primarily serve pedestrians and provide separation from vehicular traffic.

Safety Paths / Trails

Typically eight to ten feet in width, but wider in locations with heavier traffic. Designed to accommodate both pedestrian and bicycle traffic.

Bioswales

Help to control stormwater runoff and, when done properly, can beautify the surrounding neighborhood.

Textured Paving

Changes in surface texture can be used to alert drivers to crosswalks or special use areas.

Street Lighting

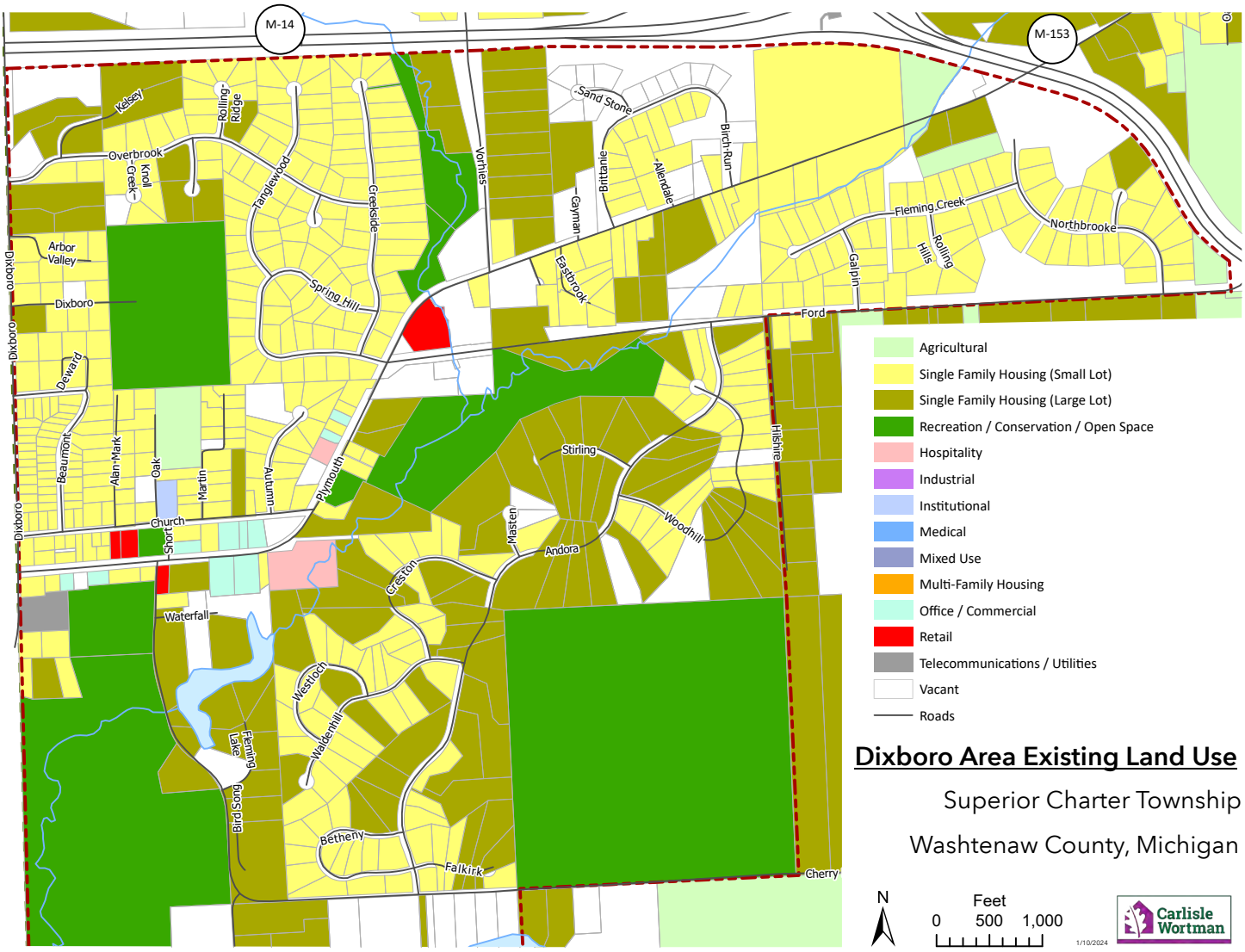
Street lighting is both a way to illuminate pedestrians and a visual cue to drivers of a potential change in traffic patterns and uses.

Land Use

Existing Land Use

Over the past 60 years Dixboro has been converted from active farmland and farmsteads to single-family subdivisions. The predomimant land use remains single family residential including small-lot, less than 1 acre, and large-lot, greater than 1 acre. The southern portion of the Dixboro study area adjoins two large conservation areas, Matthaei Botanical Gardens and Cherry Hill Nature Preserve. Along the Plymouth-Ann Arbor Road corridor, there are scattered mixed uses including some office, hospitality, retail, and institutional. Furthermore, there are a number of vacant and/or undeveloped parcels in the study area.

Map 20. Dixboro - Existing Land Use



Future Land Use

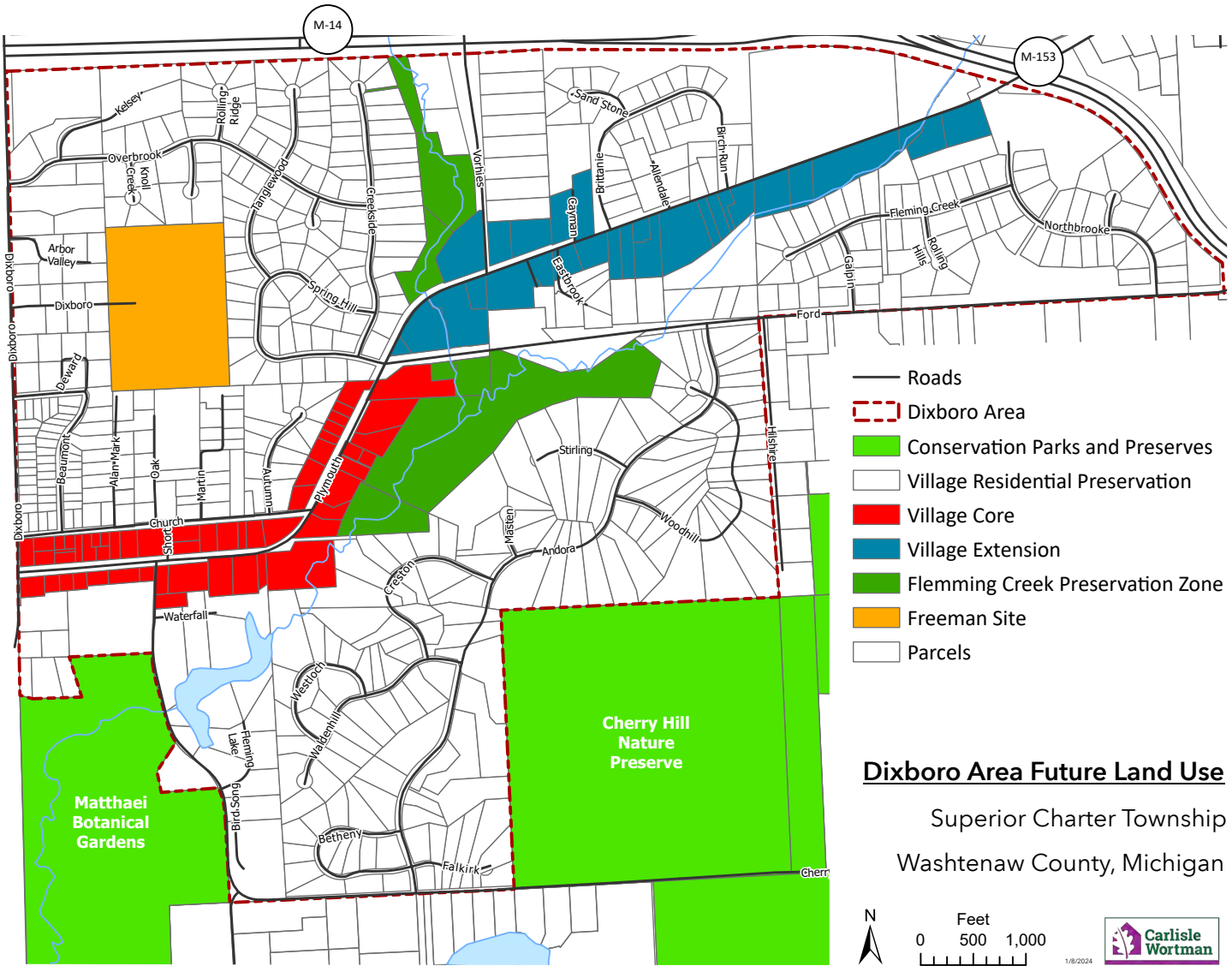
The Future Land Use Map reflects future land use patterns at an area-wide scale. The map uses color-coded "place types" to express public policy on future land use patterns– it is not a zoning map. It is built around the concept of place types – characteristic development patterns that recognize the context of each area but also provide guidance on desired improvements. Place types identify desired uses, design concepts and considerations to guide the relationships and physical improvements needed to create the types of places that are part of Dixboro's long-range vision.

Areas within Dixboro have been divided into five place types. Place types have been assigned to areas based upon the context of existing build form, physical conditions, environmental conditions, land uses, development patterns, and community input, goals, and strategies.

The intent of the Future Land Use Map is not to predetermine land uses or zoning on a specific parcel or at specific locations. Rather, individual properties or projects can be considered within the context of the location and surrounding properties, and not by a strict set of land use categories.

The purpose of the Future Land Use Map is to create a place-based development strategy tailored to Dixboro's unique characteristics, strengths, challenges, and opportunities.

Map 21. Dixboro Future Land Use Map



	USES
VILLAGE CORE Historic core of the Hamlet. Intended to accommodate the convenience shopping, food service, office, and personal service needs of the community. The Village Core supports the creation and growth of neighborhood-oriented businesses, heightened sense of place, and encourages pedestrian and other forms of non-motorized travel.	Mixed-use, neighborhood commercial, office, personal services, residential (including small square footage homes, bungalow courts, duplexes, small scale tri- and four-plex units), institutional uses, and open space/parks.
VILLAGE EXTENSION Intended to accommodate primarily low-density residential uses that retain the desired character of the area. The Village Core Extension would include a mix of single-family homes on both small and large lots, bungalow courts, small scale duplexes. Historically contextual design qualities are desired for residential developments. Non-motorized facilities and pedestrian connectivity are emphasized.	Large- and small-lot single-family homes, bungalow courts, small scale duplexes, and open space / park.
FREEMAN SITE Ann Arbor Public School District property to be maintained in its current state unless the property is sold by the District. Should site become available for development, the new owners should work in partnership with adjacent neighbors to create a site that retains the character of the surrounding area. Lower traffic generation will be required due to the lack of utilities in the area	Institutional, planned neighborhood, open space / park.
VILLAGE RESIDENTIAL PRESERVATION Maintain and seek continuing reinvestment in the existing housing stock. Any new development must fit the character of the area. Preservation of the historic Dixboro church is critical.	Large- and small-lot single-family homes, open space / park.
FLEMING CREEK PRESERVATION ZONE Critical ecological zone including Fleming Creek and its adjacent wetlands and woodlands. Most of these parcels are currently under private ownership. The Township should actively seek development rights agreements and outright acquisition as opportunities present themselves.	Preservation, passive-use recreation.

Table 11. Policies and Strategies, Dixboro Special Area Plan

Leading Policies	Strategies
Strive to recognize and protect historic assets.	Enforce design standards to preserve historic character of buildings along Plymouth-Ann Arbor Road in the Dixboro special sub-area.
Strive to recognize and protect historic assets.	Establish a program to permit outdoor dining areas for businesses in the Dixboro special sub-area.
Strive to recognize and protect historic assets. Support neighborhood commercial development that provides higher density residential neighborhoods with convenient access to day-to-day businesses.	Encourage new commercial businesses to occupy converted single-family homes along Plymouth Road in the Dixboro special sub-area.
Recognize that transportation facilities must be contextually appropriate to the unique areas of the Township that they serve.	Provide for on street parking along Plymouth Road in the core area as well as along connecting side streets where space is available within the public right-of-way.
Focus new development within designated areas and conduct it in a sustainable manner.	Update zoning to allow a variety of housing types in appropriate locations.
Promote residential development in a manner which will create, preserve, and enhance a quality living environment for existing and future Township residents and workers.	Update the Zoning Ordinance to create design standards that require duplexes and multiple family buildings to match the existing architectural style and scale of the surrounding housing stock.
Promote residential development in a manner which will create, preserve, and enhance a quality living environment for existing and future Township residents and workers.	Create standards that allow for and regulate bungalow court development. Such regulations should ensure that the architectural style of housing is consistent with existing neighboring housing.
Both motorized and non-motorized transportation facilities must be enhanced within planned growth areas.	Review neighborhoods to determine infrastructure improvements such as sidewalks, paths, and parks.
Recognize that the existing neighborhoods and the existing housing stock are an essential part of the community's character.	Provide information to residents and builders on Universal Design.
The existing housing stock is an essential part of the community's character.	Establish a program to encourage and assist in home ownership and home improvements especially for specific neighborhoods.
The need for a diversity in housing stock to support the housing needs of all residents, including young people, families, and seniors aging in place.	Encourage and assist in home ownership and home improvements.
Support clean water protection. Natural features, land preservation, and open space are key components of Superior Charter Township's community character.	Provide incentives for adjoining property owners to incorporate shared access drives and parking lots into all new redevelopment projects.
The existing neighborhoods and the existing housing stock are an essential part of the community's character.	Establish a rental inspection program.
Support diverse land uses that provide residents convenient access to goods and services.	Update the Zoning Ordinance to buffer existing neighborhoods from inconsistent uses and to thoughtfully integrate neighborhood commercial development into residential communities through design and development standards.

Leading Policies	Strategies
Promote residential development in a manner which will create, preserve, and enhance a quality living environment for existing and future Township residents and workers.	Develop building regulations that permit expansion and modernization of structures while at the same time preserving the established character of these neighborhoods.
Maintain existing and planned future housing densities where additional population will not over burden the existing or planned infrastructure. The type and density of new development should remain consistent with existing types and densities of nearby land uses.	Establish benchmarks that permit regular review of the quality of service and infrastructure provided. Services and infrastructure that should be reviewed include: a. Utilities (sewer, water, and rubbish) b. Public safety (police, fire, E-911 dispatch) c. Transportation (roads, pathways, sidewalks) d. Parks and Recreation e. Schools f. Wireless and fiber optic communications and internet
Promote increased transit options, particularly to serve underserved populations, significant shopping areas, and employment destinations.	Ensure bus routes link neighborhoods to shopping areas and employment areas.
Promote increased safety of non-motorized transportation.	Improve and maintain streetlights in residential neighborhoods.
Promote the continued maintenance of roads.	Invest in strategic traffic and road improvements.
Support increased density in planned housing developments, where feasible, to promote maximum retention of open space and natural features in other portions of the Township and region.	Promote mixed-use, walkable, development patterns in more developed areas of the Township.
Support traffic calming and the mitigation of traffic congestion.	Implement traffic-calming and traffic alleviation measures.
Support safe and convenient transportation options for all uses and modes including pedestrians, bicyclists, motorists, and transit riders.	Require new developments along major roadways to install a non-motorized pathway.
Promote increased safety of non-motorized transportation	Encourage connections between existing pathways and sidewalks.
Support the enhancement and protection of opportunities for bicycling throughout the community.	Improve safety for bicyclists along roadways in areas of high need, where a designated non-motorized pathway is not readily available.
Promote the enhancement of pedestrian facilities, including pathways, sidewalks, and crosswalks.	Support the "Ten Minute Walk" initiative by expanding sidewalks and non-motorized pathways in more developed areas of the Township.

Chapter 6: Dixboro Special Area Plan (Submitted January 3, 2024)

Map 20. (page 90.) Dixboro Area Existing Land Use

Retail (red):

5206 Plymouth – A2 Rd. (GQ Properties LTD - Dixboro General Store)

Office / Commercial (← dull teal ?):

5263 Plymouth – A2 Rd. (RFC Holdings LLC)

5347 Plymouth – A2 Rd. (MK Wilson Holding LLC – i.e.: Arbor Hills Animal Clinic)

5595 Plymouth – A2 Rd. (Howze Judith - i.e.: Dr. Judith Howze, DO <Chiropractor>)

5643 Plymouth – A2 Rd. (BBEES LLC – i.e.: Perkins Construction Company)

5300 Plymouth – A2 Rd. (Lawson Thomas W & Donajean TTEES – i.e.: Nova Environmental)

Recreation / Conservation / Open Space (green):

3540 Dixboro Lane - Ann Arbor Public School (AAPS) – Freeman Environmental Education Center

Glennborough - Common Area

Map 21. (page 91.) Dixboro Future Land Use

No Color (white):

6595 Plymouth – A2 Rd.

6075 FORD RD -

Source: MapWashtenaw 4.14.2 (Washtenaw County)

Laura Bennett

From: cherryhill7777@aol.com
Sent: Thursday, February 15, 2024 6:35 PM
To: Laura Bennett
Subject: Comments on Master Plan Revsion

David Phillips

7777 Cherry Hill Road

Superior Township, MI 48198

Dear Superior Township Planning Commission,

For around 35 years, I have observed and participated in changes, amendments and revisions to the township's master plan. Through these years, many of the issues have remained the same: Expansion of single family homes at R-4 density or large lot density, protection and conservation of natural features and farmland, capacity and extension of water and sewer, development of the tech center and other issues. IMO, the township has done a good job of addressing development. The township has successfully addressed the challenges of mobile home park expansion, extension of water and sewer north of Geddes Road, development of the tech center, resolution of the Rock property and other issues. It appears to me that the proposed master plan revision is an affirmation and continuation of the issues, policies and action items of the township's current planning status quo. I did not notice any dramatic changes in policy or land use. To me this is a good thing. Except for some issues, I am generally satisfied with the land use policy and the manner in which the Township has developed.

I have some comments on the proposed revision. Some may not be appropriate to include in the master plan but I feel they are important for discussions on the future development of the township.

1. Page 2, Commuter patterns, transportation, Geddes Road is one of the most important east-west roads in the township. Traffic continues to increase. Geddes Road is also one of the most difficult to widen. About 25 years ago, OHM completed a traffic study on the Geddes Road corridor. I have long thought that a park and ride with the AAATA on township property at Harris or Prospect Roads near Geddes would be successful. I think it would reduce traffic and would add an amenity that would increase property values of homes in the area. At one time, I was the board representative to the AAATA. They were very amenable to adding routes. However, the township would have to fund the route. The AAATA was very good at obtaining grants.

2. Page 4, Capital Improvement Plan. When I was an elected official, the township did not give much attention to the Capital Improvement Plan. Current officials should address the issue. Is the current plan up to date? How often should it be reviewed or amended? Who is responsible to maintain it? The Township Hall is an example of a capital improvement that could require extensive maintenance, repair and spending in future years. It would be good to plan for this and other large cost capital improvements and budget accordingly.

3. Pages 10 and 20, Lack of housing diversity and high housing costs and rents as a percentage of income. I would like to see more information on this. IMO the township does have a diverse housing base. Subsidized housing, moderate housing, mobile homes, SFH's and multiple housing, mid-level

housing and high end housing. Also, when I lived in the Oakbrook Subdivision, due to lower housing costs and taxes compared to the surrounding area, the area was popular with first time home buyers. I think this may still be the case. I would think that first time home buyers usually have a higher mortgage to income ratio. These factors could also affect rents in the area.

4. Page 46, Public owned and operated sewer and water. St. Joe's Hospital has a special arrangement with the township for the water and sewer system that serves their property. St. Joe's controls a certain amount of capacity for their sewer system. More than they currently require. I would think this arrangement would afford them influence on proposed development on their campus and in the area.

5. Page 53, Hyundai Tech Center, proposes allowing accessory support business but is not intended to become a principal commercial center. This is consistent with previous Master Plans.

6. Page 55, Infill development. I have no idea where this would be feasible.

7. Page 56, Hospital Sub Area, hospital has full urban services. Please see number 4.

8. Page 81, establish programs to market community assets to potential investors, new businesses.....to establish more commercial opportunities. This and the reference to accessory businesses in the tech park addressed in number 5 are the only language I find that addresses expanding the tax base, economic development or expanding commercial in the township. Table 8 on page 44 indicates that commercial development constitutes about 2.0% of acres of the township. I think it is worth discussing what percentage of the SUV/taxable value is commercial. Hyundai pays a lot of taxes, especially to the schools. Superior Township has long depended on Hyundai and expensive homes to keep the local government tax rate low for all taxpayers. However, as evidenced by the 2018 increase in the police and fire millages, taxable value provided by the new development does not cover the increasing costs of our local government. This trend appears to be continuing. Increased costs for township infrastructure, capital improvements, staff, salaries and other obligations will put an increasing burden on the township's tax collection. Are there any strategies to address this, or do are we committing our residents to increasing taxes?

9. Page 82, Dixboro, Plymouth Road cross section, indicates the plan is for a 100' ROW and that the ROW for Plymouth Road varies. What is the actual ROW for Plymouth Road. I seem to remember that some buildings (General Store), either encroach into the ROW or almost encroach. Is the cross section plan realistic for the area?

I thank all of you for the job you are doing. I know it can be a thankless job. I appreciate what you do and I am sure many others also do. Please keep up the good work.

Laura Bennett

From: PETER SANDRETTO JR <peters9971@aol.com>
Sent: Friday, December 1, 2023 9:13 AM
To: Laura Bennett
Subject: Re: Dixboro Existing Land Use Map

I looked again and the Freeman and the Freeman Environmental Education Center Property is shown as Medical Property. Totally wrong. I think the whole existing use map must be looked at again.
Pete Sandretto

Sent from my iPad

> On Dec 1, 2023, at 8:48 AM, Laura Bennett <planning@superior-twp.org> wrote:
>
> Thank you for letting me know. I've passed your message along to the Planning Consultants who are working on the Master Plan.
>
> Laura Bennett
> Planning & Zoning Administrator
> Superior Charter Township
> planning@superior-twp.org
> 734-482-6099
>
> ---
>
> **From:** peters9971@aol.com <peters9971@aol.com>
> **Sent:** Thursday, November 30, 2023 3:43 PM
> **To:** Laura Bennett <planning@superior-twp.org>
> **Subject:** Dixboro Existing Land Use Map
>
>
>
> I just did a quick review of the proposed Township Master Planning document and noted that the lot sizes are incorrectly identified for a considerable part of the existing land use map for the Dixboro area. For example, mu property is designated as a small lot of one acre or less. My property is 1.42 acres and all the lots on Deward are greater than one acre. The same is true for many other housing locations on the map..
>
> Peter P Sandretto Jr
> 3406 Deward Dr
> Ann Arbor, MI 48105

TO: Superior Township Planning Commission
FROM: Fleming Creek Advisory Council
SUBJ: Superior Township Master Plan Update
Date: February 14, 2024

The Fleming Creek Advisory Council is a group of local landowners and agency representatives (including county, city, townships, the University of Michigan, and Huron River Watershed Council (HRWC)) formed by those with an interest in maintaining and improving the quality and health of Fleming Creek. Superior Township requires FCAC review of development proposals within the Fleming Creekshed.

FCAC has the following comments on the 2024 master plan draft.

More detailed comments and suggestions are included in the attached worksheet.

To highlight a few items:

- The master plan provides detailed mapping and discussion of the need to protect the township's agriculture and natural areas. FCAC could not agree more; we would welcome the opportunity to work with the township on implementing the policies mentioned in the plan. **Specifically, HRWC offers a Green Infrastructure Natural Areas Network workshop to create a natural areas map and Greenspace Plan as mentioned in the plan. Also, HRWC has an updated ecosystems and natural features map that may be useful.**

- The current plan includes policies to preserve natural features, including stream corridors. **FCAC would welcome the opportunity to work with the township on implementing these policies; specifically, requiring a 100 ft setback and 25 ft buffer from streams, and a 25-foot buffer of protection around wetlands.**

- In addition to the concepts currently addressed to create walkable neighborhoods, consider these 4 concepts:

- Place parking behind storefronts.
- Do not require setbacks or set maximum setbacks.
- Make sidewalk-facing part of buildings attractive/accessible for pedestrians.
- Establish/maintain on-street parking.
- **HRWC can provide resources to shepherd through the process of designing mixed-use, "10-minute" neighborhoods.**

- As part of the township's goals to preserve open space, farmland, and natural areas, encourage creation of conservation easements as part of site plan review on proposals where natural areas and farmland are present.

- For the actions to identify wildlife corridors, inventory sensitive environmental area, and include zoning for renewable energy projects: the township should begin these actions more immediately than in 2 – 5 years; though we recognize full completion may take multiple years. **HRWC can provide resources to implement these actions more quickly than within the 2 – 5 year timeframe.**

FCAC would be happy to participate in the implementation of the plan; see attached review of Salem Township's zoning ordinance as an example.

FCAC thanks the township for the opportunity to review the master plan and offer these comments. Please let us know if you would like to take advantage of resources offered by FCAC and HRWC.

Sincerely

Kris Olsson

Kris Olsson

Huron River Watershed Council
www.hrwc.org

Master Plan Worksheet

ELEMENT	DESCRIPTION	MY MASTER PLAN	OBSERVATIONS & SUGGESTIONS
Conditions Section			
Natural areas and Green Infrastructure	Include language describing the municipality's Green Infrastructure, including details about specific ecological services provided by these areas. Include a map.	Yes, mentions ecosystem services. Doesn't have a comprehensive GI network map, or "Environmentally Sensitive Areas" map (p 33)	HRWC offers a Green Infrastructure Natural Areas Network workshop to create a natural areas map, "Environmentally Sensitive Areas" map, and Greenspace Plan as mentioned in the plan
Natural features listed and mapped	Describe the presence and importance of the following natural features: waterways, wetlands, forests, steep slopes, groundwater recharge areas, endangered and threatened species.	Most of these are present as separate maps.	HRWC can provide an updated ecosystems and natural features map.
Impervious capacities	Inventory of existing impervious surfaces in the municipality, describe future/anticipated	Does not have this.	Consider language addressing impervious surface capacities of the Township's watercourses. HRWC can provide resources and assist with determination of impervious surface capacities for waterways in the township.

	impervious surface increases or decreases, with specifics and maps.		
Current conditions of agriculture (for rural governments)	Include language about the current state of agriculture in the municipality.	Yes	
Transportation	Describe existing bicycle, pedestrian, and mass transit transportation networks, as well as future opportunities.	Yes.	
Smart Growth Principles			
Create compact communities	Direct development toward compact areas with pre-existing infrastructure; in very rural communities these compact areas may be in nearby villages or cities. This	Yes	

	information should be reflected in the future land use map.		
Mix land uses	In compact areas mentioned above, designate a mixture of land uses to allow shorter distances between home, work, school, and shopping, etc.	Mentions 10-minute neighborhood, mixing housing types, etc. in several parts of document. However, the planned tech center is a single use.	Consider strategies for the tech center area to offer a mix of land uses to serve employees and nearby residents. HRWC can provide resources to shepherd through the process of designing mixed-use, "10-minute" neighborhoods.
Create varied types of housing	Include variety of housing costs and densities in the future land use map to accommodate different living scenarios and encourage socio-economically diverse communities.	Yes, in many sub-areas. However, the plan also maintains the desire to keep existing type and density of current nearby land uses. These two goals may be in conflict. Lots of vacant land	Consider more focused strategies for vacant parcels within built-up areas. These parcels could provide missing land use types in sub-areas that need more commercial, residential, or other land uses to create less auto-dependent neighborhoods. HRWC can provide resources to shepherd through the process of designing mixed-use, "10-minute" neighborhoods.
Promote attractive communities with a strong sense of place	Conduct capital improvement plans or other planning and studies to create a strong community.	Included in implementation section and one of sub areas.	

Create walkable neighborhoods	Include pedestrian needs in development design along with specific plans to ensure these needs are realized.	Included as an element in all sub areas.	In addition to the concepts currently addressed to create walkable neighborhoods, consider these 4 concepts: • Place parking behind storefronts. • Do not require setbacks or set maximum setbacks. • Make sidewalk-facing part of buildings attractive/accessible for pedestrians. • Establish/maintain on-street parking.
Preserve open space, farmland, and critical natural areas	Include goals and policies to protect natural areas and farmland. Identify critical areas with parcel descriptions and maps, if available.	Included for rural sub areas	Encourage creation of conservation easements as part of site plan review on proposals where natural areas and farmland are present. HRWC would welcome the opportunity to work with the township on implementing policies mentioned in the plan.
Prioritize and incentivize development in existing built areas	Designate higher intensity land uses within sewer service areas, mass transit services areas, etc. Provide incentives for developers to build in already-built areas of the community.	Yes, for sewer services boundary and Dixboro Village.	
Promote multiple types of transportation	Ensure developments provide safe areas for bicycles and	Yes, describes "complete streets"	

	pedestrians; direct development towards areas close to bus routes.		
Promote fair, transparent, and predictable development decisions	Make sure zoning ordinances follow the master plan's goals and policies with a development review process that is transparent and consistent, and that public input is provided. This will not be easy to evaluate until you have become more familiar with your local government's meetings and decision making process.		
Promote community and stakeholder collaboration in development decisions	Hold visioning and planning sessions, and conduct surveys to include stakeholders in decision making.	Yes as part of this master plan process	
Goals/Objectives Section			

Compact development	Include a statement supporting land use patterns that provide compact development in areas with existing infrastructure.	Included.	
Agricultural preservation	Include a statement supporting agricultural preservation.	Included	
Natural features preservation	Include statements supporting protection of wetlands, slopes, groundwater recharge areas, woodlands, and waterbodies.	included	
Open space/natural areas	Include statements supporting preservation of natural areas and open space.	Included	
Policies/ Implementation Section			

Future land use map	Include mixed land uses, varied housing types, and walkable communities within compact communities designated for development. Designate surrounding areas as Green Infrastructure, farmland preservation, and other low intensity, rural uses.	Included.	
Natural features policies	Include policies the government intends to enact to preserve natural features.	Included	For the actions to identify wildlife corridors, inventory sensitive environmental area, and include zoning for renewable energy projects: the township should begin these actions more immediately than in 2 – 5 years; though we recognize full completion may take multiple years. HRWC can provide resources to implement these actions more quickly than within the 2 – 5 year timeframe.

