

X:\20164-0007001\Tech\GIS\MXD\LandUseMapBook_7.mxd

Data Sources:
Land Cover - MDNR, Forest, Mineral and Fire Management Division
Land Use - Grand Traverse County
Orthophotography - FSA NAIP, 2006, 1m from ArcIMS Server _http://gdw.apfo.usda.gov

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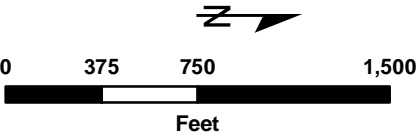
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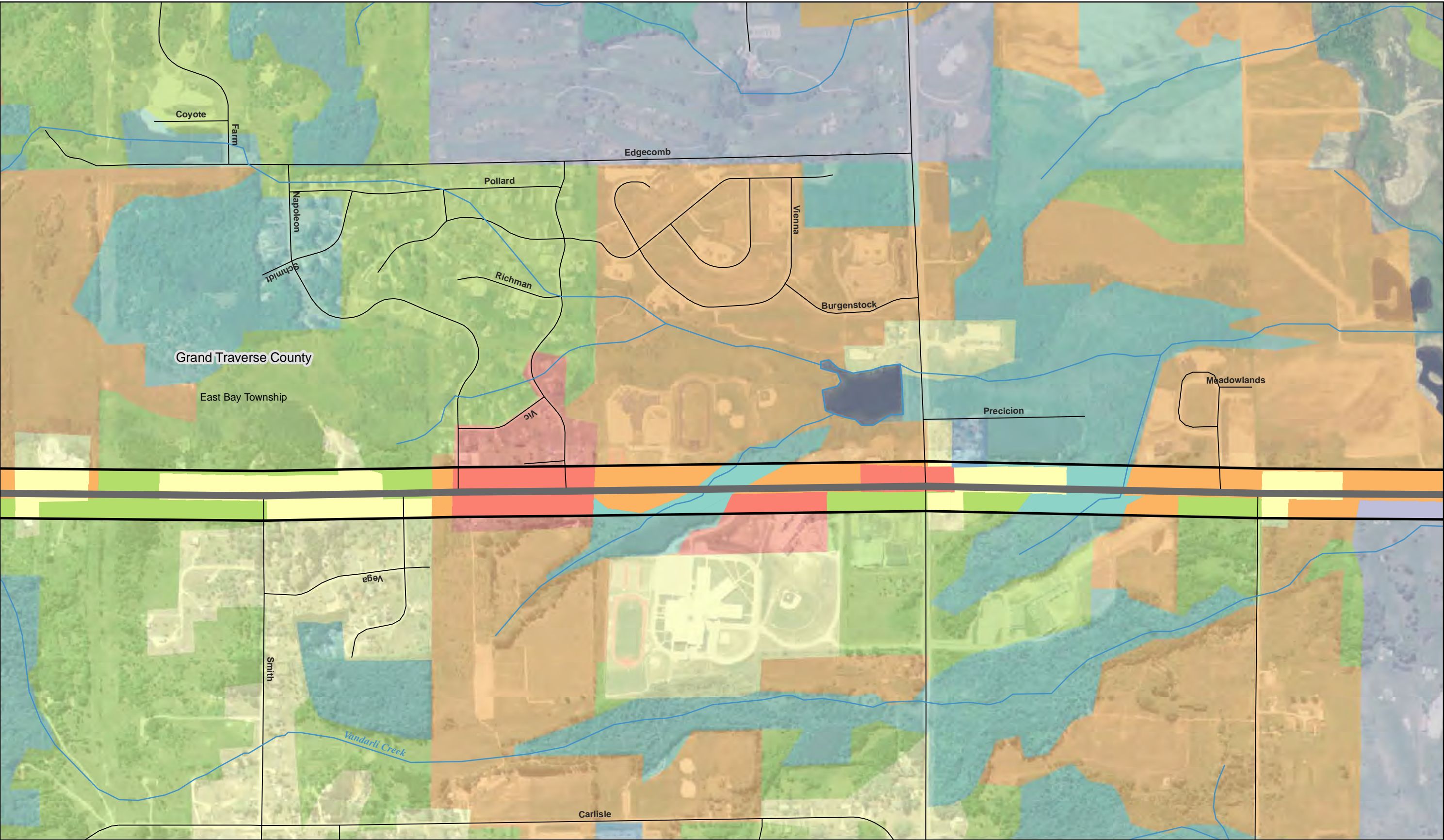
- Corridor
- Corridor Buffer
- Municipal Boundary
- Water Bodies

- Rivers/Streams
- Railroad
- Roads

LAND USE

- Mixed Residential
- Mixed Agricultural
- Mixed Commercial
- Mixed Industrial
- Open Land
- Forested Land
- Public/Semi-Public





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Sheet 2 of 3

Data Sources:
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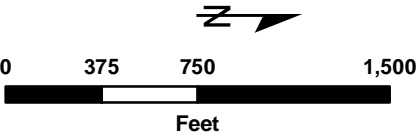
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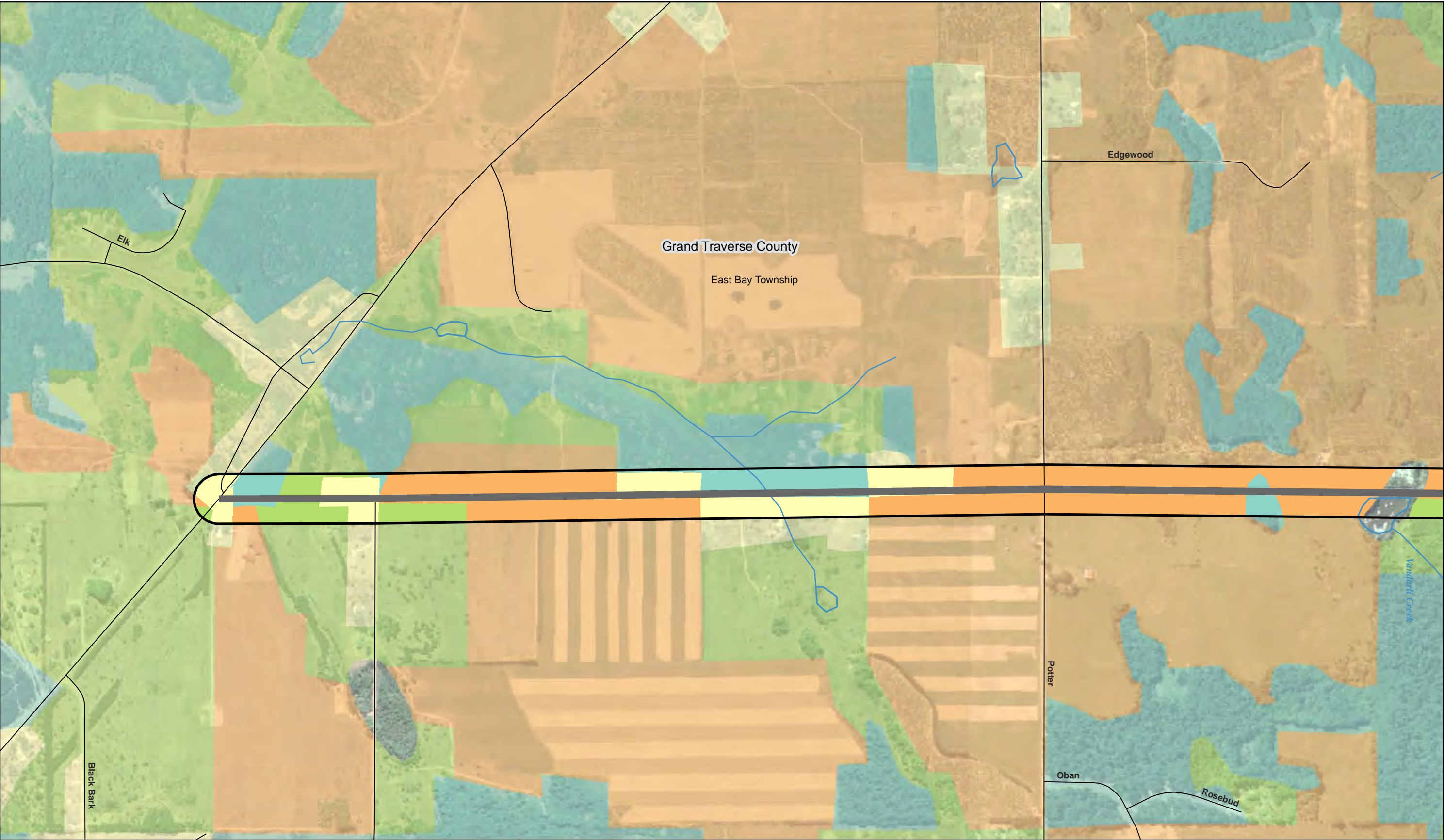
- Corridor
- Corridor Buffer
- Municipal Boundary
- Water Bodies

- Rivers/Streams
- Railroad
- Roads

LAND USE

- Mixed Residential
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- Mixed Commercial
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- Open Land
- Forested Land
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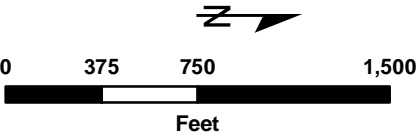
LEGEND

- Corridor
- Corridor Buffer
- Municipal Boundary
- Water Bodies

- Rivers/Streams
- Railroad
- Roads

LAND USE

- Mixed Residential
- Mixed Agricultural
- Mixed Commercial
- Mixed Industrial
- Open Land
- Forested Land
- Public/Semi-Public



Corridors of Significance Environment Reports
Corridor 7 - 3 Mile Road



Corridor 8 – M-22

The M-22 corridor is located in Leelanau County in the township of Elmwood. The corridor is approximately 1.3 miles long, and it begins at M-72 and ends at Cherry Bend Road. M-22 has three lanes with posted speeds of 35 miles per hour to 55 miles per hour and a functional classification of Minor Arterial. The M-22 corridor is made of asphalt and major intersections include M-72 and Cherry Bend Road. It has an average daily traffic (ADT) count of 13,687 cars per day, though this count varies along the length of the corridor. Total land area within the buffer is approximately 66 acres.

The table below summarizes the presence of environmental resources in the M-22 corridor. Specific geographic information is shown on the maps on the following pages.

Table 3.8 M-22 Physical Environmental Resources Summary

Resource Category	Resource Summary
Commercial / navigational rivers or streams	Lake Michigan
Landmarks	no
Threatened or endangered species	no
Wetlands	yes, 3.65 acres identified
Flood prone areas	yes, 4.3 acres identified
Coastal resources	yes, extensive area identified
Wild and scenic rivers / natural rivers	no
Prime and unique farmland soils	no
Hazardous materials	yes, eight locations identified



Data Sources:
Basemap - Michigan Geographic Data Library
Farmland and Slope - SSURGO, from Michigan Geographic Data Library
Wetlands - National Wetland Inventory, from Michigan Geographic Data Library
Flood Prone Areas - Northwest MI Council of Governments
Orthophotography - FSA NAIP, 2006, 1m from ArcIMS Server _http://gdw.apfo.usda.gov

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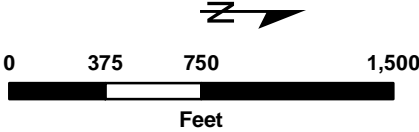
LEGEND

- Corridor
- Corridor Buffer
- Municipal Boundary
- Railroad

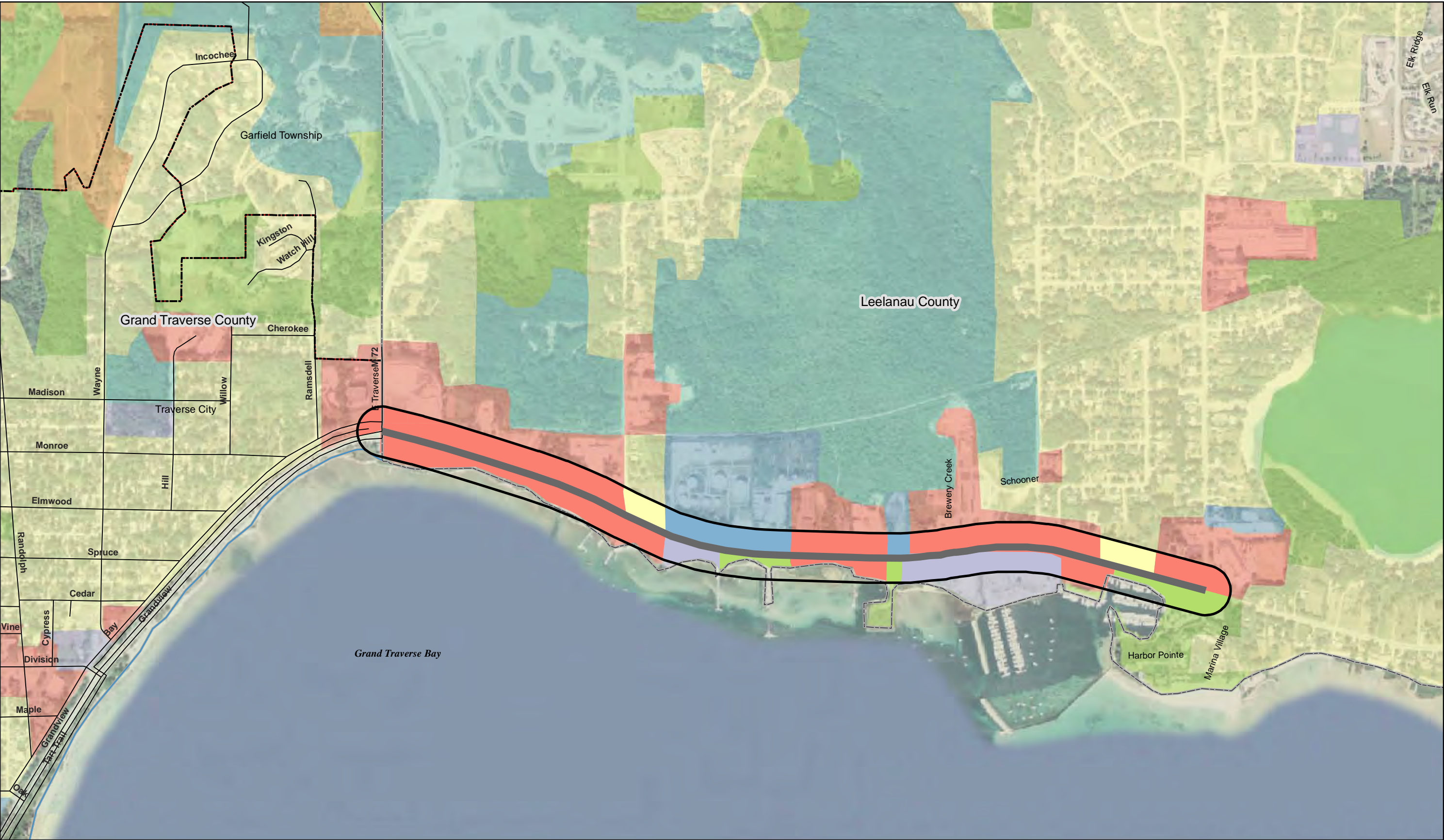
- Drinking Water Wells
- HazMat
- Landmarks
- Oil & Gas

CONSTRAINTS

- Prime and Unique Farmland Soils
- Flood Prone Areas
- Wetlands
- Steep > 6%



Corridors of Significance Environment Reports
Corridor 8 - M-22 Road



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Sheet 1 of 1

Data Sources:
Land Cover - MDNR, Forest, Mineral and Fire Management Division
Land Use - Grand Traverse County
Orthophotography - FSA NAIP, 2006, 1m from ArcIMS Server <http://gdw.apfo.usda.gov>

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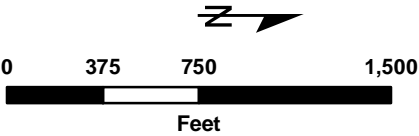
- Corridor
- Corridor Buffer
- Municipal Boundary
- Water Bodies

LAND USE

- Mixed Residential
- Mixed Agricultural
- Mixed Commercial
- Mixed Industrial
- Open Land
- Forested Land
- Public/Semi-Public

LEGEND

- Rivers/Streams
- Railroad
- Roads



Corridors of Significance Environment Reports
Corridor 8 - M-22 Road



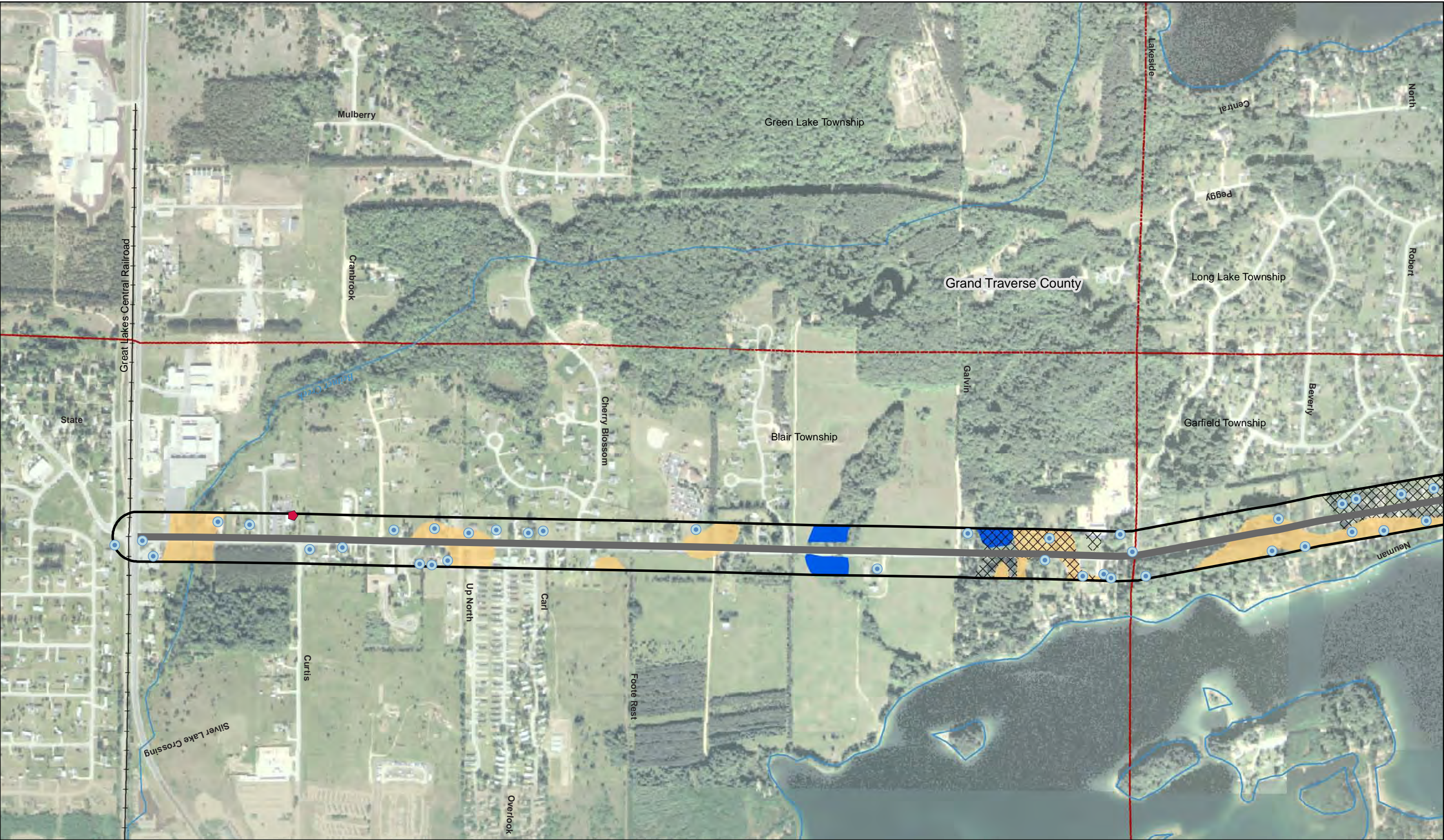
Corridor 9 – W. Silver Lake, 14th, Cass, 8th

The West Silver Lake Road, 14th, Cass, 8th corridor is located in Grand Traverse County in the townships of Blair and Garfield. The corridor is approximately 10.8 miles long; it begins at US-31 and continues to M-72. West Silver Lake Road has two lanes with a posted speed of 55 miles per hour and has a functional classification of Minor Arterial. The West Silver Lake Road corridor is made of asphalt and major intersections include US-31, Zimmerman Road, South Airport Road, Barnes Road, Division Street, Cass Street, and 8th Street. It has an average daily traffic (ADT) count of 15,380 cars per day, though this count varies along the length of the corridor. The total land area within the buffer is approximately 66 acres.