Stream corridor policies	Include policies the government intends to enact to preserve stream buffers.	Included	HRWC would welcome the opportunity to work with the township on implementing policies mentioned in the plan.
Green Infrastructure policies	Include policies the government intends to enact to preserve natural areas and other elements of Green Infrastructure.	included	HRWC would welcome the opportunity to work with the township on implementing policies mentioned in the plan.
Urban services district	Include policies the government intends to enact to create or maintain an urban services district that directs development towards areas of existing built infrastructure.	included	
Stormwater policies	Include policies the government intends to enact to properly manage stormwater runoff.	Included.	HRWC would welcome the opportunity to work with the township on implementing policies mentioned in the plan.
Agriculture preservation policies	Include policies the government intends to enact to	Included.	Willow Run schools had debt – forgiven by state. Merged with Ypsilanti schools. In USD – tax bills decreased significantly. Now chance for P&R

	preserve agriculture.		millage. Juan Bradford – township parks – 1 mill = 900K
Purchase/Transfer of Development Rights (P/TDR)	Include these policies that incentivize compact patterns of development. (see page 41 for details)	No mention of these particular policies	Consider TDR program between USD and Central, Rural areas. HRWC would welcome the opportunity to work with the township on implementing a TDR project and/or policy.
Other innovative land use planning policies	Include other policies the government intends to explore to encourage compact patterns of development and the protection of green spaces.		Great to bring to Dixboro non-motorized transportation, transit hub. Clear about implementation piece: HRWC as partner, work with partners to move forward with implementation of policies. "wait 2 years before doing because we have 5 years to go" Need implementation that can be assisted can move into immediate. Be specific about HRWC's help.

Some misgivings – aspirational; need SWAT, more concrete goals.- worried about development pressures.. If local government officials – would want to know exactly what to do to protect "green dot" of Superior.

What could be a stronger protection? Than what is in this MP?

Salem – Gotdrestson Rd. specifically.

Seeing development coming already. Had set aside rock property, but what else.

So, how do you do the great things in MP?

Lesson learned from Garrett's Space – interest in preserving land. Can be stronger – CE promoted more strongly

Tom: policy document. Township not heavily staffed. Rock, Gale Rd., Garrett's issues – need advocacy group. Bill Matthewson – Reg's neighbor.

Re: Rock CE – caused worry about township selling property. Will get different board after this election – need a way to institutionalize land protection. People not understanding of CE vs. just selling for development, etc.

Need advocates at PC to implement these things

Superior Township Monthly Report
January/February 2024

Resident Complaints/ Debris:

6980 Stommel Ct. - Mattress & Debris on extension
9843 High Meadow - Pods Container in yard - **(Letter Sent to Resident)**
1717 Dover Ct. - 2-4 Uhal Containers in yard - **(Letter Sent to Resident)**
8653 Nottingham Ct .- Debris by garage - **(Tagged for Removal)**

Vehicle Complaints:

9625 Geddes - Pick-up truck on side of road broke down
9889 High Meadow - Large box truck parked on street - **(Letter Sent to Resident)**

Illegal Dumping:

Between Geddes & Vreeland on Gotfredson - 5 spots of debris & junk have been dumped on side of road

Printed: 02/01/2024

SUPERIOR TOWNSHIP BUILDING DEPARTMENT
MONTH-END REPORT
January 2024

Category	Estimated Cost	Permit Fee	Number of Permits
Electrical	*$0.00*	*$6,935.00*	*33*
Mechanical	*$0.00*	*$5,805.00*	*41*
Plumbing	*$0.00*	*$1,950.00*	*10*
Res-Additions (Inc. Garages)	*$200,000.00*	*$1,300.00*	*1*
Res-New Building	*$3,080,518.00*	*$20,022.00*	*6*
Res-Other Building	*$9,250.00*	*$100.00*	*1*
Res-Renovations	*$692,892.00*	*$4,504.00*	*3*
Totals	***$3,982,660.00***	***$40,616.00***	***95***

SUPERIOR TOWNSHIP BUILDING DEPARTMENT
YEAR-TO-DATE REPORT

January 2024 To Date

Category	Estimated Cost	Permit Fee	Number of Permits
Electrical	*$0.00*	*$6,935.00*	*33*
Mechanical	*$0.00*	*$5,805.00*	*41*
Plumbing	*$0.00*	*$1,950.00*	*10*
Res-Additions (Inc. Garages)	*$200,000.00*	*$1,300.00*	*1*
Res-New Building	*$3,080,518.00*	*$20,022.00*	*6*
Res-Other Building	*$9,250.00*	*$100.00*	*1*
Res-Renovations	*$692,892.00*	*$4,504.00*	*3*
Totals	***$3,982,660.00***	***$40,616.00***	***95***

RESOLUTION
RECOMMENDATION OF APPROVAL
Brookwood of Superior
February 28, 2024

WHEREAS, Superior Township received Brookwood Plan petition to rezone, through amendment, one (1) parcel from PC, Planned Community Special District to PC, Planned Community Special District. The parcel is located at:

- LeForge Road, J -10-33-300-001 (currently zoned PC, Planned Community)

WHEREAS, the parcel is currently zoned PC, Planned Community Special District; and

WHEREAS, the existing PC, Planned Community Special District has expired; and

WHEREAS, the Superior Township Planning Commission reviewed the petition to amend the current zoning to a rezoned PC, Planned Community Special District;

WHEREAS, the Superior Township Planning Commission held a pre-application conference; and

WHEREAS, the Superior Township Planning Commission held a public hearing on this petition on May 24, 2023, and received comments on the petition; and

WHEREAS, the Superior Township Planning Commission considered the Area Plan rezoning petition standards set forth in Section 7.102.C of the Zoning Ordinance; and

WHEREAS, the Superior Township Planning Commission considered the Planned Community (PC) Special District eligibility criteria set forth in Section 7.301.A of the Zoning Ordinance; and

WHEREAS, the Superior Township Planning Commission found that the required finding of facts has been met:

1. The Area Plan maintains the rural character of the site and immediate area.
2. The PC, Planned Community District is intended to allow for greater collaboration to allow for a creative approach to land use and development. Through the PC, Planned Community District the township and applicant are able to collaborate to better protect the sites natural features and reduce impact upon adjacent properties than could be accomplished through a by-right site plan or through a conventional subdivision development.
3. The proposed Area Plan is compatible many elements of the adopted Growth Management Plan and other provisions of the Township Master Plan. See Master Plan Findings for more details. The most significant discussion point with regards to compatibility with the Growth Management Plan is density. The proposed density and impacts are outlined in details in this report.
4. The proposed type and intensity of use will not exceed the capacity of existing public services and the applicant will be required to provide the necessary onsite private infrastructure to accommodate use.
5. The site is 84 gross acres (70 net acres) and the applicant is preserving 26.5 AC or 51.4% of the wooded area on site, and a total of 31.7% of the total site as common open space. The land area is sufficient for the proposed uses.
6. The Area Plan is both conserving open space and preserving natural resources. Because the applicant is proposing an Area Plan, these areas are able to be conserved and protected in perpetuity, which may not be accomplished through a conventional subdivision development that would be permitted under the current zoning.
7. The proposed Area Plan is compatible with the adopted Growth Management Plan and other provisions of the Township Master Plan.

8. The proposed Area Plan is compatible with the ordinance standards. The PC, Planned Community District is intended to allow for greater collaboration to allow for a creative approach to land use and development. Through the PC, Planned Community District the township and applicant are able to collaborate to better protect the sites natural features and reduce impact upon adjacent properties than could be accomplished through a by-right site plan or through a conventional subdivision development.
9. The proposed type and intensity of use will not exceed the capacity of existing public services. If it is determined through the site plan process that utilities capacity is insufficient, the applicant shall either provide necessary onsite private infrastructure to accommodate use or reduce the number of units.
10. The applicant has arranged the site to develop in the existing farmland and maintain a significant amount of the existing natural features on site. The site is 84 gross acres (70 net acres), and the applicant is preserving 26.5 AC or 51.4% of the wooded area on site, and a total of 31.7% of the total site as common open space. The applicant is providing internal trails for additional recreation opportunities.
11. The site is controlled by one entity. If approved, the proposed Area Plan will dictate the development of the site. Additional common area maintenance and improvements will be codified through the site plan and through a development agreement.
12. The proposed Area Plan has gone through multiple rounds of reviews from Planning, Engineering, and the Fire Marshall. Additional site layout reviews will take place during the site plan and engineering review process.
13. The Area Plan provides for a mix of residential uses that satisfy the intent of the proposed Special District.
14. Through the Area Plan and site plan review, the Township can review and place reasonable conditions upon the application to ensure minimize adverse impacts.
15. The applicant has arranged the site to develop in the existing farmland and maintain a significant amount of the existing natural features on site. The site is 84 gross acres (70 net acres), and the applicant is preserving 26.5 AC or 51.4% of the wooded area on site, and a total of 31.7% of the total site as common open space. The applicant is providing internal trails for additional recreation opportunities.
16. The proposed Area Plan shows private drives/roads throughout the development. The drive/roads will be built to the private road requirements. The applicant has a connection point north between Brookwood (this development) and the Meadows. Interconnections between neighborhoods are strongly encouraged.
17. The Area Plan shows interconnected pedestrian trails and sidewalks within the site.

NOW THEREFORE BE IT RESOLVED that the Superior Township Planning Commission recommends that the Superior Township Board of Trustees approve the Brookwood Area Plan petition to rezone, through amendment, one (1) parcel to PC, Planned Community.

BE IT FURTHER RESOLVED that the Superior Township Planning Commission transmits the Planner's Report dated January 18, 2024 as the Planning Commission's report on this application.

SITE PLAN REVIEW APPLICATION

(This application must be typewritten or printed. All questions must be answered.)

APPLICANT NAME Diverse Real Estate LLC (c/o Jennifer Thomas)

NAME OF PROPOSED DEVELOPMENT Kinsley

APPLYING FOR

- ☐ PRELIMINARY SITE PLAN
- ■ FINAL SITE PLAN
- ☐ COMBINED PRELIMINARY AND FINAL SITE PLAN (Combination is at discretion of Planning Commission)
- ☐ MINOR SITE PLAN
- ☐ MAJOR/MINOR CHANGE DETERMINATION
- ☐ ADMINISTRATIVE REVIEW

WILL PROJECT BE PHASED? ☐ YES ■ NO

IF PROJECT IS PHASED COMPLETE THE FOLLOWING:

- Total number of phases 1
- Phase number of current application 1
- Name and date of preliminary site plan approval

Kinsley - November 17, 2022

- Date of Previous Phase Approvals:
  - Phase # _____ Date _____
  - Phase # _____ Date _____
  - Phase # _____ Date _____
  - Phase # _____ Date _____

SEEKING ADDITIONAL APPROVAL FOR A CONDITIONAL USE ☐ YES ☐ NO

Laura Bennett

Signature of the Clerk or Designee

April 18, 2023

Date of Receipt of Application

4 5,900

Amount of Fee

GENERAL INFORMATION

- Name of Proposed Development Kinsley
- Address of Property 6595 Plymouth Road
- Current Zoning District Classification of Property R2 (Approved 6/21/22)

  Is the zoning classification a Special District as defined by Article 7 ? ☐ YES ☐ NO

- Has this property been the subject of a rezoning request, Zoning Board of Appeals petition or other Township action with the past five (5) years? ☐ YES ☐ NO

  Please explain Subject parcel was just rezoned in June 2022 R1 to R2 Board of Trustees rezoning approval received 6/21/22

- Tax ID Number(s) of property 10-08-400-003 & 004
- Site Location - Property is located on (circle one) N S E W side of Plymouth Road between Ford Road and Birch Run Drive Roads.
- Legal Description of Property (please attach a separate sheet)
  Where a metes and bounds description is used, lot line angles or bearings shall be indicated on the plan. Lot line dimensions and angles or bearings shall be based upon a boundary survey prepared by a registered surveyor and shall correlate with the legal description.

Site Area (Acreage) and Dimensions

- Are there any existing structures on the property? ☐ YES ☐ NO
  Please explain: _____

PROPOSED LAND USE

■ Residential ☐ Office ☐ Commercial ☐ Other

If other, please specify _____

- Number of units 21
- Total floor area of each unit _____
- Give a complete description of the proposed development.
  Kinsley is a 21 Unit Single Family Development.

ESTIMATED COSTS

- Buildings and other structures _____
- Site improvements $939,268
- Landscaping $263,260
- Total _____

ESTIMATED DATES OF CONSTRUCTION

- Initial construction 2023
- Project completion 2023
- Initial construction of phases (IF APPLICABLE) _____
- Completion of subsequent phases. (IF APPLICABLE) _____
- Estimated date of first occupancy 2024

IDENTIFY EACH DRAWING SUBMITTED BY NAME OF PLAN OR DRAWING, DATE AND DRAWING NUMBER (ATTACH ADDITIONAL SHEET IF NECESSARY)

Final Site Plan Set Kinsley

Prepared by Atwell, Job #21002863

APPLICANT INFORMATION

- APPLICANTS NAME Jennifer Thomas
  Company Diverse Real Estate, LLC
  Address 13001 23 Mile Road, Suite 200, Shelby Twp, MI 48315
  Telephone Number 248-761-8930 Email jthomas@lombardocompanies.com

- PROPERTY OWNER'S NAME Jennifer Thomas
  Company CP LAND HOLDINGS LLC
  Address 6595 PLYMOUTH-ANN ARBOR RD
  Telephone Number 248-761-8930 Email jthomas@lombardocompanies.com

- DEVELOPER'S NAME Jennifer Thomas
  Company Diverse Real Estate, LLC
  Address 13001 23 Mile Road, Suite 200, Shelby Twp, MI 48315
  Telephone Number 248-761-8930 Email jthomas@lombardocompanies.com

- ENGINEER'S NAME Chris Rothhaar
  Company Atwell, LLC
  Address 311 N Main St, Ann Arbor, MI 48104
  Telephone Number 947-886-9874 Email crothhaar@atwell-group.com

- ARCHITECT/PLANNER'S NAME Jim Allen
  Company Allen Design
  Address 557 Carpenter Road, Northville, MI 48167
  Telephone Number (248) 467-4668 Email jca@wideopenwest.com

The applicant indicated on page 4 must sign this application. All correspondence regarding the application and plan will be directed to the applicant. If the applicant is not the property owner, the owner's signed consent must also be provided with this application.

APPLICANT'S DEPOSITION

I hereby depose and certify that all information contained in this application, all accompanying plans and all attachments are complete and accurate to the best of my knowledge.

APPLICANT'S PRINTED NAME: Jennifer Thomas

APPLICANT'S SIGNATURE _____ DATE 4-13-2023

PROPERTY OWNER'S PRINTED NAME Jennifer Thomas

PROPERTY OWNER'S SIGNATURE _____ DATE 4-13-2023

ENGINEER'S OPINION OF PROBABLE COST

Project: Kinsley
Atwell #: 21002863
Date: 4/11/2023

STORM	Quantity	Unit	Unit Price	Amount
12" C-76 RCP Storm Sewer	1,790	L.F.	$30.00	$53,700.00
15" C-76 RCP Storm Sewer	1,803	L.F.	$35.00	$63,105.00
18" C-76 RCP Storm Sewer	921	L.F.	$40.00	$36,840.00
24" C-76 RCP Storm Sewer	1,106	L.F.	$45.00	$49,770.00
30" C-76 RCP Storm Sewer	851	L.F.	$65.00	$55,315.00
12" RCP End Section	4	EA.	$1,500.00	$6,000.00
15" RCP End Section	1	EA.	$1,750.00	$1,750.00
18" RCP End Section	1	EA.	$2,000.00	$2,000.00
24" RCP End Section	1	EA.	$3,000.00	$3,000.00
12" CMP Culvert	1	EA.	$100.00	$100.00
15" CMP Culvert	12	EA.	$200.00	$2,400.00
12" CMP End Section	2	EA.	$150.00	$300.00
15" CMP End Section	24	EA.	$175.00	$4,200.00
4' Diameter Catch Basin / Manhole	16	EA.	$2,000.00	$32,000.00
5' Diameter Catch Basin / Manhole	2	EA.	$3,000.00	$6,000.00
6' Diameter Catch Basin / Manhole	5	EA.	$3,600.00	$18,000.00
Outlet Control Structure	1	EA.	$7,000.00	$7,000.00
				$341,480.00

STORM (R.O.W.)	Quantity	Unit	Unit Price	Amount
12" C-76 RCP Storm Sewer	88	L.F.	$30.00	$2,640.00
15" C-76 RCP Storm Sewer	91	L.F.	$35.00	$3,185.00
12" Concrete Flared End Section	2	EA.	$1,500.00	$3,000.00
15" Concrete Flared End Section	2	EA.	$1,750.00	$3,500.00
				$12,325.00

WATER	Quantity	Unit	Unit Price	Amount
8" SCH 40 PVC	334	L.F.	$44.00	$14,696.00
Dry Hydrant Connection	1	EA.	$250.00	$250.00
				$14,946.00

PAVING (ON-SITE)	Quantity	Unit	Unit Price	Amount
Bituminous Wearing Course (1.5")	5,648	S.Y.	$6.00	$33,888.00
Bituminous Leveling Course (1.5")	5,648	S.Y.	$6.00	$33,888.00
Bituminous Base Course (2")	5,648	S.Y.	$5.36	$30,273.00
10" 21AA Aggregate Base	5,648	S.Y.	$10.00	$56,480.00
6" Limestone Pond Access Path	148	S.Y.	$6.00	$888.00
5' Gravel Shoulder	2,081	S.Y.	$4.00	$8,324.00
				$163,741.00

PAVING (R.O.W.)	Quantity	Unit	Unit Price	Amount
Bituminous Wearing Course (1.5")	879	S.Y.	$6.00	$5,274.00
Bituminous Leveling Course (1.5")	879	S.Y.	$6.00	$5,274.00
Bituminous Base Course (2")	879	S.Y.	$7.15	$6,285.00
10" 21AA Aggregate Base	879	S.Y.	$10.00	$8,790.00
5' Gravel Shoulder	349	S.Y.	$4.00	$1,396.00
Sawcut	595	L.F.	$5.00	$2,975.00
				$29,994.00

GRADING	**Quantity**	**Unit**	**Unit Price**	**Amount**
Earthwork (Mass Grading)	75,000	C.Y.	$3.00	$225,000.00
Clear and Grub	30	AC.	$1,500.00	$45,000.00
				$270,000.00

EROSION CONTROL	**Quantity**	**Unit**		
Silt fence	6,055	L.F.	$2.00	$12,110.00
Tree Protection Fencing	3,293	L.F.	$4.00	$13,172.00
Inlet protection	20	EA.	$75.00	$1,500.00
Tracking Mat	1	EA.	$5,000.00	$5,000.00
3" topsoil seed and mulch	30	AC.	$2,500.00	$75,000.00
				$106,782.00

Total:	**$939,268.00**
1.5% of Total:	**$14,089.02**

Cost Opinion Assumptions, Notes & Comments

- *Cost opinion are based on Final Site Plans for Kinsley dated 4/10/2023*
- *The above provides for estimated labor/installation fees but does not include costs for construction services, staking, inspections, testing, dewatering, borings, franchise utilities, engineering, permitting, corporation fees, & mobilization fees. It should be noted that the above is only an engineer's opinion of probable construction cost for the proposed project and no guarantee is made to the accuracy or completeness thereof. Since actual construction cost will be determined by contractor bidding, we can not make a guarantee that the final construction quantities and/or costs will not vary from the number presented.*

Carlisle | Wortman
ASSOCIATES, INC.

117 NORTH FIRST STREET SUITE 70 ANN ARBOR, MI 48104 734.662.2200 734.662.1935 FAX

Date: October 18. 2022
November 8, 2022
April 28, 2023
February 16, 2024

Final Site Plan Review
For
Superior Township, Michigan

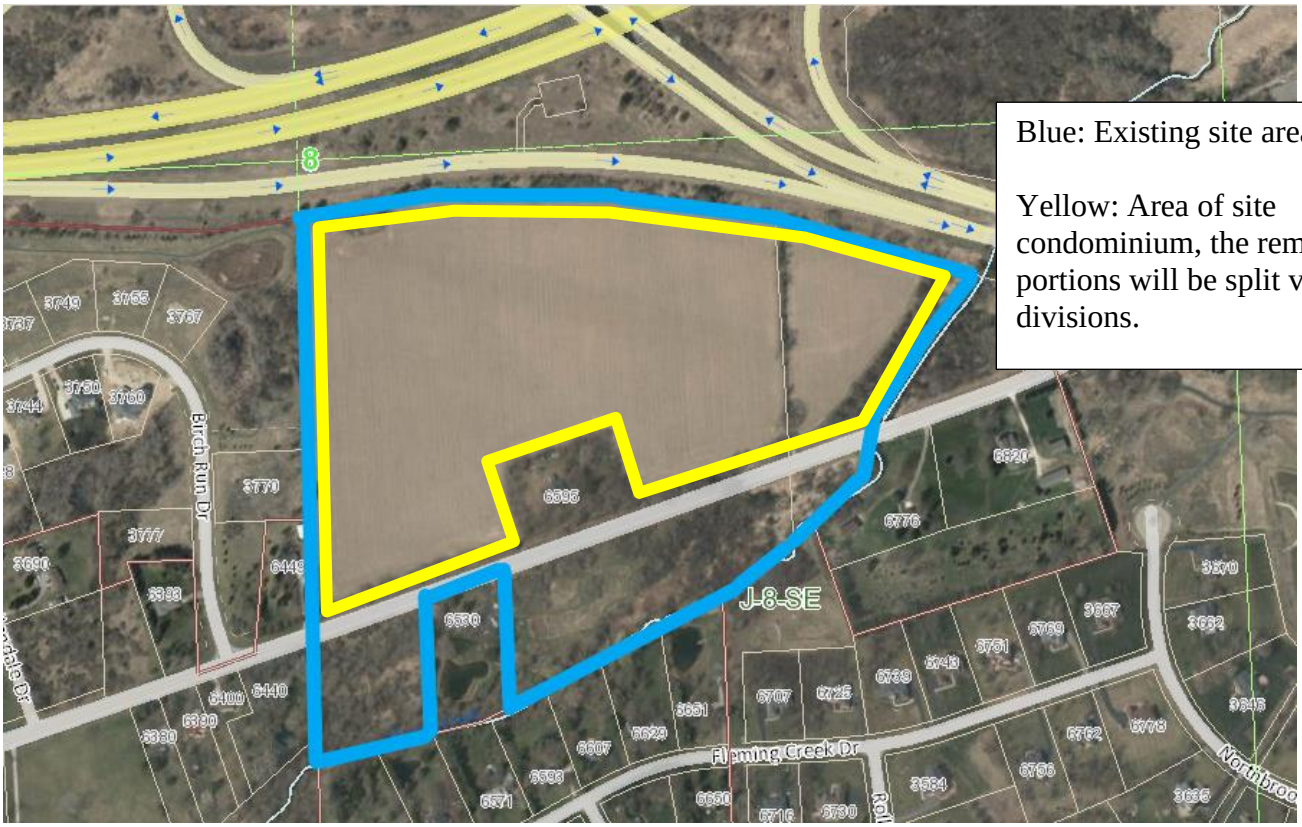
Applicant:	Lombardo
Project Name:	Kinsley Development
Location:	6595 Plymouth Road
Plan Date:	April 18, 2023
Zoning:	R2 Single Family Residential
Action Requested:	Final Site Plan Approval

PROJECT DESCRIPTION

The site, totaling 48.49 acres in size, was rezoned from R-1 Single-Family Residential to R-2, Single-Family Residential. The site is located on the north side of Plymouth Road just south of the M-14 and M-53 interchange. The north side of the site is bound by the off ramp from east-bound M-14. The existing site is made up of two parcels which each have a portion on the north and south side of Plymouth Road.

The applicant is submitting a 21-unit single-family site condominium plan. Please note that the plan shows 25 total lots; however four (4) of those lots directly front on Plymouth, are proposed to be split via land divisions, and are not being reviewed as part of this site plan review.

Aerial Photograph



The Zoning and existing land uses for the subject site and surrounding parcels are identified in the following table:

Direction	Zoning	Existing Use
North	MDOT Right-of-Way	M-14 Corridor
South	R-2 and PC	Single Family Residential
East	R-2 and PC	Single Family Residential
West	R-1 and PC	Single Family Residential

PRELIMINARY SITE PLAN APPROVAL

The Planning Commission approved the preliminary site plan on November 16, 2022, with the following conditions:

1. *Confirm access to and maintenance of the rain garden to the satisfaction of the Township Engineer.*
2. *Based on needed access to rain garden, confirm that lot 6 and 7 is buildable.*
3. *Show rain garden access*
4. *Provide required tree mitigation*
5. *Road Commission approval of access and ROW*
6. *Water Resources Commission approval*
7. *Detailed grading plans*
8. *The regulatory status of each wetland along with verification of the size and delineation from the EGLE*
9. *Confirm if the applicant is proposing street lighting for final site plan*
10. *Building floor plans and elevations*
11. *Add a dry hydrant at the road that fronts the pond/rain basin for fire department use.*

FINAL SITE PLAN

The following items are requirements for the final site plan submittal:

1. **Confirm access to and maintenance of the rain garden to the satisfaction of the Township Engineer***.*

   CWA Response: The applicant has shown a 20-foot-wide easement between lot 6 and 7, with a 12-foot grass paver drive. Access, and more specifically weight loads, should be reviewed by the Township Engineer.

2. **Based on needed access to rain garden, confirm that lot 6 and 7 is buildable.**

   CWA Response: Lot 6 and 7 remain buildable. Lot 6 is 49,769 sq/ft and lot 7 is 43,837 sq/ft.

3. **Show rain garden access**

   CWA Response: The applicant has shown a 20-foot-wide easement between lot 6 and 7, with a 12-foot grass paver drive. Access, and more specifically weight loads, should be reviewed by the Township Engineer.

4. **Provide required tree mitigation**

   CWA Response: The applicant has provided a tree survey and mitigation calculations. Based on the tree survey, the applicant is removing 35 totals trees, 8 of which are regulated. The applicant is required to replace with 118 trees.

5. **Road Commission approval of access and ROW**

   CWA Response: The applicant should provide a review and approval letter from the Washtenaw County Road Commission.

6. **Water Resources Commission approval**

   CWA Response: The applicant should provide a review and approval letter from the Washtenaw County Water Resource Commission.

7. **Detailed grading plans**

   CWA Response: The applicant has submitted detailed grading plans, which will be reviewed by the Township engineer.

8. **The regulatory status of each wetland along with verification of the size and delineation from the EGLE**

   CWA Response: The applicant obtained an EGLE permit.

9. **Confirm if the applicant is proposing street lighting for final site plan**

   CWA Response: The applicant is not providing any street lighting.

10. **Building elevations**

    CWA Response: The applicant has provided building elevations for four models.

11. **Add a dry hydrant at the road that fronts the pond/rain basin for fire department use**.

    CWA Response: The dry hydrant to be reviewed by fire department.

RECOMONDATION

We recommend final site plan approval.

CARLISLE/WORTMAN ASSOC., INC.
Benjamin R. Carlisle, AICP, LEED AP
Principal

cc: Ken Schwartz, Township Supervisor
Lynette Findley, Township Clerk
Laura Bennett, Planning & Zoning Administrator
George Tsakof, Township Engineer
Cresson Slotten, Township Engineer

February 20, 2024

CHARTER TOWNSHIP OF SUPERIOR
3040 N. Prospect Road
Ypsilanti, MI 48198

Attention: **Lynette Findley, Township Clerk**

Regarding: **Kinsley Development**
Final Site Plan - Review No. 3
OHM Job No. 0140-22-1030

Dear Ms. Findley,

On behalf of the Township, we have reviewed the Final Site Plan submittal with a revised date of January 12, 2024, for the above referenced project. We have reviewed the submittal consistent with requirements for final site plans based on the Township Zoning Ordinance. In our opinion, this plan is ready for consideration by the Planning Commission at their February meeting regarding Final Site Plan approval. We have outlined the status of outside agency permits below for informational purposes. Also, please note that once final site plan approval is obtained by the Applicant, they are required to submit detailed engineering plans for our administrative review consistent with Township Engineering Standards.

Outside Agency Permits and Approvals
The petitioner should provide/confirm all necessary approvals, or have reasonable assurance of approvals, prior to our recommendation that the Planning Commission consider approval of the final site plan. At a minimum, the following approvals/permits are anticipated for this project with status provided:

1. A Floodplain Permit has been approved and issued by the Michigan Department of Environment, Great Lakes, and Energy (EGLE) for the proposed floodplain impacts and mitigation.
2. The stormwater management design on the site plan should be consistent with Washtenaw County Water Resources Commissioner (WCWRC) Standards. The WCWRC issued a review letter dated February 12, 2024 indicating that the plans are technically correct and do not require revisions, and that a Drain Use Permit (No. DRA2023-00104) has been issued, which was attached to their letter.
3. The soil erosion and sedimentation control (SESC) measures on the site plan should meet the requirements of the WCWRC Standards with a permit issued by WCWRC. It is our understanding that approval from WCWRC is reasonably assured.
4. The Washtenaw County Road Commission (WCRC) has approved and issued a permit (Permit No. 2024-000028) for the proposed work in the Plymouth Road right-of-way.
5. The individual well and septic systems for each proposed site condominium unit are to meet all requirements of the Washtenaw County Health Department's (WCHD) Environmental Health Division. We understand that WCHD issued a review letter dated February 7, 2024, identifying several items to be addressed. We anticipate that future changes to the plans as a result of addressing these comments will not significantly impact the proposed work and therefore can be reviewed in the engineering plan stage.

If you have any questions regarding our review, please do not hesitate to contact me at (734) 466-4585, or George Tsakoff at (734) 466-4439.

Sincerely,
OHM Advisors

_____
Cresson Slotten, PE
Senior Project Manager

cc: Ken Schwartz, Township Supervisor (via e-mail)
Bill Balmes, Building Department (via e-mail)
Laura Bennett, Planning Coordinator (via e-mail)
Ben Carlisle, CWA, Twp Planner (via email)
Paul Montagno, CWA (via email)
George Tsakoff, OHM
Claire Martin, OHM
file

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CHARTER TOWNSHIP OF SUPERIOR FIRE DEPARTMENT

BUREAU OF FIRE PREVENTION

7999 Ford Rd, Ypsilanti, MI 48198

February 13, 2024

Laura Bennett
Planning and Zoning Administrator
Charter Township of Superior
3040 N. Prospect Rd.
Superior Charter Twp, MI 48198

RE: Final Site Plan

Project Name:	Kinsley Development
Project Location:	6595 Plymouth Road
Plan Date:	9/28/2021
Revised Plan Date	2/13/24
Project Job Number:	21002863
Applicable Codes:	IFC 2015
Engineer:	Atwell
Engineer Address:	311 N. Main St. Ann Arbor, MI 48104

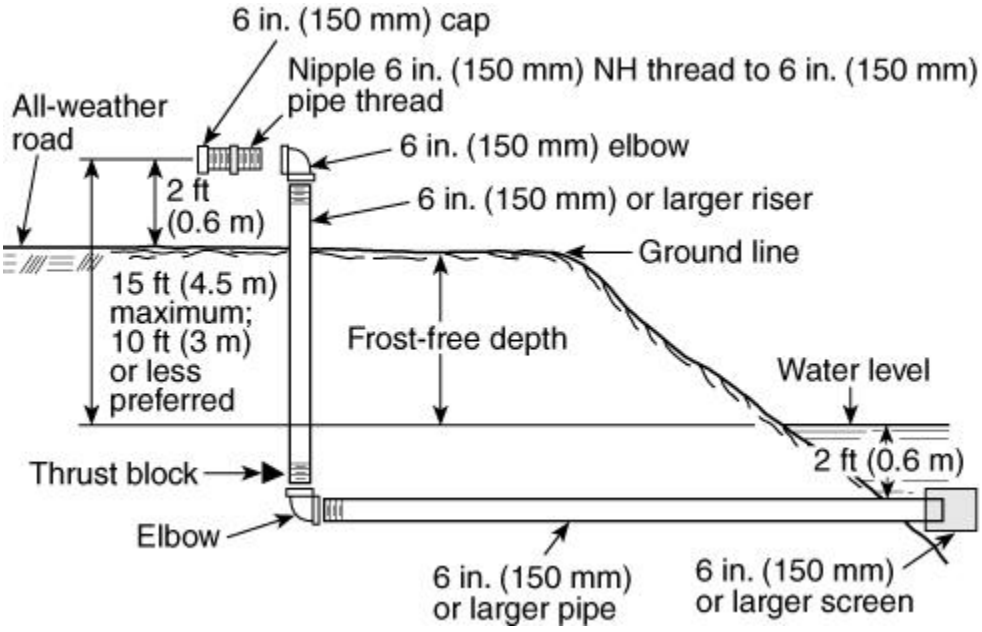
Status of Review

Status of review: Approved as Submitted

Site Coverage for Dry Hydrants

Comments: Meets NFPA 1142 2022,

Figure A.8.3.2(b) Exploded View of Dry Hydrant Construction.



A.8.3.3

System design requirements should allow for required fire flow, atmospheric pressure, lift, vapor pressure, length of required pipe run, coefficient of materials (C factor), piping configuration, and other design factors that approved engineering practices would necessitate.

The following are some factors that should be considered when a dry hydrant system is designed:

1. (1)

   Lift should be as low as possible and not exceed 10 ft to 12 ft (3.1 m to 3.7 m), if possible. This loss cannot be overcome by enlarging the pipe size.

2. (2)

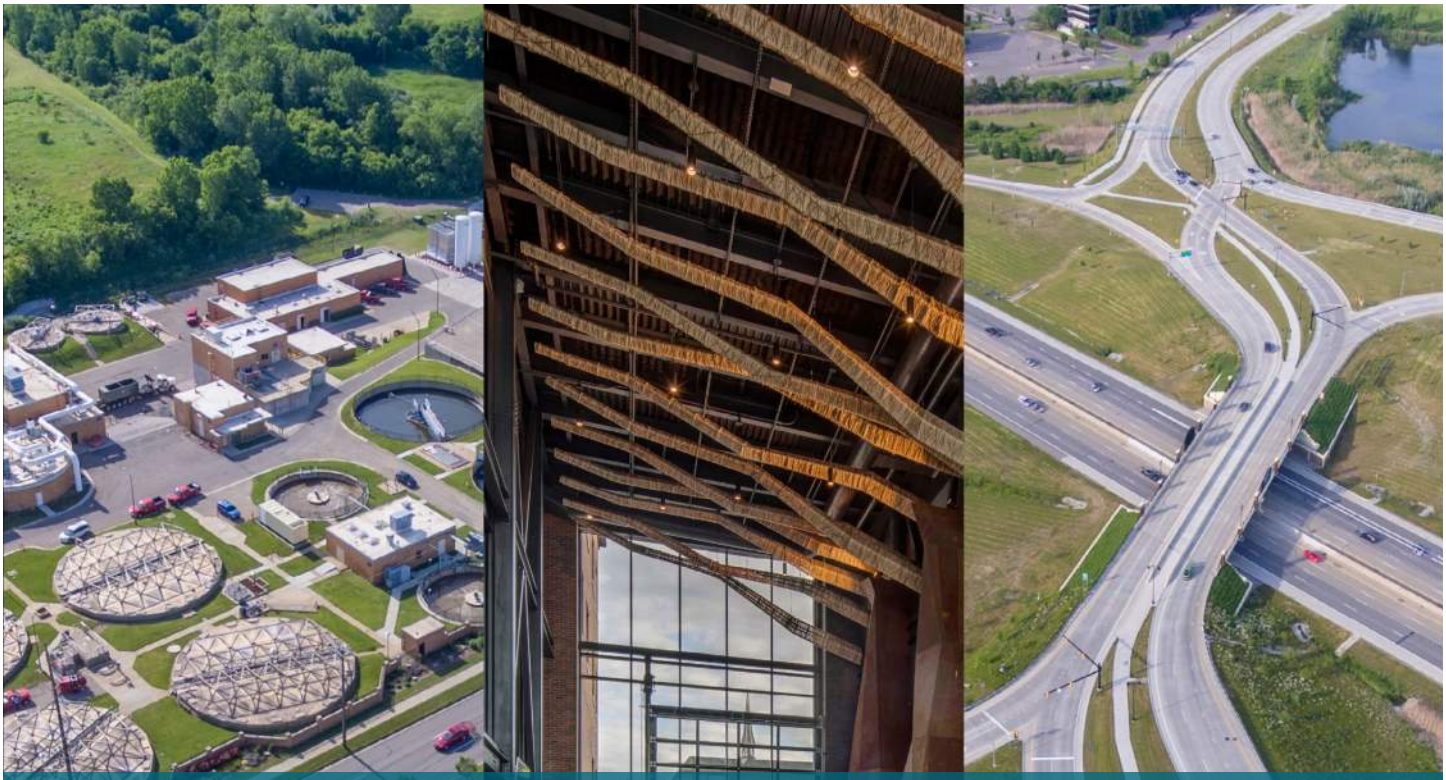
   Total head loss should not exceed 20 ft (6.1 m), or the pump might not supply its rated gpm (L/min). If the fire department will be using portable pumps on the dry hydrant, those pumps generally have less capability to create a vacuum and head loss needs to be as low as possible

Site Coverage - Access

Comments: Meets IFC 2015

Sincerely,

Dan Kimball, Fire Marshal
Charter Township of Superior Fire Department
CFPS, CFI II, CFPE



Kinsley Residential Traffic Impact Study

Project No. 230178
June 23, 2023

fishbeck
Engineers | Architects | Scientists | Constructors

fishbeck
Engineers | Architects | Scientists | Constructors

1515 Arboretum Drive, SE
Grand Rapids, Michigan 49546

616.575.3824 | fishbeck.com

Kinsley Residential
Traffic Impact Study

Prepared For:
Lombardo Companies
Shelby Township, MI

June 23, 2023
Project No. 230178

Table of Contents

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List of Abbreviations/Acronyms

AADT	Average Annual Daily Traffic
AASHTO	American Association of State Highway and Transportation Officials
DU	Dwelling Units
EB	Eastbound
ft	Foot/Feet
HCM	Highway Capacity Manual
ITE	Institute of Transportation Engineers
LOS	Level of Service
LUC	Land Use Code
MDOT	Michigan Department of Transportation
mph	Miles Per Hour
NB	Northbound
RTP	Regional Transportation Plan
SB	Southbound
SEMCOG	Southeast Michigan Council of Governments
TDMS	Transportation Data Management System
TIS	Traffic Impact Study
TMC	Turning Movement Count
Township	Superior Township
vpd	Vehicles Per Day
WB	Westbound
WCRC	Washtenaw County Road Commission

References

Institute of Transportation Engineers, 2017, *Trip Generation Handbook*, 3rd Edition.
Institute of Transportation Engineers, 2021, *Trip Generation Manual*, 11th Edition.
Michigan Department of Transportation, 2017, *Geometric Design Guidance*.
Michigan Department of Transportation, 2013, *Michigan Manual on Uniform Traffic Control Devices*.
Transportation Research Board, 2016, *Highway Capacity Manual*, 6th Edition.
Transportation Research Board, 2000, *Highway Capacity Manual: 2000*.

Executive Summary

Fishbeck has conducted a traffic impact study (TIS) related to a proposed residential development located on a currently vacant parcel on the north side of Plymouth Road between Birch Run Drive and M-153 in Superior Township (Township), Washtenaw County, Michigan. The development will consist of 21 single family homes and will have access to Plymouth Road via two proposed site driveways. The development will be completed in one phase, assumed to be open and fully operational in 2025.

This study was conducted according to the methodologies and guidance published by Institute of Transportation Engineers (ITE), the American Association of State Highway and Transportation Officials (AASHTO), the Michigan Department of Transportation (MDOT), the Washtenaw County Road Commission (WCRC), and the Township.

Vehicular Turning Movement Counts (TMCs) were collected at the study intersection on Wednesday January 18, 2023, during the weekday a.m. (7 a.m. to 9 a.m.) and p.m. (4 p.m. to 6 p.m.) peak periods for the roadway network. Comparison of the TMCs collected in January 2023 to historical counts completed by MDOT in September 2022 on M-153 and counts completed by WCRC in April 2023 on Plymouth Road indicated the need to apply MDOT seasonal adjustment factors to the TMCs collected in January 2023 for this project.

It was noted on the Southeast Michigan Council of Governments (SEMCOG) website that the intersection of Plymouth Road and M-153 is earmarked in the Regional Transportation Plan (RTP) for conversion to indirect left turns in 2027. This project will occur two years after the full build-out of the proposed site and was not included in study analyses.

Site-generated traffic was forecast using the information and methodologies specified in the *Trip Generation Manual*. Existing traffic volumes, site layout, and engineering judgement were used to develop a trip distribution model for the a.m. and p.m. peak hours for the new traffic that would be generated by the proposed development. Additionally, directions of origin, surrounding residential densities, and commuting patterns were considered.

Level of Service (LOS) analyses were conducted for existing, background, and total future conditions based on the *Highway Capacity Manual* (HCM) 6th Edition and HCM 2000 methodologies using Synchro traffic analysis software. Synchro network models were also simulated using SimTraffic to evaluate network operations including intersection queueing.

Based on the findings of the HCM operational analyses and site traffic generation, no improvements are recommended at the studied intersections to mitigate traffic impacts.

The opinions, findings, and conclusions expressed in this TIS are those of Fishbeck and not necessarily those of the Owner/Applicant, MDOT, WCRC, or Superior Township.

Prepared By:

Alyssa Wambold, PE, PTOE – Fishbeck

Kyle Reidsma, PE, PTOE – Fishbeck
Project Manager

1.0 Introduction

1.1 Project Overview

On behalf of Lombardo Companies, Fishbeck has conducted a traffic impact study (TIS) related to a proposed residential development located on a currently vacant parcel on the north side of Plymouth Road between Birch Run Drive and M-153 in Superior Township (Township), Washtenaw County, Michigan. The development will consist of 21 single family homes and will have access to Plymouth Road via two proposed site driveways. The development will be completed in one phase, assumed to be open and fully operational in 2025.

The project location and study intersections are displayed in Figure 1 – Project Location and Study Network.

Figure 1 – Project Location and Study Network

1.2 Study Methodology

The objectives of this TIS were to determine what impacts, if any, the proposed project would have on adjacent roadway traffic operations, and to develop recommendations for any improvements necessary to mitigate the project impacts on the studied intersections. Study analyses were completed relative to typical weekday a.m. and p.m. peak periods. This study was conducted according to the methodologies and guidance published by Institute of Transportation Engineers (ITE), the American Association of State Highway and Transportation Officials (AASHTO), the Michigan Department of Transportation (MDOT), the Washtenaw County Road Commission (WCRC), and the Township. Comments received from WCRC on June 14, 2023, were incorporated into this study.

1.3 Intersection Characteristics

Based on the type and size of the proposed development and the likely area of influence for the site trips, traffic operations were analyzed for the following intersections:

1. Plymouth Road and M-153 (signalized).
2. Plymouth Road and East Site Driveway (proposed unsignalized driveway approximately 1,600 feet (ft) west of M-153).
3. Plymouth Road and West Site Driveway (proposed unsignalized driveway approximately 2,400 ft west of M-153).

The existing intersection lane configurations, traffic controls, and posted speed limits are displayed in Figure 2 – Existing Lane Configurations.

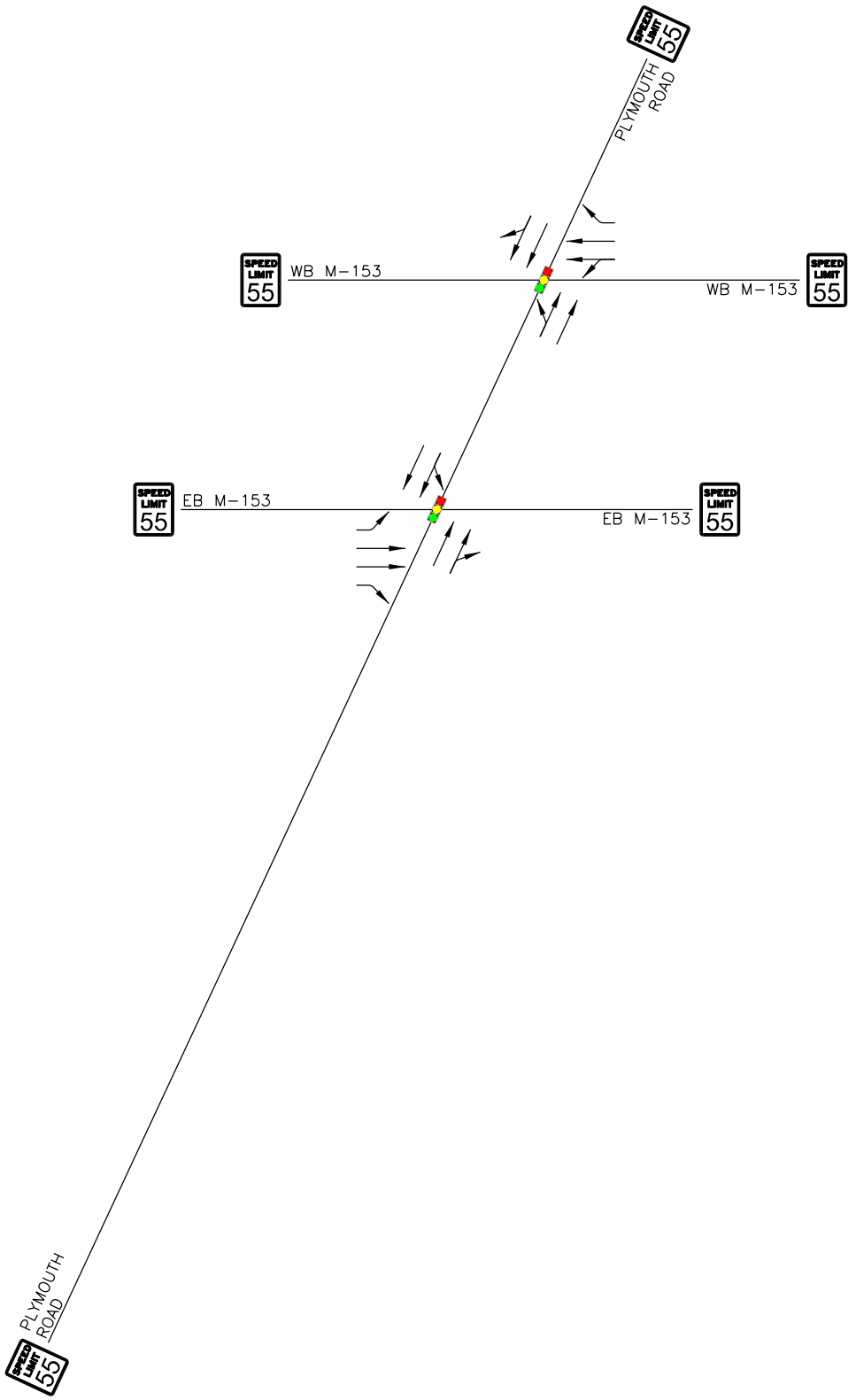
NORTH

EXISTING LANE CONFIGURATIONS

NO SCALE

LEGEND

- LANE ASSIGNMENT
- SIGNALIZED INTERSECTION
- STOP CONTROL
- XX a.m. PEAK HOUR
- (XX) p.m. PEAK HOUR



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KINSLEY RESIDENTIAL DEVELOPMENT
Superior Township, MI 48105

Traffic Impact Study

PROJECT NO.
230178

FIGURE NO.
2

PLOT INFO: M:\CUSTOM\AUTODESK PRODUCTS\ACAD\SYMBOLS\B-85X11.DWG LAYOUT: MODEL DATE: ---- TIME: ---- USER: DMEADE

1.4 Roadway Characteristics

The characteristics of the study area roadways and signalized intersections are described in Table 1 – Roadway Characteristics and Table 2 – Signal Characteristics. The data points referenced were from the MDOT Transportation Data Management System (TDMS) website Southeast Michigan Council of Governments (SEMCOG) online maps, and traffic counts provided by WCRC on Plymouth Road.

Table 1 – Roadway Characteristics

Roadway	Jurisdiction	Speed Limit (mph)	No. of Lanes	Roadway Classification	Direction	AADT (vpd)
M-153	MDOT	55	2-4 per bound	Principal Arterial	EB	8,073
					WB	8,208
Plymouth Road	WCRC	55	2-3	Minor Arterial	NB	2,758
					SB	3,327

Average Annual Daily Traffic (AADT)
miles per hour(mph)
vehicles per day (vpd)

Table 2 – Signal Characteristics

Intersection	Jurisdiction	Left Turn Phasing			
		NB	SB	EB	WB
Plymouth Road and M-153	MDOT	Permitted			

Eastbound (EB)
Northbound (NB)
Southbound (SB)
Westbound (WB)

It was noted on the SEMCOG website the intersection of Plymouth Road and M-153 is earmarked in the Regional Transportation Plan (RTP) for conversion to indirect left turns in 2027. This project is scheduled to occur two years after the full build-out of the proposed site and was not included in study analyses.

1.5 Existing Traffic Volumes

Vehicular turning movement count (TMC)s were collected at the following study intersection during the weekday a.m. (7 a.m. to 9 a.m.) and p.m. (4 p.m. to 6 p.m.) peak periods of the road network on Wednesday January 18, 2023:

- Plymouth Road and M-153.

Due to the impact of COVID-19 and time of year that the counts were completed, current traffic volume data may not be representative of typical operations. Historical traffic data from the MDOT TDMS website and traffic counts provided by WCRC on Plymouth Road were reviewed. It was noted that the traffic counts collected in January 2023 were lower than the counts collected by MDOT in September 2022 on M-153 and were lower than the counts collected by WCRC in April 2023 on Plymouth Road. Additionally, it was noted that the AADT calculated by MDOT for M-153 was lower than the total traffic counted by MDOT in September 2022. The MDOT Seasonal Adjustment Factors were reviewed in relation to the TMCs collected for this project in January 2023, the MDOT counts completed in September 2022 on M-153, and the WCRC counts completed in April 2023 on Plymouth Road. Based on this review, the MDOT recommended seasonal adjustment factor of 1.089 was applied to the TMCs collected for this study. This factor is based on the month and day of the week during which the TMCs were completed.

Traffic volume information can be found in Appendix 1 – Traffic Volume Data, which includes heavy vehicle data. The adjusted existing traffic volumes used in this study are provided in Figure 3 – Existing Traffic Volumes.

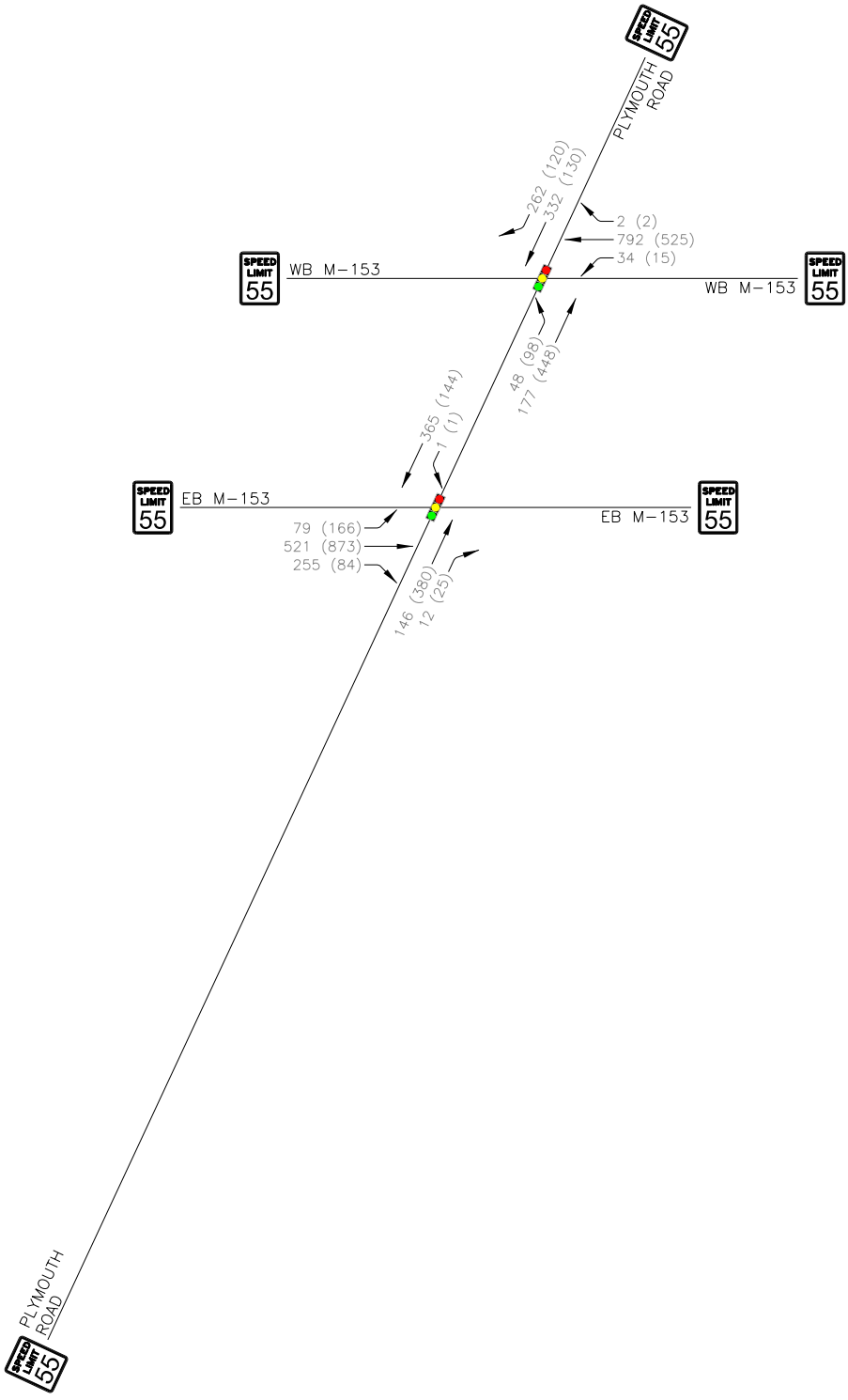
NORTH

2023 EXISTING TRAFFIC VOLUMES

NO SCALE

LEGEND

- LANE ASSIGNMENT
- SIGNALIZED INTERSECTION
- STOP CONTROL
- XX a.m. PEAK HOUR
- (XX) p.m. PEAK HOUR



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KINSLEY RESIDENTIAL DEVELOPMENT
Superior Township, MI 48105

Traffic Impact Study

PROJECT NO.
230178

FIGURE NO.
3

PLOT INFO: M:\CUSTOM\AUTODESK PRODUCTS\ACAD\SYMBOLS\B-85X11.DWG LAYOUT: MODEL DATE: — TIME: — USER: DMEADE

2.0 Existing Conditions Analysis

2.1 Traffic Operations Analysis Methodology

Synchro was used to perform Highway Capacity Manual (HCM) operational analyses during the a.m. and p.m. peak hours for all intersections within this study. According to the most recent editions of the HCM, Level of Service (LOS) is a qualitative measure describing operational conditions of a traffic stream or intersection. LOS ranges from A to F, with LOS A representing desirable traffic operations characterized by low delay and LOS F representing extremely poor traffic operations characterized by excessive delays and long vehicle queues. LOS D is generally considered acceptable for most areas. Table 3 – LOS Criteria presents the HCM criteria for various LOS for unsignalized and signalized intersections. The color coding in the table is used in the capacity analysis summary tables later in this report.

Table 3 – LOS Criteria

LOS	Average Stopped Vehicle Delay (seconds)	
	Unsignalized	Signalized
A	≤ 10	≤ 10
B	> 10 and ≤ 15	> 10 and ≤ 20
C	> 15 and ≤ 25	> 20 and ≤ 35
D	> 25 and ≤ 35	> 35 and ≤ 55
E	> 35 and ≤ 50	> 55 and ≤ 80
F	> 50	> 80

2.2 Existing Conditions Traffic Analysis

Synchro models for the existing network were created based on the existing roadway configurations and traffic controls. Where applicable, data concerning the existing intersection and roadway lane configurations, geometry, and traffic control that were observed in the field were entered in the models. The traffic signal timing permit for the signalized intersection was provided by MDOT for use in the models.

The intersection of Plymouth Road and M-153 cannot be evaluated using HCM 6th Edition methods due to the clustered signals; therefore, HCM 2000 calculations were utilized for this intersection.

The resulting LOS and delay for the existing conditions are provided in Table 4 – LOS Analysis for Existing Conditions.

Table 4 – LOS Analysis for Existing Conditions

Approach	Lane Group	LOS/Delay(s)			
		a.m. Peak Hour		p.m. Peak Hour	
Plymouth Road and M-153 (Signalized)					
EB M-153	Left	B	10.4	A	9.4
	Thru	B	12.1	B	12.0
	Right	B	11.8	A	8.4
	Overall	B	11.9	B	11.4
WB M-153	Left/Thru	B	14.1	B	10.3
	Right	A	9.6	A	8.0
	Overall	B	14.1	B	10.3
NB Plymouth Road	Left/Thru	B	14.7	B	17.1
	Thru/Right	C	20.8	C	24.5
	Overall	C	20.8	C	24.5
SB Plymouth Road	Left/Thru	A	5.0	B	11.7
	Thru/Right	C	28.6	C	22.1
	Overall	C	28.6	C	22.1
Overall		B	19.9	B	15.1

Further analysis of the LOS results for existing conditions indicated that all of the movements, approaches, and intersections operate at a LOS C or better during both the a.m. and p.m. peak hours.

SimTraffic simulations were also reviewed to observe network operations and vehicle queues. For existing conditions, there are no significant vehicle queues or spill-back from available storage lanes. No 95th percentile queue lengths exceed the provided storage length. See Appendix 2 – Existing LOS Output Reports for the existing conditions LOS reports and queueing analysis reports.

3.0 Background Conditions Analysis

Historical traffic data on the MDOT TDMS website was referenced to determine the applicable growth rate for the existing traffic volumes to the project build-out year in 2025. Based on this review, a background growth rate of 2.0% was utilized. No background developments were identified for inclusion in this study. The total background traffic volumes are presented in Figure 4 – Background Traffic Volumes.