The table below summarizes the presence of environmental resources in the West Silver Lake Road corridor. Specific geographic information is shown on the maps on the following pages.

Table 3.9 W. Silver Lake, 14th, Cass, 8th Physical Environmental Resources Summary

Resource Category	Resource Summary
Commercial / navigational rivers or streams	Lake Michigan
Landmarks	yes, 12 identified
Threatened or endangered species	yes
Wetlands	yes, 23.08 acres identified
Flood prone areas	yes, 42.2 acres identified
Coastal resources	yes, one area identified
Wild and scenic rivers / natural rivers	Boardman River
Prime and unique farmland soils	yes, about 143.30 acres identified
Hazardous materials	yes, 11 locations identified



Data Sources:
Basemap - Michigan Geographic Data Library
Farmland and Slope - SSURGO, from Michigan Geographic Data Library
Wetlands - National Wetland Inventory, from Michigan Geographic Data Library
Flood Prone Areas - Northwest MI Council of Governments
Orthophotography - FSA NAIP, 2006, 1m from ArcIMS Server _http://gdw.apfo.usda.gov

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LEGEND

Corridor

Corridor Buffer

Municipal Boundary

Railroad

Drinking Water Wells

HazMat

Landmarks

Oil & Gas

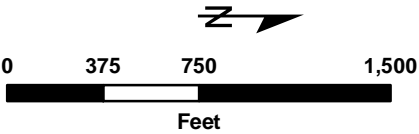
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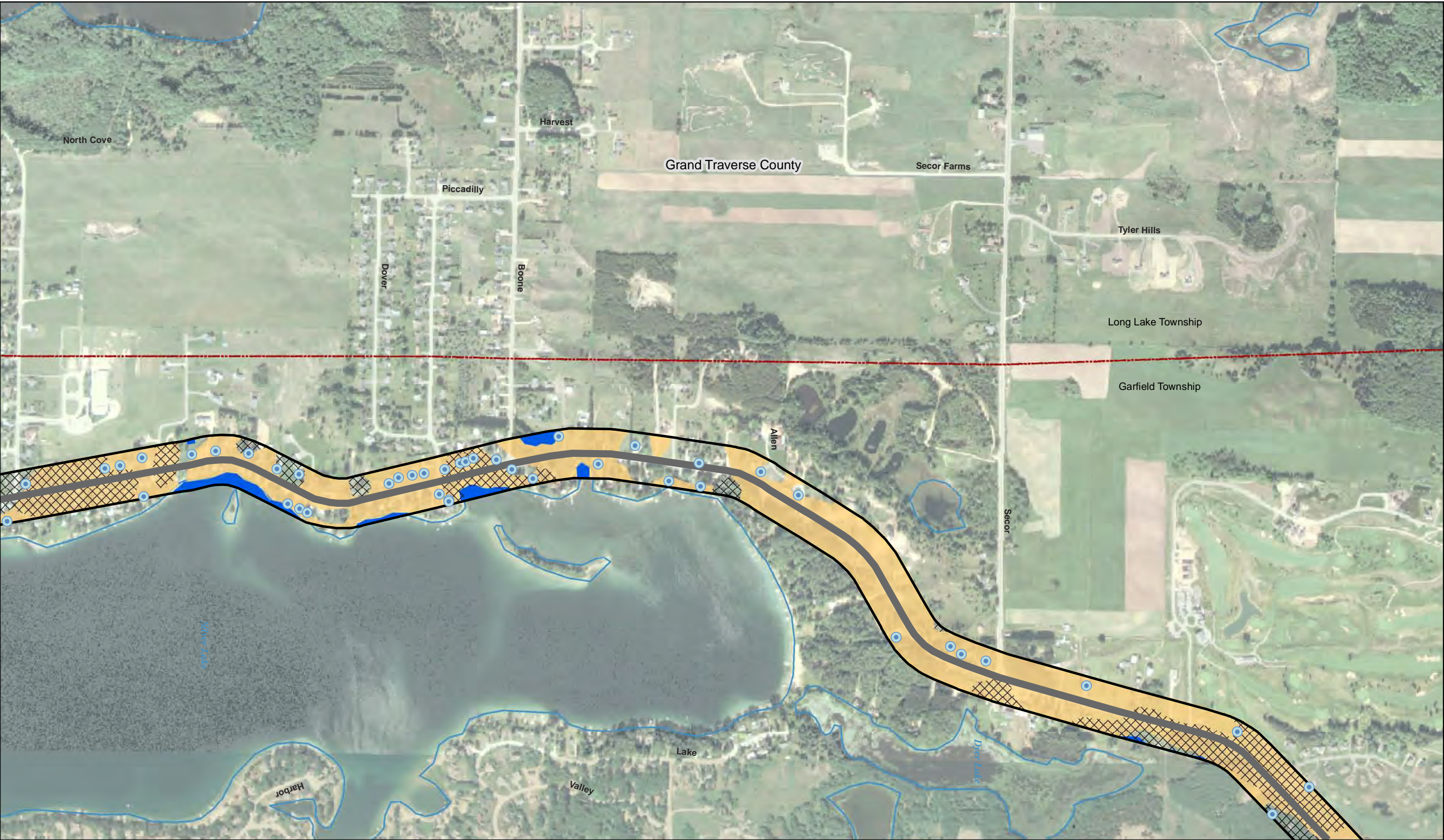
Prime and Unique Farmland Soils

Flood Prone Areas

Wetlands

Steep > 6%





Data Sources:
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Farmland and Slope - SSURGO, from Michigan Geographic Data Library
Wetlands - National Wetland Inventory, from Michigan Geographic Data Library
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LEGEND

Corridor

Corridor Buffer

Municipal Boundary

Railroad

Drinking Water Wells

HazMat

Landmarks

Oil & Gas

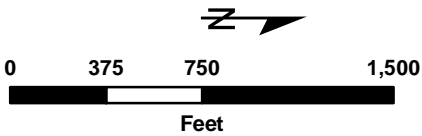
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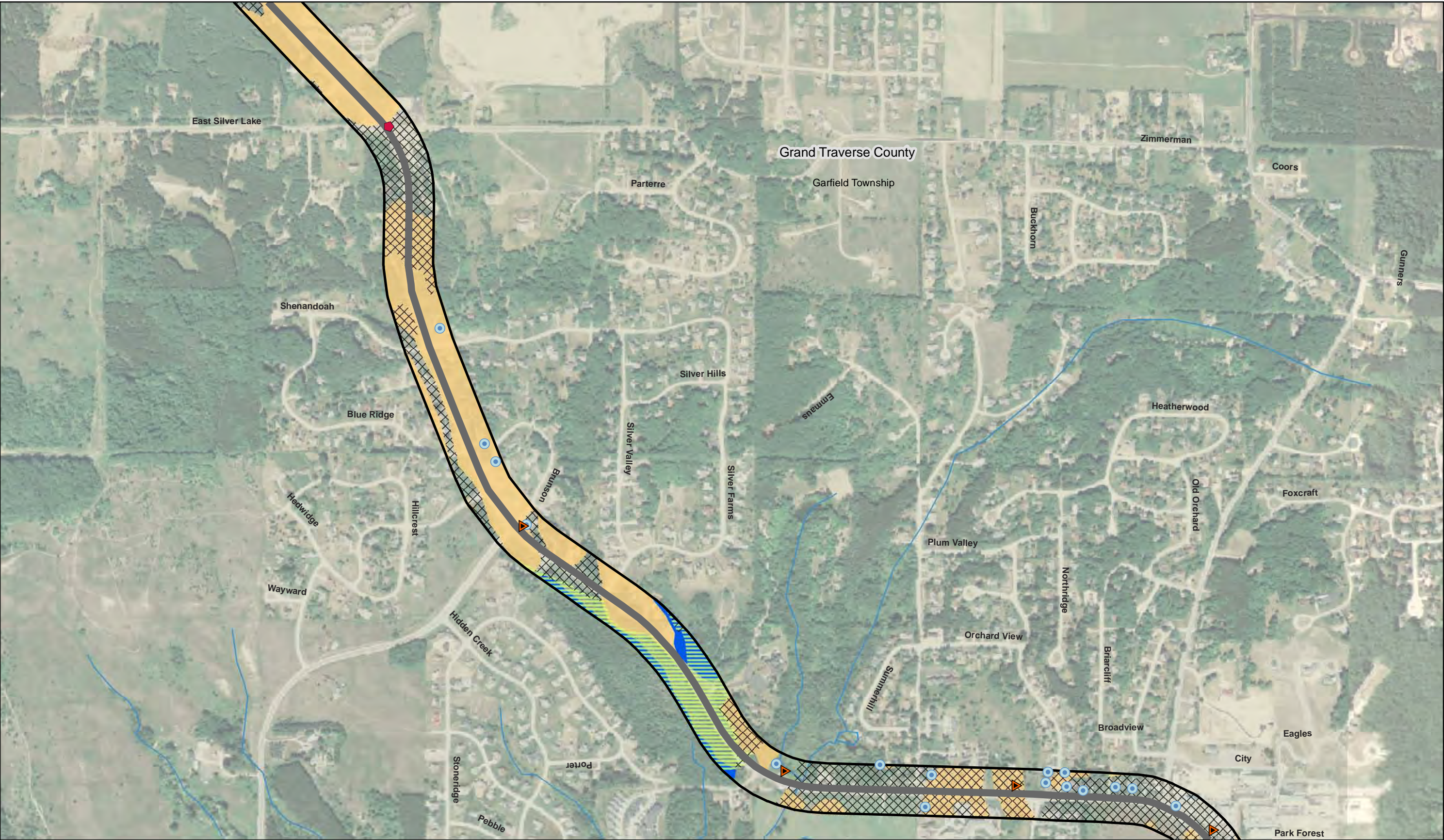
Prime and Unique Farmland Soils

Flood Prone Areas

Wetlands

Steep > 6%



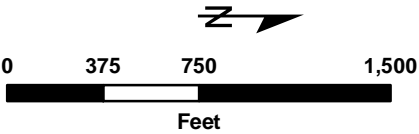


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Wetlands - National Wetland Inventory, from Michigan Geographic Data Library
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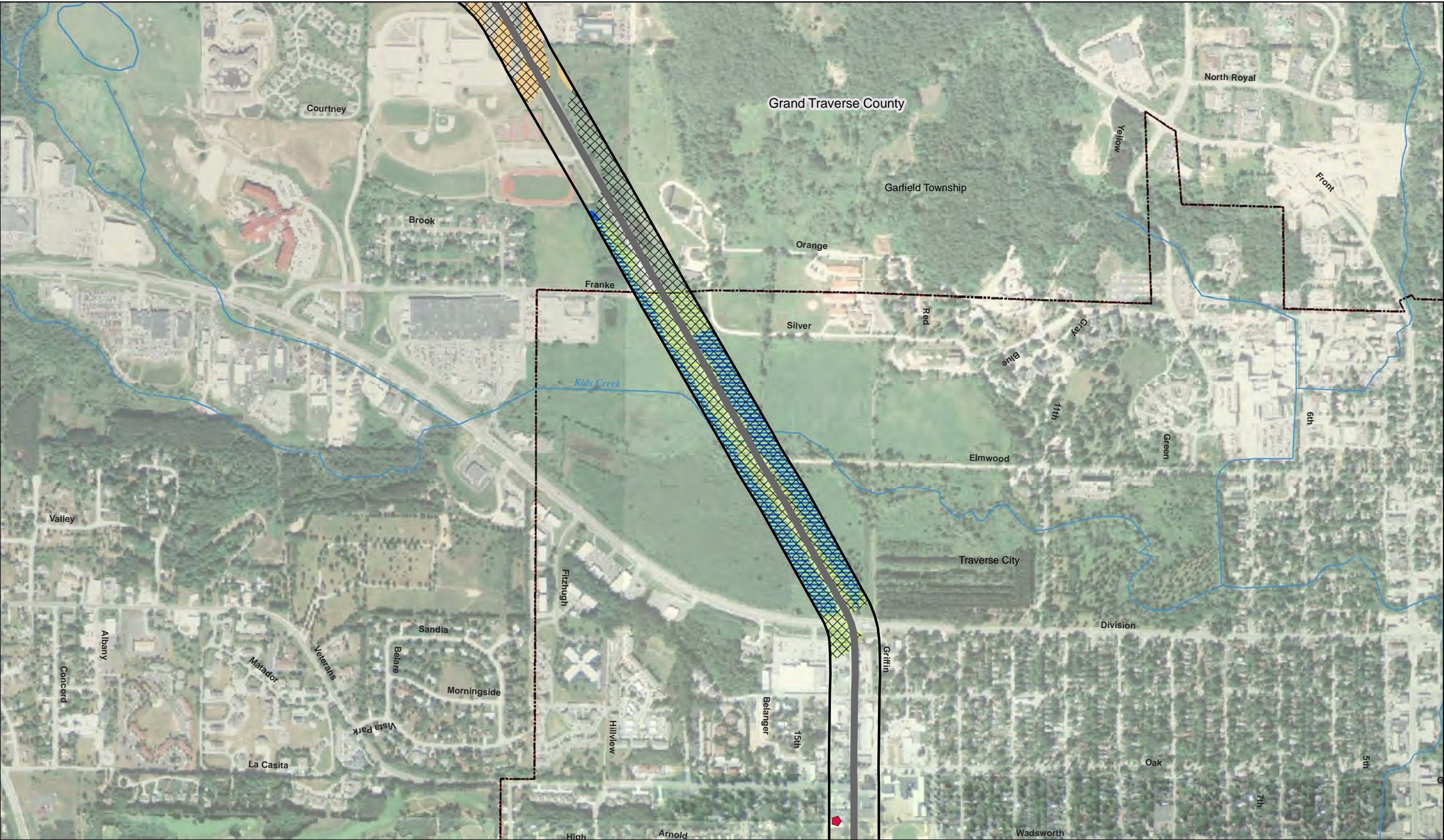
LEGEND

- Corridor
- Corridor Buffer
- Municipal Boundary
- Railroad
- Drinking Water Wells
- HazMat
- Landmarks
- Oil & Gas
- Prime and Unique Farmland Soils
- Flood Prone Areas
- Wetlands
- Steep > 6%



Corridors of Significance Environment Reports
Corridor 9 - West Silver Lake Road





Data Sources:
Basemap - Michigan Geographic Data Library
Farmland and Slope - SSURGO, from Michigan Geographic Data Library
Wetlands - National Wetland Inventory, from Michigan Geographic Data Library
Flood Prone Areas - Northwest MI Council of Governments
Orthophotography - FSA NAIP, 2006, 1m from ArcIMS Server _http://gdw.apfo.usda.gov

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LEGEND

Corridor

Corridor Buffer

Municipal Boundary

Railroad

Drinking Water Wells

HazMat

Landmarks

Oil & Gas

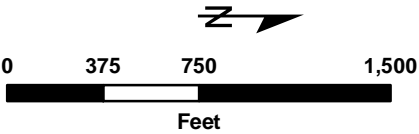
CONSTRAINTS

Prime and Unique Farmland Soils

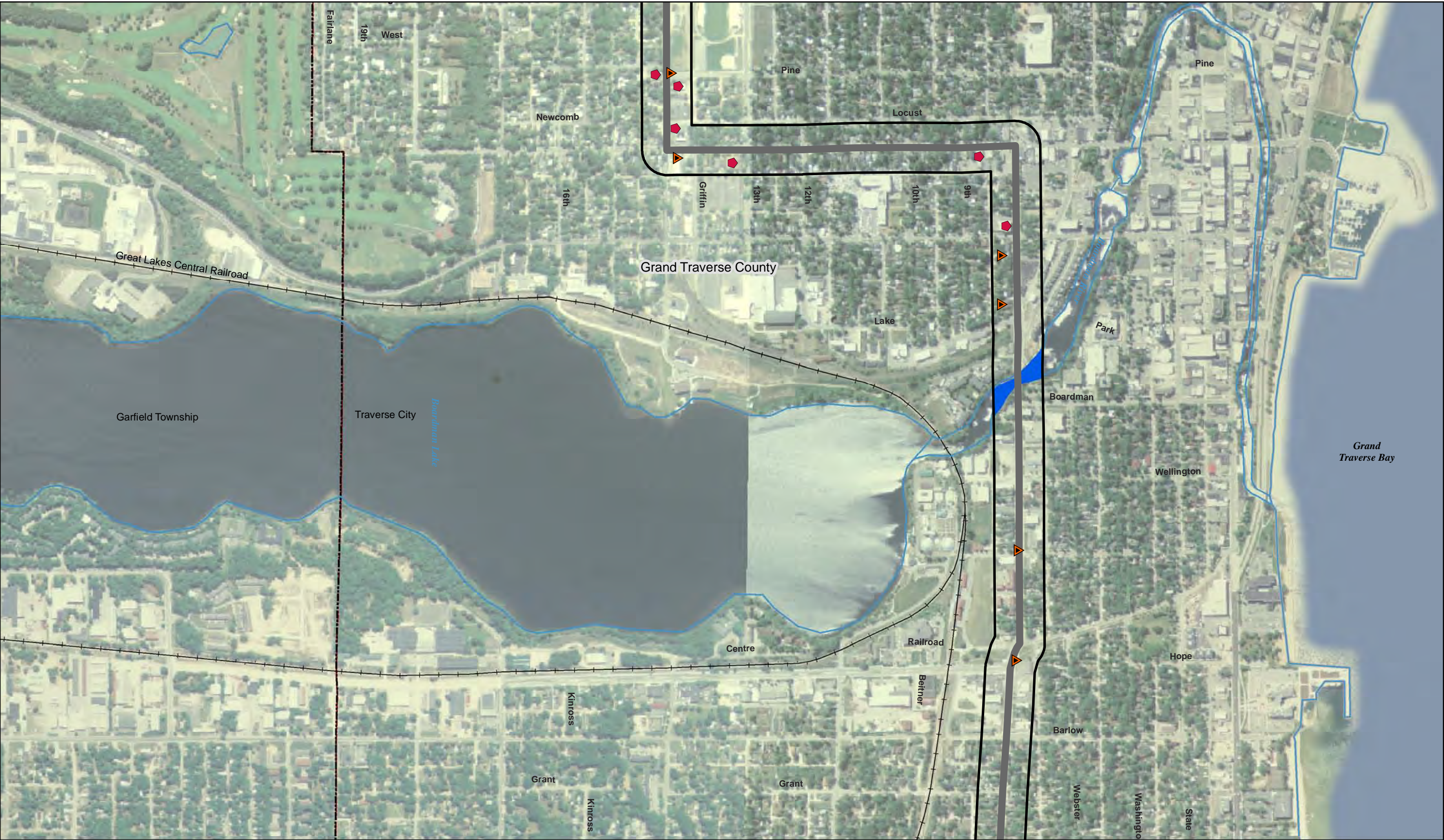
Flood Prone Areas

Wetlands

Steep > 6%



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Data Sources:
Basemap - Michigan Geographic Data Library
Farmland and Slope - SSURGO, from Michigan Geographic Data Library
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Orthophotography - FSA NAIP, 2006, 1m from ArcIMS Server _http://gdw.apfo.usda.gov

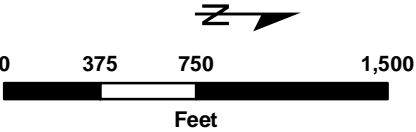
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LEGEND

- Corridor
- Corridor Buffer
- Municipal Boundary
- Railroad
- Drinking Water Wells
- HazMat
- Landmarks
- Oil & Gas

CONSTRAINTS

- Prime and Unique Farmland Soils
- Flood Prone Areas
- Wetlands
- Steep > 6%



**Corridors of Significance Environment Reports
Corridor 9 - West Silver Lake Road**





Data Sources:
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Wetlands - National Wetland Inventory, from Michigan Geographic Data Library
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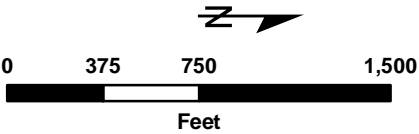
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LEGEND

- Corridor
- Corridor Buffer
- Municipal Boundary
- Railroad
- Drinking Water Wells
- HazMat
- Landmarks
- Oil & Gas

CONSTRAINTS

- Prime and Unique Farmland Soils
- Flood Prone Areas
- Wetlands
- Steep > 6%



**Corridors of Significance Environment Reports
Corridor 9 - West Silver Lake Road**





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Sheet 1 of 6

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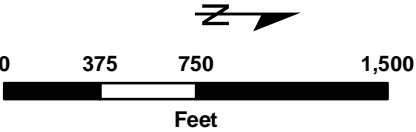
LEGEND

- Corridor
- Corridor Buffer
- Municipal Boundary
- Water Bodies

- Rivers/Streams
- Railroad
- Roads

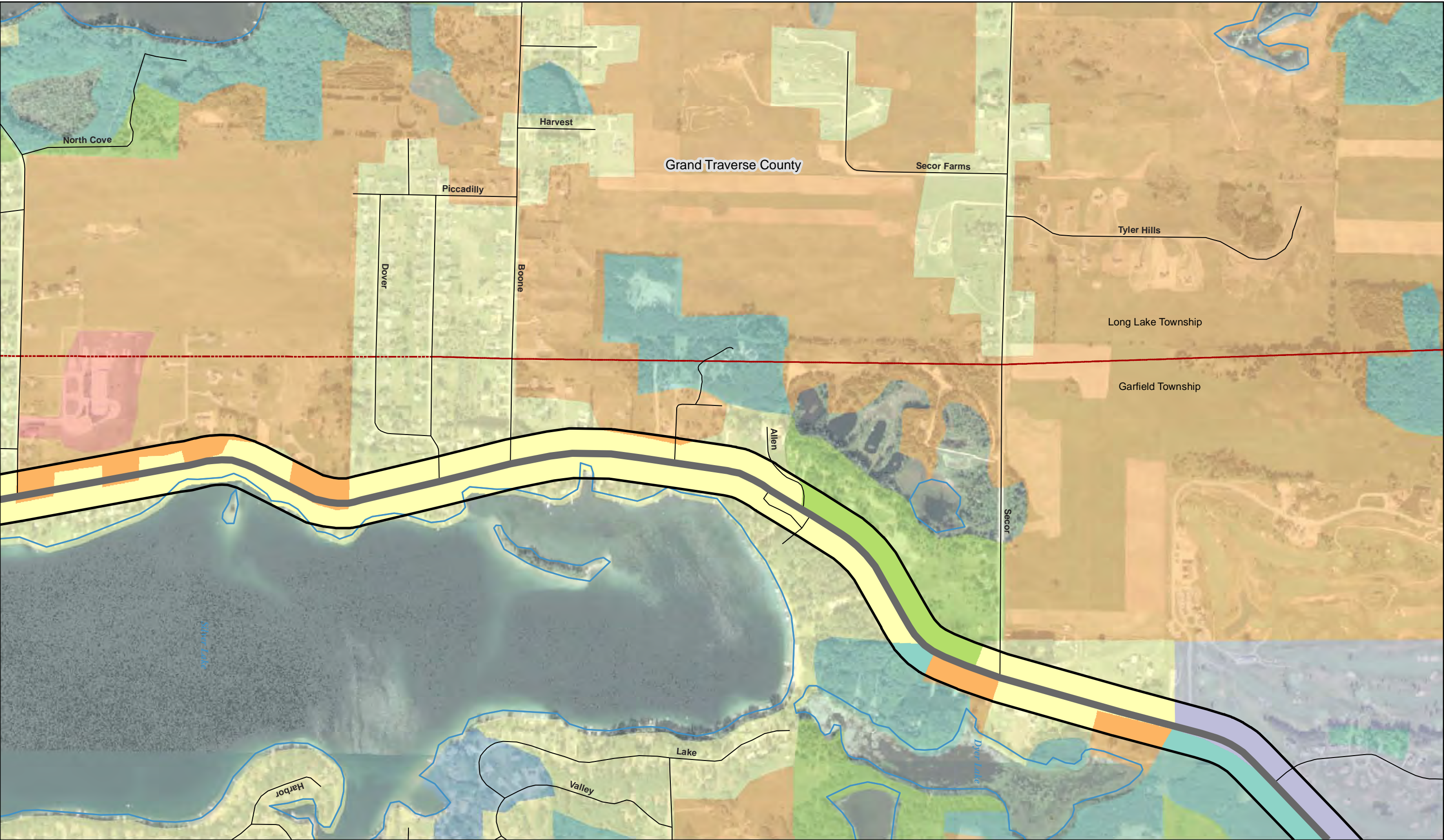
LAND USE

- Mixed Residential
- Mixed Agricultural
- Mixed Commercial
- Mixed Industrial
- Open Land
- Forested Land
- Public/Semi-Public



Corridors of Significance Environment Reports
Corridor 9 - West Silver Lake Road





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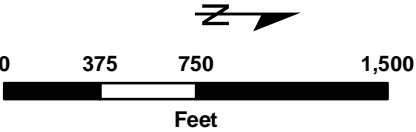
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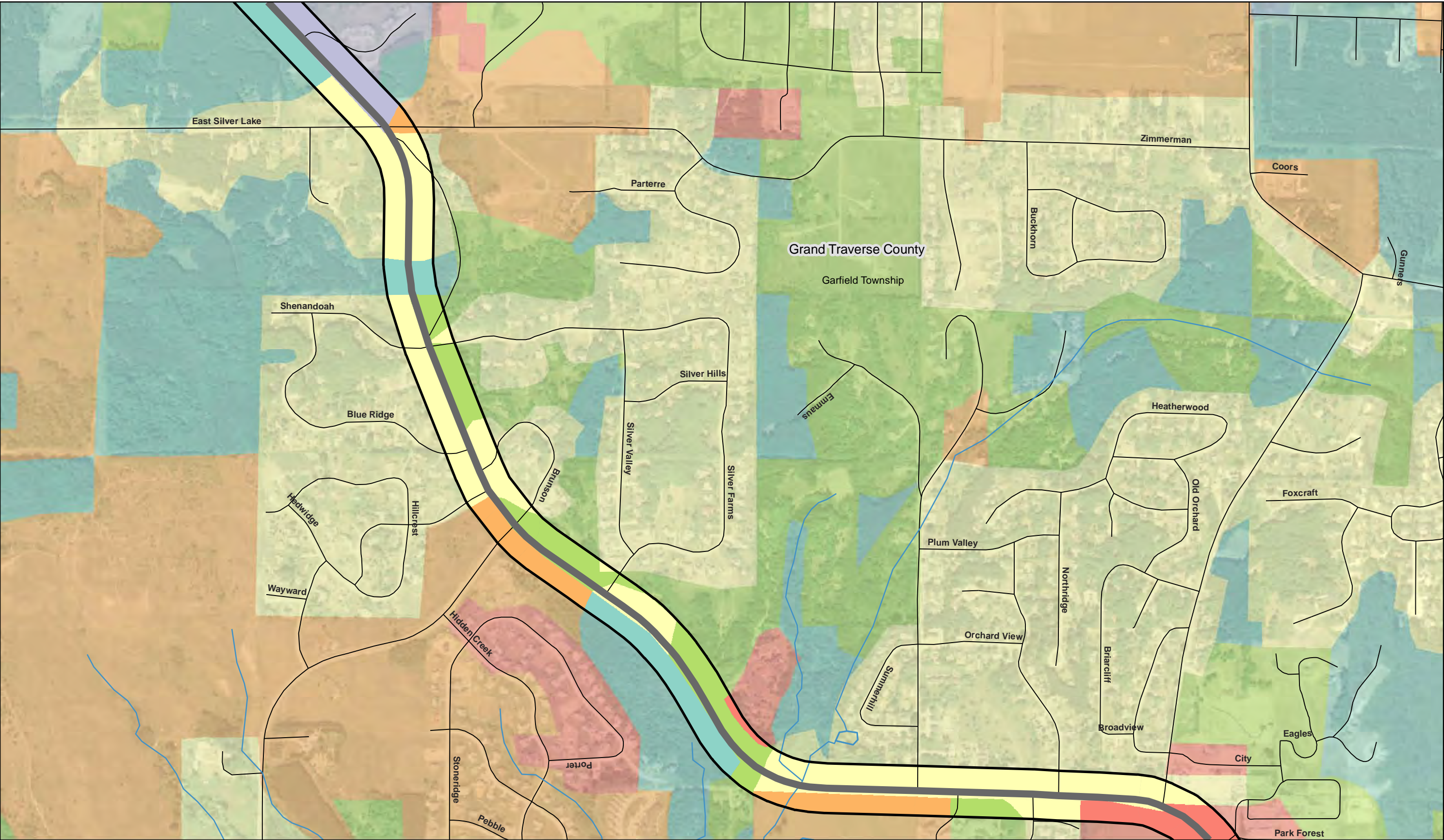
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- Municipal Boundary
- Water Bodies

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LAND USE

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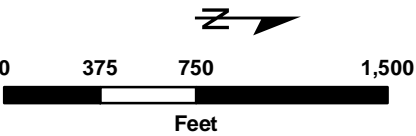
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- Corridor Buffer
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- Water Bodies

- Rivers/Streams
- Railroad
- Roads

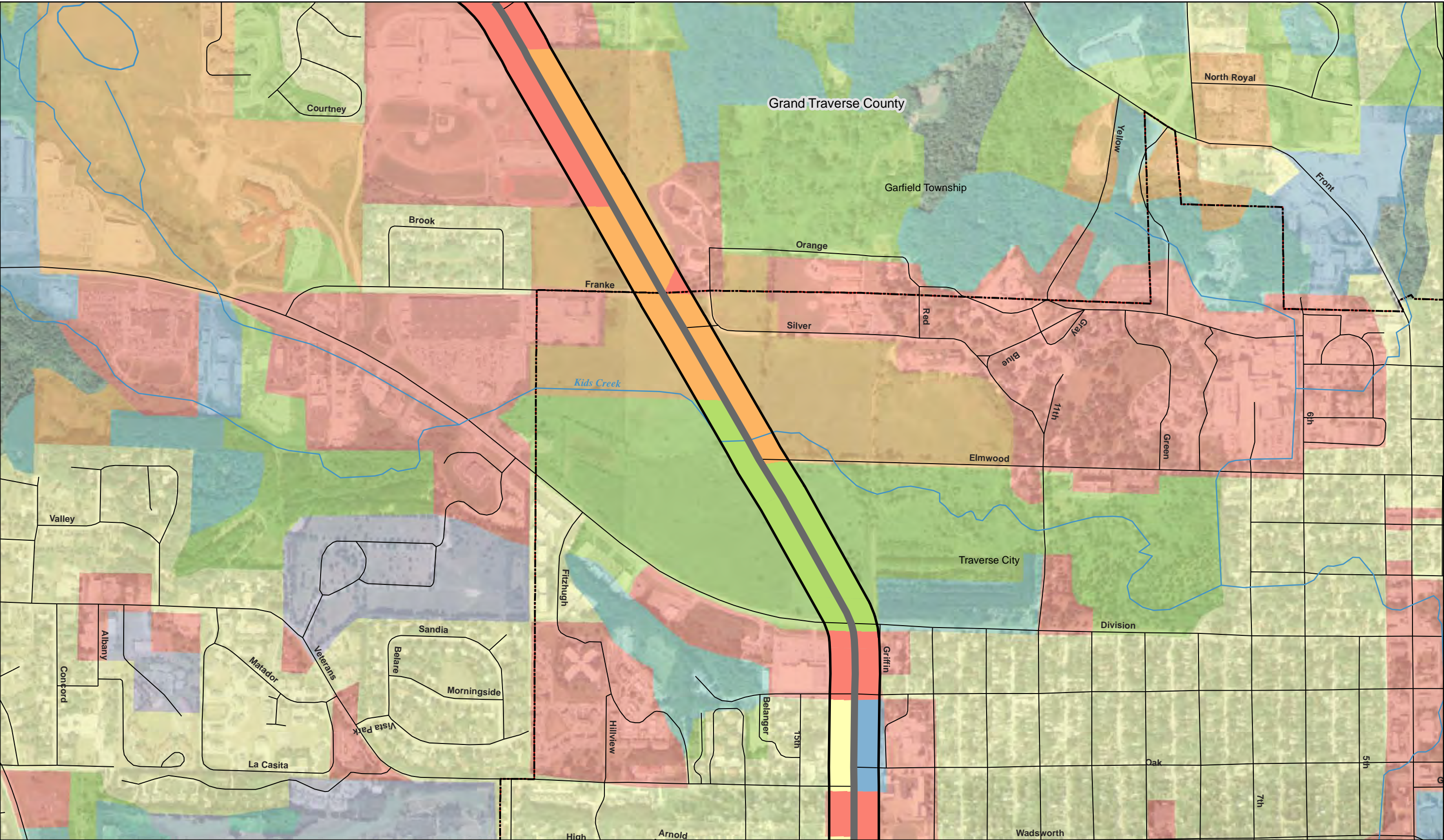
LAND USE

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Corridors of Significance Environment Reports
Corridor 9 - West Silver Lake Road





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Sheet 4 of 6

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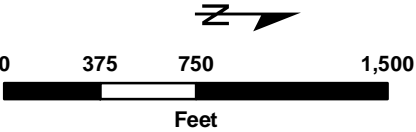
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- Rivers/Streams
- Railroad
- Roads