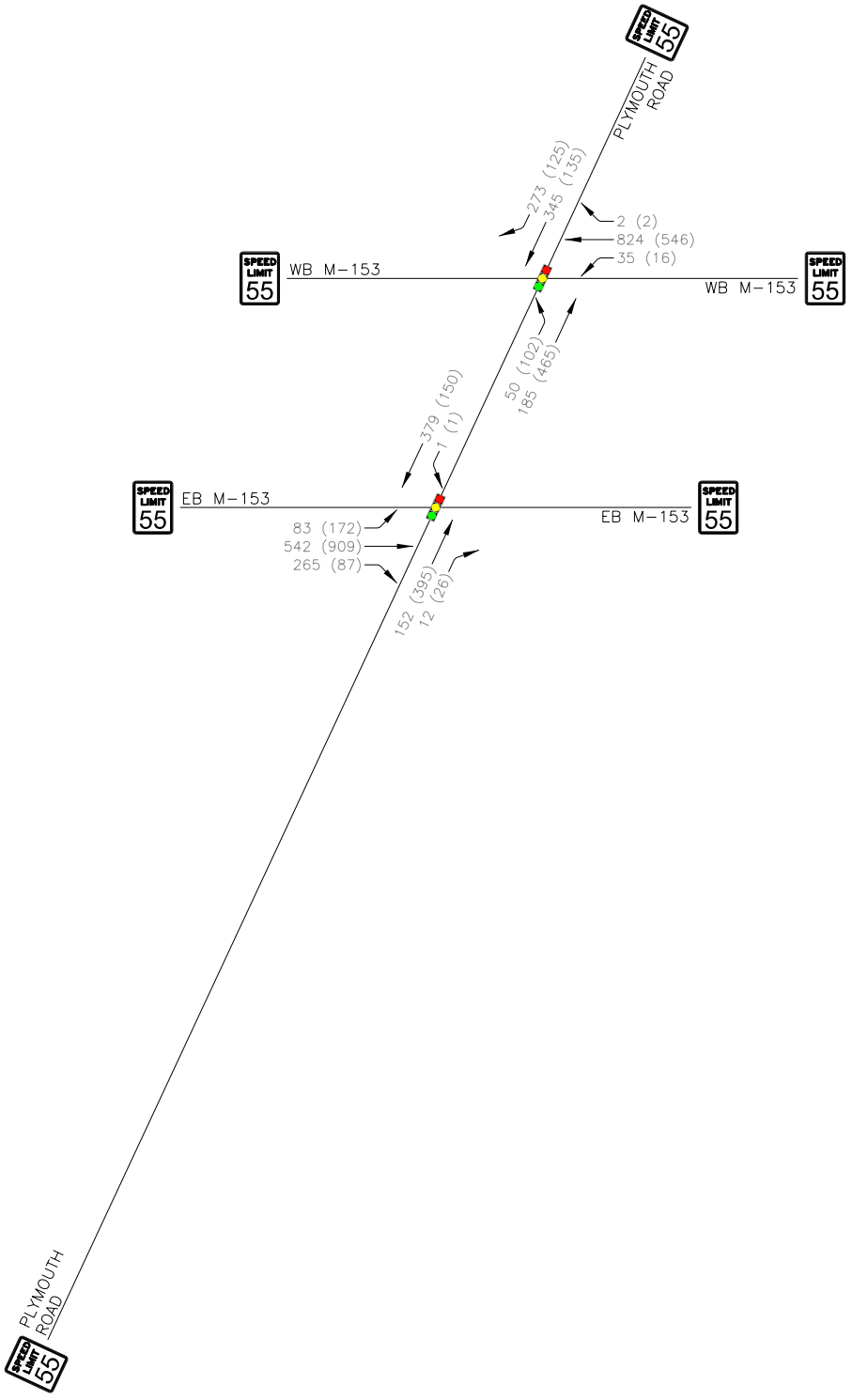
NORTH

2025 BACKGROUND TRAFFIC VOLUMES

NO SCALE

LEGEND

- LANE ASSIGNMENT
- SIGNALIZED INTERSECTION
- STOP CONTROL
- XX a.m. PEAK HOUR
- (XX) p.m. PEAK HOUR



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Superior Township, MI 48105

Traffic Impact Study

PROJECT NO.
230178

FIGURE NO.
4

PLOT INFO: M:\CUSTOM\AUTODESK PRODUCTS\ACAD\SYMBOLS\B-85X11.DWG LAYOUT: MODEL DATE: — TIME: — USER: DMEADE

3.1 Background Conditions Traffic Analysis

The resulting LOS and delay for the background conditions are provided in Table 5 – LOS Analysis for Background Conditions.

Table 5 – LOS Analysis for Background Conditions

Approach	Lane Group	LOS/Delay(s)			
		a.m. Peak Hour		p.m. Peak Hour	
Plymouth Road and M-153 (Signalized)					
EB M-153	Left	B	10.8	A	9.8
	Thru	B	12.7	B	12.7
	Right	B	12.4	A	8.7
	Overall	B	12.4	B	12.0
WB M-153	Left/Thru	B	14.9	B	10.8
	Right	A	10.0	A	8.3
	Overall	B	14.9	B	10.8
NB Plymouth Road	Left/Thru	B	14.9	B	17.4
	Thru/Right	C	20.6	C	24.4
	Overall	C	20.6	C	24.4
SB Plymouth Road	Left/Thru	A	4.6	B	11.7
	Thru/Right	C	29.2	C	21.9
	Overall	C	29.2	C	21.9
Overall		C	20.5	B	15.4

Further analysis of the LOS results for background conditions indicated that all of the movements, approaches, and intersections are expected to continue to operate at a LOS C or better during both the a.m. and p.m. peak hours.

SimTraffic simulations were also reviewed to observe network operations and vehicle queues. For background conditions, there are no significant vehicle queues or spill-back from available storage lanes. No 95th percentile queue lengths exceed the provided storage length; see Appendix 3 – Background LOS Output Reports.

4.0 Site Traffic Characteristics

A representation of the current conceptual site plan is provided in Figure 5 – Conceptual Site Plan.

Figure 5 – Conceptual Site Plan

4.1 Trip Generation

Using the information and methodologies specified in the *Trip Generation Manual*, Fishbeck forecast the weekday a.m. and p.m. peak hour trips associated with the proposed development. Table 6 – Trip Generation for Proposed Development presents the resulting trip generation for the development. Refer to Appendix 4 – Trip Generation Calculations for additional information.

Table 6 – Trip Generation for Proposed Development

ITE Land Use	LUC	Units	a.m. Peak Hour			p.m. Peak Hour			Weekday
			In	Out	Total	In	Out	Total	
Single-Family Detached Housing	210	21 DU	5	13	18	14	9	23	240
		Total	5	13	18	14	9	23	240

Dwelling Units (DU)
Land Use Code (LUC)

The directions that site traffic will travel to and from were based upon existing traffic patterns during the a.m. and p.m. peak hours. The existing traffic patterns reflect the gravity between origins and destinations in the study area, and therefore an accurate indication of where the proposed trips would be coming from and going to. Table 7 – Trip Distribution provides the probable distribution based on existing traffic patterns.

Table 7 – Trip Distribution

Direction	Via	New Trips			
		a.m. Peak Hour		p.m. Peak Hour	
		To	From	To	From
North	Plymouth Road	27%	43%	60%	21%
South	Plymouth Road	62%	19%	21%	62%
East	M-153	2%	5%	4%	3%
West	M-153	9%	33%	15%	14%

The trip distribution for the site is indicated in Figure 6 – Trip Generation Volumes. These trips were added to the background volumes (Figure 4 – Background Traffic Volumes) to result in the future conditions volumes in Figure 7 – Future Conditions Volumes.

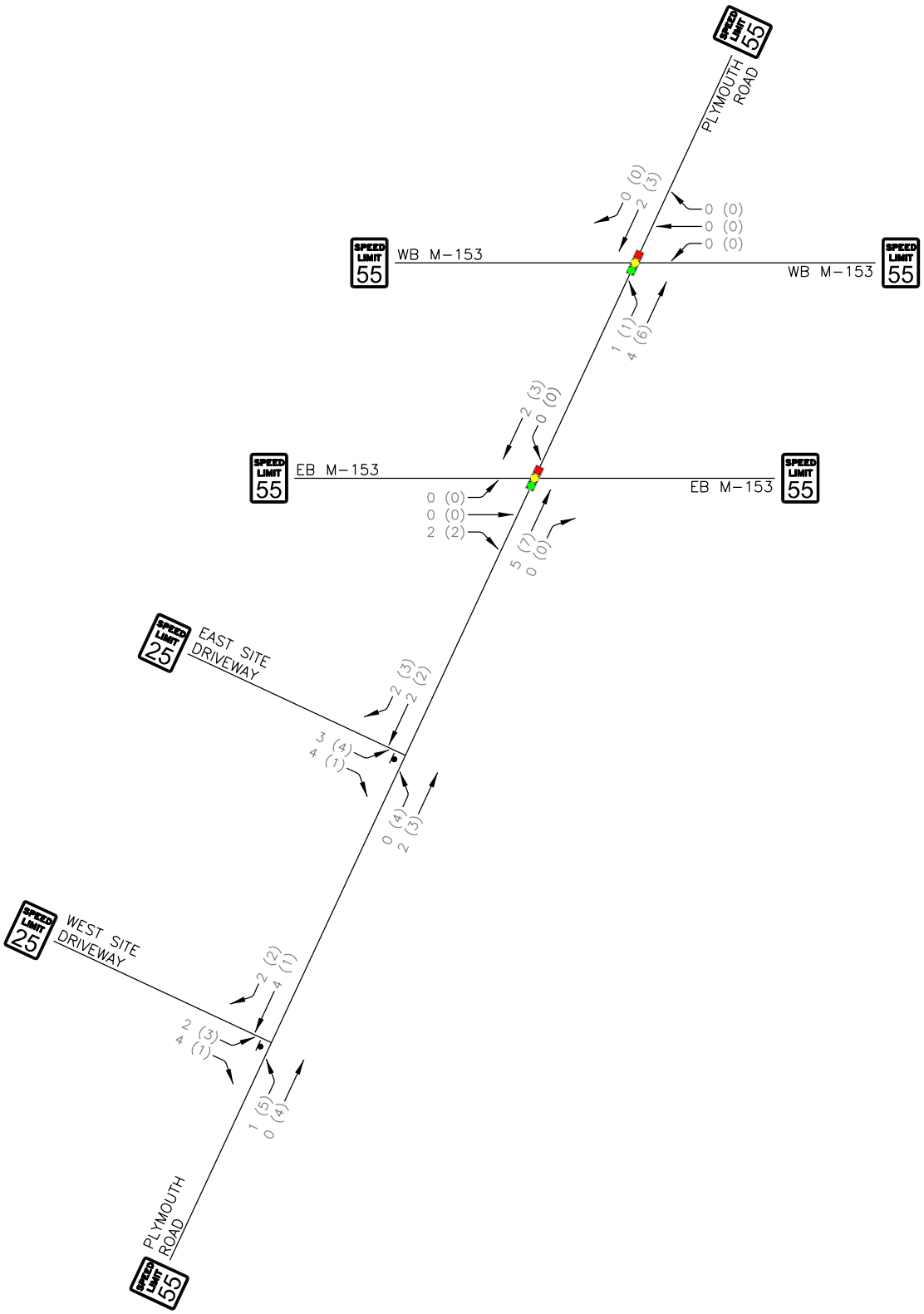
NORTH

TRIP GENERATION VOLUMES

NO SCALE

LEGEND

- LANE ASSIGNMENT
- SIGNALIZED INTERSECTION
- STOP CONTROL
- XX a.m. PEAK HOUR
- (XX) p.m. PEAK HOUR



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Traffic Impact Study

PROJECT NO.
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FIGURE NO.
6

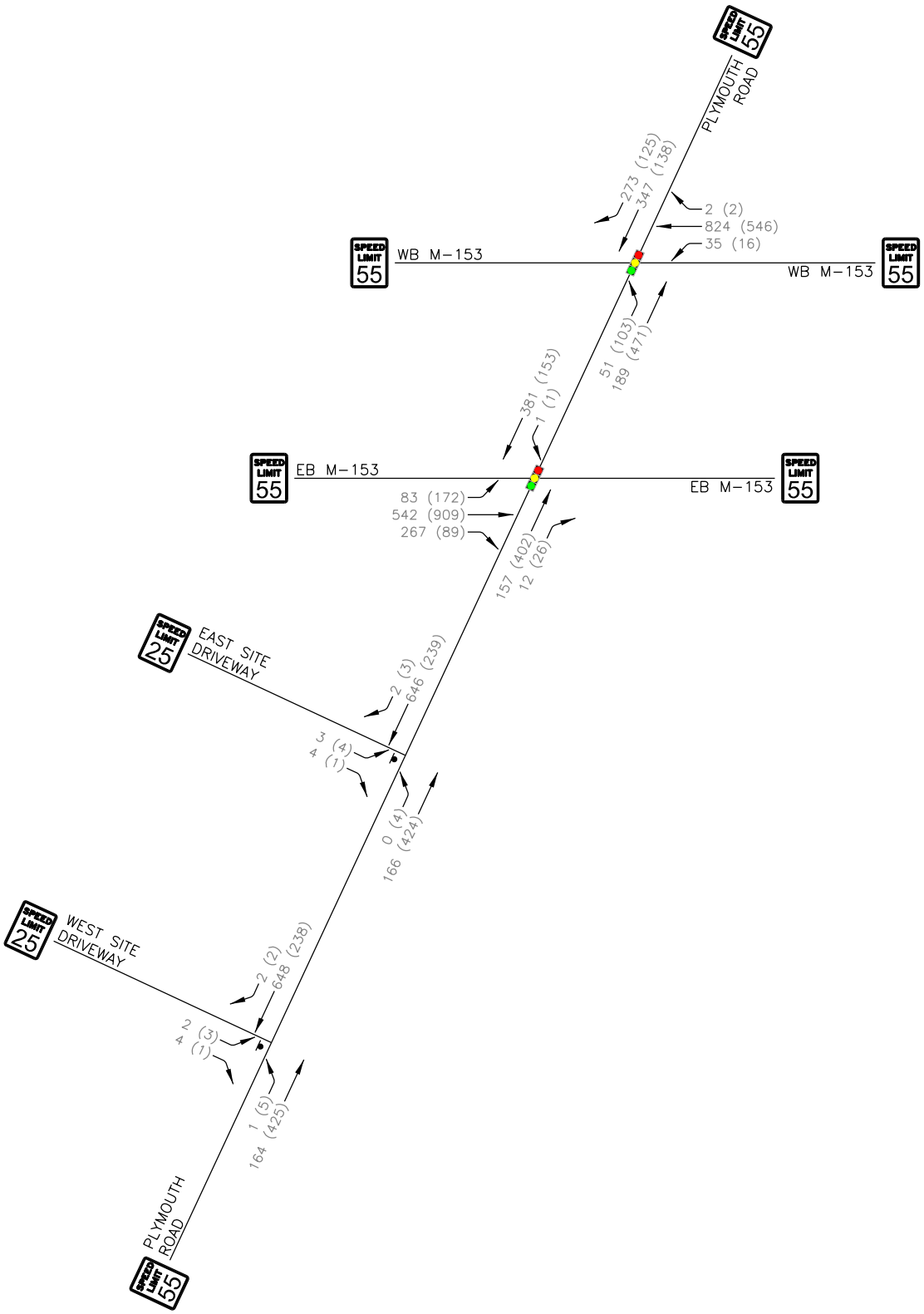
PLOT INFO: M:\CUSTOM\AUTODESK PRODUCTS\ACAD\SYMBOLS\B-85X11.DWG LAYOUT: MODEL DATE: ---- TIME: ---- USER: DMEADE

NORTH

2025 FUTURE CONDITIONS
VOLUMES
NO SCALE

LEGEND

- LANE ASSIGNMENT
- SIGNALIZED INTERSECTION
- STOP CONTROL
- XX a.m. PEAK HOUR
- (XX) p.m. PEAK HOUR



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Traffic Impact Study

PROJECT NO.
230178

FIGURE NO.
7

PLOT INFO: M:\CUSTOM\AUTODESK PRODUCTS\ACAD\SYMBOLS\B-85X11.DWG LAYOUT: MODEL DATE: ---- TIME: ---- USER: DMEADE

5.0 Future Conditions Analysis

5.1 Turn Lane Warrants

An evaluation was performed in accordance with WCRC and MDOT requirements to determine if left turn passing lanes or right turn deceleration lanes are required at the site driveways. The results of the analysis indicated no turn lane treatment is warranted at either site driveway. All turn lane warrant charts are provided in Appendix 5 – Turn Lane Warrants. The results of the analysis are presented in Table 8 – Turn Lane Warrants.

Table 8 – Turn Lane Warrants

Intersection	Movement	Existing Treatment	Result
Plymouth Road and East Site Driveway	EB Left	None	Not Warranted
	WB Right	None	Not Warranted
Plymouth Road and West Site Driveway	EB Left	None	Not Warranted
	WB Right	None	Not Warranted

5.2 Future Conditions Traffic Analysis

The resulting LOS and delay for the future conditions are presented in Table 9 – LOS Analysis for Future Conditions.

Table 9 – LOS Analysis for Future Conditions

Approach	Lane Group	LOS/Delay(s)			
		a.m. Peak Hour		p.m. Peak Hour	
Plymouth Road and M-153 (Signalized)					
EB M-153	Left	B	10.8	A	9.9
	Thru	B	12.7	B	12.9
	Right	B	12.5	A	8.8
	Overall	B	12.4	B	12.1
WB M-153	Left/Thru	B	14.9	B	10.9
	Right	A	10.0	A	8.4
	Overall	B	14.9	B	10.9
NB Plymouth Road	Left/Thru	B	14.6	B	17.5
	Thru/Right	C	20.7	C	24.4
	Overall	C	20.7	C	24.4
SB Plymouth Road	Left/Thru	A	4.6	B	11.6
	Thru/Right	C	29.4	C	21.9
	Overall	C	29.4	C	21.9
Overall		C	20.5	B	15.5
Plymouth Road and East Site Driveway (Stop-Controlled)					
EB Plymouth Road	Left	A	0.0	A	7.7
	Overall	A	0.0	A	0.0
WB Plymouth Road	Overall	A	0.0	A	0.1
SB East Site Driveway	Overall	C	17.0	B	13.6
Overall		A	0.1	A	0.2
Plymouth Road and West Site Driveway (Stop-Controlled)					
EB Plymouth Road	Left	A	9.6	A	7.7
	Overall	A	0.0	A	0.0
WB Plymouth Road	Overall	A	0.1	A	0.1
SB West Site Driveway	Overall	C	16.6	B	13.4
Overall		A	0.1	A	0.1

Further analysis of the LOS results for future conditions indicated that all of the movements, approaches, and intersections are expected to continue to operate at a LOS C or better during both the a.m. and p.m. peak hours.

SimTraffic simulations were also reviewed to observe network operations and vehicle queues. For future conditions, there are no significant vehicle queues or spill-back from available storage lanes. No 95th percentile queue lengths exceed the provided storage length.

Further review of the 95th percentile queue lengths at the site driveways indicated no measurable queues for WB traffic completing a right turn into the site. For EB traffic competing a left turn into the site, a 95th percentile queue length of 7 ft (less than one vehicle) was recorded in the a.m. peak hour and a 95th percentile queue length of 9 ft (less than one vehicle) was recorded in the p.m. peak hour. For traffic exiting the site, no 95th percentile queue length exceeded 29ft (one vehicle) in the a.m. peak hour and 24 ft (one vehicle) in the p.m. peak hour.

See Appendix 6 – Future LOS Output Reports for the future conditions LOS reports and queueing analysis reports.

6.0 Findings and Recommendations

The analyses conducted for this TIS indicate the proposed development will not result in any significant impact to the adjacent road network. The proposed site access configuration is appropriate and will acceptably facilitate site ingress and egress. These conclusions are supported by the following key findings:

1. Existing storage lengths are adequate for all movements in existing and future conditions.
2. Lane configurations and physical capacity are appropriate within the study area.

Based on the findings of the HCM operational analyses and site traffic generation, no improvements are recommended at the studied intersections to mitigate traffic impacts.

Appendix 1

Traffic Volume Data

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
#100/101 - Plymouth Road and M-153	a.m. Peak Hour 01/18/23		PHF	0.89			0.90			0.81			0.77		
			% Heavy	4%			2%			2%			3%		
		2023	Existing	**73**	**478**	**234**	**31**	**727**	**2**	**44**	**90**	**11**	**1**	**304**	**241**
		2023	Existing Adj.	79	521	255	34	792	2	48	98	12	1	331	262
		2025	Background	83	542	265	35	824	2	50	102	12	1	344	273
			Bckgrd. Dev. A												
			Bckgrd. Dev. B												
			Bckgrd. Dev. C												
			Total Background	**83**	**542**	**265**	**35**	**824**	**2**	**50**	**102**	**12**	**1**	**344**	**273**
			Site Generated			2				1	4			2	
			Pass By												
			Total Site Gen	0	0	2	0	0	0	1	4	0	0	2	0
			Total Future	**83**	**542**	**267**	**35**	**824**	**2**	**51**	**106**	**12**	**1**	**346**	**273**

Count Date: 1/18/2023
Count Year: 2023
Existing Adj. Year: 2023

Existing Adjustment Rate: 1.089
Growth Rate: 2.0%
Buildout Year: 2025
Scenario: a.m. Peak Hour

Bckgrd. Dev. A:
Bckgrd. Dev. B:
Bckgrd. Dev. C:

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
#200 - Plymouth Road and East Site Driveway	a.m. Peak Hour 01/18/23		PHF		0.81			0.77						0.92	
			% Heavy		2%			3%						2%	
		2023	Existing		**145**			**569**							
		2023	Existing Adj.		158			620							
		2025	Background		164			644							
			Bckgrd. Dev. A												
			Bckgrd. Dev. B												
			Bckgrd. Dev. C												
			Total Background		**164**			**644**							
			Site Generated		2			2	2				3		4
			Pass By												
			Total Site Gen	0	2			2	2				3		4
			Total Future	**0**	**166**			**646**	**2**				**3**		**4**

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
#300 - Plymouth Road and West Site Driveway	a.m. Peak Hour 01/18/23		PHF		0.81			0.77						0.92	
			% Heavy		2%			3%						2%	
		2023	Existing		**145**			**569**							
		2023	Existing Adj.		158			620							
		2025	Background		164			644							
			Bckgrd. Dev. A												
			Bckgrd. Dev. B												
			Bckgrd. Dev. C												
			Total Background		**164**			**644**							
			Site Generated	1				4	2				2		4
			Pass By												
			Total Site Gen	1	0			4	2				2		4
			Total Future	**1**	**164**			**648**	**2**				**2**		**4**

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
#100/101 - Plymouth Road and M-153	p.m. Peak Hour 01/18/23		PHF	0.91			0.85			0.88			0.94		
			% Heavy	2%			2%			0%			3%		
		2023	Existing	**152**	**802**	**77**	**14**	**482**	**2**	**90**	**259**	**23**	**1**	**118**	**110**
		2023	Existing Adj.	166	873	84	15	525	2	98	282	25	1	129	120
		2025	Background	172	909	87	16	546	2	102	293	26	1	134	125
			Bckgrd. Dev. A												
			Bckgrd. Dev. B												
			Bckgrd. Dev. C												
			Total Background	**172**	**909**	**87**	**16**	**546**	**2**	**102**	**293**	**26**	**1**	**134**	**125**
			Site Generated			2				1	6			3	
			Pass By												
			Total Site Gen	0	0	2	0	0	0	1	6	0	0	3	0
			Total Future	**172**	**909**	**89**	**16**	**546**	**2**	**103**	**299**	**26**	**1**	**137**	**125**

Count Date: 1/18/2023
Count Year: 2023
Existing Adj. Year: 2023

Existing Adjustment Rate: 1.089
Growth Rate: 2.0%
Buildout Year: 2025
Scenario: p.m. Peak Hour

Bckgrd. Dev. A:
Bckgrd. Dev. B:
Bckgrd. Dev. C:

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
#200 - Plymouth Road and East Site Driveway	p.m. Peak Hour 01/18/23		PHF		0.88			0.94						0.92	
			% Heavy		0%			3%						2%	
		2023	Existing		**372**			**209**							
		2023	Existing Adj.		405			228							
		2025	Background		421			237							
			Bckgrd. Dev. A												
			Bckgrd. Dev. B												
			Bckgrd. Dev. C												
			Total Background		**421**			**237**							
			Site Generated	4	3			2	3				4		1
			Pass By												
			Total Site Gen	4	3			2	3				4		1
			Total Future	**4**	**424**			**239**	**3**				**4**		**1**

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
#300 - Plymouth Road and West Site Driveway	p.m. Peak Hour 01/18/23		PHF		0.88			0.94						0.92	
			% Heavy		0%			3%						2%	
		2023	Existing		**372**			**209**							
		2023	Existing Adj.		405			228							
		2025	Background		421			237							
			Bckgrd. Dev. A												
			Bckgrd. Dev. B												
			Bckgrd. Dev. C												
			Total Background		**421**			**237**							
			Site Generated	5	4			1	2				3		1
			Pass By												
			Total Site Gen	5	4			1	2				3		1
			Total Future	**5**	**425**			**238**	**2**				**3**		**1**

MDOT Seasonal Factors 2021

Seasonal Factors are used to correct for seasonal bias in short duration counts. These factors are generated using data from permanent/continuous count stations.

MDOT uses 9 Seasonal Factor Groups with Groups 1-6 classified as Trunkline and Groups 7-9 classified as Non-Trunkline (No calculated Seasonal Factors for Groups 7-9, placeholder value of 1 is used until factors are created)

Group 1 - Urban Trunkline

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Sunday	1.816	1.617	1.428	1.354	1.233	1.158	1.177	1.145	1.168	1.234	1.364	1.358
Monday	1.123	1.122	1.018	1	0.949	0.919	0.957	0.909	0.91	0.942	0.944	1.011
Tuesday	1.15	1.171	0.988	0.966	0.917	0.896	0.896	0.881	0.907	0.899	0.922	0.971
Wednesday	1.089	1.05	0.96	0.956	0.897	0.878	0.866	0.868	0.889	0.883	0.901	0.945
Thursday	1.065	1.045	0.97	0.956	0.88	0.852	0.855	0.853	0.86	0.871	0.905	0.938
Friday	1.03	1.031	0.919	0.907	0.863	0.848	0.852	0.831	0.82	0.845	0.855	0.931
Saturday	1.375	1.35	1.151	1.139	1.046	1.039	1.029	0.997	1.023	1.051	1.182	1.132

Group 2 - Urban Rural Trunkline

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Sunday	1.819	1.654	1.413	1.334	1.163	1.047	1.008	1.001	1.076	1.166	1.32	1.376
Monday	1.167	1.17	1.065	1.032	0.976	0.921	0.91	0.904	0.931	0.961	0.987	1.069
Tuesday	1.214	1.222	1.044	1.016	0.96	0.91	0.892	0.903	0.938	0.934	0.971	1.031
Wednesday	1.129	1.092	1.015	0.998	0.933	0.887	0.865	0.873	0.909	0.918	0.929	0.996
Thursday	1.093	1.084	1.009	0.977	0.896	0.857	0.83	0.836	0.864	0.89	0.945	0.983
Friday	1.037	1.069	0.92	0.9	0.828	0.8	0.777	0.772	0.779	0.809	0.857	0.961
Saturday	1.403	1.377	1.162	1.163	1.031	0.969	0.94	0.927	0.98	1.01	1.137	1.159

Group 3 - Rural Trunkline

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Sunday	1.732	1.626	1.349	1.208	1.025	0.909	0.853	0.861	0.941	1.022	1.145	1.295
Monday	1.27	1.291	1.145	1.083	1.007	0.933	0.863	0.901	0.97	0.99	1.034	1.129
Tuesday	1.341	1.342	1.135	1.088	1.017	0.94	0.91	0.934	0.987	0.992	1.019	1.095
Wednesday	1.244	1.207	1.097	1.062	0.987	0.916	0.88	0.89	0.956	0.972	0.949	1.062
Thursday	1.188	1.178	1.088	1.015	0.916	0.868	0.819	0.815	0.879	0.925	0.963	1.02
Friday	1.089	1.12	0.952	0.887	0.795	0.767	0.723	0.726	0.743	0.786	0.836	0.985
Saturday	1.42	1.439	1.177	1.119	0.961	0.909	0.851	0.857	0.902	0.958	1.053	1.202

Group 4 - Rural North Trunkline

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Sunday	1.728	1.573	1.483	1.424	1.079	0.848	0.696	0.718	0.805	0.934	1.262	1.715
Monday	1.602	1.517	1.449	1.378	1.092	0.85	0.688	0.749	0.837	0.928	1.284	1.546
Tuesday	1.691	1.565	1.478	1.401	1.134	0.899	0.744	0.78	0.871	0.983	1.291	1.374
Wednesday	1.563	1.465	1.447	1.344	1.084	0.858	0.726	0.711	0.866	0.974	1.112	1.298
Thursday	1.475	1.374	1.313	1.175	0.975	0.819	0.67	0.657	0.762	0.872	1.111	1.266
Friday	1.335	1.253	1.114	1.024	0.844	0.721	0.602	0.617	0.651	0.727	0.912	1.216
Saturday	1.606	1.517	1.37	1.403	1.035	0.853	0.693	0.71	0.813	0.905	1.175	1.74

Group 5 - Recreational Trunkline

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Sunday	1.62	1.479	1.307	1.187	0.925	0.781	0.685	0.703	0.805	0.927	1.172	1.397
Monday	1.448	1.463	1.296	1.197	1.075	0.921	0.757	0.874	0.977	1.033	1.19	1.31
Tuesday	1.577	1.52	1.307	1.229	1.132	0.973	0.871	0.954	1.039	1.081	1.196	1.275
Wednesday	1.454	1.379	1.256	1.201	1.07	0.943	0.85	0.884	1.013	1.052	1.092	1.244
Thursday	1.348	1.294	1.223	1.112	0.941	0.854	0.753	0.782	0.878	0.972	1.11	1.168
Friday	1.155	1.151	1.017	0.918	0.759	0.709	0.628	0.653	0.702	0.779	0.903	1.129
Saturday	1.433	1.458	1.221	1.149	0.917	0.848	0.727	0.743	0.859	0.948	1.148	1.37

Group 6 - Recreational Corridor Trunkline

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Sunday	1.6	1.31	1.233	1.122	0.849	0.675	0.563	0.546	0.681	0.832	1.189	1.43
Monday	1.868	1.854	1.466	1.383	1.12	0.874	0.651	0.799	1.012	1.071	1.464	1.689
Tuesday	2.077	1.832	1.502	1.338	1.188	0.934	0.801	0.887	1.078	1.169	1.541	1.62
Wednesday	1.831	1.699	1.448	1.338	1.114	0.912	0.769	0.814	1.026	1.127	1.341	1.574
Thursday	1.631	1.533	1.429	1.312	0.929	0.792	0.695	0.697	0.875	1.052	1.348	1.425
Friday	1.419	1.323	1.117	0.968	0.759	0.693	0.58	0.595	0.667	0.837	1.084	1.401
Saturday	1.573	1.512	1.28	1.208	0.931	0.803	0.618	0.634	0.801	0.927	1.293	1.753

Group 7-10 Non-Trunkline/Local Road

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Sunday	1	1	1	1	1	1	1	1	1	1	1	1
Monday	1	1	1	1	1	1	1	1	1	1	1	1
Tuesday	1	1	1	1	1	1	1	1	1	1	1	1
Wednesday	1	1	1	1	1	1	1	1	1	1	1	1
Thursday	1	1	1	1	1	1	1	1	1	1	1	1
Friday	1	1	1	1	1	1	1	1	1	1	1	1
Saturday	1	1	1	1	1	1	1	1	1	1	1	1

Ford Rd & Plymouth Rd - TMC

Wed Jan 18, 2023
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights and Motorcycles, Heavy)
All Movements
ID: 1030754, Location: 42.324743, -83.625774, Site Code: 230178

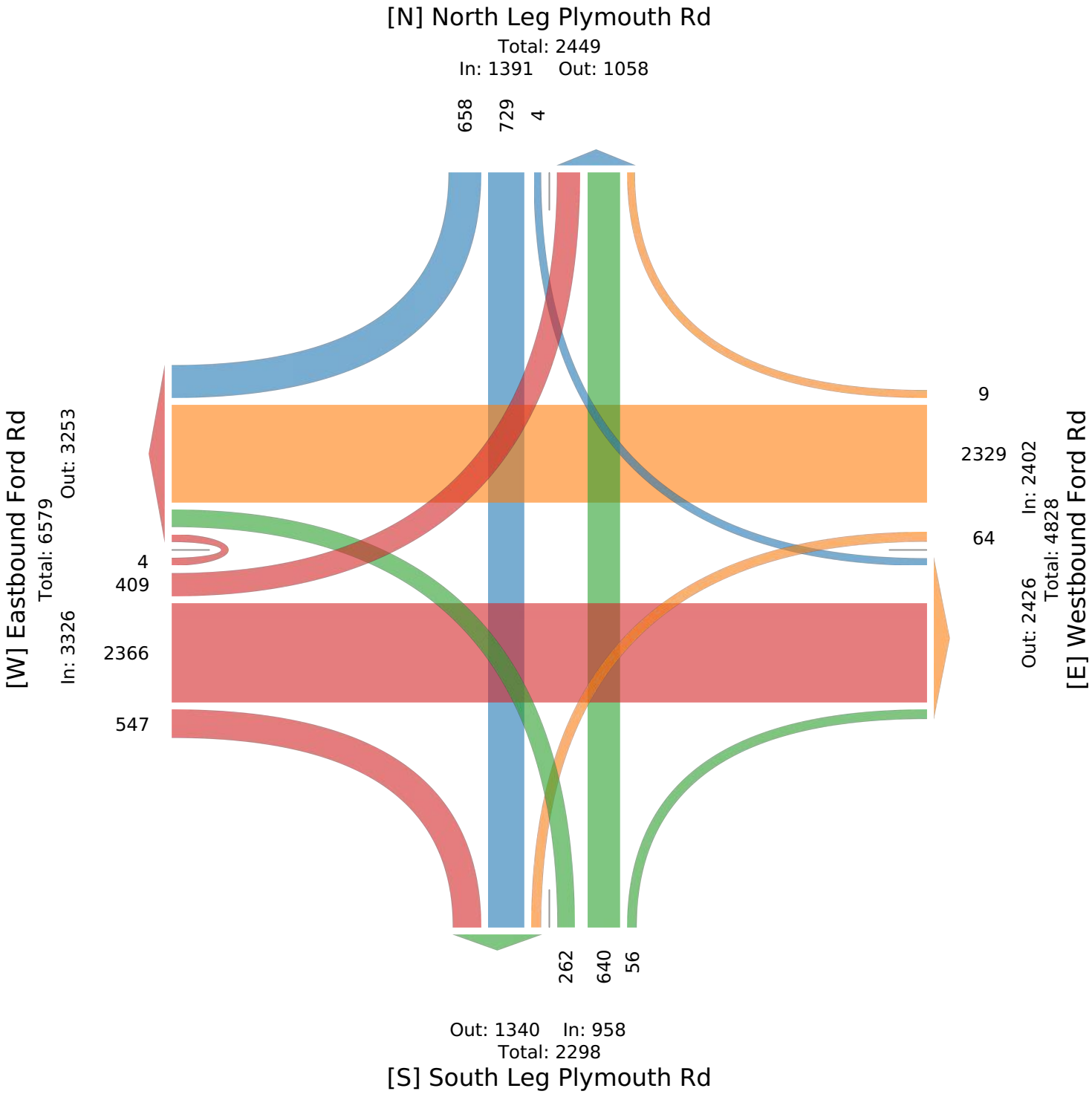
Provided by: Fishbeck-Main Account
1515 Arboretum Drive SE, Grand Rapids, MI, 49546, US

Leg	Eastbound Ford Rd					Westbound Ford Rd					South Leg Plymouth Rd					North Leg Plymouth Rd					
Direction	Eastbound					Westbound					Northbound					Southbound					
Time	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	Int
2023-01-18 7:00AM	3	50	23	0	**76**	1	141	1	0	**143**	6	24	1	0	**31**	0	40	39	0	**79**	**329**
7:15AM	8	108	32	0	**148**	1	182	0	0	**183**	2	26	2	0	**30**	0	56	60	0	**116**	**477**
7:30AM	18	141	61	0	**220**	4	192	1	0	**197**	12	31	2	0	**45**	0	93	85	0	**178**	**640**
7:45AM	17	124	71	0	**212**	7	205	0	0	**212**	14	24	2	0	**40**	0	67	55	0	**122**	**586**
Hourly Total	46	423	187	0	**656**	13	720	2	0	**735**	34	105	7	0	**146**	0	256	239	0	**495**	**2032**
8:00AM	20	94	49	0	**163**	7	155	0	0	**162**	9	20	3	0	**32**	0	57	55	0	**112**	**469**
8:15AM	18	119	53	0	**190**	13	175	1	0	**189**	9	15	4	0	**28**	1	87	46	0	**134**	**541**
8:30AM	12	109	51	0	**172**	5	173	0	0	**178**	11	18	1	0	**30**	1	64	48	0	**113**	**493**
8:45AM	22	108	51	0	**181**	7	139	0	0	**146**	11	13	1	0	**25**	0	55	41	0	**96**	**448**
Hourly Total	72	430	204	0	**706**	32	642	1	0	**675**	40	66	9	0	**115**	2	263	190	0	**455**	**1951**
4:00PM	33	164	18	0	**215**	0	118	0	0	**118**	23	39	1	0	**63**	1	21	24	0	**46**	**442**
4:15PM	38	174	24	0	**236**	2	145	1	0	**148**	20	66	6	0	**92**	0	30	34	0	**64**	**540**
4:30PM	38	190	18	0	**246**	2	111	2	0	**115**	32	57	5	0	**94**	0	13	32	0	**45**	**500**
4:45PM	46	219	19	0	**284**	2	144	0	0	**146**	18	68	9	0	**95**	0	33	28	0	**61**	**586**
Hourly Total	155	747	79	0	**981**	6	518	3	0	**527**	93	230	21	0	**344**	1	97	118	0	**216**	**2068**
5:00PM	32	176	15	1	**224**	4	109	1	0	**114**	26	58	5	0	**89**	0	25	31	0	**56**	**483**
5:15PM	36	202	23	0	**261**	5	126	0	0	**131**	21	79	6	0	**106**	0	25	28	0	**53**	**551**
5:30PM	35	205	20	2	**262**	3	103	1	0	**107**	25	54	3	0	**82**	1	35	23	0	**59**	**510**
5:45PM	33	183	19	1	**236**	1	111	1	0	**113**	23	48	5	0	**76**	0	28	29	0	**57**	**482**
Hourly Total	136	766	77	4	**983**	13	449	3	0	**465**	95	239	19	0	**353**	1	113	111	0	**225**	**2026**
Total	409	2366	547	4	**3326**	64	2329	9	0	**2402**	262	640	56	0	**958**	4	729	658	0	**1391**	**8077**
% Approach	12.3%	71.1%	16.4%	0.1%	**-**	2.7%	97.0%	0.4%	0%	**-**	27.3%	66.8%	5.8%	0%	**-**	0.3%	52.4%	47.3%	0%	**-**	-
% Total	5.1%	29.3%	6.8%	0%	**41.2%**	0.8%	28.8%	0.1%	0%	**29.7%**	3.2%	7.9%	0.7%	0%	**11.9%**	0%	9.0%	8.1%	0%	**17.2%**	-
Lights and Motorcycles	395	2288	537	4	**3224**	64	2276	7	0	**2347**	259	637	53	0	**949**	4	717	634	0	**1355**	7875
% Lights and Motorcycles	96.6%	96.7%	98.2%	100%	**96.9%**	100%	97.7%	77.8%	0%	**97.7%**	98.9%	99.5%	94.6%	0%	**99.1%**	100%	98.4%	96.4%	0%	**97.4%**	97.5%
Heavy	14	78	10	0	**102**	0	53	2	0	**55**	3	3	3	0	**9**	0	12	24	0	**36**	202
% Heavy	3.4%	3.3%	1.8%	0%	**3.1%**	0%	2.3%	22.2%	0%	**2.3%**	1.1%	0.5%	5.4%	0%	**0.9%**	0%	1.6%	3.6%	0%	**2.6%**	2.5%

*L: Left, R: Right, T: Thru, U: U-Turn

Ford Rd & Plymouth Rd - TMC
Wed Jan 18, 2023
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights and Motorcycles, Heavy)
All Movements
ID: 1030754, Location: 42.324743, -83.625774, Site Code: 230178

Provided by: Fishbeck-Main Account
1515 Arboretum Drive SE, Grand Rapids, MI, 49546, US



Ford Rd & Plymouth Rd - TMC

Wed Jan 18, 2023
AM Peak (7:30 AM - 8:30 AM) - Overall Peak Hour
All Classes (Lights and Motorcycles, Heavy)
All Movements
ID: 1030754, Location: 42.324743, -83.625774, Site Code: 230178

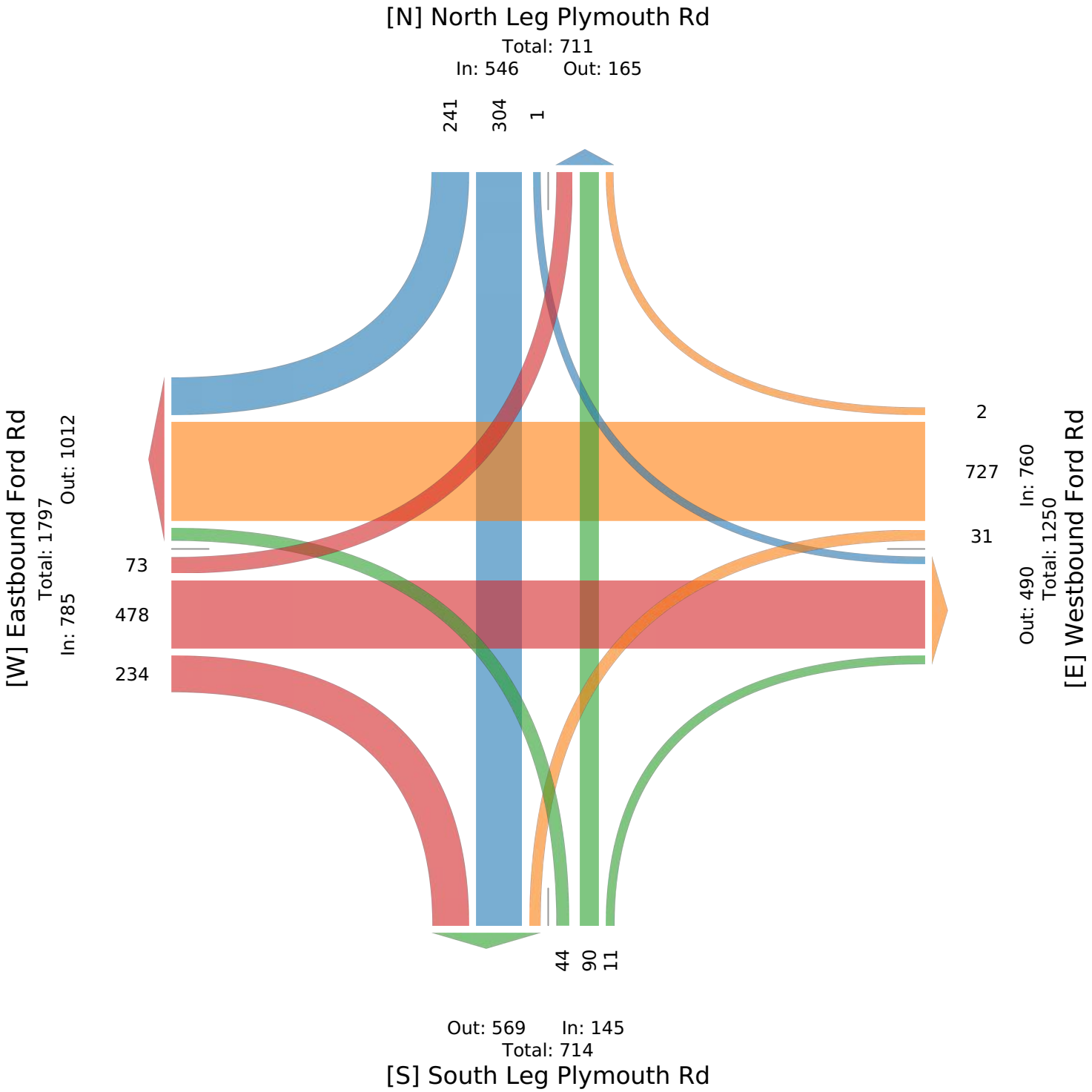
Provided by: Fishbeck-Main Account
1515 Arboretum Drive SE, Grand Rapids, MI, 49546, US

Leg	Eastbound Ford Rd					Westbound Ford Rd					South Leg Plymouth Rd					North Leg Plymouth Rd					
Direction	Eastbound					Westbound					Northbound					Southbound					
Time	L	T	R	U	**App**	L	T	R	U	**App**	L	T	R	U	**App**	L	T	R	U	**App**	**Int**
2023-01-18 7:30AM	18	141	61	0	**220**	4	192	1	0	**197**	12	31	2	0	**45**	0	93	85	0	**178**	**640**
7:45AM	17	124	71	0	**212**	7	205	0	0	**212**	14	24	2	0	**40**	0	67	55	0	**122**	**586**
8:00AM	20	94	49	0	**163**	7	155	0	0	**162**	9	20	3	0	**32**	0	57	55	0	**112**	**469**
8:15AM	18	119	53	0	**190**	13	175	1	0	**189**	9	15	4	0	**28**	1	87	46	0	**134**	**541**
Total	73	478	234	0	**785**	31	727	2	0	**760**	44	90	11	0	**145**	1	304	241	0	**546**	**2236**
% Approach	9.3%	60.9%	29.8%	0%	**-**	4.1%	95.7%	0.3%	0%	**-**	30.3%	62.1%	7.6%	0%	**-**	0.2%	55.7%	44.1%	0%	**-**	-
% Total	3.3%	21.4%	10.5%	0%	**35.1%**	1.4%	32.5%	0.1%	0%	**34.0%**	2.0%	4.0%	0.5%	0%	**6.5%**	0%	13.6%	10.8%	0%	**24.4%**	-
PHF	0.913	0.848	0.824	-	**0.892**	0.596	0.887	0.500	-	**0.896**	0.786	0.726	0.688	-	**0.806**	0.250	0.817	0.709	-	**0.767**	0.873
Lights and Motorcycles	68	456	228	0	**752**	31	710	1	0	**742**	43	90	9	0	**142**	1	301	228	0	**530**	2166
% Lights and Motorcycles	93.2%	95.4%	97.4%	0%	**95.8%**	100%	97.7%	50.0%	0%	**97.6%**	97.7%	100%	81.8%	0%	**97.9%**	100%	99.0%	94.6%	0%	**97.1%**	96.9%
Heavy	5	22	6	0	**33**	0	17	1	0	**18**	1	0	2	0	**3**	0	3	13	0	**16**	70
% Heavy	6.8%	4.6%	2.6%	0%	**4.2%**	0%	2.3%	50.0%	0%	**2.4%**	2.3%	0%	18.2%	0%	**2.1%**	0%	1.0%	5.4%	0%	**2.9%**	3.1%

*L: Left, R: Right, T: Thru, U: U-Turn

Ford Rd & Plymouth Rd - TMC
Wed Jan 18, 2023
AM Peak (7:30 AM - 8:30 AM) - Overall Peak Hour
All Classes (Lights and Motorcycles, Heavy)
All Movements
ID: 1030754, Location: 42.324743, -83.625774, Site Code: 230178

Provided by: Fishbeck-Main Account
1515 Arboretum Drive SE, Grand Rapids, MI, 49546, US



Ford Rd & Plymouth Rd - TMC

Wed Jan 18, 2023
PM Peak (4:45 PM - 5:45 PM)
All Classes (Lights and Motorcycles, Heavy)
All Movements
ID: 1030754, Location: 42.324743, -83.625774, Site Code: 230178

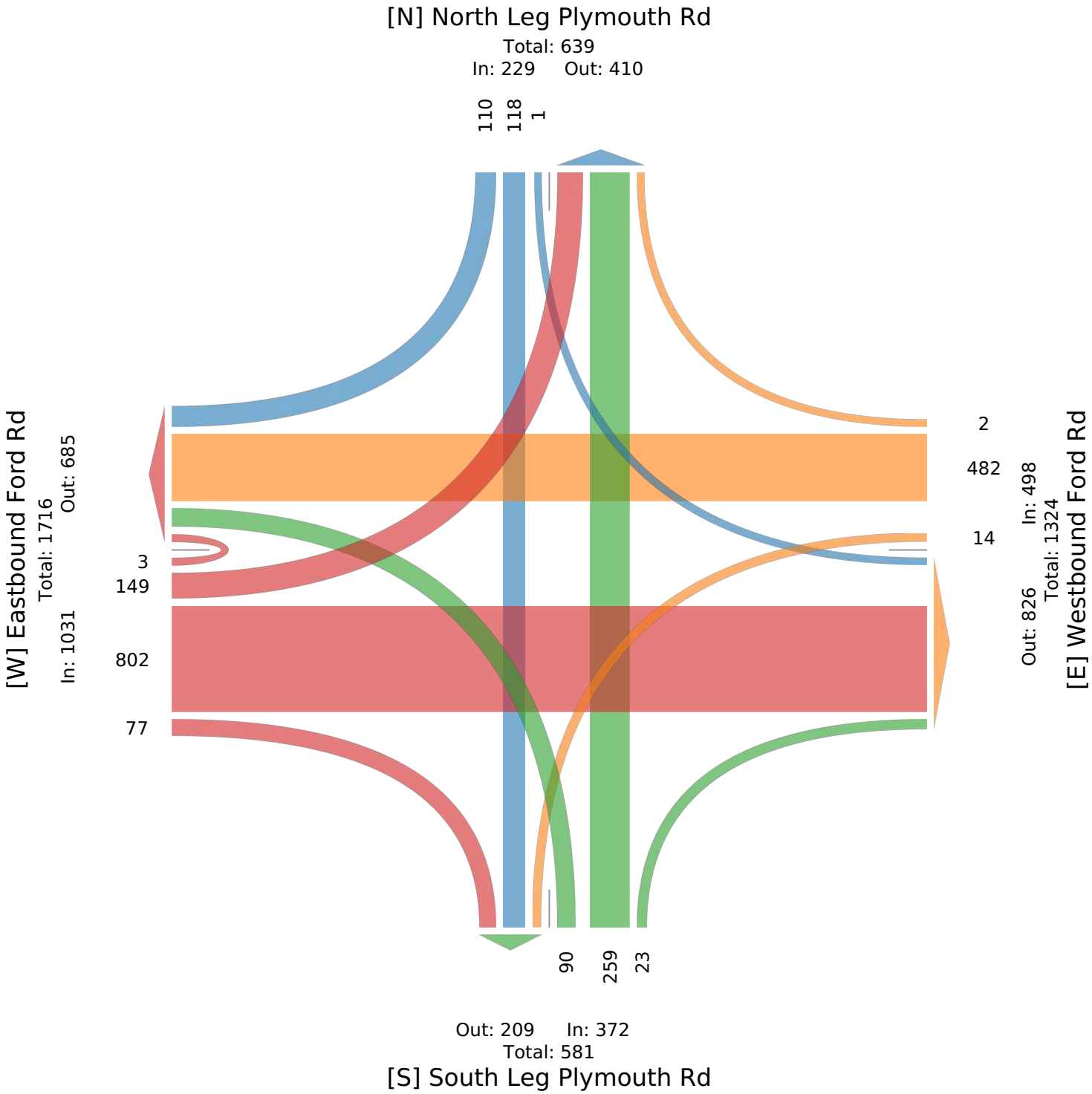
Provided by: Fishbeck-Main Account
1515 Arboretum Drive SE, Grand Rapids, MI, 49546, US

Leg	Eastbound Ford Rd					Westbound Ford Rd					South Leg Plymouth Rd					North Leg Plymouth Rd					
Direction	Eastbound					Westbound					Northbound					Southbound					
Time	L	T	R	U	**App**	L	T	R	U	**App**	L	T	R	U	**App**	L	T	R	U	**App**	**Int**
2023-01-18 4:45PM	46	219	19	0	**284**	2	144	0	0	**146**	18	68	9	0	**95**	0	33	28	0	**61**	**586**
5:00PM	32	176	15	1	**224**	4	109	1	0	**114**	26	58	5	0	**89**	0	25	31	0	**56**	**483**
5:15PM	36	202	23	0	**261**	5	126	0	0	**131**	21	79	6	0	**106**	0	25	28	0	**53**	**551**
5:30PM	35	205	20	2	**262**	3	103	1	0	**107**	25	54	3	0	**82**	1	35	23	0	**59**	**510**
Total	149	802	77	3	**1031**	14	482	2	0	**498**	90	259	23	0	**372**	1	118	110	0	**229**	**2130**
% Approach	14.5%	77.8%	7.5%	0.3%	-	2.8%	96.8%	0.4%	0%	-	24.2%	69.6%	6.2%	0%	-	0.4%	51.5%	48.0%	0%	-	-
% Total	7.0%	37.7%	3.6%	0.1%	**48.4%**	0.7%	22.6%	0.1%	0%	**23.4%**	4.2%	12.2%	1.1%	0%	**17.5%**	0%	5.5%	5.2%	0%	**10.8%**	-
PHF	0.810	0.916	0.837	0.375	**0.908**	0.700	0.837	0.500	-	**0.853**	0.865	0.820	0.639	-	**0.877**	0.250	0.843	0.887	-	**0.939**	0.909
Lights and Motorcycles	145	789	77	3	**1014**	14	474	2	0	**490**	90	258	23	0	**371**	1	114	107	0	**222**	2097
% Lights and Motorcycles	97.3%	98.4%	100%	100%	**98.4%**	100%	98.3%	100%	0%	**98.4%**	100%	99.6%	100%	0%	**99.7%**	100%	96.6%	97.3%	0%	**96.9%**	98.5%
Heavy	4	13	0	0	**17**	0	8	0	0	**8**	0	1	0	0	**1**	0	4	3	0	**7**	33
% Heavy	2.7%	1.6%	0%	0%	**1.6%**	0%	1.7%	0%	0%	**1.6%**	0%	0.4%	0%	0%	**0.3%**	0%	3.4%	2.7%	0%	**3.1%**	1.5%

*L: Left, R: Right, T: Thru, U: U-Turn

Ford Rd & Plymouth Rd - TMC
Wed Jan 18, 2023
PM Peak (4:45 PM - 5:45 PM)
All Classes (Lights and Motorcycles, Heavy)
All Movements
ID: 1030754, Location: 42.324743, -83.625774, Site Code: 230178

Provided by: Fishbeck-Main Account
1515 Arboretum Drive SE, Grand Rapids, MI, 49546, US



Volume Count Report

LOCATION INFO

Location ID	81-0566
Type	SPOT
Fnct'l Class	3
Located On	M-153
Loc On Alias	
NW OF	Plymouth Rd
Direction	2-WAY
County	Washtenaw
Community	Superior Twp - Washtenaw
MPO ID	57783
HPMS ID	
Agency	MDOT

COUNT DATA INFO

Count Status	Accepted
Holiday	No
Start Date	Tue 9/20/2022
End Date	Wed 9/21/2022
Start Time	1:00:00 PM
End Time	1:00:00 PM
Direction	2-WAY
Notes	
Station	010117-0006063
Study	
Speed Limit	
Description	
Sensor Type	Axle/Tube
Source	CombineVolumeCountsIncremental
Latitude,Longitude	

INTERVAL:15-MIN

Time	15-min Interval 1st	2nd	3rd	4th	Hourly Count
0:00-1:00	45	28	28	13	114
1:00-2:00	20	10	21	9	60
2:00-3:00	16	5	14	10	45
3:00-4:00	24	14	17	21	76
4:00-5:00	20	20	37	59	136
5:00-6:00	61	89	118	113	381
6:00-7:00	154	228	302	333	1,017
7:00-8:00	413	456	567	490	1,926
8:00-9:00	478	475	487	394	1,834
9:00-10:00	332	310	291	284	1,217
10:00-11:00	278	287	301	301	1,167
11:00-12:00	222	280	263	288	1,053
12:00-13:00	270	301	297	257	1,125
13:00-14:00	270	260	295	295	1,120
14:00-15:00	311	321	327	355	1,314
15:00-16:00	400	417	447	445	1,709
16:00-17:00	445	457	485	466	1,853
17:00-18:00	482	557	476	432	1,947
18:00-19:00	380	382	299	330	1,391
19:00-20:00	362	295	185	173	1,015
20:00-21:00	160	161	133	144	598
21:00-22:00	97	140	96	103	436
22:00-23:00	66	51	71	62	250
23:00-24:00	35	48	46	42	171
Total					21,955
AADT					19,393
AM Peak					07:30-08:30 2,010
PM Peak					16:30-17:30 1,990

Volume Count Report

LOCATION INFO

Location ID	81-0566_SE
Type	SPOT
Fnct'l Class	3
Located On	M-153
Loc On Alias	
NW OF	Plymouth Rd
Direction	SE
County	Washtenaw
Community	Superior Twp - Washtenaw
MPO ID	57783
HPMS ID	
Agency	MDOT

COUNT DATA INFO

Count Status	Accepted
Holiday	No
Start Date	Tue 9/20/2022
End Date	Wed 9/21/2022
Start Time	1:00:00 PM
End Time	1:00:00 PM
Direction	
Notes	
Station	010117-0005912
Study	
Speed Limit	
Description	
Sensor Type	Axle/Tube
Source	
Latitude,Longitude	

INTERVAL:15-MIN

Time	15-min Interval 1st	2nd	3rd	4th	Hourly Count
0:00-1:00	23	11	16	3	53
1:00-2:00	15	4	15	7	41
2:00-3:00	11	2	11	4	28
3:00-4:00	9	11	9	14	43
4:00-5:00	8	13	17	22	60
5:00-6:00	15	31	53	53	152
6:00-7:00	66	80	117	147	410
7:00-8:00	151	184	249	202	786
8:00-9:00	215	206	166	185	772
9:00-10:00	151	139	119	136	545
10:00-11:00	132	139	142	135	548
11:00-12:00	89	148	121	130	488
12:00-13:00	129	141	138	120	528
13:00-14:00	119	125	153	152	549
14:00-15:00	124	147	155	198	624
15:00-16:00	204	203	208	234	849
16:00-17:00	244	263	273	255	1,035
17:00-18:00	252	289	241	230	1,012
18:00-19:00	206	218	175	191	790
19:00-20:00	171	126	101	107	505
20:00-21:00	95	84	80	83	342
21:00-22:00	63	84	48	51	246
22:00-23:00	37	35	36	38	146
23:00-24:00	23	26	22	23	94
Total					10,646
AM Peak					07:30-08:30 872
PM Peak					16:30-17:30 1,069

Volume Count Report

LOCATION INFO

Location ID	81-0566_NW
Type	SPOT
Fnct'l Class	3
Located On	M-153
Loc On Alias	
NW OF	Plymouth Rd
Direction	NW
County	Washtenaw
Community	Superior Twp - Washtenaw
MPO ID	57783
HPMS ID	
Agency	MDOT

COUNT DATA INFO

Count Status	Accepted
Holiday	No
Start Date	Tue 9/20/2022
End Date	Wed 9/21/2022
Start Time	1:00:00 PM
End Time	1:00:00 PM
Direction	
Notes	
Station	010117-0006063
Study	
Speed Limit	
Description	
Sensor Type	Axle/Tube
Source	
Latitude,Longitude	

INTERVAL:15-MIN

Time	15-min Interval 1st	2nd	3rd	4th	Hourly Count
0:00-1:00	22	17	12	10	61
1:00-2:00	5	6	6	2	19
2:00-3:00	5	3	3	6	17
3:00-4:00	15	3	8	7	33
4:00-5:00	12	7	20	37	76
5:00-6:00	46	58	65	60	229
6:00-7:00	88	148	185	186	607
7:00-8:00	262	272	318	288	1,140
8:00-9:00	263	269	321	209	1,062
9:00-10:00	181	171	172	148	672
10:00-11:00	146	148	159	166	619
11:00-12:00	133	132	142	158	565
12:00-13:00	141	160	159	137	597
13:00-14:00	151	135	142	143	571
14:00-15:00	187	174	172	157	690
15:00-16:00	196	214	239	211	860
16:00-17:00	201	194	212	211	818
17:00-18:00	230	268	235	202	935
18:00-19:00	174	164	124	139	601
19:00-20:00	191	169	84	66	510
20:00-21:00	65	77	53	61	256
21:00-22:00	34	56	48	52	190
22:00-23:00	29	16	35	24	104
23:00-24:00	12	22	24	19	77
Total					11,309
AM Peak					07:15-08:15 1,141
PM Peak					16:45-17:45 944