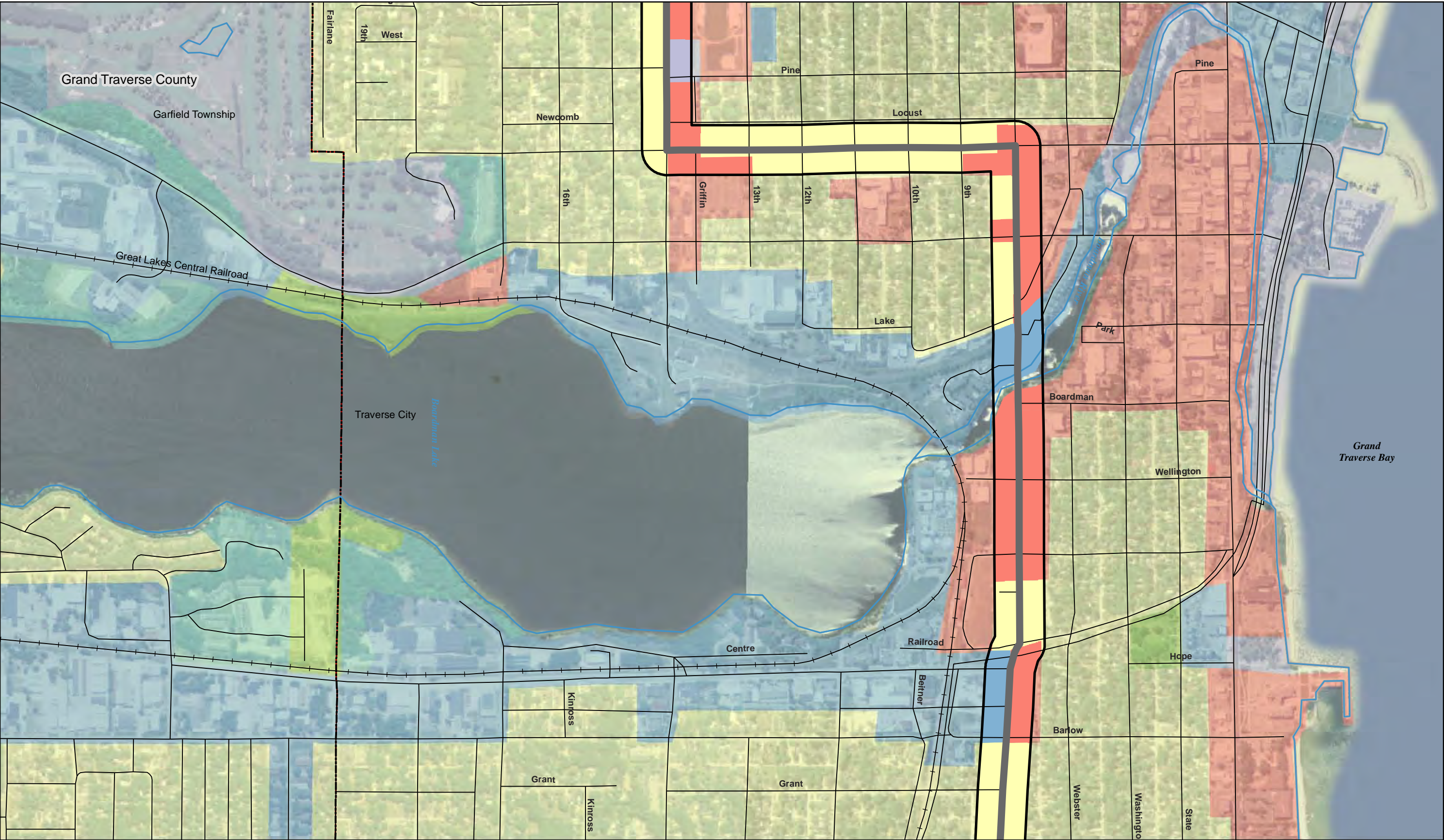
LAND USE

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Corridors of Significance Environment Reports
Corridor 9 - West Silver Lake Road





Sheet 5 of 6

Data Sources:
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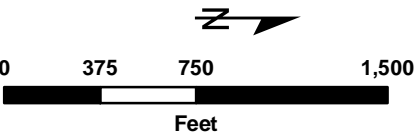
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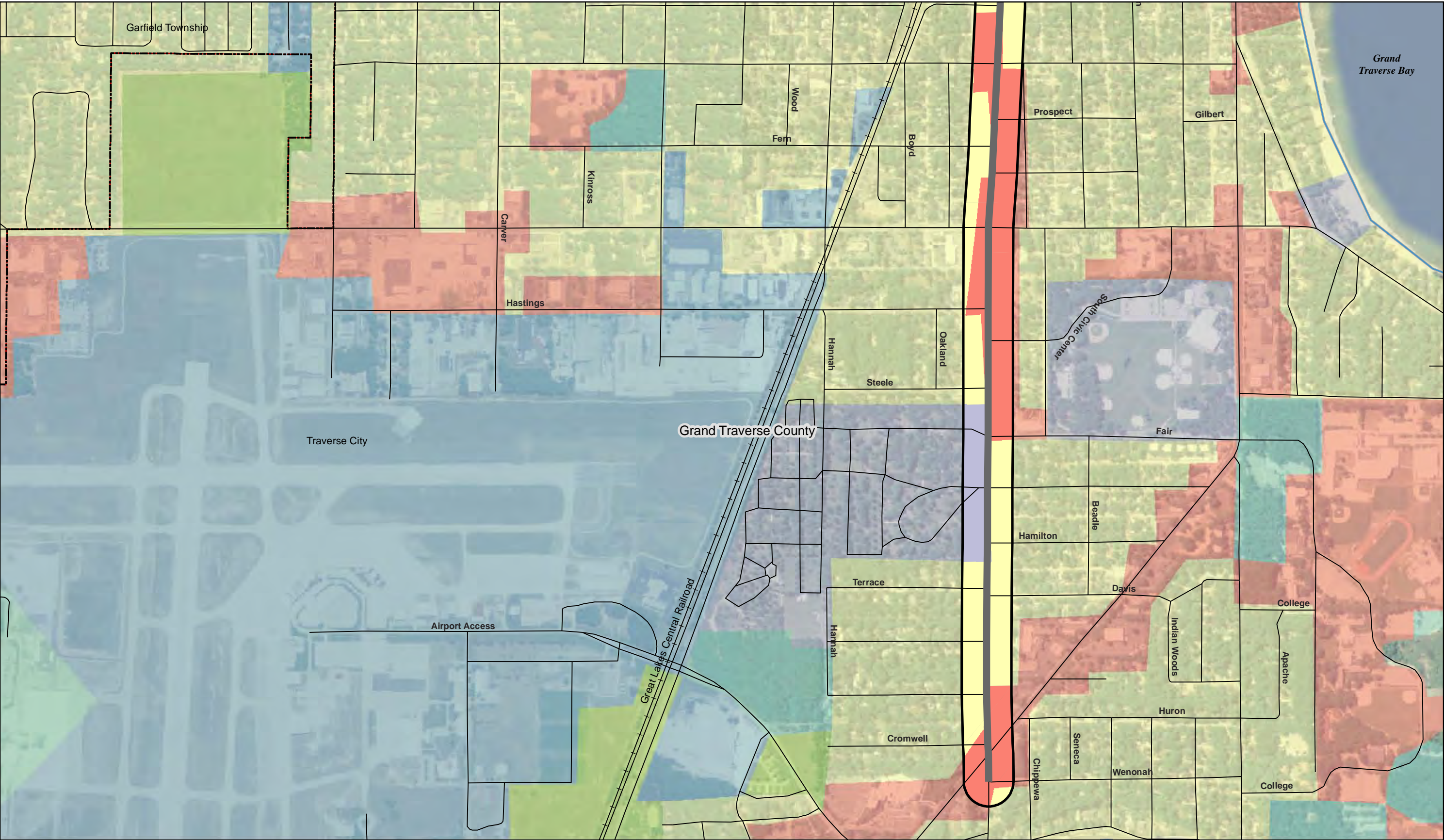
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- Municipal Boundary
- Water Bodies

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LAND USE

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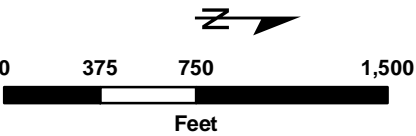
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LEGEND

- Corridor
- Corridor Buffer
- Municipal Boundary
- Water Bodies
- Rivers/Streams
- Railroad
- Roads

LAND USE

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- Mixed Commercial
- Mixed Industrial
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Corridors of Significance Environment Reports
Corridor 9 - West Silver Lake Road



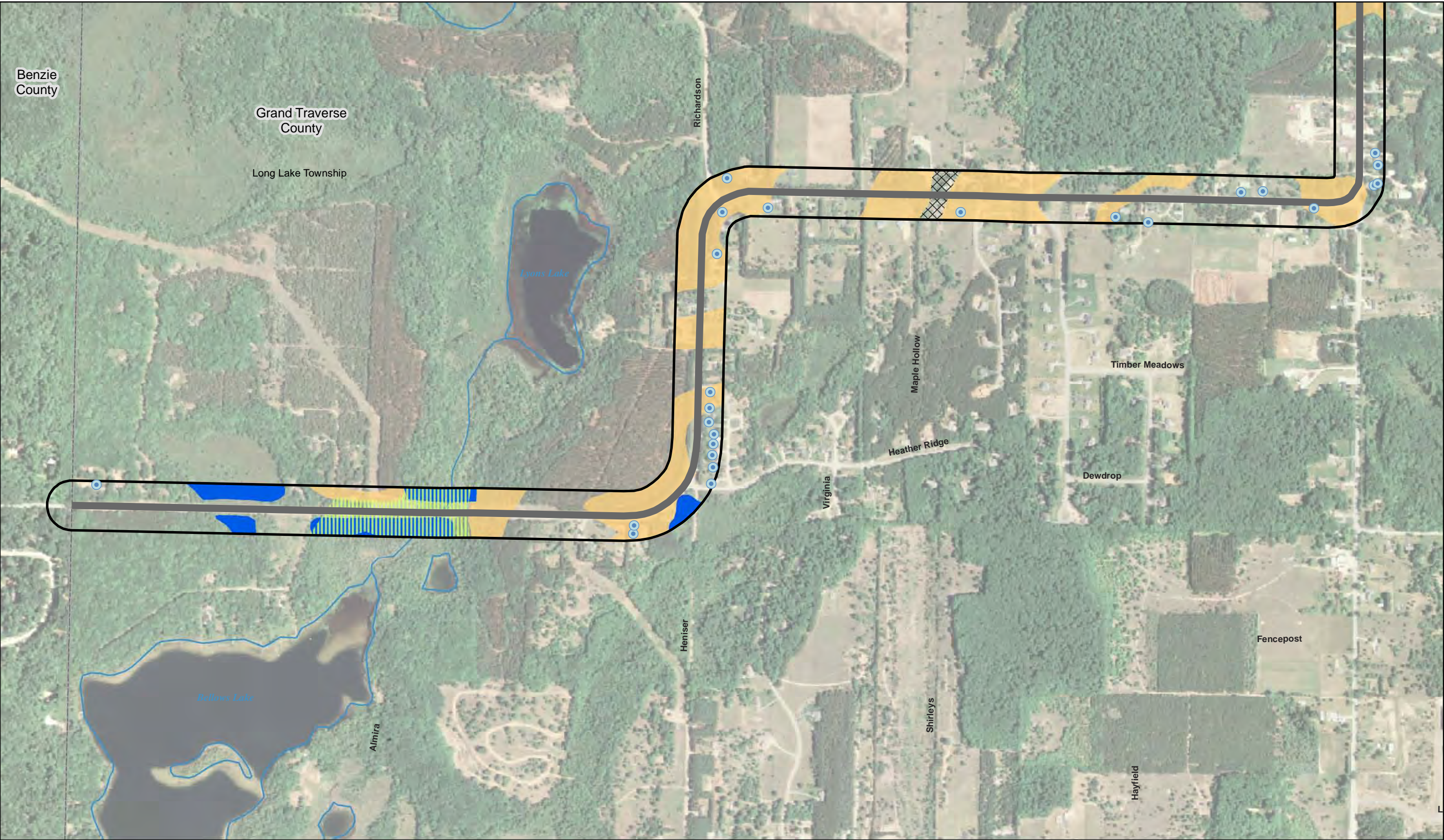
Corridor 10 – North Long Lake Road

The North Long Lake Road corridor is located in Grand Traverse County in the townships of Long Lake and Garfield. The corridor is approximately 9.4 miles long, and it begins at the Benzie County line and terminates at Silver Lake Road. North Long Lake Road has two lanes with a posted speed of 55 miles per hour and has a functional classification of Minor Arterial. The North Long Lake Road corridor is made of asphalt and major intersections include Barnes Road, Silver Lake Road, Zimmerman Road, Traverse City West High School. It has an average daily traffic (ADT) count of 10,746 cars per day, though this count varies along the length of the corridor. The total land area within the buffer is approximately 458 acres.

The table below summarizes the presence of environmental resources in the North Long Lake Road corridor. Specific geographic information is shown on the maps on the following pages.

Table 3.10 N. Long Lake Road Physical Environmental Resource Summary

Resource Category	Resource Summary
Commercial / navigational rivers or streams	no
Landmarks	yes, five identified
Threatened or endangered species	no
Wetlands	yes, 10.12 acres identified
Flood prone areas	yes, 9.19 acres identified
Coastal resources	no
Wild and scenic rivers / natural rivers	no
Prime and unique farmland soils	yes, about 153.73 acres identified
Hazardous materials	yes, one location identified



Data Sources:
Basemap - Michigan Geographic Data Library
Farmland and Slope - SSURGO, from Michigan Geographic Data Library
Wetlands - National Wetland Inventory, from Michigan Geographic Data Library
Flood Prone Areas - Northwest MI Council of Governments
Orthophotography - FSA NAIP, 2006, 1m from ArcIMS Server _http://gdw.apfo.usda.gov

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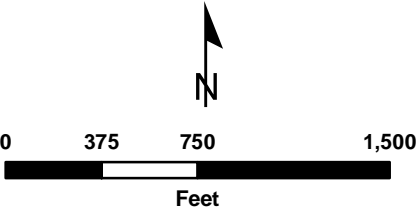
LEGEND

- Corridor
- Corridor Buffer
- Municipal Boundary
- Railroad

- Drinking Water Wells
- HazMat
- Landmarks
- Oil & Gas

CONSTRAINTS

- Prime and Unique Farmland Soils
- Flood Prone Areas
- Wetlands
- Slopes > 6%



**Corridors of Significance Environment Reports
Corridor 10 - North Long Lake Road**





Data Sources:
Basemap - Michigan Geographic Data Library
Farmland and Slope - SSURGO, from Michigan Geographic Data Library
Wetlands - National Wetland Inventory, from Michigan Geographic Data Library
Flood Prone Areas - Northwest MI Council of Governments
Orthophotography - FSA NAIP, 2006, 1m from ArcIMS Server _http://gdw.apfo.usda.gov

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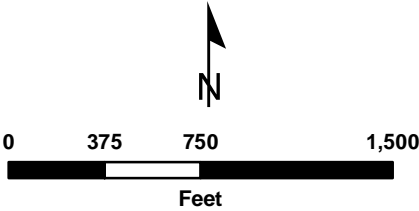
LEGEND

- Corridor
- Corridor Buffer
- Municipal Boundary
- Railroad

- Drinking Water Wells
- HazMat
- Landmarks
- Oil & Gas

CONSTRAINTS

- Prime and Unique Farmland Soils
- Flood Prone Areas
- Wetlands
- Slopes > 6%



**Corridors of Significance Environment Reports
Corridor 10 - North Long Lake Road**



Data Sources:
Basemap - Michigan Geographic Data Library
Farmland and Slope - SSURGO, from Michigan Geographic Data Library
Wetlands - National Wetland Inventory, from Michigan Geographic Data Library
Flood Prone Areas - Northwest MI Council of Governments
Orthophotography - FSA NAIP, 2006, 1m from ArcIMS Server _http://gdw.apfo.usda.gov

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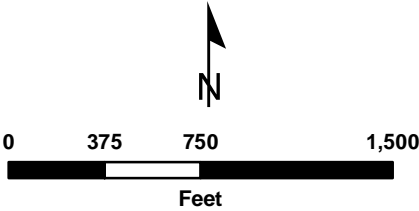
LEGEND

- Corridor
- Corridor Buffer
- Municipal Boundary
- Railroad

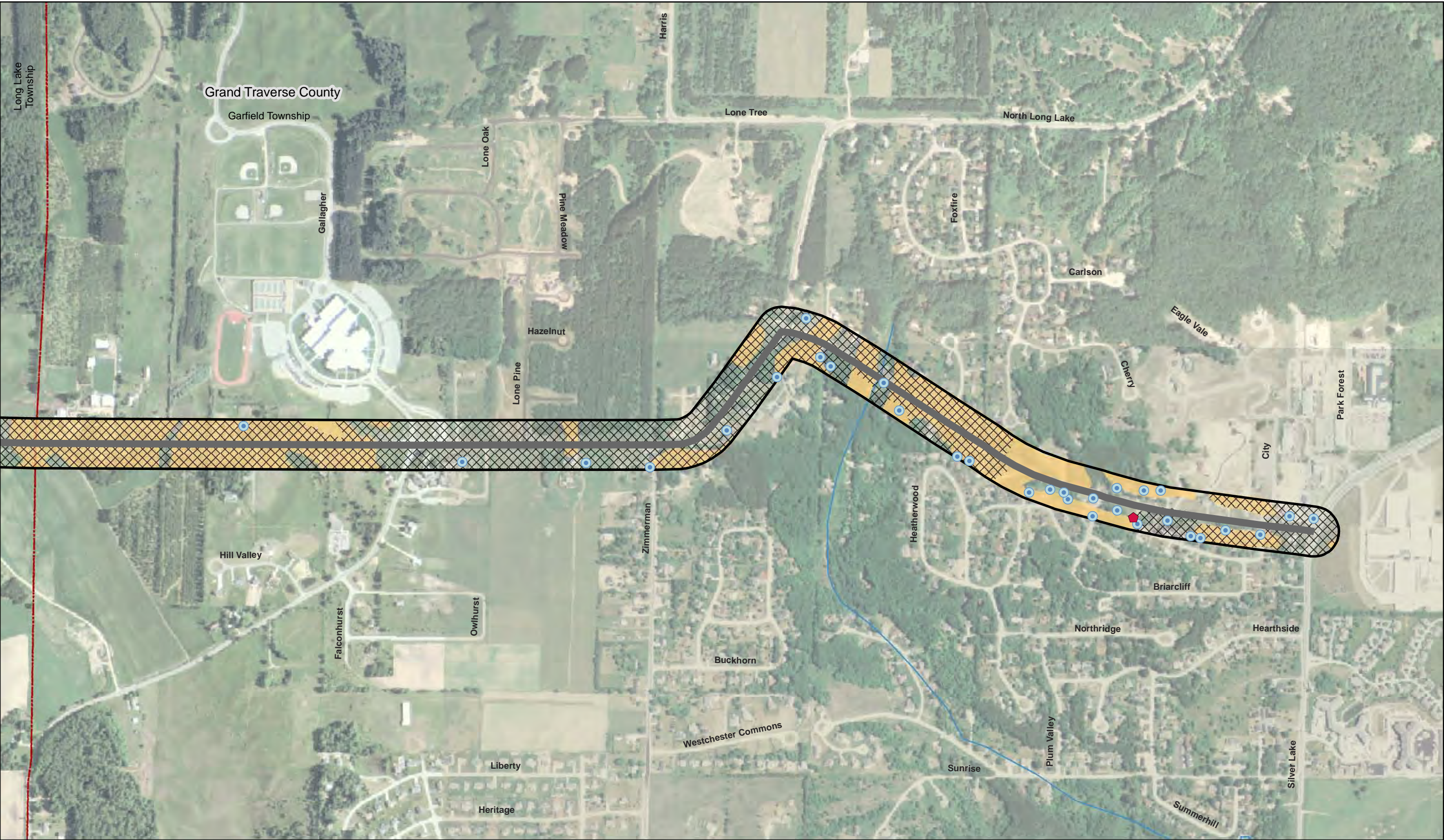
- Drinking Water Wells
- HazMat
- Landmarks
- Oil & Gas