Default Report Title
Use Preferences to Define Titles

Superior Township

Plymouth W of M153
Vorhies M-153
Site Code: 0100840007
Start Date: 04 12 2023

	04 10 23		Mon	04 11 2023		Tue	04 12 2023		Wed	04 13 2023		Thu	04 14 2023		Fri	Day
Time	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	Average
12:00 AM										10	5	15				15
01:00										2	2	4				4
02:00										4	7	11				11
03:00										4	7	11				11
04:00										3	9	12				12
05:00										11	60	71				71
06:00										48	173	221				221
07:00										92	412	504				504
08:00							101	506	607							607
09:00							116	286	402							402
10:00							105	177	282							282
11:00							174	163	337							337
12:00 PM							157	194	351							351
01:00							127	173	300							300
02:00							203	182	385							385
03:00							296	187	483							483
04:00							398	203	601							601
05:00							426	202	628							628
06:00							166	152	318							318
07:00							131	86	217							217
08:00							87	65	152							152
09:00							51	38	89							89
10:00							26	28	54							54
11:00							20	10	30							30
Total	0	0		0	0		2584	2652		174	675		0	0		
Total			0			0			5236			849			0	
24 Hr. Ang.																6085
AM Peak							11:00	08:00	08:00	07:00	07:00	07:00				
Volume							174	506	607	92	412	504				
PM Peak							05:00	04:00	05:00							
Volume							426	203	628							

Default Report Title
Use Preferences to Define Titles

Superior Township

Plymouth W of M153
Vorhies M-153
Site Code: 0100840007
Start Date: 04 12 2023

Direction: EB

04 12 2023 Time	Motor Cycles	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	5 Axl Double	5 Axle Double	6 Axl Double	6 Axl Multi	6 Axle Multi	6 Axl Multi	nclassed	Total
12:00 AM															0
01:00 AM															0
02:00 AM															0
03:00 AM															0
04:00 AM															0
05:00 AM															0
06:00 AM															0
07:00 AM															0
08:00 AM	0	68	22	1	9	0	0	0	1	0	0	0	0	0	101
09:00 AM	0	66	29	2	13	0	2	3	1	0	0	0	0	0	116
10:00 AM	1	60	25	2	14	0	0	2	1	0	0	0	0	0	105
11:00 AM	4	119	33	1	17	0	0	0	0	0	0	0	0	0	174
12:00 PM	4	106	30	1	13	0	0	1	2	0	0	0	0	0	157
01:00 PM	1	79	26	1	19	0	0	0	0	1	0	0	0	0	127
02:00 PM	3	128	46	1	20	0	0	4	0	0	0	0	0	1	203
03:00 PM	5	214	48	4	17	0	0	5	0	0	0	0	0	3	296
04:00 PM	1	285	74	1	29	0	0	8	0	0	0	0	0	0	398
05:00 PM	5	317	73	2	24	0	0	4	0	0	0	0	0	1	426
06:00 PM	4	128	24	0	10	0	0	0	0	0	0	0	0	0	166
07:00 PM	4	85	33	0	8	0	0	0	1	0	0	0	0	0	131
08:00 PM	0	59	19	0	9	0	0	0	0	0	0	0	0	0	87
09:00 PM	2	44	4	0	1	0	0	0	0	0	0	0	0	0	51
10:00 PM	0	15	9	0	2	0	0	0	0	0	0	0	0	0	26
11:00 PM	0	16	4	0	0	0	0	0	0	0	0	0	0	0	20
Total	34	1789	499	16	205	0	2	27	6	1	0	0	0	5	2584
Percent	1.3	69.2	19.3	0.6	7.9	0.0	0.1	1.0	0.2	0.0	0.0	0.0	0.0	0.2	
AM Peak	11:00 AM	11:00 AM	11:00 AM	09:00 AM	11:00 AM		09:00 AM	09:00 AM	08:00 AM						11:00 AM
	4	119	33	2	17		2	3	1						174
PM Peak	03:00 PM	05:00 PM	04:00 PM	03:00 PM	04:00 PM			04:00 PM	12:00 PM	01:00 PM				03:00 PM	05:00 PM
	5	317	74	4	29			8	2	1				3	426

Default Report Title
Use Preferences to Define Titles

Superior Township

Plymouth W of M153
Vorhies M-153
Site Code: 0100840007
Start Date: 04 12 2023

Direction: EB

04 13 2023 Time	Motor Cycles	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	5 Axl Double	5 Axle Double	6 Axl Double	6 Axl Multi	6 Axle Multi	6 Axl Multi	nclassed	Total
12:00 AM	0	8	2	0	0	0	0	0	0	0	0	0	0	0	10
01:00 AM	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
02:00 AM	0	2	1	1	0	0	0	0	0	0	0	0	0	0	4
03:00 AM	0	3	1	0	0	0	0	0	0	0	0	0	0	0	4
04:00 AM	0	1	0	0	2	0	0	0	0	0	0	0	0	0	3
05:00 AM	0	6	3	0	2	0	0	0	0	0	0	0	0	0	11
06:00 AM	2	33	10	0	3	0	0	0	0	0	0	0	0	0	48
07:00 AM	0	62	21	2	6	0	0	0	0	1	0	0	0	0	92
08:00 AM															0
09:00 AM															0
10:00 AM															0
11:00 AM															0
12:00 PM															0
01:00 PM															0
02:00 PM															0
03:00 PM															0
04:00 PM															0
05:00 PM															0
06:00 PM															0
07:00 PM															0
08:00 PM															0
09:00 PM															0
10:00 PM															0
11:00 PM															0
Total	2	117	38	3	13	0	0	0	0	1	0	0	0	0	174
Percent	1.1	67.2	21.8	1.7	7.5	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	
AM Peak	06:00 AM	07:00 AM	07:00 AM	07:00 AM	07:00 AM					07:00 AM					07:00 AM
	2	62	21	2	6					1					92
PM Peak															

Default Report Title
Use Preferences to Define Titles

Superior Township

Plymouth W of M153
Vorhies M-153
Site Code: 0100840007
Start Date: 04 12 2023

Direction: WB

04 12 2023 Time	Motor Cycles	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	5 Axl Double	5 Axle Double	6 Axl Double	6 Axl Multi	6 Axle Multi	6 Axl Multi	nclassed	Total
12:00 AM															0
01:00 AM															0
02:00 AM															0
03:00 AM															0
04:00 AM															0
05:00 AM															0
06:00 AM															0
07:00 AM															0
08:00 AM	2	411	64	9	16	0	0	4	0	0	0	0	0	0	506
09:00 AM	2	217	36	0	17	1	0	11	0	0	0	0	0	2	286
10:00 AM	2	143	22	0	8	1	0	1	0	0	0	0	0	0	177
11:00 AM	2	126	27	0	5	1	0	1	0	1	0	0	0	0	163
12:00 PM	2	157	25	1	6	0	0	2	0	1	0	0	0	0	194
01:00 PM	0	134	33	0	4	0	0	1	0	0	0	0	0	1	173
02:00 PM	3	161	14	1	1	0	0	0	1	0	0	0	0	1	182
03:00 PM	3	150	26	1	5	0	0	1	0	0	0	0	0	1	187
04:00 PM	3	164	28	2	5	0	0	1	0	0	0	0	0	0	203
05:00 PM	3	173	22	0	3	0	0	1	0	0	0	0	0	0	202
06:00 PM	3	123	23	0	2	0	0	0	0	0	0	0	0	1	152
07:00 PM	1	77	7	0	0	0	0	1	0	0	0	0	0	0	86
08:00 PM	3	56	3	0	3	0	0	0	0	0	0	0	0	0	65
09:00 PM	0	34	3	0	0	0	0	1	0	0	0	0	0	0	38
10:00 PM	0	24	3	0	1	0	0	0	0	0	0	0	0	0	28
11:00 PM	0	8	1	0	1	0	0	0	0	0	0	0	0	0	10
Total	29	2158	337	14	77	3	0	25	1	2	0	0	0	6	2652
Percent	1.1	81.4	12.7	0.5	2.9	0.1	0.0	0.9	0.0	0.1	0.0	0.0	0.0	0.2	
AM Peak	08:00 AM	08:00 AM	08:00 AM	08:00 AM	09:00 AM	09:00 AM		09:00 AM		11:00 AM				09:00 AM	08:00 AM
	2	411	64	9	17	1		11		1				2	506
PM Peak	02:00 PM	05:00 PM	01:00 PM	04:00 PM	12:00 PM			12:00 PM	02:00 PM	12:00 PM				01:00 PM	04:00 PM
	3	173	33	2	6			2	1	1				1	203

Default Report Title
Use Preferences to Define Titles

Superior Township

Plymouth W of M153
Vorhies M-153
Site Code: 0100840007
Start Date: 04 12 2023

Direction: WB

04 13 2023 Time	Motor Cycles	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	5 Axl Double	5 Axle Double	6 Axl Double	6 Axl Multi	6 Axle Multi	6 Axl Multi	nclassed	Total
12:00 AM	0	4	1	0	0	0	0	0	0	0	0	0	0	0	5
01:00 AM	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
02:00 AM	0	7	0	0	0	0	0	0	0	0	0	0	0	0	7
03:00 AM	0	6	1	0	0	0	0	0	0	0	0	0	0	0	7
04:00 AM	0	5	4	0	0	0	0	0	0	0	0	0	0	0	9
05:00 AM	0	47	10	0	3	0	0	0	0	0	0	0	0	0	60
06:00 AM	2	116	34	1	18	0	0	1	0	0	0	0	0	1	173
07:00 AM	3	285	88	1	30	0	0	2	1	1	0	0	0	1	412
08:00 AM															0
09:00 AM															0
10:00 AM															0
11:00 AM															0
12:00 PM															0
01:00 PM															0
02:00 PM															0
03:00 PM															0
04:00 PM															0
05:00 PM															0
06:00 PM															0
07:00 PM															0
08:00 PM															0
09:00 PM															0
10:00 PM															0
11:00 PM															0
Total	5	472	138	2	51	0	0	3	1	1	0	0	0	2	675
Percent	0.7	69.9	20.4	0.3	7.6	0.0	0.0	0.4	0.1	0.1	0.0	0.0	0.0	0.3	
AM Peak	07:00 AM	07:00 AM	07:00 AM	06:00 AM	07:00 AM			07:00 AM	07:00 AM	07:00 AM				06:00 AM	07:00 AM
	3	285	88	1	30			2	1	1				1	412
PM Peak															

Default Report Title
Use Preferences to Define Titles

Superior Township

Plymouth W of M153
Vorhies M-153
Site Code: 0100840007
Start Date: 04 12 2023

Direction: Combined

04 12 2023 Time	Motor Cycles	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	5 Axl Double	5 Axle Double	6 Axl Double	6 Axl Multi	6 Axle Multi	6 Axl Multi	nclassed	Total
12:00 AM															0
01:00 AM															0
02:00 AM															0
03:00 AM															0
04:00 AM															0
05:00 AM															0
06:00 AM															0
07:00 AM															0
08:00 AM	2	479	86	10	25	0	0	4	1	0	0	0	0	0	607
09:00 AM	2	283	65	2	30	1	2	14	1	0	0	0	0	2	402
10:00 AM	3	203	47	2	22	1	0	3	1	0	0	0	0	0	282
11:00 AM	6	245	60	1	22	1	0	1	0	1	0	0	0	0	337
12:00 PM	6	263	55	2	19	0	0	3	2	1	0	0	0	0	351
01:00 PM	1	213	59	1	23	0	0	1	0	1	0	0	0	1	300
02:00 PM	6	289	60	2	21	0	0	4	1	0	0	0	0	2	385
03:00 PM	8	364	74	5	22	0	0	6	0	0	0	0	0	4	483
04:00 PM	4	449	102	3	34	0	0	9	0	0	0	0	0	0	601
05:00 PM	8	490	95	2	27	0	0	5	0	0	0	0	0	1	628
06:00 PM	7	251	47	0	12	0	0	0	0	0	0	0	0	1	318
07:00 PM	5	162	40	0	8	0	0	1	1	0	0	0	0	0	217
08:00 PM	3	115	22	0	12	0	0	0	0	0	0	0	0	0	152
09:00 PM	2	78	7	0	1	0	0	1	0	0	0	0	0	0	89
10:00 PM	0	39	12	0	3	0	0	0	0	0	0	0	0	0	54
11:00 PM	0	24	5	0	1	0	0	0	0	0	0	0	0	0	30
Total	63	3947	836	30	282	3	2	52	7	3	0	0	0	11	5236
Percent	1.2	75.4	16.0	0.6	5.4	0.1	0.0	1.0	0.1	0.1	0.0	0.0	0.0	0.2	
AM Peak	11:00 AM	08:00 AM	08:00 AM	08:00 AM	09:00 AM	09:00 AM	09:00 AM	09:00 AM	08:00 AM	11:00 AM				09:00 AM	08:00 AM
	6	479	86	10	30	1	2	14	1	1				2	607
PM Peak	03:00 PM	05:00 PM	04:00 PM	03:00 PM	04:00 PM			04:00 PM	12:00 PM	12:00 PM				03:00 PM	05:00 PM
	8	490	102	5	34			9	2	1				4	628

Default Report Title
Use Preferences to Define Titles

Superior Township

Plymouth W of M153
Vorhies M-153
Site Code: 0100840007
Start Date: 04 12 2023

Direction: Combined

04 13 2023 Time	Motor Cycles	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	5 Axl Double	5 Axle Double	6 Axl Double	6 Axl Multi	6 Axle Multi	6 Axl Multi	nclassed	Total
12:00 AM	0	12	3	0	0	0	0	0	0	0	0	0	0	0	15
01:00 AM	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4
02:00 AM	0	9	1	1	0	0	0	0	0	0	0	0	0	0	11
03:00 AM	0	9	2	0	0	0	0	0	0	0	0	0	0	0	11
04:00 AM	0	6	4	0	2	0	0	0	0	0	0	0	0	0	12
05:00 AM	0	53	13	0	5	0	0	0	0	0	0	0	0	0	71
06:00 AM	4	149	44	1	21	0	0	1	0	0	0	0	0	1	221
07:00 AM	3	347	109	3	36	0	0	2	1	2	0	0	0	1	504
08:00 AM															0
09:00 AM															0
10:00 AM															0
11:00 AM															0
12:00 PM															0
01:00 PM															0
02:00 PM															0
03:00 PM															0
04:00 PM															0
05:00 PM															0
06:00 PM															0
07:00 PM															0
08:00 PM															0
09:00 PM															0
10:00 PM															0
11:00 PM															0
Total	7	589	176	5	64	0	0	3	1	2	0	0	0	2	849
Percent	0.8	69.4	20.7	0.6	7.5	0.0	0.0	0.4	0.1	0.2	0.0	0.0	0.0	0.2	
AM Peak	06:00 AM	07:00 AM	07:00 AM	07:00 AM	07:00 AM			07:00 AM	07:00 AM	07:00 AM				06:00 AM	07:00 AM
	4	347	109	3	36			2	1	2				1	504
PM Peak															

Default Report Title
Use Preferences to Define Titles

Superior Township

Plymouth W of M153
Vorhies M-153
Site Code: 0100840007
Start Date: 04 12 2023

Direction: Combined

04 12 2023 Time	0 - 25 MPH	25 - 35 MPH	35 - 40 MPH	40 - 45 MPH	45 - 47 MPH	47 - 50 MPH	50 - 52 MPH	52 - 55 MPH	55 - 57 MPH	57 - 60 MPH	60 - 62 MPH	62 - 64 MPH	64 - 66 MPH	66 MPH	Total
12:00 AM															0
1:00															0
2:00															0
3:00															0
4:00															0
5:00															0
6:00															0
7:00															0
8:00	0	0	5	24	32	109	112	179	59	55	17	6	5	4	607
9:00	1	1	0	20	27	90	69	72	41	46	14	11	4	6	402
10:00	1	0	3	14	26	55	39	74	22	22	11	4	5	6	282
11:00	5	1	8	22	19	52	55	79	44	34	8	4	3	3	337
12:00 PM	1	0	1	20	11	75	59	85	32	41	9	12	3	2	351
1:00	1	1	0	10	14	46	60	77	31	40	13	5	1	1	300
2:00	1	5	4	10	17	66	62	91	51	44	16	7	7	4	385
3:00	7	0	3	14	21	72	84	124	72	55	17	5	3	6	483
4:00	0	0	2	19	26	81	81	152	94	92	29	10	6	9	601
5:00	0	4	2	19	20	79	90	153	104	98	37	19	1	2	628
6:00	2	1	7	8	20	35	47	78	50	36	16	6	5	7	318
7:00	2	2	2	10	11	30	27	51	31	33	6	7	3	2	217
8:00	1	2	5	16	11	30	19	41	12	11	2	1	0	1	152
9:00	0	0	6	3	4	16	12	24	12	9	0	0	2	1	89
10:00	0	1	0	3	2	6	7	14	7	6	2	3	1	2	54
11:00	0	0	0	4	2	6	3	4	3	3	2	0	1	2	30
Total	22	18	48	216	263	848	826	1298	665	625	199	100	50	58	5236

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Superior Township

Plymouth W of M153
Vorhies M-153
Site Code: 0100840007
Start Date: 04 12 2023

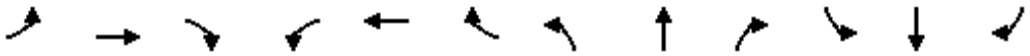
Direction: Combined

04 13 2023 Time	0 - 25 MPH	25 - 35 MPH	35 - 40 MPH	40 - 45 MPH	45 - 47 MPH	47 - 50 MPH	50 - 52 MPH	52 - 55 MPH	55 - 57 MPH	57 - 60 MPH	60 - 62 MPH	62 - 64 MPH	64 - 66 MPH	66 MPH	Total
12:00 AM	0	0	1	1	2	0	3	4	1	1	1	0	0	1	15
1:00	0	0	0	0	0	2	0	1	0	1	0	0	0	0	4
2:00	0	0	1	1	0	1	3	2	2	1	0	0	0	0	11
3:00	0	0	0	3	3	2	0	2	0	0	0	0	0	1	11
4:00	0	0	1	2	0	3	2	1	0	3	0	0	0	0	12
5:00	0	0	0	2	1	8	11	19	10	12	4	0	2	2	71
6:00	0	1	0	4	3	19	17	48	38	42	21	11	11	6	221
7:00	0	1	3	17	13	54	53	119	78	87	38	22	9	10	504
8:00															0
9:00															0
10:00															0
11:00															0
12:00 PM															0
1:00															0
2:00															0
3:00															0
4:00															0
5:00															0
6:00															0
7:00															0
8:00															0
9:00															0
10:00															0
11:00															0
Total	0	2	6	30	22	89	89	196	129	147	64	33	22	20	849
Grand Total	22	20	54	246	285	937	915	1494	794	772	263	133	72	78	6085

Stats		Percentile	15th	50th	85th	95th
		Speed	48	53	58	62
	Mean Speed (Average)		54.2			
	10 MPH Pace Speed		47-56			
	Number in Pace		4115			
	Percent in Pace		67.6			
	Number	55 MPH	2112			
	Percent	55 MPH	34.7			

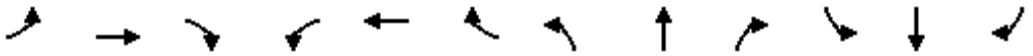
Appendix 2

Existing LOS Output Reports



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	34	792	2	48	177	0	0	332	262
Future Volume (vph)	0	0	0	34	792	2	48	177	0	0	332	262
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					7.0	7.0		6.7			9.7	
Lane Util. Factor					0.95	1.00		0.95			0.95	
Frt					1.00	0.85		1.00			0.93	
Flt Protected					1.00	1.00		0.99			1.00	
Satd. Flow (prot)					3532	1583		3502			3273	
Flt Permitted					1.00	1.00		0.66			1.00	
Satd. Flow (perm)					3532	1583		2318			3273	
Peak-hour factor, PHF	0.89	0.89	0.89	0.90	0.90	0.90	0.81	0.81	0.81	0.77	0.77	0.77
Adj. Flow (vph)	0	0	0	38	880	2	59	219	0	0	431	340
RTOR Reduction (vph)	0	0	0	0	0	1	0	0	0	0	67	0
Lane Group Flow (vph)	0	0	0	0	918	1	0	278	0	0	704	0
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	2%	2%	2%	3%	3%	3%
Turn Type				Perm	NA	Perm	Perm	NA			NA	
Protected Phases					6			8			4	
Permitted Phases				6		6	8					
Actuated Green, G (s)					38.1	38.1		24.7			21.7	
Effective Green, g (s)					38.1	38.1		24.7			21.7	
Actuated g/C Ratio					0.50	0.50		0.32			0.28	
Clearance Time (s)					7.0	7.0		6.7			9.7	
Vehicle Extension (s)					3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)					1759	788		748			928	
v/s Ratio Prot											c0.22	
v/s Ratio Perm					0.26	0.00		0.12				
v/c Ratio					0.52	0.00		0.37			0.76	
Uniform Delay, d1					13.0	9.6		19.9			25.0	
Progression Factor					1.00	1.00		0.72			1.00	
Incremental Delay, d2					1.1	0.0		0.3			3.6	
Delay (s)					14.1	9.6		14.7			28.6	
Level of Service					B	A		B			C	
Approach Delay (s)		0.0			14.1			14.7			28.6	
Approach LOS		A			B			B			C	

Intersection Summary			
HCM 2000 Control Delay	19.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	76.5	Sum of lost time (s)	16.7
Intersection Capacity Utilization	66.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	79	521	255	0	0	0	0	146	12	1	365	0
Future Volume (vph)	79	521	255	0	0	0	0	146	12	1	365	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0					9.7			6.7	
Lane Util. Factor	1.00	0.95	1.00					0.95			0.95	
Frt	1.00	1.00	0.85					0.99			1.00	
Flt Protected	0.95	1.00	1.00					1.00			1.00	
Satd. Flow (prot)	1736	3471	1553					3498			3504	
Flt Permitted	0.95	1.00	1.00					1.00			0.95	
Satd. Flow (perm)	1736	3471	1553					3498			3345	
Peak-hour factor, PHF	0.89	0.89	0.89	0.90	0.90	0.90	0.81	0.81	0.81	0.77	0.77	0.77
Adj. Flow (vph)	89	585	287	0	0	0	0	180	15	1	474	0
RTOR Reduction (vph)	0	0	94	0	0	0	0	8	0	0	0	0
Lane Group Flow (vph)	89	585	193	0	0	0	0	187	0	0	475	0
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	2%	2%	2%	3%	3%	3%
Turn Type	Perm	NA	Perm					NA		Perm	NA	
Protected Phases		2						4			8	
Permitted Phases	2		2							8		
Actuated Green, G (s)	38.1	38.1	38.1					21.7			24.7	
Effective Green, g (s)	38.1	38.1	38.1					21.7			24.7	
Actuated g/C Ratio	0.50	0.50	0.50					0.28			0.32	
Clearance Time (s)	7.0	7.0	7.0					9.7			6.7	
Vehicle Extension (s)	3.0	3.0	3.0					3.0			3.0	
Lane Grp Cap (vph)	864	1728	773					992			1080	
v/s Ratio Prot		c0.17						0.05				
v/s Ratio Perm	0.05		0.12								c0.14	
v/c Ratio	0.10	0.34	0.25					0.19			0.44	
Uniform Delay, d1	10.2	11.6	11.0					20.7			20.4	
Progression Factor	1.00	1.00	1.00					1.00			0.23	
Incremental Delay, d2	0.2	0.5	0.8					0.1			0.2	
Delay (s)	10.4	12.1	11.8					20.8			5.0	
Level of Service	B	B	B					C			A	
Approach Delay (s)		11.9			0.0			20.8			5.0	
Approach LOS		B			A			C			A	

Intersection Summary			
HCM 2000 Control Delay	10.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	76.5	Sum of lost time (s)	16.7
Intersection Capacity Utilization	37.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 100: Plymouth Road & WB M-153

Movement	WB	WB	WB	NB	NB	SB	SB
Directions Served	LT	T	R	LT	T	T	TR
Maximum Queue (ft)	216	184	14	68	70	112	104
Average Queue (ft)	105	61	1	32	9	72	43
95th Queue (ft)	180	142	6	58	34	124	87
Link Distance (ft)	517	517		17	17	58	58
Upstream Blk Time (%)				42	8	15	3
Queuing Penalty (veh)				48	9	46	10
Storage Bay Dist (ft)			225				
Storage Blk Time (%)		0					
Queuing Penalty (veh)		0					

Intersection: 101: Plymouth Road & EB M-153

Movement	EB	EB	EB	EB	NB	NB	SB	SB
Directions Served	L	T	T	R	T	TR	LT	T
Maximum Queue (ft)	46	162	112	151	80	68	59	45
Average Queue (ft)	6	75	34	58	24	11	18	8
95th Queue (ft)	23	138	83	116	60	41	43	29
Link Distance (ft)		506	506		1052		17	17
Upstream Blk Time (%)							19	8
Queuing Penalty (veh)							35	15
Storage Bay Dist (ft)	150			315		125		
Storage Blk Time (%)		0						
Queuing Penalty (veh)		0						

Intersection: 200: Plymouth Road & East Site Driveway

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 300: Plymouth Road & West Site Driveway

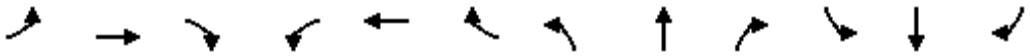
Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 9000: Plymouth Road

Movement	WB	WB
Directions Served	T	T
Maximum Queue (ft)	85	7
Average Queue (ft)	10	0
95th Queue (ft)	48	5
Link Distance (ft)	1259	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		275
Storage Blk Time (%)		
Queuing Penalty (veh)		

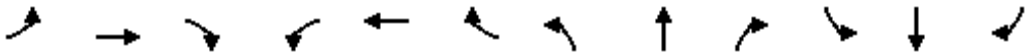
Network Summary

Network wide Queuing Penalty: 164



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	15	525	2	98	448	0	0	130	120
Future Volume (vph)	0	0	0	15	525	2	98	448	0	0	130	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					7.0	7.0		6.7			9.7	
Lane Util. Factor					0.95	1.00		0.95			0.95	
Frt					1.00	0.85		1.00			0.93	
Flt Protected					1.00	1.00		0.99			1.00	
Satd. Flow (prot)					3534	1583		3578			3252	
Flt Permitted					1.00	1.00		0.82			1.00	
Satd. Flow (perm)					3534	1583		2977			3252	
Peak-hour factor, PHF	0.91	0.91	0.91	0.85	0.85	0.85	0.88	0.88	0.88	0.94	0.94	0.94
Adj. Flow (vph)	0	0	0	18	618	2	111	509	0	0	138	128
RTOR Reduction (vph)	0	0	0	0	0	1	0	0	0	0	97	0
Lane Group Flow (vph)	0	0	0	0	636	1	0	620	0	0	169	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	0%	0%	0%	3%	3%	3%
Turn Type				Perm	NA	Perm	Perm	NA			NA	
Protected Phases					6			8			4	
Permitted Phases				6		6	8					
Actuated Green, G (s)					38.2	38.2		20.4			17.4	
Effective Green, g (s)					38.2	38.2		20.4			17.4	
Actuated g/C Ratio					0.53	0.53		0.28			0.24	
Clearance Time (s)					7.0	7.0		6.7			9.7	
Vehicle Extension (s)					3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)					1867	836		839			782	
v/s Ratio Prot											0.05	
v/s Ratio Perm					0.18	0.00		c0.21				
v/c Ratio					0.34	0.00		0.74			0.22	
Uniform Delay, d1					9.8	8.0		23.5			22.0	
Progression Factor					1.00	1.00		0.58			1.00	
Incremental Delay, d2					0.5	0.0		3.3			0.1	
Delay (s)					10.3	8.0		17.1			22.1	
Level of Service					B	A		B			C	
Approach Delay (s)		0.0			10.3			17.1			22.1	
Approach LOS		A			B			B			C	

Intersection Summary			
HCM 2000 Control Delay	15.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	72.3	Sum of lost time (s)	16.7
Intersection Capacity Utilization	57.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	166	873	84	0	0	0	0	380	25	1	144	0
Future Volume (vph)	166	873	84	0	0	0	0	380	25	1	144	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0					9.7			6.7	
Lane Util. Factor	1.00	0.95	1.00					0.95			0.95	
Frt	1.00	1.00	0.85					0.99			1.00	
Flt Protected	0.95	1.00	1.00					1.00			1.00	
Satd. Flow (prot)	1770	3539	1583					3577			3504	
Flt Permitted	0.95	1.00	1.00					1.00			0.95	
Satd. Flow (perm)	1770	3539	1583					3577			3336	
Peak-hour factor, PHF	0.91	0.91	0.91	0.85	0.85	0.85	0.88	0.88	0.88	0.94	0.94	0.94
Adj. Flow (vph)	182	959	92	0	0	0	0	432	28	1	153	0
RTOR Reduction (vph)	0	0	43	0	0	0	0	7	0	0	0	0
Lane Group Flow (vph)	182	959	49	0	0	0	0	453	0	0	154	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	0%	0%	0%	3%	3%	3%
Turn Type	Perm	NA	Perm					NA		Perm	NA	
Protected Phases		2						4			8	
Permitted Phases	2		2							8		
Actuated Green, G (s)	38.2	38.2	38.2					17.4			20.4	
Effective Green, g (s)	38.2	38.2	38.2					17.4			20.4	
Actuated g/C Ratio	0.53	0.53	0.53					0.24			0.28	
Clearance Time (s)	7.0	7.0	7.0					9.7			6.7	
Vehicle Extension (s)	3.0	3.0	3.0					3.0			3.0	
Lane Grp Cap (vph)	935	1869	836					860			941	
v/s Ratio Prot		c0.27						c0.13				
v/s Ratio Perm	0.10		0.03								0.05	
v/c Ratio	0.19	0.51	0.06					0.53			0.16	
Uniform Delay, d1	9.0	11.0	8.3					23.9			19.5	
Progression Factor	1.00	1.00	1.00					1.00			0.59	
Incremental Delay, d2	0.5	1.0	0.1					0.6			0.1	
Delay (s)	9.4	12.0	8.4					24.5			11.7	
Level of Service	A	B	A					C			B	
Approach Delay (s)		11.4			0.0			24.5			11.7	
Approach LOS		B			A			C			B	

Intersection Summary			
HCM 2000 Control Delay	14.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	72.3	Sum of lost time (s)	16.7
Intersection Capacity Utilization	49.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 100: Plymouth Road & WB M-153

Movement	WB	WB	WB	NB	NB	SB	SB
Directions Served	LT	T	R	LT	T	T	TR
Maximum Queue (ft)	161	104	14	107	124	70	49
Average Queue (ft)	64	24	1	56	39	17	7
95th Queue (ft)	130	71	6	89	96	48	32
Link Distance (ft)	517	517		17	17	58	58
Upstream Blk Time (%)				52	24	1	0
Queuing Penalty (veh)				141	66	1	0
Storage Bay Dist (ft)			225				
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 101: Plymouth Road & EB M-153

Movement	EB	EB	EB	EB	NB	NB	SB	SB
Directions Served	L	T	T	R	T	TR	LT	T
Maximum Queue (ft)	170	210	176	60	150	148	22	17
Average Queue (ft)	35	114	80	18	67	55	10	1
95th Queue (ft)	106	180	149	42	117	115	27	8
Link Distance (ft)		506	506		1052		17	17
Upstream Blk Time (%)							9	1
Queuing Penalty (veh)							6	1
Storage Bay Dist (ft)	150			315		125		
Storage Blk Time (%)	0	2			1	0		
Queuing Penalty (veh)	1	3			2	1		

Intersection: 200: Plymouth Road & East Site Driveway

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 300: Plymouth Road & West Site Driveway

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 9000: Plymouth Road

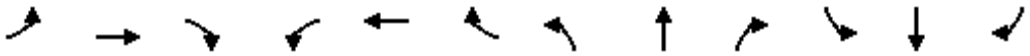
Movement	EB	EB
Directions Served	T	T
Maximum Queue (ft)	48	52
Average Queue (ft)	5	3
95th Queue (ft)	27	23
Link Distance (ft)	58	58
Upstream Blk Time (%)	0	0
Queuing Penalty (veh)	0	0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 222

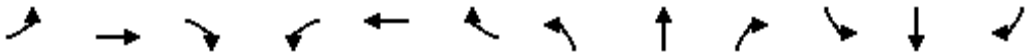
Appendix 3

Background LOS Output Reports



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	35	824	2	50	185	0	0	345	273
Future Volume (vph)	0	0	0	35	824	2	50	185	0	0	345	273
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					7.0	7.0		6.7			9.7	
Lane Util. Factor					0.95	1.00		0.95			0.95	
Frt					1.00	0.85		1.00			0.93	
Flt Protected					1.00	1.00		0.99			1.00	
Satd. Flow (prot)					3532	1583		3502			3272	
Flt Permitted					1.00	1.00		0.64			1.00	
Satd. Flow (perm)					3532	1583		2259			3272	
Peak-hour factor, PHF	0.89	0.89	0.89	0.90	0.90	0.90	0.81	0.81	0.81	0.77	0.77	0.77
Adj. Flow (vph)	0	0	0	39	916	2	62	228	0	0	448	355
RTOR Reduction (vph)	0	0	0	0	0	1	0	0	0	0	59	0
Lane Group Flow (vph)	0	0	0	0	955	1	0	290	0	0	744	0
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	2%	2%	2%	3%	3%	3%
Turn Type				Perm	NA	Perm	Perm	NA			NA	
Protected Phases					6			8			4	
Permitted Phases				6		6	8					
Actuated Green, G (s)					38.1	38.1		25.6			22.6	
Effective Green, g (s)					38.1	38.1		25.6			22.6	
Actuated g/C Ratio					0.49	0.49		0.33			0.29	
Clearance Time (s)					7.0	7.0		6.7			9.7	
Vehicle Extension (s)					3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)					1738	779		747			955	
v/s Ratio Prot											c0.23	
v/s Ratio Perm					0.27	0.00		0.13				
v/c Ratio					0.55	0.00		0.39			0.78	
Uniform Delay, d1					13.7	10.0		19.9			25.1	
Progression Factor					1.00	1.00		0.73			1.00	
Incremental Delay, d2					1.3	0.0		0.3			4.1	
Delay (s)					14.9	10.0		14.9			29.2	
Level of Service					B	A		B			C	
Approach Delay (s)		0.0			14.9			14.9			29.2	
Approach LOS		A			B			B			C	

Intersection Summary			
HCM 2000 Control Delay	20.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	77.4	Sum of lost time (s)	16.7
Intersection Capacity Utilization	68.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	83	542	265	0	0	0	0	152	12	1	379	0
Future Volume (vph)	83	542	265	0	0	0	0	152	12	1	379	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0					9.7			6.7	
Lane Util. Factor	1.00	0.95	1.00					0.95			0.95	
Frt	1.00	1.00	0.85					0.99			1.00	
Flt Protected	0.95	1.00	1.00					1.00			1.00	
Satd. Flow (prot)	1736	3471	1553					3500			3504	
Flt Permitted	0.95	1.00	1.00					1.00			0.95	
Satd. Flow (perm)	1736	3471	1553					3500			3346	
Peak-hour factor, PHF	0.89	0.89	0.89	0.90	0.90	0.90	0.81	0.81	0.81	0.77	0.77	0.77
Adj. Flow (vph)	93	609	298	0	0	0	0	188	15	1	492	0
RTOR Reduction (vph)	0	0	89	0	0	0	0	8	0	0	0	0
Lane Group Flow (vph)	93	609	209	0	0	0	0	195	0	0	493	0
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	2%	2%	2%	3%	3%	3%
Turn Type	Perm	NA	Perm					NA		Perm	NA	
Protected Phases		2						4			8	
Permitted Phases	2		2							8		
Actuated Green, G (s)	38.1	38.1	38.1					22.6			25.6	
Effective Green, g (s)	38.1	38.1	38.1					22.6			25.6	
Actuated g/C Ratio	0.49	0.49	0.49					0.29			0.33	
Clearance Time (s)	7.0	7.0	7.0					9.7			6.7	
Vehicle Extension (s)	3.0	3.0	3.0					3.0			3.0	
Lane Grp Cap (vph)	854	1708	764					1021			1106	
v/s Ratio Prot		c0.18						0.06				
v/s Ratio Perm	0.05		0.13								c0.15	
v/c Ratio	0.11	0.36	0.27					0.19			0.45	
Uniform Delay, d1	10.5	12.1	11.5					20.5			20.3	
Progression Factor	1.00	1.00	1.00					1.00			0.22	
Incremental Delay, d2	0.3	0.6	0.9					0.1			0.2	
Delay (s)	10.8	12.7	12.4					20.6			4.6	
Level of Service	B	B	B					C			A	
Approach Delay (s)		12.4			0.0			20.6			4.6	
Approach LOS		B			A			C			A	

Intersection Summary			
HCM 2000 Control Delay	11.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	77.4	Sum of lost time (s)	16.7
Intersection Capacity Utilization	38.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 100: Plymouth Road & WB M-153

Movement	WB	WB	WB	NB	NB	SB	SB
Directions Served	LT	T	R	LT	T	T	TR
Maximum Queue (ft)	204	162	14	74	60	122	115
Average Queue (ft)	108	59	1	33	13	75	53
95th Queue (ft)	180	135	6	62	40	125	102
Link Distance (ft)	517	517		17	17	58	58
Upstream Blk Time (%)				43	11	16	6
Queuing Penalty (veh)				52	13	52	19
Storage Bay Dist (ft)			225				
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 101: Plymouth Road & EB M-153

Movement	EB	EB	EB	EB	NB	NB	SB	SB
Directions Served	L	T	T	R	T	TR	LT	T
Maximum Queue (ft)	59	170	129	155	98	82	82	44
Average Queue (ft)	9	78	34	69	27	14	22	9
95th Queue (ft)	36	136	89	128	73	55	52	32
Link Distance (ft)		506	506		1052		17	17
Upstream Blk Time (%)							22	8
Queuing Penalty (veh)							44	18
Storage Bay Dist (ft)	150			315		125		
Storage Blk Time (%)		0			0	0		
Queuing Penalty (veh)		0			0	0		

Intersection: 200: Plymouth Road & East Site Driveway

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 300: Plymouth Road & West Site Driveway

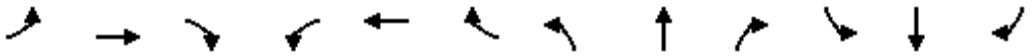
Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 9000: Plymouth Road

Movement	WB	WB
Directions Served	T	T
Maximum Queue (ft)	79	71
Average Queue (ft)	12	3
95th Queue (ft)	50	30
Link Distance (ft)	1259	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		275
Storage Blk Time (%)		
Queuing Penalty (veh)		

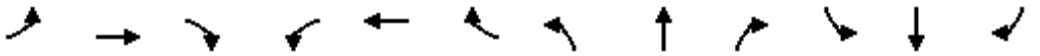
Network Summary

Network wide Queuing Penalty: 199



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	16	546	2	102	465	0	0	135	125
Future Volume (vph)	0	0	0	16	546	2	102	465	0	0	135	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					7.0	7.0		6.7			9.7	
Lane Util. Factor					0.95	1.00		0.95			0.95	
Frt					1.00	0.85		1.00			0.93	
Flt Protected					1.00	1.00		0.99			1.00	
Satd. Flow (prot)					3534	1583		3578			3252	
Flt Permitted					1.00	1.00		0.82			1.00	
Satd. Flow (perm)					3534	1583		2962			3252	
Peak-hour factor, PHF	0.91	0.91	0.91	0.85	0.85	0.85	0.88	0.88	0.88	0.94	0.94	0.94
Adj. Flow (vph)	0	0	0	19	642	2	116	528	0	0	144	133
RTOR Reduction (vph)	0	0	0	0	0	1	0	0	0	0	100	0
Lane Group Flow (vph)	0	0	0	0	661	1	0	644	0	0	177	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	0%	0%	0%	3%	3%	3%
Turn Type				Perm	NA	Perm	Perm	NA			NA	
Protected Phases					6			8			4	
Permitted Phases				6		6	8					
Actuated Green, G (s)					38.2	38.2		21.2			18.2	
Effective Green, g (s)					38.2	38.2		21.2			18.2	
Actuated g/C Ratio					0.52	0.52		0.29			0.25	
Clearance Time (s)					7.0	7.0		6.7			9.7	
Vehicle Extension (s)					3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)					1846	827		859			809	
v/s Ratio Prot											0.05	
v/s Ratio Perm					0.19	0.00		c0.22				
v/c Ratio					0.36	0.00		0.75			0.22	
Uniform Delay, d1					10.2	8.3		23.5			21.8	
Progression Factor					1.00	1.00		0.59			1.00	
Incremental Delay, d2					0.5	0.0		3.5			0.1	
Delay (s)					10.8	8.3		17.4			21.9	
Level of Service					B	A		B			C	
Approach Delay (s)		0.0			10.8			17.4			21.9	
Approach LOS		A			B			B			C	

Intersection Summary			
HCM 2000 Control Delay	15.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	73.1	Sum of lost time (s)	16.7
Intersection Capacity Utilization	58.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	172	909	87	0	0	0	0	395	26	1	150	0
Future Volume (vph)	172	909	87	0	0	0	0	395	26	1	150	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0					9.7			6.7	
Lane Util. Factor	1.00	0.95	1.00					0.95			0.95	
Frt	1.00	1.00	0.85					0.99			1.00	
Flt Protected	0.95	1.00	1.00					1.00			1.00	
Satd. Flow (prot)	1770	3539	1583					3576			3504	
Flt Permitted	0.95	1.00	1.00					1.00			0.95	
Satd. Flow (perm)	1770	3539	1583					3576			3337	
Peak-hour factor, PHF	0.91	0.91	0.91	0.85	0.85	0.85	0.88	0.88	0.88	0.94	0.94	0.94
Adj. Flow (vph)	189	999	96	0	0	0	0	449	30	1	160	0
RTOR Reduction (vph)	0	0	46	0	0	0	0	7	0	0	0	0
Lane Group Flow (vph)	189	999	50	0	0	0	0	472	0	0	161	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	0%	0%	0%	3%	3%	3%
Turn Type	Perm	NA	Perm					NA		Perm	NA	
Protected Phases		2						4			8	
Permitted Phases	2		2							8		
Actuated Green, G (s)	38.2	38.2	38.2					18.2			21.2	
Effective Green, g (s)	38.2	38.2	38.2					18.2			21.2	
Actuated g/C Ratio	0.52	0.52	0.52					0.25			0.29	
Clearance Time (s)	7.0	7.0	7.0					9.7			6.7	
Vehicle Extension (s)	3.0	3.0	3.0					3.0			3.0	
Lane Grp Cap (vph)	924	1849	827					890			967	
v/s Ratio Prot		c0.28						c0.13				
v/s Ratio Perm	0.11		0.03								0.05	
v/c Ratio	0.20	0.54	0.06					0.53			0.17	
Uniform Delay, d1	9.3	11.6	8.6					23.8			19.4	
Progression Factor	1.00	1.00	1.00					1.00			0.60	
Incremental Delay, d2	0.5	1.1	0.1					0.6			0.1	
Delay (s)	9.8	12.7	8.7					24.4			11.7	
Level of Service	A	B	A					C			B	
Approach Delay (s)		12.0			0.0			24.4			11.7	
Approach LOS		B			A			C			B	

Intersection Summary			
HCM 2000 Control Delay	15.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	73.1	Sum of lost time (s)	16.7
Intersection Capacity Utilization	50.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 100: Plymouth Road & WB M-153

Movement	WB	WB	WB	NB	NB	SB	SB
Directions Served	LT	T	R	LT	T	T	TR
Maximum Queue (ft)	135	116	19	114	137	75	52
Average Queue (ft)	69	29	1	57	44	21	6
95th Queue (ft)	123	79	9	92	103	56	31
Link Distance (ft)	517	517		17	17	58	58
Upstream Blk Time (%)				54	29	1	0
Queuing Penalty (veh)				152	81	1	0
Storage Bay Dist (ft)			225				
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 101: Plymouth Road & EB M-153

Movement	EB	EB	EB	EB	NB	NB	SB	SB
Directions Served	L	T	T	R	T	TR	LT	T
Maximum Queue (ft)	131	230	192	60	151	144	35	22
Average Queue (ft)	31	115	84	19	78	64	11	2
95th Queue (ft)	87	183	159	43	139	126	29	12
Link Distance (ft)		506	506		1052		17	17
Upstream Blk Time (%)							11	1
Queuing Penalty (veh)							8	1
Storage Bay Dist (ft)	150			315		125		
Storage Blk Time (%)	0	2			2	1		
Queuing Penalty (veh)	0	3			4	2		

Intersection: 200: Plymouth Road & East Site Driveway

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 300: Plymouth Road & West Site Driveway

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 9000: Plymouth Road

Movement	EB	EB
Directions Served	T	T
Maximum Queue (ft)	62	63
Average Queue (ft)	7	7
95th Queue (ft)	37	35
Link Distance (ft)	58	58
Upstream Blk Time (%)	0	0
Queuing Penalty (veh)	1	0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 254

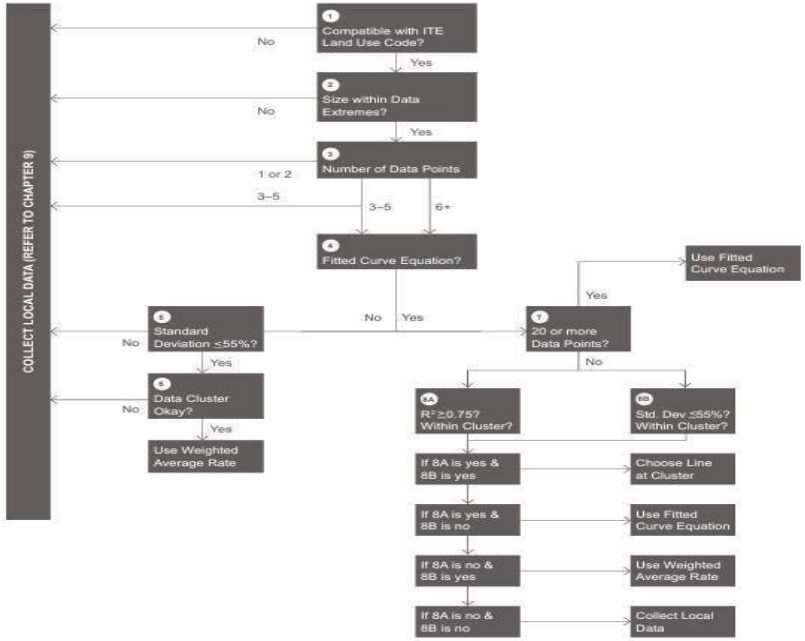
Appendix 4

Trip Generation Calculations

ITE Land Use	Land Use Code	Units	AM Peak Hour			PM Peak Hour			Weekday
			In	Out	Total	In	Out	Total	
Single-Family Detached Housing	210	21 DU	5	13	18	14	9	23	240
		Total	5	13	18	14	9	23	240

ITE Land Use	Land Use Code	Units	Time Period	Equation	R2	Rate	Pass-By	Studies	Notes
Single-Family Detached Housing	210	21 DU	AM	Ln(T)=0.91 Ln(X)+ 0.12	0.9	0.7	-	192	# Studies>20, Use Fitted Curve
			PM	Ln(T)=0.94 Ln(X)+ 0.27	0.92	0.94	-	208	# Studies>20, Use Fitted Curve
			Weekday	Ln(T)=0.92 Ln(X)+ 2.68	0.95	9.43	-	174	# Studies>20, Use Fitted Curve

Figure 4.2 Process for Selecting Average Rate or Equation in *Trip Generation Manual* Data



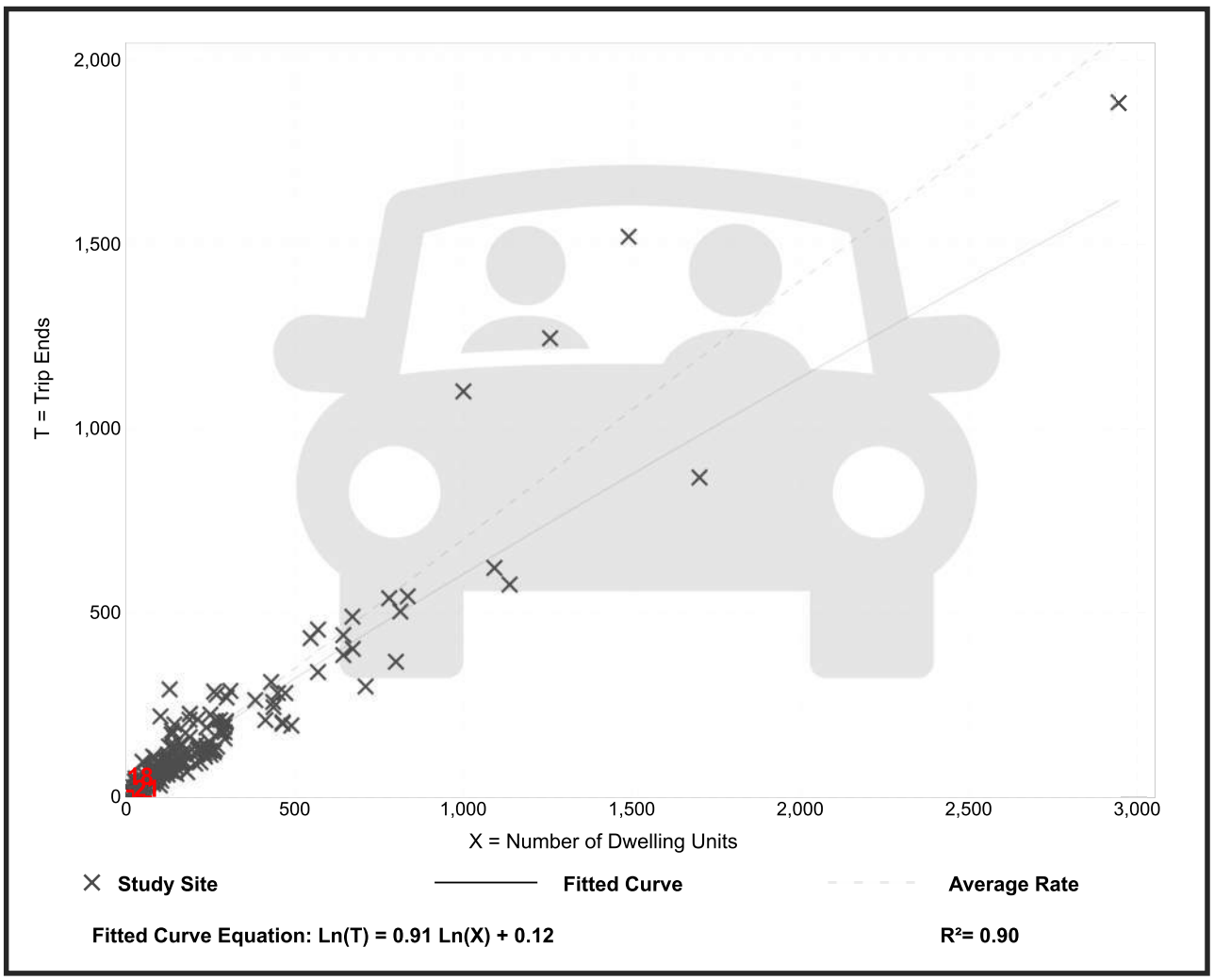
Single-Family Detached Housing
(210)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 192
Avg. Num. of Dwelling Units: 226
Directional Distribution: 25% entering, 75% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.70	0.27 - 2.27	0.24

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.91 Ln(X) + 0.12

R^2= 0.90

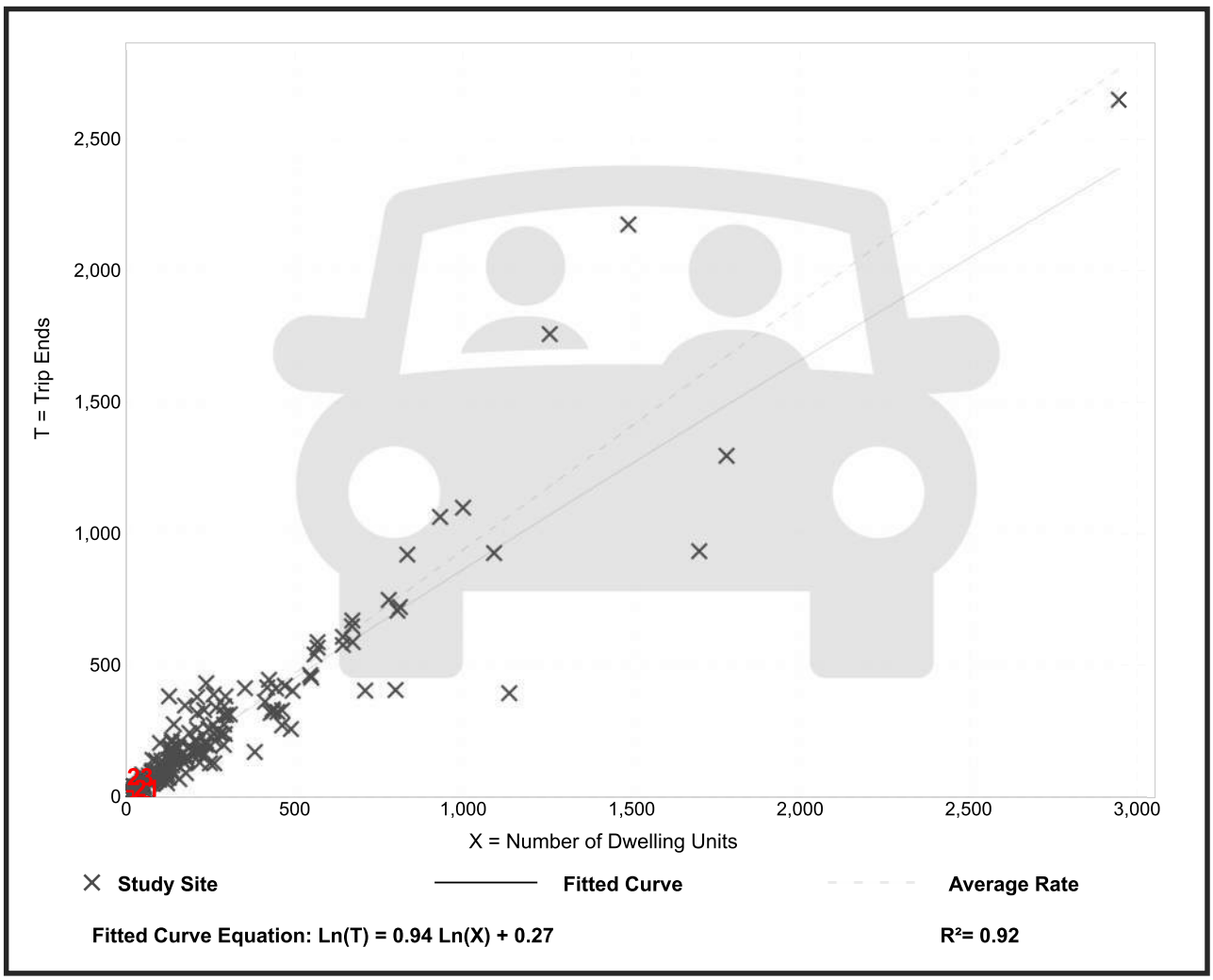
Single-Family Detached Housing
(210)

Vehicle Trip Ends vs:	**Dwelling Units**
On a:	**Weekday,**
	Peak Hour of Adjacent Street Traffic,
	One Hour Between 4 and 6 p.m.
Setting/Location:	**General Urban/Suburban**
Number of Studies:	208
Avg. Num. of Dwelling Units:	248
Directional Distribution:	63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.94	0.35 - 2.98	0.31

Data Plot and Equation



Single-Family Detached Housing
(210)

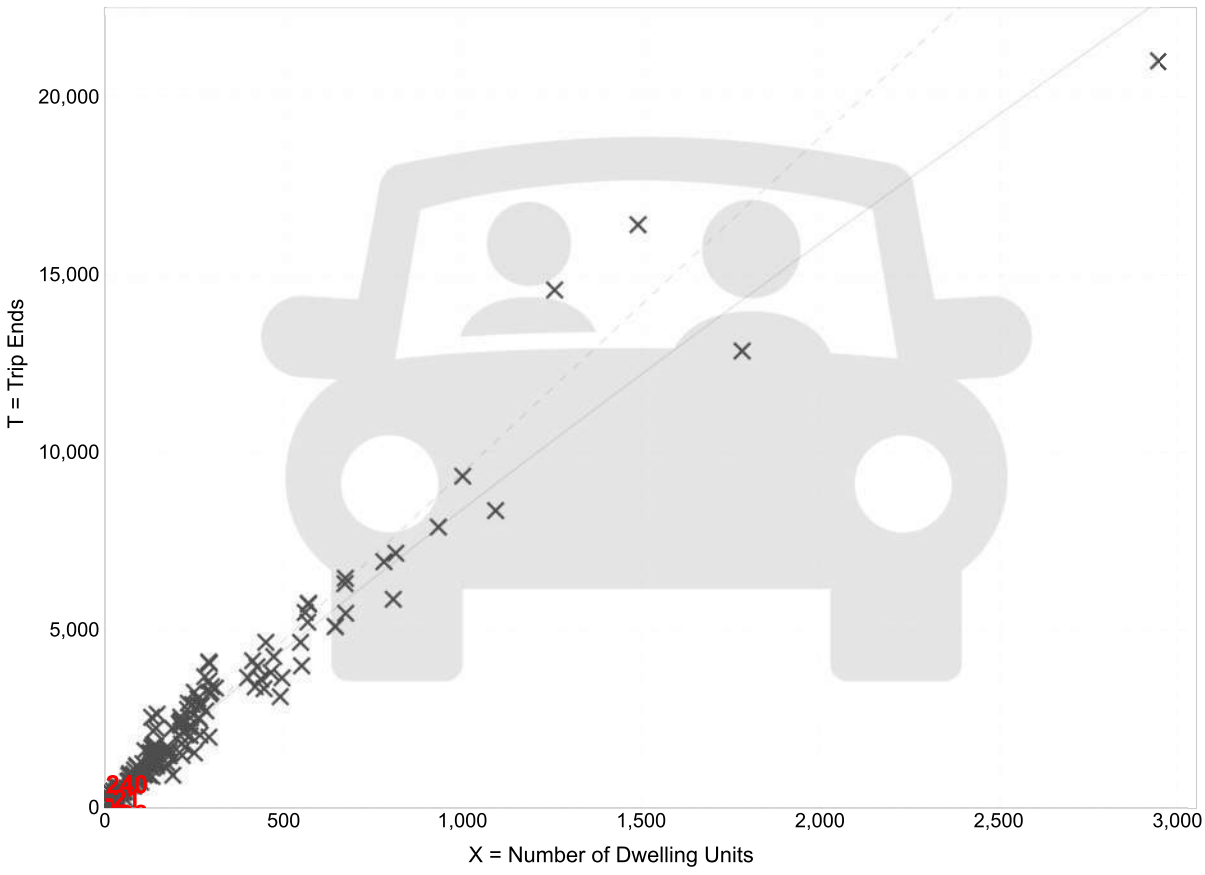
Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 174
Avg. Num. of Dwelling Units: 246
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
9.43	4.45 - 22.61	2.13