CONSTRAINTS

- Prime and Unique Farmland Soils
- Flood Prone Areas
- Wetlands
- Slopes > 6%



**Corridors of Significance Environment Reports
Corridor 10 - North Long Lake Road**



Data Sources:
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Farmland and Slope - SSURGO, from Michigan Geographic Data Library
Wetlands - National Wetland Inventory, from Michigan Geographic Data Library
Flood Prone Areas - Northwest MI Council of Governments
Orthophotography - FSA NAIP, 2006, 1m from ArcIMS Server _http://gdw.apfo.usda.gov

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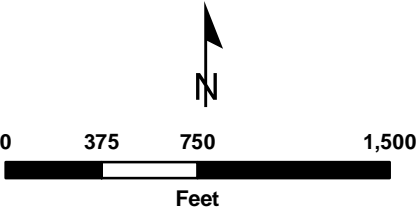
LEGEND

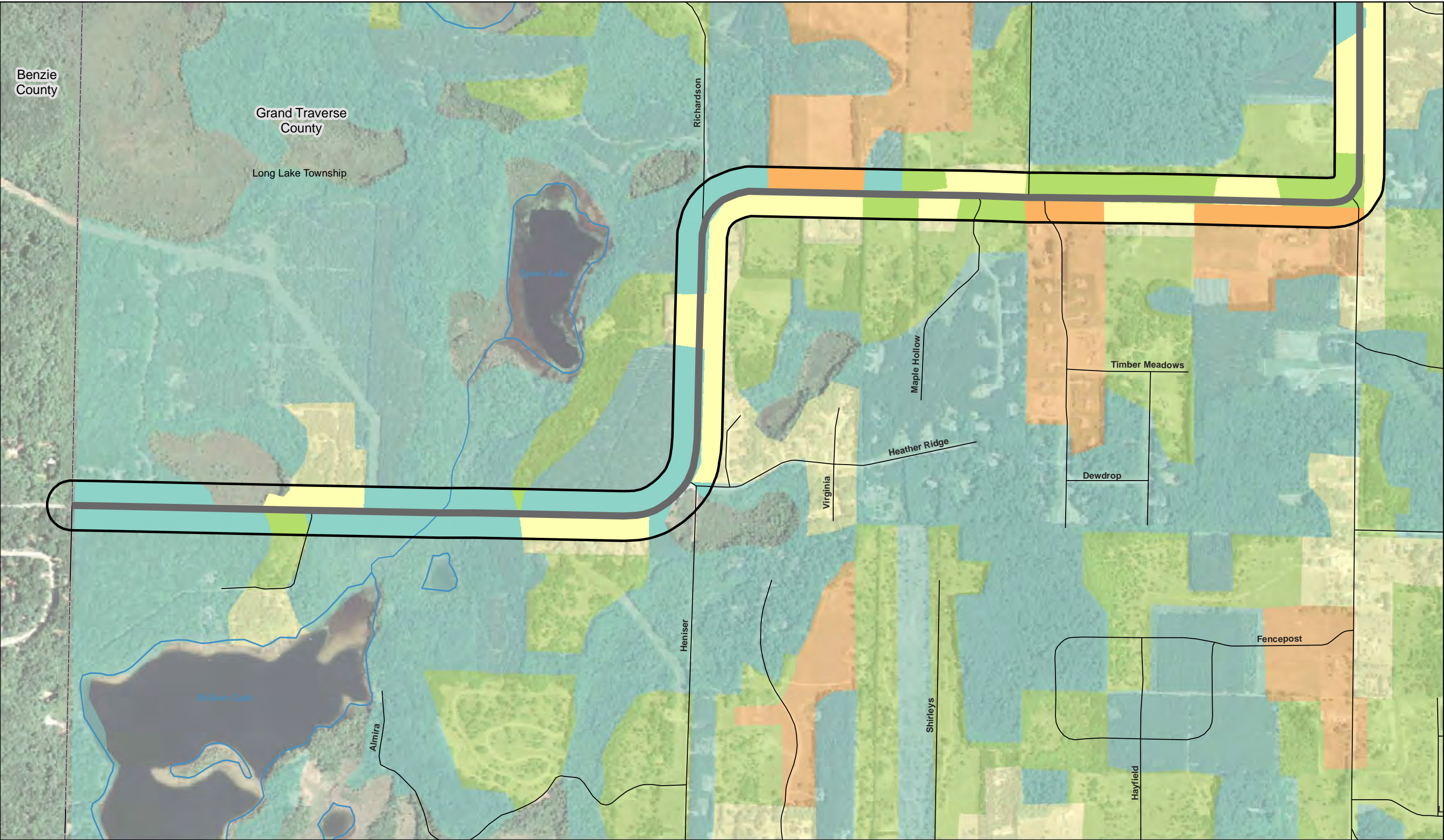
- Corridor
- Corridor Buffer
- Municipal Boundary
- Railroad

- Drinking Water Wells
- HazMat
- Landmarks
- Oil & Gas

CONSTRAINTS

- Prime and Unique Farmland Soils
- Flood Prone Areas
- Wetlands
- Slopes > 6%





Data Sources:
Land Cover - MDNR, Forest, Mineral and Fire Management Division
Land Use - Grand Traverse County
Orthophotography - FSA NAIP, 2006, 1m from ArcIMS Server <http://gdw.apfo.usda.gov>

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LEGEND

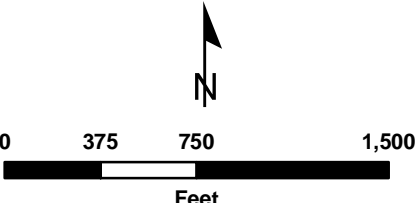
- Corridor
- Corridor Buffer
- Municipal Boundary
- Water Bodies

LAND USE

- Mixed Residential
- Mixed Agricultural
- Mixed Commercial
- Mixed Industrial
- Open Land
- Forested Land
- Public/Semi-Public

LEGEND

- Rivers/Streams
- Railroad
- Roads



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Sheet 2 of 4

Data Sources:
Land Cover - MDNR, Forest, Mineral and Fire Management Division
Land Use - Grand Traverse County
Orthophotography - FSA NAIP, 2006, 1m from ArcIMS Server _http://gdw.apfo.usda.gov

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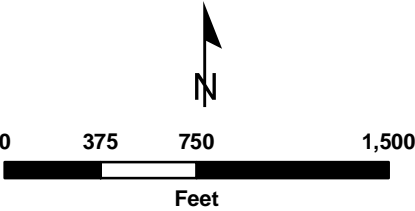
LEGEND

- Corridor
- Corridor Buffer
- Municipal Boundary
- Water Bodies

- Rivers/Streams
- Railroad
- Roads

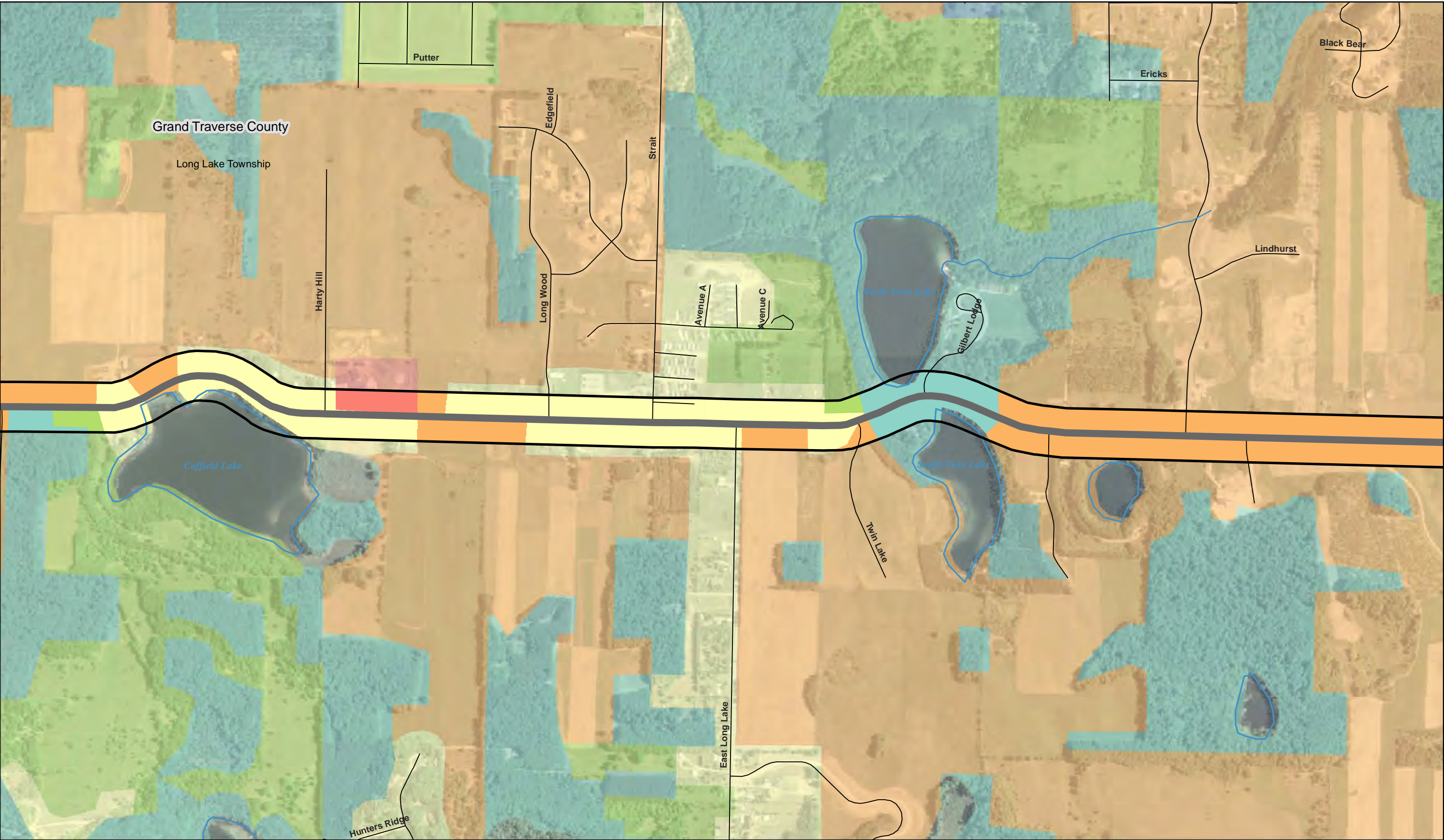
LAND USE

- Mixed Residential
- Mixed Agricultural
- Mixed Commercial
- Mixed Industrial
- Open Land
- Forested Land
- Public/Semi-Public



Corridors of Significance Environment Reports
Corridor 10 - North Long Lake Road





Data Sources:
Land Cover - MDNR, Forest, Mineral and Fire Management Division
Land Use - Grand Traverse County
Orthophotography - FSA NAIP, 2006, 1m from ArcIMS Server [_http://gdw.apfo.usda.gov](http://gdw.apfo.usda.gov)

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LEGEND

- Corridor
- Corridor Buffer
- Municipal Boundary
- Water Bodies

Rivers/Streams

Railroad

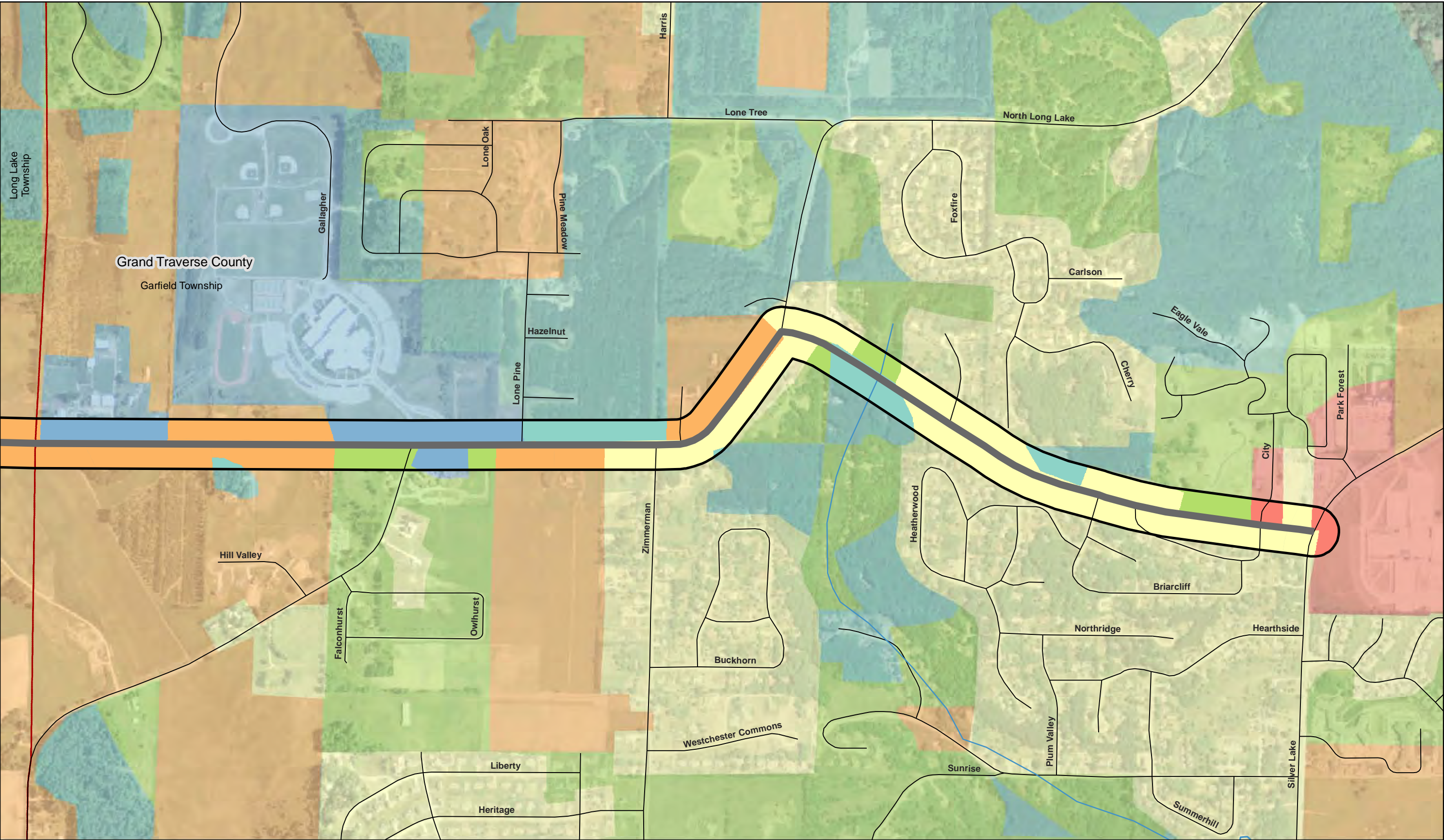
Roads

LAND USE

- Mixed Residential
- Mixed Agricultural
- Mixed Commercial
- Mixed Industrial
- Open Land
- Forested Land
- Public/Semi-Public



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Data Sources:
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Land Use - Grand Traverse County
Orthophotography - FSA NAIP, 2006, 1m from ArcIMS Server _http://gdw.apfo.usda.gov

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LEGEND

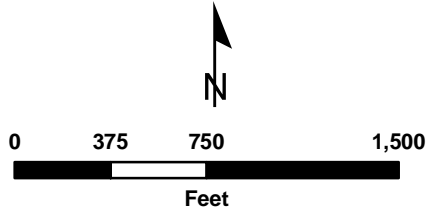
- Corridor
- Corridor Buffer
- Municipal Boundary
- Water Bodies

LAND USE

- Mixed Residential
- Mixed Agricultural
- Mixed Commercial
- Mixed Industrial
- Open Land
- Forested Land
- Public/Semi-Public

Other Features

- Rivers/Streams
- Railroad
- Roads



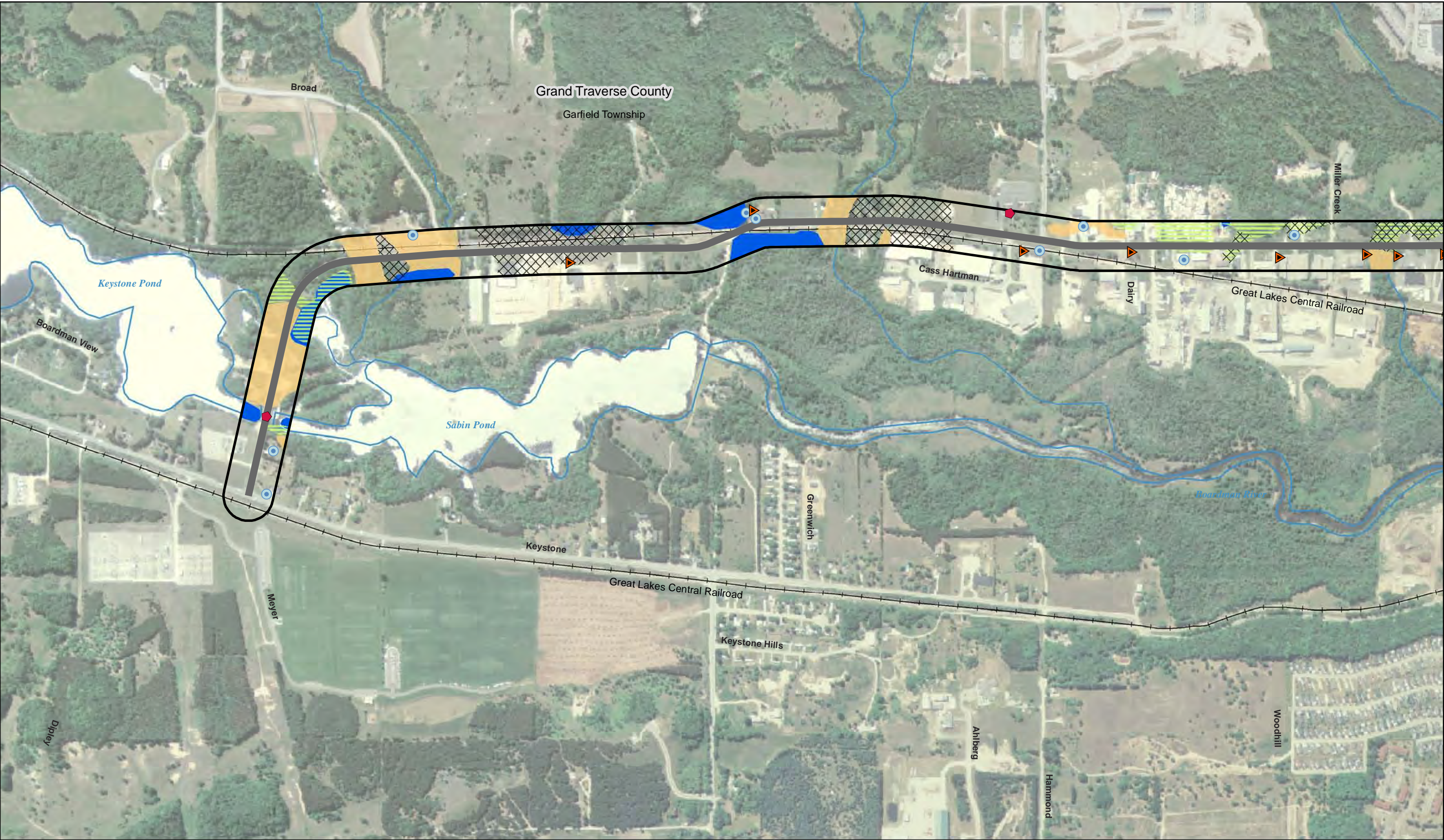
Corridor 11 – Cass Road

The Cass Road corridor is located in Grand Traverse County in the township of Garfield. The corridor is approximately 4.2 miles long; it begins at Keystone Road and ends at 14th Street. Cass Road has two lanes with a posted speed range from 25 miles per hour to 45 miles per hour. The functional classification of Cass Road is Minor Arterial. The Cass Road corridor is made of asphalt and major intersections includes Keystone Road, South Airport Road, and 14th Street. It has an average daily traffic (ADT) count of 10,176 cars per day, though this count varies along the length of the corridor. Total land area within the buffer is approximately 201 acres.