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.92 Ln(X) + 2.68

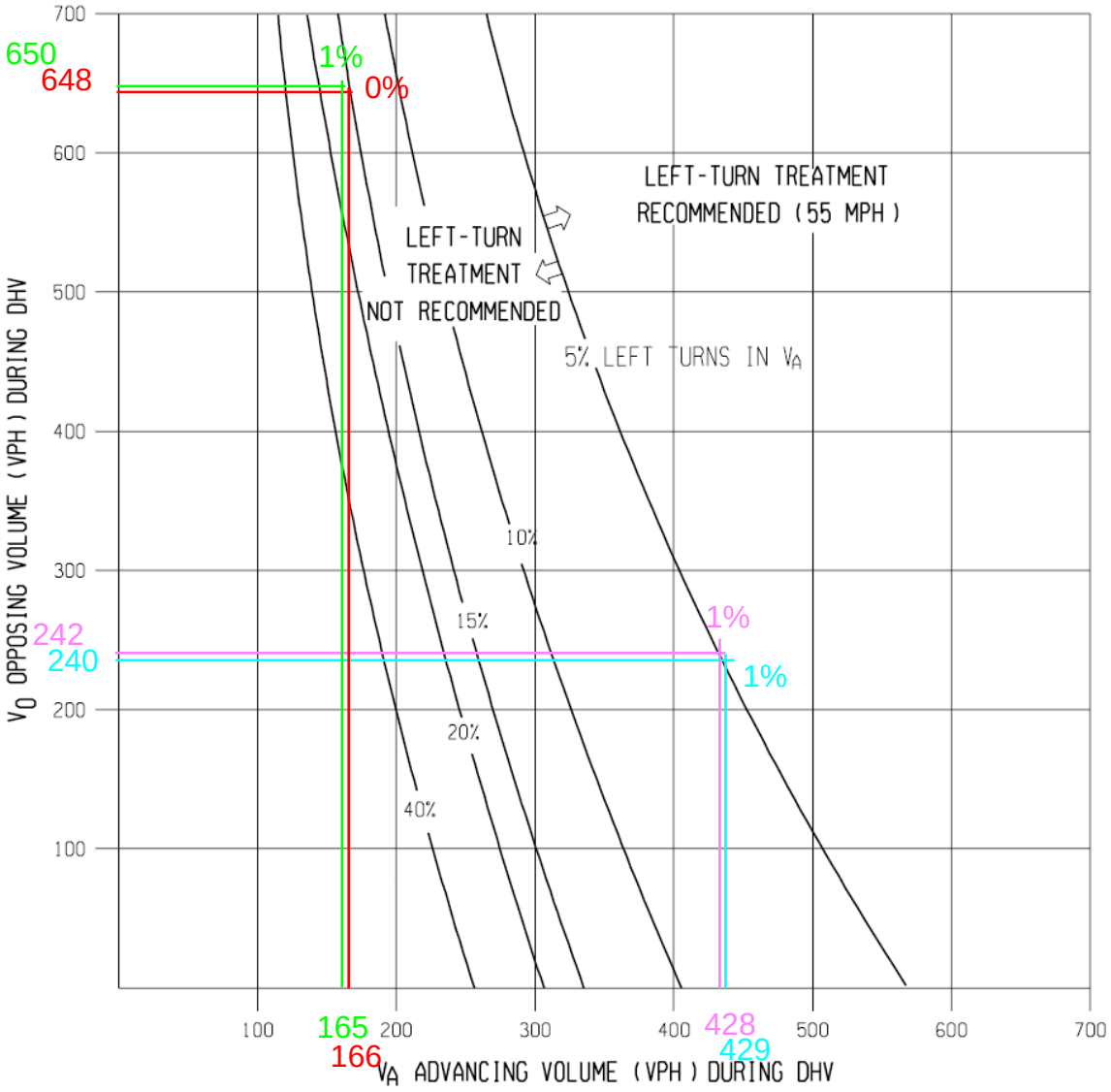
R^2= 0.95

Appendix 5

Turn Lane Warrants

East Site Driveway a.m. Peak Hour
East Site Driveway p.m. Peak Hour
West Site Driveway a.m. Peak Hour
West Site Driveway p.m. Peak Hour

TWO-LANE HIGHWAYS WITH A POSTED SPEED OF 55 MPH OR GREATER



Instructions:

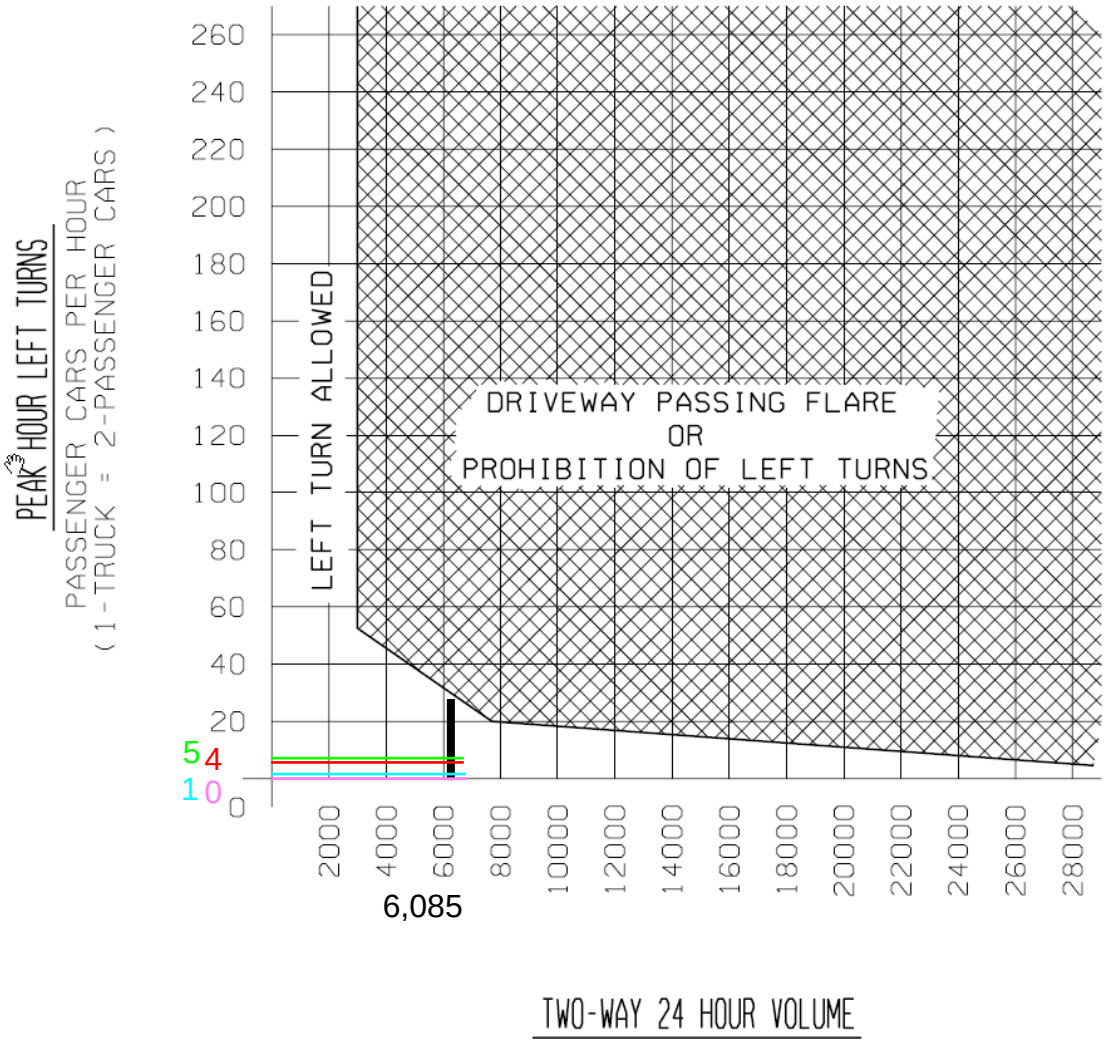
1. The family of curves represent the percentage of left turns in advancing volume (V_A). The designer should locate the curve for the actual percentage of left turns. When this is not an even increment of 5, the designer should estimate where the curve lies.
2. Read V_A and V_O into the chart and locate the intersection of the two volumes.
3. Note the location of the point in #2 relative to the line in #1. If the point is to the right of the line, then a left-turn lane is recommended. If the point is to the left of the line, then a left-turn is not recommended based on traffic volumes.

East Site Driveway a.m. Peak Hour
East Site Driveway p.m. Peak Hour
West Site Driveway a.m. Peak Hour
West Site Driveway p.m. Peak Hour

1.2.3 Traffic Volume Guidelines for Driveway Passing Flares

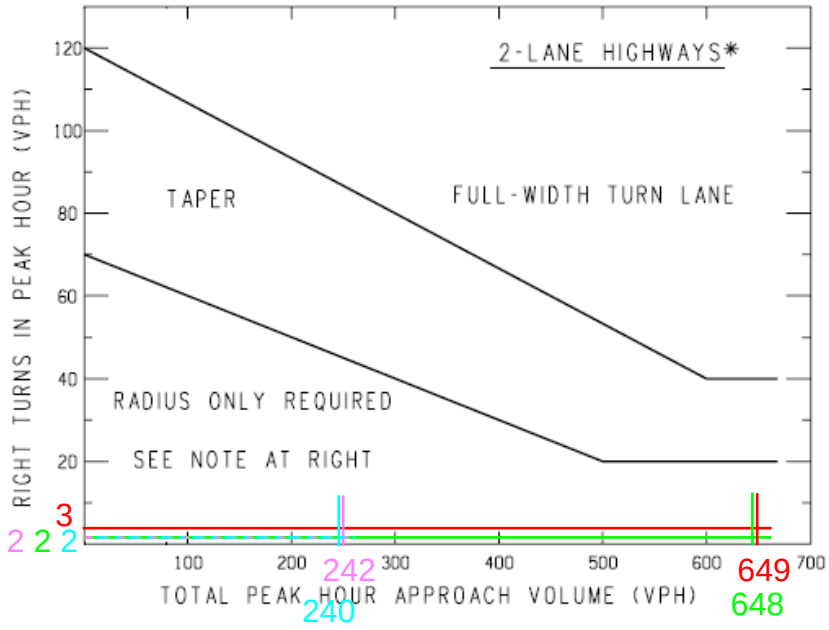
Driveways serving large developments along state trunkline highways frequently generate large numbers of left-turns. On two-lane, two-way roadways, this situation can aggravate the efficiency of traffic operations and often make shoulder maintenance difficult. In such situations, prohibition of left-turns at driveways to large developments or construction of driveway passing flares should be considered.

In an attempt to alleviate the types of problems outlined above, the following chart is provided showing the relationship between peak hour left-turns and 24-hour volumes. When peak hour left-turns and 24-hour volumes fall within the area above and to the right of the trend line, left-turns should be prohibited or a driveway passing flare be installed. If a driveway passing flare is constructed, the entire cost should be borne by the developer. For additional information and geometric design guidance regarding driveway passing flares, please refer to Geometric Design Guide GEO-650.



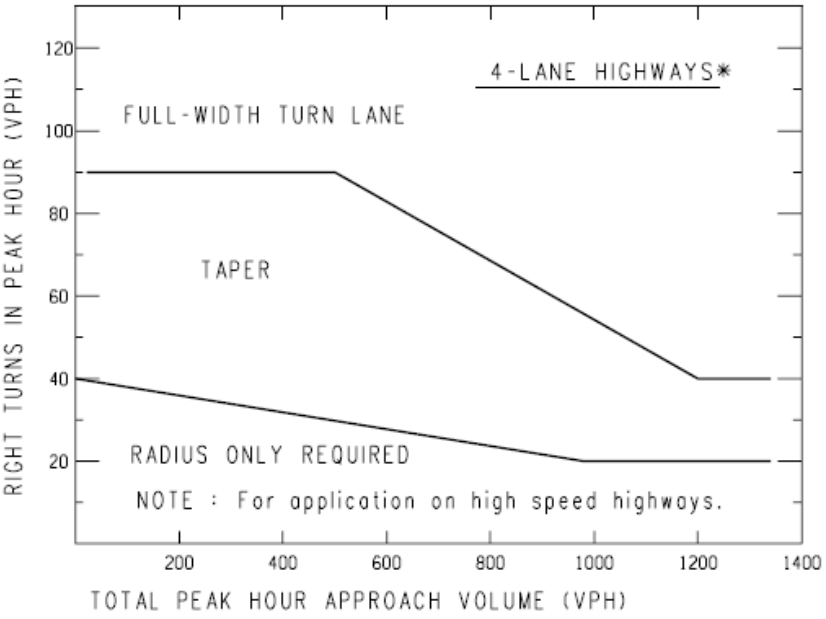
NOTE: This chart is based on Total Development and is for Two-Way Roadways.

East Site Driveway a.m. Peak Hour
East Site Driveway p.m. Peak Hour
West Site Driveway a.m. Peak Hour
West Site Driveway p.m. Peak Hour



NOTE: For posted speeds at or under 45 mph, peak hour right turns greater than 40 vph, and total peak hour approach less than 300 vph, adjust right turn volumes.

Adjust peak hour
Right turns = Peak hour
Right turns – 20



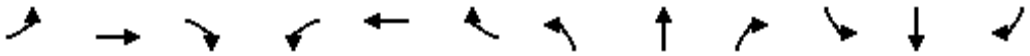
*If a center left-turn lane exists (ie 3 or 5 lane roadway), subtract the number of left turns in approach volume form the total approach volume to get an adjusted total approach volume.

Sample Problem: The Design Speed is 55 mph. The Peak Hour Approach Volume is 300 vph. The Number of Right Turns in the Peak Hous is 100 vph. Determine if a right turn lane is recommended.

Solution: Figure indicates that the intersection of 300 vph and 100 vph is located above the upper trend line; thus, a right-turn lane may be recommended.

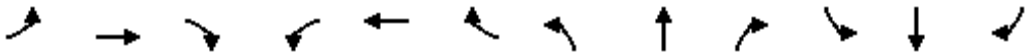
Appendix 6

Future LOS Output Reports



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	35	824	2	51	189	0	0	347	273
Future Volume (vph)	0	0	0	35	824	2	51	189	0	0	347	273
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					7.0	7.0		6.7			9.7	
Lane Util. Factor					0.95	1.00		0.95			0.95	
Frt					1.00	0.85		1.00			0.93	
Flt Protected					1.00	1.00		0.99			1.00	
Satd. Flow (prot)					3532	1583		3502			3273	
Flt Permitted					1.00	1.00		0.63			1.00	
Satd. Flow (perm)					3532	1583		2247			3273	
Peak-hour factor, PHF	0.89	0.89	0.89	0.90	0.90	0.90	0.81	0.81	0.81	0.77	0.77	0.77
Adj. Flow (vph)	0	0	0	39	916	2	63	233	0	0	451	355
RTOR Reduction (vph)	0	0	0	0	0	1	0	0	0	0	59	0
Lane Group Flow (vph)	0	0	0	0	955	1	0	296	0	0	747	0
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	2%	2%	2%	3%	3%	3%
Turn Type				Perm	NA	Perm	Perm	NA			NA	
Protected Phases					6			8			4	
Permitted Phases				6		6	8					
Actuated Green, G (s)					38.1	38.1		25.6			22.6	
Effective Green, g (s)					38.1	38.1		25.6			22.6	
Actuated g/C Ratio					0.49	0.49		0.33			0.29	
Clearance Time (s)					7.0	7.0		6.7			9.7	
Vehicle Extension (s)					3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)					1738	779		743			955	
v/s Ratio Prot											c0.23	
v/s Ratio Perm					0.27	0.00		0.13				
v/c Ratio					0.55	0.00		0.40			0.78	
Uniform Delay, d1					13.7	10.0		20.0			25.1	
Progression Factor					1.00	1.00		0.72			1.00	
Incremental Delay, d2					1.3	0.0		0.4			4.2	
Delay (s)					14.9	10.0		14.6			29.4	
Level of Service					B	A		B			C	
Approach Delay (s)		0.0			14.9			14.6			29.4	
Approach LOS		A			B			B			C	

Intersection Summary			
HCM 2000 Control Delay	20.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	77.4	Sum of lost time (s)	16.7
Intersection Capacity Utilization	68.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	83	542	267	0	0	0	0	157	12	1	381	0
Future Volume (vph)	83	542	267	0	0	0	0	157	12	1	381	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0					9.7			6.7	
Lane Util. Factor	1.00	0.95	1.00					0.95			0.95	
Frt	1.00	1.00	0.85					0.99			1.00	
Flt Protected	0.95	1.00	1.00					1.00			1.00	
Satd. Flow (prot)	1736	3471	1553					3501			3505	
Flt Permitted	0.95	1.00	1.00					1.00			0.95	
Satd. Flow (perm)	1736	3471	1553					3501			3346	
Peak-hour factor, PHF	0.89	0.89	0.89	0.90	0.90	0.90	0.81	0.81	0.81	0.77	0.77	0.77
Adj. Flow (vph)	93	609	300	0	0	0	0	194	15	1	495	0
RTOR Reduction (vph)	0	0	88	0	0	0	0	7	0	0	0	0
Lane Group Flow (vph)	93	609	212	0	0	0	0	202	0	0	496	0
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	2%	2%	2%	3%	3%	3%
Turn Type	Perm	NA	Perm					NA		Perm	NA	
Protected Phases		2						4			8	
Permitted Phases	2		2							8		
Actuated Green, G (s)	38.1	38.1	38.1					22.6			25.6	
Effective Green, g (s)	38.1	38.1	38.1					22.6			25.6	
Actuated g/C Ratio	0.49	0.49	0.49					0.29			0.33	
Clearance Time (s)	7.0	7.0	7.0					9.7			6.7	
Vehicle Extension (s)	3.0	3.0	3.0					3.0			3.0	
Lane Grp Cap (vph)	854	1708	764					1022			1106	
v/s Ratio Prot		c0.18						0.06				
v/s Ratio Perm	0.05		0.14								c0.15	
v/c Ratio	0.11	0.36	0.28					0.20			0.45	
Uniform Delay, d1	10.5	12.1	11.6					20.6			20.4	
Progression Factor	1.00	1.00	1.00					1.00			0.22	
Incremental Delay, d2	0.3	0.6	0.9					0.1			0.2	
Delay (s)	10.8	12.7	12.5					20.7			4.6	
Level of Service	B	B	B					C			A	
Approach Delay (s)		12.4			0.0			20.7			4.6	
Approach LOS		B			A			C			A	

Intersection Summary			
HCM 2000 Control Delay	11.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	77.4	Sum of lost time (s)	16.7
Intersection Capacity Utilization	38.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	166	646	2	3	4
Future Vol, veh/h	0	166	646	2	3	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	81	81	77	77	92	92
Heavy Vehicles, %	2	2	3	3	2	2
Mvmt Flow	0	205	839	3	3	4

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	842	0	-	0	1046	841
Stage 1	-	-	-	-	841	-
Stage 2	-	-	-	-	205	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	794	-	-	-	253	365
Stage 1	-	-	-	-	423	-
Stage 2	-	-	-	-	829	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	794	-	-	-	253	365
Mov Cap-2 Maneuver	-	-	-	-	253	-
Stage 1	-	-	-	-	423	-
Stage 2	-	-	-	-	829	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	17
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	794	-	-	-	307
HCM Lane V/C Ratio	-	-	-	-	0.025
HCM Control Delay (s)	0	-	-	-	17
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	164	648	2	2	4
Future Vol, veh/h	1	164	648	2	2	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	81	81	77	77	92	92
Heavy Vehicles, %	2	2	3	3	2	2
Mvmt Flow	1	202	842	3	2	4

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	845	0	-	0	1048	844
Stage 1	-	-	-	-	844	-
Stage 2	-	-	-	-	204	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	792	-	-	-	252	363
Stage 1	-	-	-	-	422	-
Stage 2	-	-	-	-	830	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	792	-	-	-	252	363
Mov Cap-2 Maneuver	-	-	-	-	252	-
Stage 1	-	-	-	-	422	-
Stage 2	-	-	-	-	830	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	16.6
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	792	-	-	-	317
HCM Lane V/C Ratio	0.002	-	-	-	0.021
HCM Control Delay (s)	9.6	0	-	-	16.6
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection: 100: Plymouth Road & WB M-153

Movement	WB	WB	WB	NB	NB	SB	SB
Directions Served	LT	T	R	LT	T	T	TR
Maximum Queue (ft)	204	182	14	70	48	131	110
Average Queue (ft)	113	66	0	33	13	75	50
95th Queue (ft)	182	145	5	59	37	133	102
Link Distance (ft)	517	517		17	17	58	58
Upstream Blk Time (%)				46	11	18	7
Queuing Penalty (veh)				56	14	63	26
Storage Bay Dist (ft)			225				
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 101: Plymouth Road & EB M-153

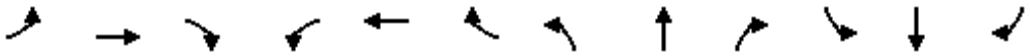
Movement	EB	EB	EB	EB	NB	NB	SB	SB
Directions Served	L	T	T	R	T	TR	LT	T
Maximum Queue (ft)	48	167	134	168	112	96	73	49
Average Queue (ft)	7	72	31	62	31	13	23	11
95th Queue (ft)	29	141	81	127	77	55	56	37
Link Distance (ft)		506	506		1052		17	17
Upstream Blk Time (%)							24	11
Queuing Penalty (veh)							49	22
Storage Bay Dist (ft)	150			315		125		
Storage Blk Time (%)		0			0	0		
Queuing Penalty (veh)		0			0	0		

Intersection: 200: Plymouth Road & East Site Driveway

Movement	SB
Directions Served	LR
Maximum Queue (ft)	34
Average Queue (ft)	7
95th Queue (ft)	29
Link Distance (ft)	452
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

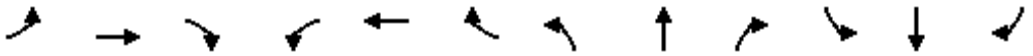
Intersection: 300: Plymouth Road & West Site Driveway

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	15	31
Average Queue (ft)	1	5
95th Queue (ft)	7	24
Link Distance (ft)	768	549
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	16	546	2	103	471	0	0	138	125
Future Volume (vph)	0	0	0	16	546	2	103	471	0	0	138	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					7.0	7.0		6.7			9.7	
Lane Util. Factor					0.95	1.00		0.95			0.95	
Frt					1.00	0.85		1.00			0.93	
Flt Protected					1.00	1.00		0.99			1.00	
Satd. Flow (prot)					3534	1583		3578			3255	
Flt Permitted					1.00	1.00		0.82			1.00	
Satd. Flow (perm)					3534	1583		2960			3255	
Peak-hour factor, PHF	0.91	0.91	0.91	0.85	0.85	0.85	0.88	0.88	0.88	0.94	0.94	0.94
Adj. Flow (vph)	0	0	0	19	642	2	117	535	0	0	147	133
RTOR Reduction (vph)	0	0	0	0	0	1	0	0	0	0	100	0
Lane Group Flow (vph)	0	0	0	0	661	1	0	652	0	0	180	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	0%	0%	0%	3%	3%	3%
Turn Type				Perm	NA	Perm	Perm	NA			NA	
Protected Phases					6			8			4	
Permitted Phases				6		6	8					
Actuated Green, G (s)					38.2	38.2		21.4			18.4	
Effective Green, g (s)					38.2	38.2		21.4			18.4	
Actuated g/C Ratio					0.52	0.52		0.29			0.25	
Clearance Time (s)					7.0	7.0		6.7			9.7	
Vehicle Extension (s)					3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)					1841	824		864			817	
v/s Ratio Prot											0.06	
v/s Ratio Perm					0.19	0.00		c0.22				
v/c Ratio					0.36	0.00		0.75			0.22	
Uniform Delay, d1					10.3	8.4		23.6			21.8	
Progression Factor					1.00	1.00		0.59			1.00	
Incremental Delay, d2					0.5	0.0		3.6			0.1	
Delay (s)					10.9	8.4		17.5			21.9	
Level of Service					B	A		B			C	
Approach Delay (s)		0.0			10.9			17.5			21.9	
Approach LOS		A			B			B			C	

Intersection Summary			
HCM 2000 Control Delay	15.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	73.3	Sum of lost time (s)	16.7
Intersection Capacity Utilization	58.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	172	909	89	0	0	0	0	402	26	1	153	0
Future Volume (vph)	172	909	89	0	0	0	0	402	26	1	153	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0					9.7			6.7	
Lane Util. Factor	1.00	0.95	1.00					0.95			0.95	
Frt	1.00	1.00	0.85					0.99			1.00	
Flt Protected	0.95	1.00	1.00					1.00			1.00	
Satd. Flow (prot)	1770	3539	1583					3577			3504	
Flt Permitted	0.95	1.00	1.00					1.00			0.95	
Satd. Flow (perm)	1770	3539	1583					3577			3337	
Peak-hour factor, PHF	0.91	0.91	0.91	0.85	0.85	0.85	0.88	0.88	0.88	0.94	0.94	0.94
Adj. Flow (vph)	189	999	98	0	0	0	0	457	30	1	163	0
RTOR Reduction (vph)	0	0	47	0	0	0	0	7	0	0	0	0
Lane Group Flow (vph)	189	999	51	0	0	0	0	480	0	0	164	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	0%	0%	0%	3%	3%	3%
Turn Type	Perm	NA	Perm					NA		Perm	NA	
Protected Phases		2						4			8	
Permitted Phases	2		2							8		
Actuated Green, G (s)	38.2	38.2	38.2					18.4			21.4	
Effective Green, g (s)	38.2	38.2	38.2					18.4			21.4	
Actuated g/C Ratio	0.52	0.52	0.52					0.25			0.29	
Clearance Time (s)	7.0	7.0	7.0					9.7			6.7	
Vehicle Extension (s)	3.0	3.0	3.0					3.0			3.0	
Lane Grp Cap (vph)	922	1844	824					897			974	
v/s Ratio Prot		c0.28						c0.13				
v/s Ratio Perm	0.11		0.03								0.05	
v/c Ratio	0.20	0.54	0.06					0.54			0.17	
Uniform Delay, d1	9.4	11.7	8.7					23.8			19.3	
Progression Factor	1.00	1.00	1.00					1.00			0.59	
Incremental Delay, d2	0.5	1.1	0.1					0.6			0.1	
Delay (s)	9.9	12.9	8.8					24.4			11.6	
Level of Service	A	B	A					C			B	
Approach Delay (s)		12.1			0.0			24.4			11.6	
Approach LOS		B			A			C			B	

Intersection Summary			
HCM 2000 Control Delay	15.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	73.3	Sum of lost time (s)	16.7
Intersection Capacity Utilization	51.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	4	424	239	3	4	1
Future Vol, veh/h	4	424	239	3	4	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	88	88	94	94	92	92
Heavy Vehicles, %	0	0	3	3	2	2
Mvmt Flow	5	482	254	3	4	1

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	257	0	-	0	748	256
Stage 1	-	-	-	-	256	-
Stage 2	-	-	-	-	492	-
Critical Hdwy	4.1	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.2	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1320	-	-	-	380	783
Stage 1	-	-	-	-	787	-
Stage 2	-	-	-	-	615	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1320	-	-	-	378	783
Mov Cap-2 Maneuver	-	-	-	-	378	-
Stage 1	-	-	-	-	783	-
Stage 2	-	-	-	-	615	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	13.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1320	-	-	-	422
HCM Lane V/C Ratio	0.003	-	-	-	0.013
HCM Control Delay (s)	7.7	0	-	-	13.6
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	425	238	2	3	1
Future Vol, veh/h	5	425	238	2	3	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	88	88	94	94	92	92
Heavy Vehicles, %	0	0	3	3	2	2
Mvmt Flow	6	483	253	2	3	1

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	255	0	-	0	749	254
Stage 1	-	-	-	-	254	-
Stage 2	-	-	-	-	495	-
Critical Hdwy	4.1	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.2	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1322	-	-	-	379	785
Stage 1	-	-	-	-	788	-
Stage 2	-	-	-	-	613	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1322	-	-	-	377	785
Mov Cap-2 Maneuver	-	-	-	-	377	-
Stage 1	-	-	-	-	783	-
Stage 2	-	-	-	-	613	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	13.4
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1322	-	-	-	433
HCM Lane V/C Ratio	0.004	-	-	-	0.01
HCM Control Delay (s)	7.7	0	-	-	13.4
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection: 100: Plymouth Road & WB M-153

Movement	WB	WB	WB	NB	NB	SB	SB
Directions Served	LT	T	R	LT	T	T	TR
Maximum Queue (ft)	159	116	18	102	127	77	54
Average Queue (ft)	69	29	1	54	37	21	8
95th Queue (ft)	135	82	8	87	91	56	35
Link Distance (ft)	517	517		17	17	58	58
Upstream Blk Time (%)				52	25	1	0
Queuing Penalty (veh)				149	73	1	0
Storage Bay Dist (ft)			225				
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 101: Plymouth Road & EB M-153

Movement	EB	EB	EB	EB	NB	NB	SB	SB
Directions Served	L	T	T	R	T	TR	LT	T
Maximum Queue (ft)	112	240	196	58	175	155	38	22
Average Queue (ft)	28	119	81	19	78	63	10	2
95th Queue (ft)	75	201	159	45	134	124	29	11
Link Distance (ft)		506	506		1052		17	17
Upstream Blk Time (%)							10	1
Queuing Penalty (veh)							7	1
Storage Bay Dist (ft)	150			315		125		
Storage Blk Time (%)		2			2	1		
Queuing Penalty (veh)		4			4	1		

Intersection: 200: Plymouth Road & East Site Driveway

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	20	30
Average Queue (ft)	1	4
95th Queue (ft)	9	21
Link Distance (ft)	1205	452
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 300: Plymouth Road & West Site Driveway

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	19	31
Average Queue (ft)	1	3
95th Queue (ft)	9	19
Link Distance (ft)	768	549
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		