The table below summarizes the presence of environmental resources in the Cass Road corridor. Specific geographic information is shown on the maps on the following pages.

Table 3.11 Cass Road Physical Environmental Resource Summary

Resource Category	Resource Summary
Commercial / navigational rivers or streams	Boardman Lake and Boardman River
Landmarks	yes, two identified
Threatened or endangered species	yes
Wetlands	yes, 7.12 acres identified
Flood prone areas	yes, 14.09 acres identified
Coastal resources	yes, extensive areas identified
Wild and scenic rivers / natural rivers	Boardman River
Prime and unique farmland soils	yes, about 25.11 acres identified
Hazardous materials	yes, 17 locations identified

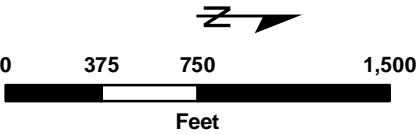


Data Sources:
Basemap - Michigan Geographic Data Library
Farmland and Slope - SSURGO, from Michigan Geographic Data Library
Wetlands - National Wetland Inventory, from Michigan Geographic Data Library
Flood Prone Areas - Northwest MI Council of Governments
Orthophotography - FSA NAIP, 2006, 1m from ArcIMS Server <http://gdw.apfo.usda.gov>

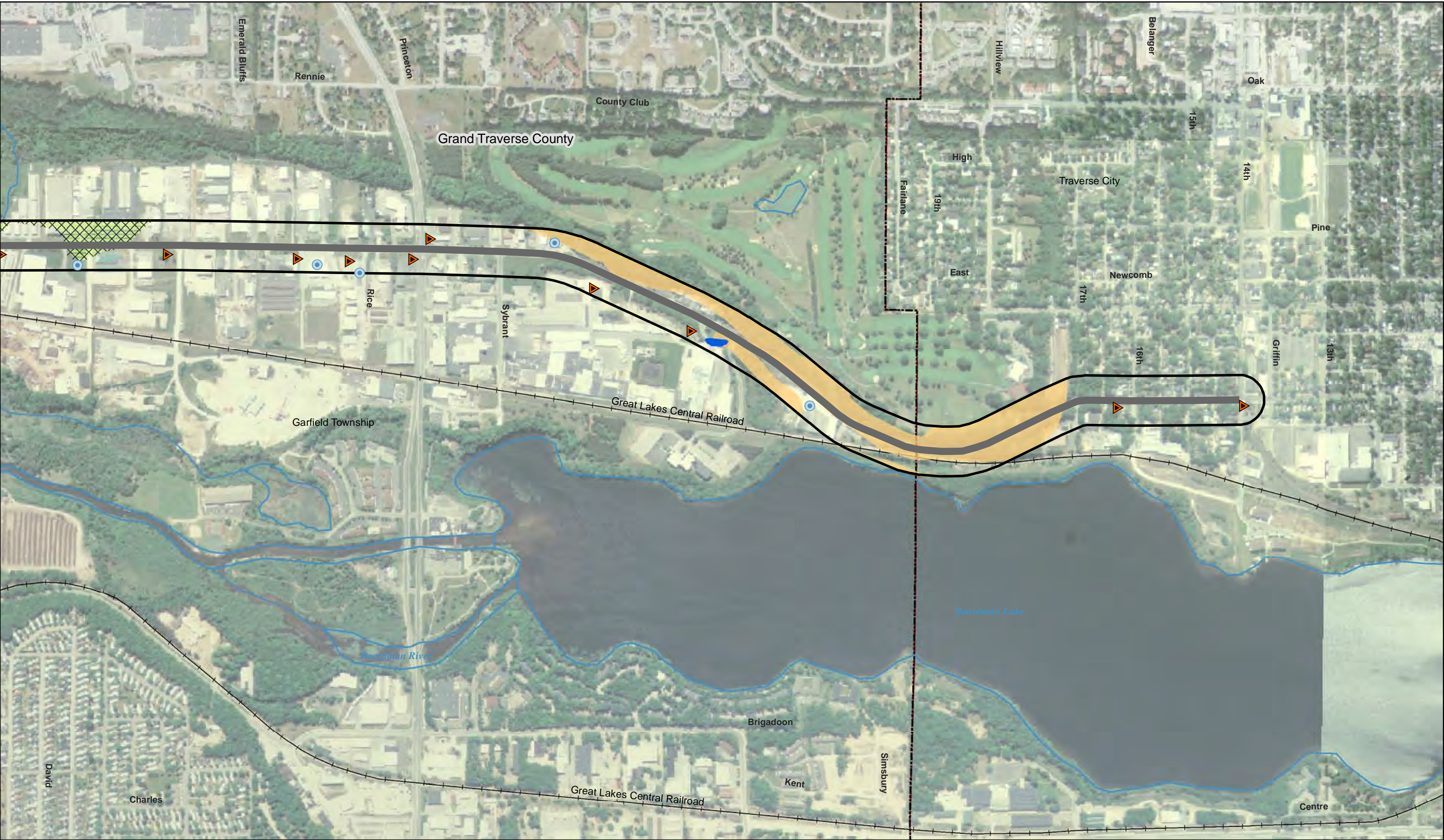
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LEGEND

- Corridor
- Corridor Buffer
- Municipal Boundary
- Railroad
- Drinking Water Wells
- HazMat
- Landmarks
- Oil & Gas
- Prime and Unique Farmland Soils
- Flood Prone Areas
- Wetlands
- Slopes > 6%



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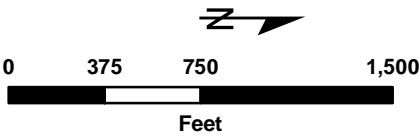
Sheet 2 of 2

Data Sources:
Basemap - Michigan Geographic Data Library
Farmland and Slope - SSURGO, from Michigan Geographic Data Library
Wetlands - National Wetland Inventory, from Michigan Geographic Data Library
Flood Prone Areas - Northwest MI Council of Governments
Orthophotography - FSA NAIP, 2006, 1m from ArcIMS Server _http://gdw.apfo.usda.gov

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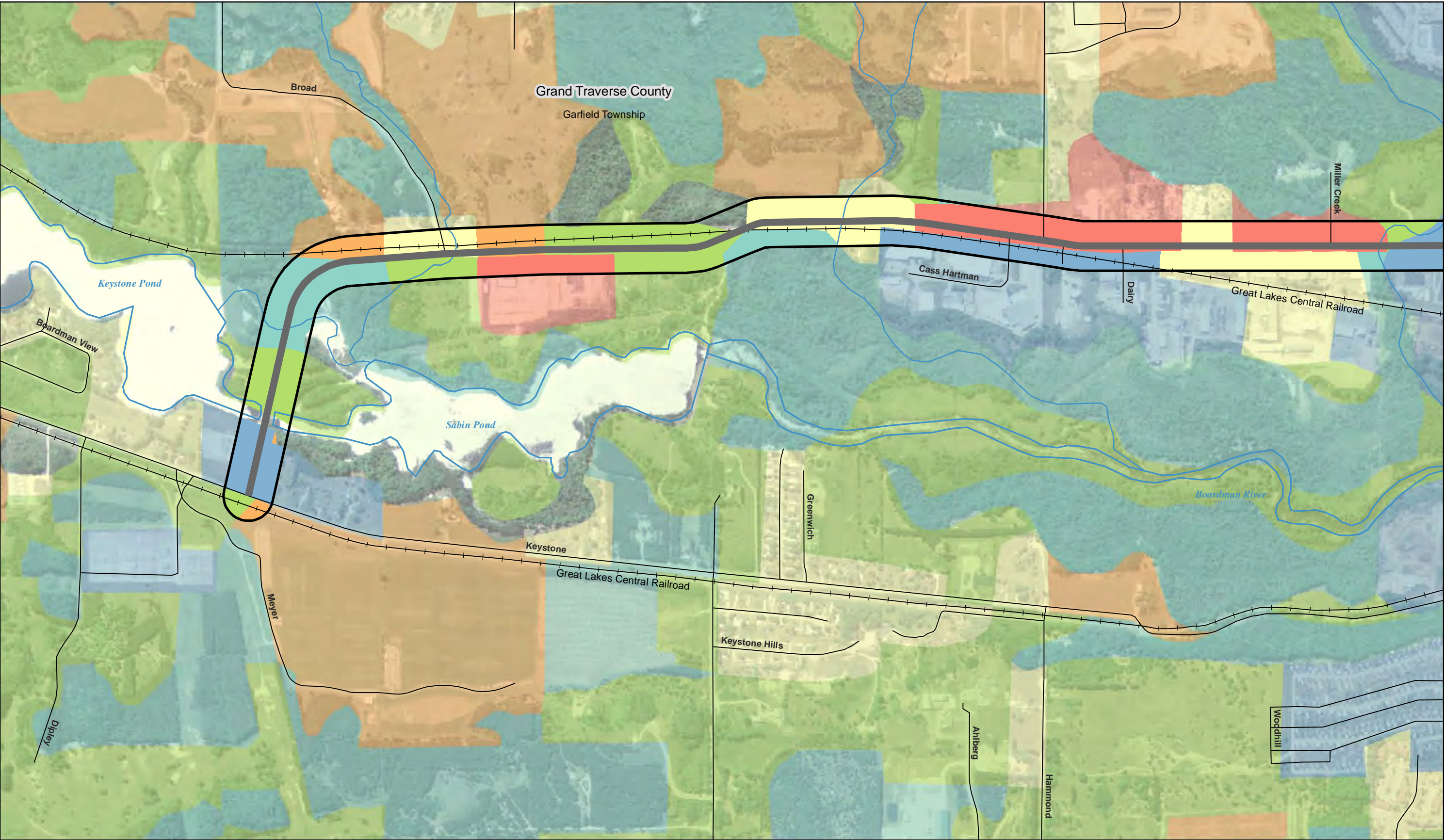
LEGEND

- Corridor
- Corridor Buffer
- Municipal Boundary
- Railroad
- Drinking Water Wells
- HazMat
- Landmarks
- Oil & Gas
- Prime and Unique Farmland Soils
- Flood Prone Areas
- Wetlands
- Slopes > 6%



Corridors of Significance Environment Reports
Corridor 11 - Cass Road





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Sheet 1 of 2

Data Sources:
Land Cover - MDNR, Forest, Mineral and Fire Management Division
Land Use - Grand Traverse County
Orthophotography - FSA NAIP, 2006, 1m from ArcIMS Server _http://gdw.apfo.usda.gov

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LEGEND

- Corridor
- Corridor Buffer
- Municipal Boundary
- Water Bodies

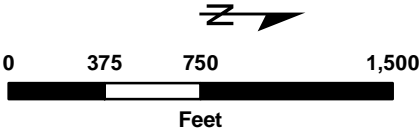
Rivers/Streams

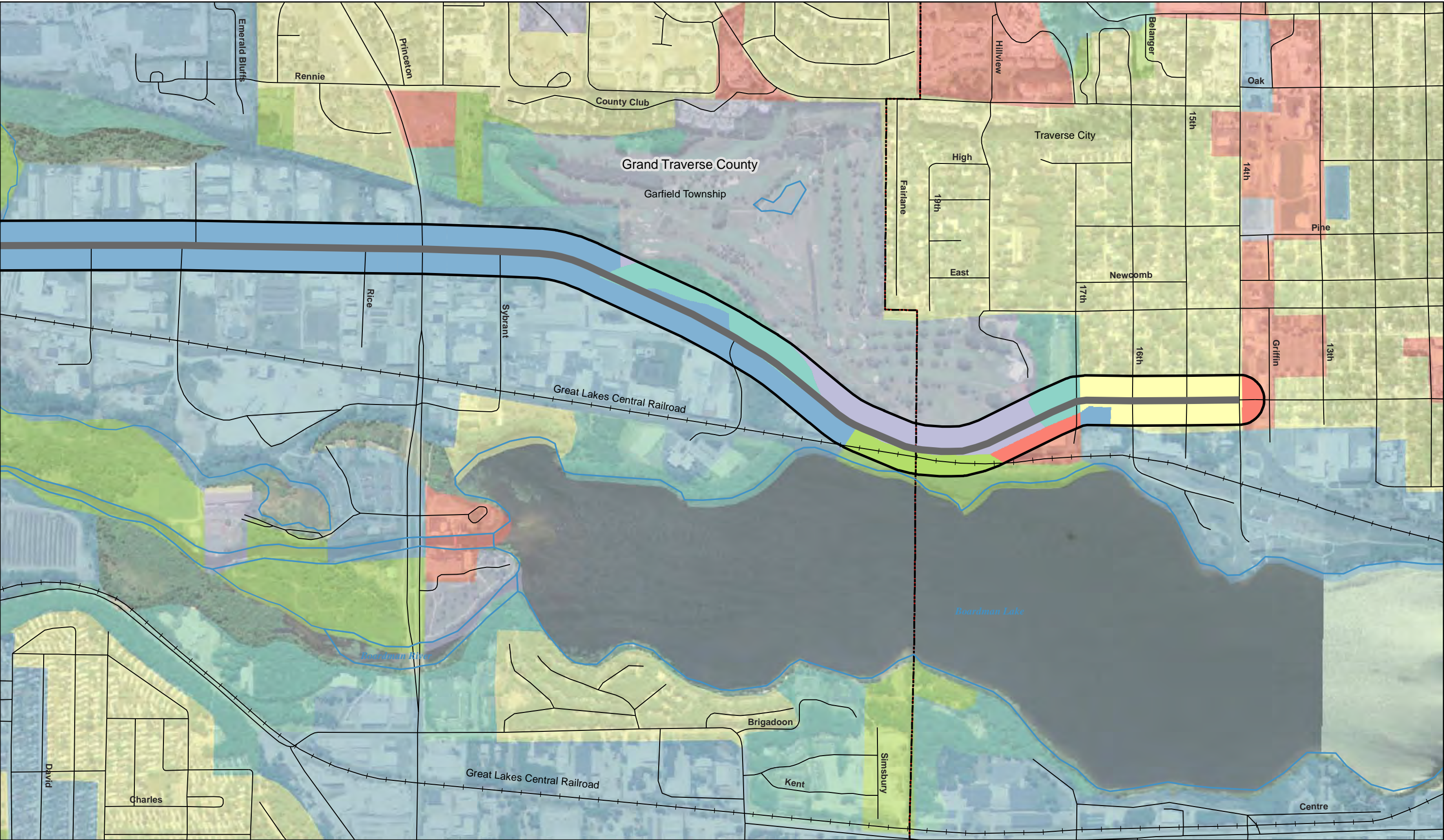
Railroad

Roads

LAND USE

- Mixed Residential
- Mixed Agricultural
- Mixed Commercial
- Mixed Industrial
- Open Land
- Forested Land
- Public/Semi-Public





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Sheet 2 of 2

Data Sources:
Land Cover - MDNR, Forest, Mineral and Fire Management Division
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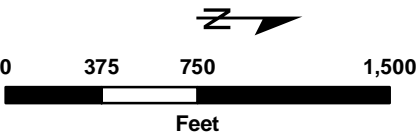
LEGEND

- Corridor
- Corridor Buffer
- Municipal Boundary
- Water Bodies

- Rivers/Streams
- Railroad
- Roads

LAND USE

- Mixed Residential
- Mixed Agricultural
- Mixed Commercial
- Mixed Industrial
- Open Land
- Forested Land
- Public/Semi-Public



4.0 Land Use Scenario Impacts by Corridor

The Grand Vision Land Use and Transportation Study identified eleven “Corridors of Significance.” The project scope includes twelve specific categories for discussion. This section addresses land use impacts of each scenario individually which includes land use, planned growth, and development activity associated with each scenario.

From a policy perspective, each of the scenarios approaches growth in a different manner. As a result, there are themes that can be associated with each scenario as it relates to regional land use, transportation, social and environmental considerations. Before going into specific commentary by corridor, here are some general observations about the land use impacts of each scenario. The corridors are in and around Traverse City, so comments are provided in relation to the Traverse City area but the same principles apply to development near Cadillac on other transportation corridors.

The Trend scenario (A) is a continuation of current land use patterns into the future. Low density land use patterns spread out from Traverse City and along major transportation corridors. Most housing is single-family residential and most commercial development is built in an auto-oriented development type. As a result, land use has a more significant impact on the transportation corridors under consideration than in other scenarios. There are more individual driveways serving more auto-oriented developments. The development spreads out further geographically and impacts more transportation corridors as a result.

The Rural by design scenario (B) places new development in a scattered pattern in rural areas around the region. As a result, there is less development in Traverse City so the land use impacts on the transportation network do not reach as far geographically from the city center. Outside of the urban center, the rural cluster developments are like hamlets with a mix of housing options and some commercial development. Internally, there are non-motorized connections and some opportunity for daily transit connections to Traverse City. Externally, there are a limited number of planned access points to the adjacent transportation corridor.

The Villages scenario (C) places new development in nodes in Traverse City and in villages around the region. As a result, there is less development in and around Traverse City than in the Trend scenario and the Traverse City development is concentrated in specific nodes at major intersections. This scenario offers more compact, walkable development types and limits corridor development geographically. Transit is more effective in Traverse City and between villages than in the Trend scenario and non-motorized facilities serve major development nodes in Traverse City and in the villages.

The City focused scenario (D) places almost all of the new growth in the region in Traverse City and Cadillac. The land use impact on many of these corridors in the central city is significant. However, the impact is limited geographically so those corridors outside of the central city have lower land use impacts. This scenario offers the highest amount of new walkable residential units and new walkable employment. Transit and non-motorized transportation is most effective in this scenario.

4.1 Corridor 1 – M-72

In the Trend scenario (A), land use patterns follow the major transportation corridors in a strip development pattern (including this one). The overall land use pattern pushes outward rather than upward so most buildings are single story with no breaks in development along the corridor. Access management is an effective form of planned growth along this corridor but other efforts will struggle in this scenario as there is little change along the urban corridor to leverage. There is a more dense development pattern in the downtown area near the main waterfront with some multi-story buildings. New development is primarily retail commercial and waterfront resort in this area. Housing opportunities remain essentially unchanged in this scenario so there are limited opportunities to live along this corridor.

In the Rural by design scenario (B), there is very little new development along this primary corridor. The existing land uses remain in a sprawling, strip development patterns. Access management is an effective form of planned growth along this corridor but otherwise, growth planning is ineffective as there is little change along the urban corridor. With the regional emphasis on planned rural development and land preservation, there is some infill development along this corridor on a lot by lot basis and some increase in housing options as a result.

In the Villages scenario (C), there is new development along this corridor in nodes downtown and at major intersections. The nodes have two- and three-story buildings in place of existing single story buildings. The intersection of US-31 and M-72 has its most dense development pattern in this scenario. The denser land use pattern prevents sprawling land use beyond the limits of this corridor and at the west end of this corridor. Planned development is effective in the high-density nodes where there is redevelopment pressure and access management is an effective tool. Some redevelopment along the corridor also occurs in a planned, mixed use pattern. Re-development expands the amount and variety of housing choices, especially at major intersections.

In the City focused scenario (D), this corridor runs through the heart of a large, regional downtown center. The land use density along this corridor increases exponentially as most of the regional growth concentrates in this location. Buildings fill in empty lots and new, taller buildings replace smaller ones. The denser land use pattern prevents sprawling land use beyond the limits of this corridor. There is an increase in residential, retail, and office development. Planned growth, including access management, is effective along the corridor as development pressure causes significant redevelopment.

4.2 Corridor 2 – S. Airport Road

In the Trend scenario (A), the scattered new growth all along this corridor occurs through infill development since it is already built-out. More commercial uses and multi-family housing is added along the corridor in different locations, but there is little mixed-use development. Planned growth areas will help guide redevelopment but the scattered development will not bring a noticeable transformation.

In the Rural by design scenario (B), there is little new growth along this corridor. The new development in rural areas takes the development pressure off of this corridor and the land use remains essentially

unchanged. There may be some planned growth areas along the corridor but there is no market development force to bring them about.

In the Villages scenario (C), major intersections serve as a type of village center including the intersection at Division Street and at Garfield Roads. In these areas, there is more redevelopment with new multi-story, buildings replacing small retail stores. There are mixed-use developments and multi-family housing in these areas along with new commercial and office uses. These areas are planned as a sub-area plan.

In the City focused scenario (D), development pressure will come as the downtown reaches the corridor directly in some areas around major intersections and exerts redevelopment pressure in others. This growth will bring new residential, commercial and office uses along the corridor. In areas where the downtown extends to this corridor, buildings will reach four- and six-stories and more. Corridor planning and planned growth will be effective along most of the corridor as a result.

This corridor was originally identified in part because it promotes alternative modes of transportation.

4.3 Corridor 3 – M-37

In the Trend scenario (A), there is new sprawling development along most of the corridor. Rather than infill development, this land use pattern builds on vacant lots. The density stays low and the buildings are primarily single-story. The development extends all the way to the south end of the corridor at M-113. Access management is an effective growth management tool in this scenario.

In the Rural by design scenario (B), this corridor experiences sprawling development along the corridor from Grandview Parkway to US-31/Beitner Road where new growth occurs on vacant lots in the urbanized area but there is limited redevelopment. The rural development pattern around the region takes some pressure off the corridor so that development doesn't continue south of US-31. Planned growth is effective for the rural cluster areas and access management is effective along the corridor itself.

In the Villages scenario (C), this corridor experiences land use growth along its full extent with dense development patterns at the corridors north end near Grandview Parkway and at major intersections including US-31 and M-113. Planned growth, including access management, is very effective in this scenario, especially where development pressure drives infill and redevelopment. Higher density brings more housing options and new commercial, office and activity center uses.

In the City focused scenario (D), land use development is extremely high at the north end of the corridor and at the intersection with S. Airport Road. Both of these areas have new multi-story buildings due to demand for location. There is infill and new development along the corridor to US-31 but the city center keeps development from moving to the south end of the corridor. There are new multi-family housing, commercial and office uses along the corridor. Planned development is effective along the corridor from Grandview Parkway to US-31 and access management is effective along the whole corridor.

4.4 Corridor 4 – West US-31, Beitner, Keystone

In the Trend scenario (A), this corridor experiences sprawling growth development on the west end and in the center. The urban center pushes out into the rural fringe. In the rural area along the west part of the corridor, commercial development arrives in a scattered, strip pattern. Along the corridor between Silver Lake Road and Division Street (M-37), there is growth in every direction with several new activity centers. There is little change along the Boardman River where natural features provide a development barrier. Additional single family residential developments are built around M-37. Access management is an effective tool in this corridor.

In the Rural by design scenario (B), there is urban growth near the intersection with M-37 but the emphasis stays north of US-31. There is little other corridor development on either the east or west end. Some planned, rural developments with a mix of residential and commercial uses are built along the west end of the corridor but they are well-screened from the corridor. A few others are built along the Boardman River east of M-37 as some agricultural parcels are converted to planned development. Some large lot subdivisions are built as well. Access management is an effective tool and growth planning can also restrict or limit strip development along the corridor and encourage rural, cluster development.

In the Villages scenario (C), new development is concentrated in three nodes along the corridor: in Interlochen at the intersection with M-137; at the intersection with M-37; and near the intersection with South Airport Road. The node at M-37 experiences a large amount of dense, compact development. The other two nodes experience some infill development in areas of existing development. New development includes commercial mixed use buildings and multi-family housing. Planned growth through sub-area plans is effective in the growth nodes. Along the corridor, access management is also a good growth tool.

In the City focused scenario (D), urban growth is concentrated further north so the development pressure on this corridor drops. There is still some compact development at the intersection with M-137 in Interlochen with some mixed-use commercial development. There is also some development at the intersection with M-37, but it is primarily lower density, auto-oriented commercial that grows out from Traverse City. There is some infill development near the intersection with South Airport Road, too. Planned growth is effective in Interlochen, and access management is a good tool to use along the corridor.

4.5 Corridor 5 – Garfield Road

In the Trend scenario (A), there is very little new development on the corridor south of Hammond Road except around Kingsley. North of Hammond Road, there is new infill development all along and around the corridor. Planned growth is very effective in this area to guide redevelopment and encourage some increased density, access management and mixed-use. Access management is also an effective growth management tool. New development north of Hammond Road remains primarily commercial and office but some small, multi-family and mixed use buildings will add to housing options in the area.

In the Rural by design scenario (B), there is less development in and around Traverse City so new growth does not extend as far south. The north part of the Garfield Road corridor, however, is still in the center of new urban development. The area at the intersection with M-72/US-31 sees the most new development and the highest density levels. Higher buildings and higher densities replace existing buildings and some parking lots disappear in this area. South of Hammond Road, there is little new development except for planned, rural developments which occur sporadically along the corridor. Planned growth is very effective on the corridor north of Hammond Road and access management is a good tool along the whole corridor. Guides for rural cluster development are also effective for planned growth in rural areas.

In the Villages scenario (C), there is less development in and around Traverse City so new growth does not extend as far south from the lakefront. The north tip of the Garfield Road corridor, however, is still in the center of new urban development. The area at the intersection with M-72/US-31 sees the most new development and the highest density levels. Higher buildings and higher densities replace existing buildings and some parking lots disappear in this area. Some mixed-use and multi-family building development is built among the commercial uses on the corridor. South of Airport Road, there is much less new development. The Village of Kingsley has lots of compact growth at its core. Planned growth is an effective tool on the corridor north of Airport Road and in Kingsley. Access management can be used along the whole corridor.

In the City focused scenario (D), intense development is anticipated along the north end of the corridor as the regional development locates almost exclusively in Traverse City and Cadillac. In this area, the corridor could convert from an auto-oriented, strip commercial pattern to a downtown area with zero lot-line, multi-story buildings as space is at a premium. New development in this area includes multi-family residential, mixed-use, commercial and office uses. There is little new development south of South Airport Road along the corridor except that there is some new growth in Kingsley. Planned growth is an effective tool on the north end of the corridor in the urban center and access management can be used effectively along the whole corridor.

4.6 Corridor 6 – Hammond Road

In the Trend scenario (A), there is new development all along the corridor that reaches past the south side of the road. The low-density development pattern pushes out in all directions from Traverse City and Hammond Road is part of the urban center. Most of the agricultural land is converted to suburban development. Along the road frontage, most new uses are strip commercial and office buildings, with new activity centers at major intersections.

In the Rural by design scenario (B), there is much less development on Traverse City overall and on this corridor specifically. The rural nature of the land use patterns remains with some planned rural development clusters built off of the road. Rural cluster development includes a mix of residential uses with some office and commercial services as well. Planned growth is effective for guiding the rural cluster development and restricting strip commercial development.

In the Villages scenario (C), there is much less development on Traverse City overall and on this corridor specifically. The rural nature of the land use patterns remains and some new urban development occurs around the intersections at Garfield Road and Keystone Road. Planned growth initiatives are not effective here due to the absence of new development.

In the City focused scenario (D), the intense growth is focused in the center of Traverse City which relieves development pressure from this corridor. The rural nature of the land use patterns remains and some new urban development occurs around the intersections at Garfield Road and Keystone Road. Planned growth initiatives are not effective here due to the absence of new development.

4.7 Corridor 7 – 3 Mile Road

In the Trend scenario (A), there is new growth along the north end of the corridor where possible. The State Park and the airport will restrict development in many places where growth pressure will be highest. New suburban growth is anticipated between the airport and through the intersection at Hammond Road though not much further south. Most of this growth is agricultural land being converted to single-family residential with commercial uses at the intersection with Hammond Road. Because urban development in this area is fairly limited south of the airport, growth planning is possible for new development along the corridor.

In the Rural by design scenario (B), most of the urban development pressure is on the north end of this corridor where development is fairly restricted by the state park and the airport. Development will fill in where possible between US-31 and South Airport Road and otherwise will be rural cluster and large lot subdivision development in rural areas. Rural cluster development includes a mix of residential uses with some office and commercial services. Planned growth is effective for guiding the rural cluster development and for infill development along the north end of the corridor.

In the Villages scenario (C), there is new growth along the north end of the corridor where possible. The State Park and the airport will restrict development in many places where growth pressure will be highest. New suburban growth is not anticipated south of the airport anywhere along the corridor. Planned growth is effective as part of a larger growth plan on the west side of the corridor between US-31 and Parsons Road for infill development along the north end of the corridor. This area could convert from single family residential to mixed-use, multi-family uses and neighborhood commercial uses over time.

In the City focused scenario (D), intense development is anticipated along the north end of the corridor as the regional development locates almost exclusively in Traverse City and Cadillac. In this area, the corridor could convert from a residential neighborhood to a downtown area with zero lot-line, multi-story buildings as space is at a premium. The state park and the airport will limit development in the northern part of the corridor and new development is likely to slow south of South Airport Road. Planned growth is an effective tool on the north end of the corridor in the urban center.

4.8 Corridor 8 – M-22

In the Trend scenario (A), growth spreads out from Traverse City in every direction, including the length of this corridor and even further to the north. On the south end of the corridor, new development will be infill or redevelopment of existing uses. On the north end of the corridor, new land uses will fill in open spaces. Land uses will be mixed-use, commercial and high-density residential. Planned growth can permit and promote infill development and allow increased development density. Access management will also be essential on this corridor.

In the Rural by design scenario (B), there is less development on the corridor itself and more development in the region in the rural areas. However, this is still a commercial waterfront area and growth is anticipated. Land uses are likely to include regional and commercial tourism services and high-end housing. Planned growth can permit and promote infill development and allow increased development density. Access management will also be essential on this corridor.

In the Villages scenario (C), growth spreads out from Traverse City along the length of this corridor but doesn't stretch beyond to the north. On the south end of the corridor, new development will be infill or redevelopment of existing uses. On the north end of the corridor, new land uses will fill in open spaces. Land uses will be mixed-use, commercial and high-density residential. Planned growth can permit and promote infill development and allow increased development density. Access management will also be essential on this corridor.

In the City focused scenario (D), this corridor is likely to become part of downtown Traverse City. Development pressure and land values will increase dramatically. Existing buildings will be replaced and taller buildings will be built. Hotels and condominiums as well as mixed-use developments will crowd the shoreline along this corridor. Planned growth is an effective tool in this scenario as the area is transformed. Access management will also be essential on this corridor.

4.9 Corridor 9 – W. Silver Lake, 14th, Cass, 8th

In the Trend scenario (A), most of the regional growth is located in and around Traverse City at relatively low densities outside of the expanding downtown. This corridor is on the fringe of downtown. Scattered new development will take place as infill on vacant lots in the commercial parts of the corridor. Larger intersections will have new buildings replace existing buildings. In some residential areas, existing homes may convert to office, commercial or apartment uses. Growth planning will help to set redevelopment parameters and can identify priority development nodes but is limited by the existing development pattern.

In the Rural by design scenario (B), there is much less development in and around Traverse City but this route remains at the urban center. Scattered new development will take place as infill on vacant lots in the commercial parts of the corridor but overall land use will remain relatively unchanged. Development guidelines will not be effective as there will be little change in the overall land use.

In the Villages scenario (C), the corridor is included in an expanding downtown area and experiences more redevelopment in existing commercial areas than in Scenarios A and B. Some are converted to mixed-use and others to commercial and office uses. Multi-family housing is also added along the corridor. Single-family housing remains structurally unchanged but some homes are converted to offices or duplexes. Growth planning is an effective tool in this scenario.

In the City focused scenario (D), the corridor becomes part of a much larger downtown area. There is dramatic change in land use over time and density increases as surface parking lots are replaced by buildings, and single-stories are replaced with multi-stories. There are new commercial, office, and multi-family residential uses along the corridor. Growth planning is a very effective tool in this scenario.

4.10 Corridor 10 – North Long Lake Road

In the Trend scenario (A), suburban development patterns continue to expand out from Traverse City. The east end of the corridor experiences a large conversion of agricultural land to single family residential development. The same pattern is seen on the west end of the corridor around Bellows Lake as development fills in between Lake Ann and Long Lake. There is also some strip commercial development on the corridor. Access management standards would be a helpful growth planning tool in this scenario.

In the Rural by design scenario (B), there is little suburban-style development along this corridor. Instead, new growth is built in rural cluster developments. The corridor maintains its rural appearance and some agricultural land is permanently preserved as part of the conservation designs. New residential development is scattered among the agricultural with some commercial services. These uses can be incompatible with agricultural uses in the area. Growth planning for the cluster development is an effective tool.

In the Villages scenario (C), the compact development patterns in Traverse City and in villages around the region prevent new suburban or strip commercial development along the corridor. There is some new development to the east of the high school but otherwise land uses remain essentially unchanged. Growth planning can help restrict urban development in rural areas.

In the City focused scenario (D), the concentration of new development in Traverse City prevents new suburban or strip commercial development along this corridor. There is some new development to the east of the high school but otherwise land uses remain essentially unchanged. Growth planning can help restrict urban development in rural areas.

4.11 Corridor 11 – Cass Road

In the Trend scenario (A), there is some new infill development along the corridor but most development is growing out in other directions. New uses are similar to existing uses so there is no major change in overall land use. Growth planning is not an effective tool on this corridor.

In the Rural by design scenario (B), there is some development pressure on the north end of the corridor but almost no change south of South Airport Road. On the north end, there is some infill development and some redevelopment of existing properties. New development is mixed-use, commercial, office or small multi-family residential units. Growth planning can help to guide the development patterns between South Airport and 14th Street.

In the Villages scenario (C), there is very little new development on this corridor. Instead, the compact development pattern of the Villages scenario concentrates new development downtown and at nodes along other major transportation corridors. Growth planning has little impact on this area.

In the City focused scenario (D), there is very little new development on this corridor. Instead, the downtown focused development pattern of this scenario keeps most new development north of 14th Street. Growth planning has little impact on this area.

5.0 Transportation Impacts by Scenario

The travel demand model (TDM) from Task 3.4 was developed in response to the four land use patterns identified in the public participation process. The TDM associated a feasible transportation scenario with each of the land use patterns. The model used existing conditions as a base and future demographic data by scenario to predict future transportation system performance.

By using indicators such as vehicle miles traveled (VMT), vehicle hours traveled (VHT) and delay, future outcomes can be reasonably predicted for each scenario. Other factors that are of particular importance for transportation planning purposes are “value of time lost” and “gallons of fuel wasted annually.” The graphs, taken from the Travel Demand Methodology Report by Kimley-Horn Associates (KHA), summarize the changes in these key indicators between the four scenarios. That report is the source of all other transportation statistics presented in this section.

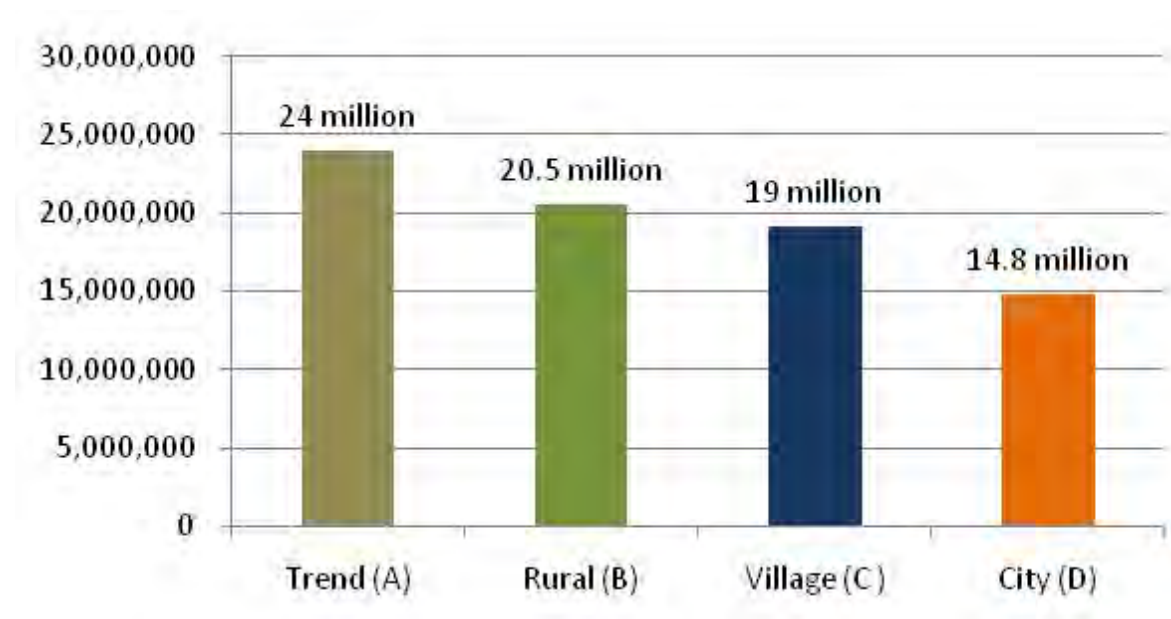


Figure 5.1 Value of Time Lost (per year)

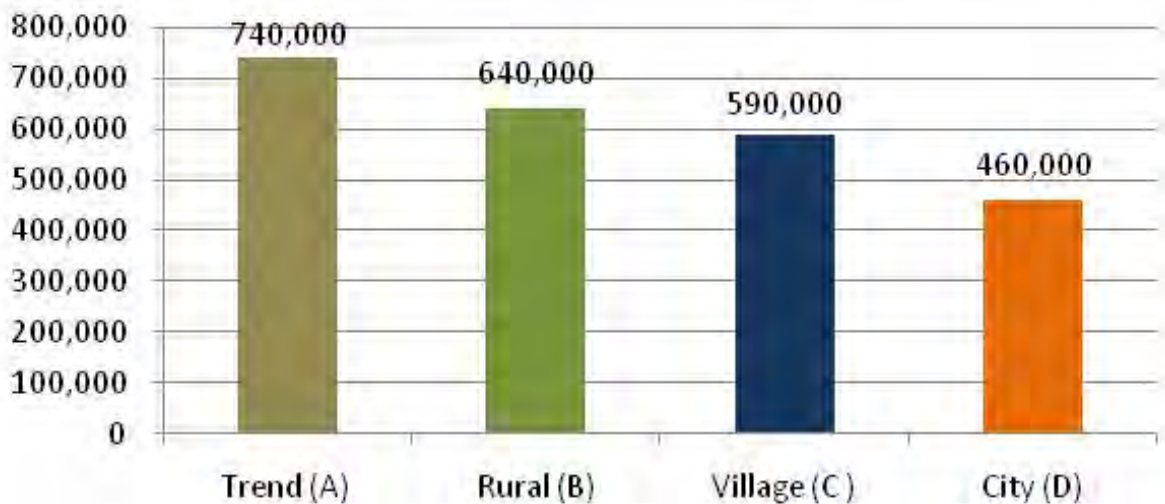


Figure 5.2 Gallons of Fuel Wasted Annually (Due to Congestion and Delay)

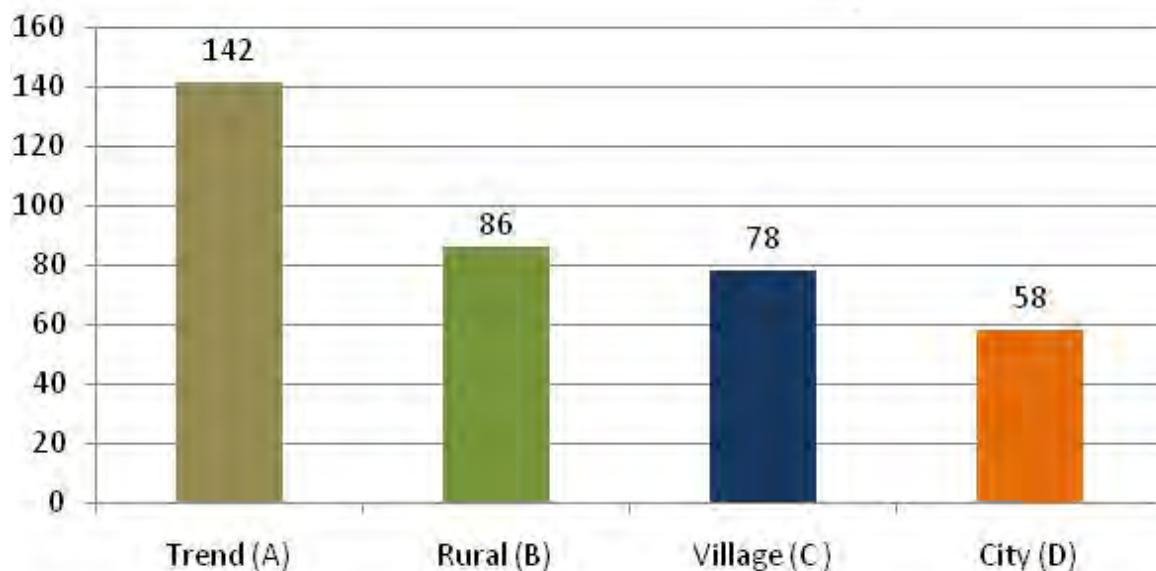


Figure 5.3 Additional Lane Miles Required

As a result of the expected growth through 2035, the corridors in each of the scenarios will witness varying travel patterns. Therefore, each scenario requires a different emphasis on improvements, including multi-modal changes.

This section will address both automobile traffic and multi-modal transportation options associated with each scenario in the TDM. Traffic volumes and traffic patterns are considered through a discussion of congestion levels overall as measured by transportation modeling results. Also, a chart is provided with a

list of the anticipated congestion areas along each corridor by scenario from the Travel Demand Model (TDM) Report. Also, a chart is provided with a list of the transit features in the traffic model for the corridor.

The impact of multi-modal transportation will be presented from a policy perspective by scenario and the specific model output numbers will be provided at the end of the scenario summaries. The measures of percentage change with transit are taken from the scenario model output documented in the Travel Demand Methodology Report (Task 3.4). In that report the VMT for each scenario is quantified with a modified “VMT with 4D Processing.” 4D Processing is an additional calculation or function within the scenario model that reflects the impact of mode shifts to non-motorized and transit trips on the overall VMT. The VMT from the base model was produced by the scenario model but was not included in the final version of the Task 3.4 Report. It is provided in the chart below. Using these two measures, the impact of transit is expressed as a percentage ratio of the Reduced VMT with 4D Processing divided by the original VMT from the base model. The specific VMT numbers from the scenario model are provided here along with the VMT reduction and resulting percentage change calculation:

Table 5.1 Scenario TDM Model Output: Impact of 4D Processing on Base Model Counts

	Scenario A	Scenario B	Scenario C	Scenario D
VMT from base model	2,860,000	2,710,000	2,660,000	2,560,000
VMT with 4D Processing	2,500,000	2,400,000	2,300,000	2,100,000
Reduced VMT with 4D Processing	360,000	310,000	360,000	460,000
% Decrease in VMT with 4D Processing	9.3%	11.4%	13.5%	11.4%

As in other instances where the TDM for scenario analysis is used, these numbers express an expected comparative difference between the different scenarios. They are not intended to be used for the specific corridor analysis that will be developed in later reports nor are they intended to propose specific road or transit improvements. They are useful at this point to note the different impacts of transit and non-motorized trips in different land use scenarios.

5.1 Overall transportation impacts by scenario

Scenario A: This scenario has the highest levels of automobile travel and congestion of the four scenarios as measured through vehicle miles travelled (VMT), vehicle hours travelled (VHT) and delay time. Part of this is because in scenario A, most new development around the region is located within the traffic models boundaries. But it is also a result of the low-density, auto-oriented development-types that are being built. This scenario has the smallest percentage reduction in VMT when transit and non-motorized improvements are added to the transportation model (9.3%) and the highest number of new lane miles (142).

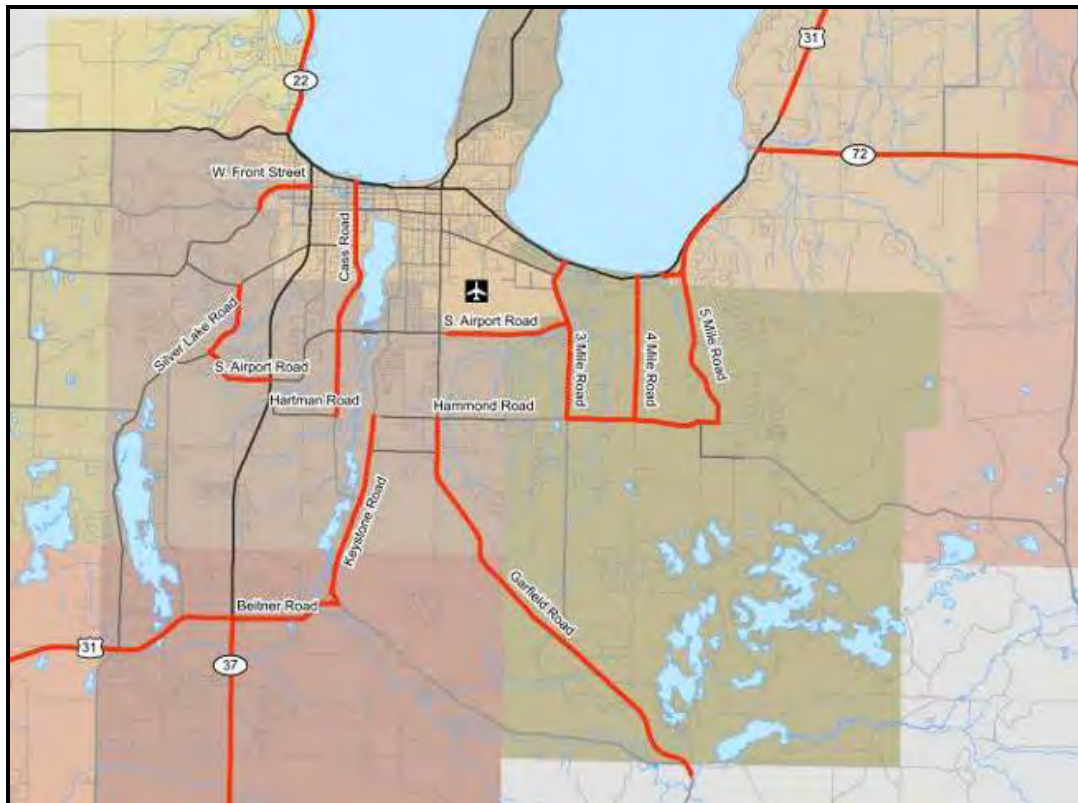


Figure 5.4 Scenario A Roadway Capacity Areas of Concern

There are transit routes in the transportation model, but the low density development pattern means that there are fewer origin points (residential units) or destination points (jobs, shopping or services) within a comfortable walking distance of a stop. As a result, fewer trips are captured by transit. Non-motorized trips are also limited by design. The lower density and the auto-oriented design of new development lowers the number of walking trips due to distance and safety. When sidewalks are located between busy roads and a surface parking lot, a walking trip can feel both unpleasant and unsafe. When single lots are a minimum of 200 feet wide and buildings are set back 50 feet from the road, even a trip between neighboring buildings can be “too far to walk.”

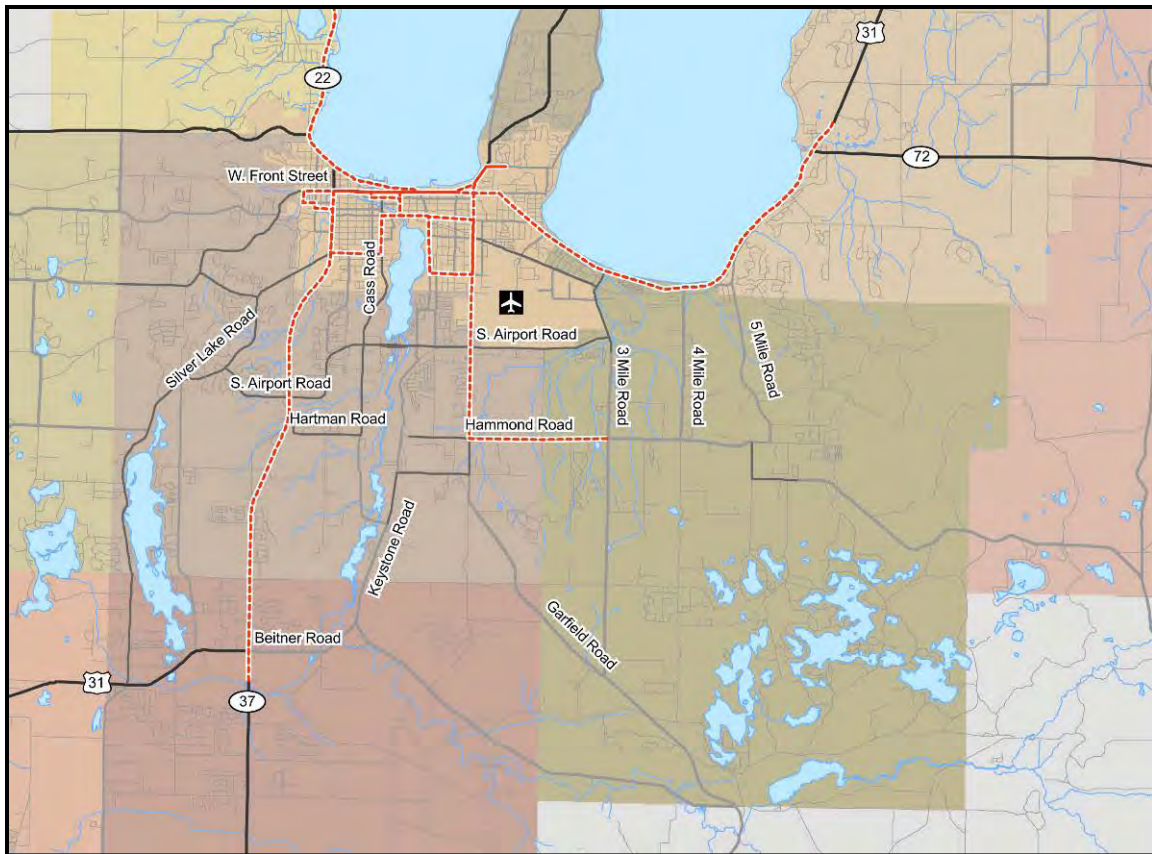


Figure 5.5 Scenario A Transit Lines

Scenario B: This scenario has the second highest levels of automobile travel and congestion of the four scenarios as measured through vehicle miles travelled (VMT), vehicle hours travelled (VHT) and delay time. Some of the reduction in traffic congestion comes because much of the new development in Scenario B is located in rural areas around the region and much of it is outside of the traffic models boundaries. Some of the reduction is a result of the walkability levels within the new cluster developments and the ability to provide transit connections from clusters to urban centers. Both of these features cause a shift that reduces the number of vehicle trips. In the TDM, the addition of transit results in a reduction of 11.4% in VMT based on the scenario model comparison.

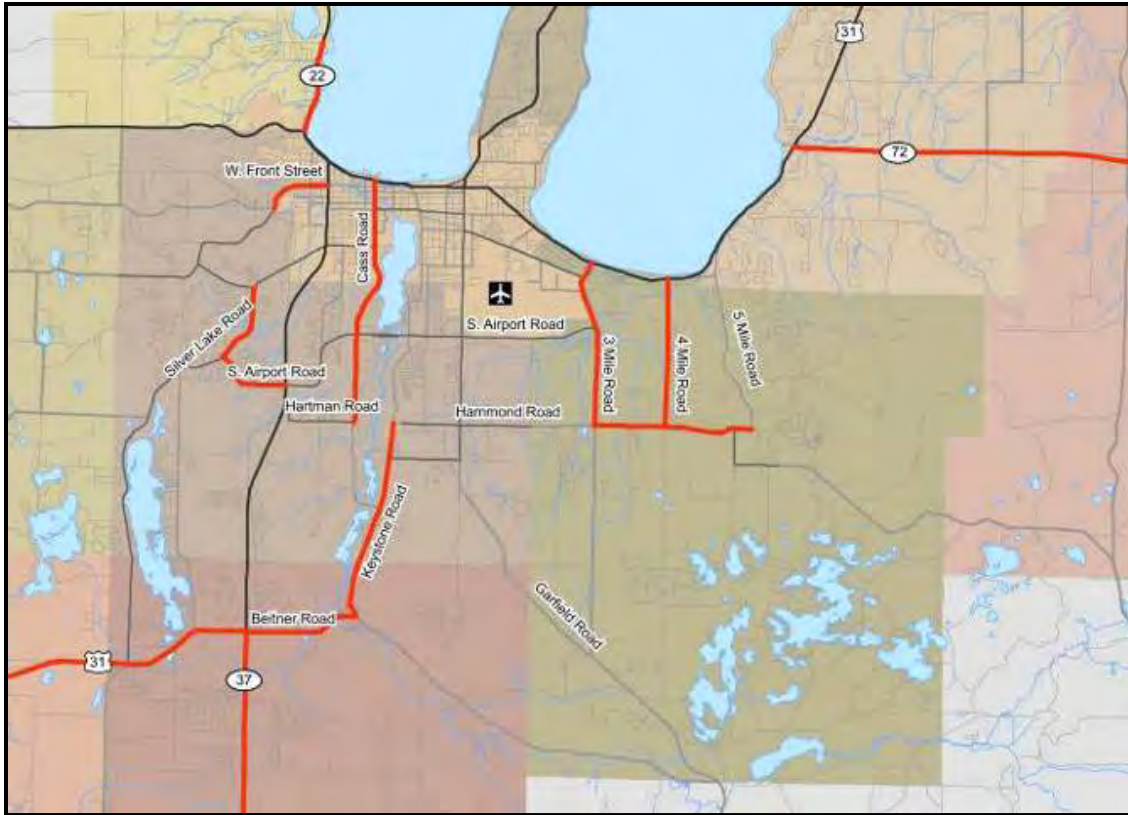


Figure 5.6 Scenario B Roadway Capacity Areas of Concern

However, the dispersed location of new development throughout the six-county region increases the time and length of trips from a rural residential location to an urban center for work, services and shopping. Many transit trips will also be longer due to the extended distance between origin and destination. The traffic model does not capture trips outside of the model limits so this travel pattern is not documented but rather deduced. A regional traffic model might show lower levels of congestion based on travel delay, but more miles travelled based on higher VMT and VHT.

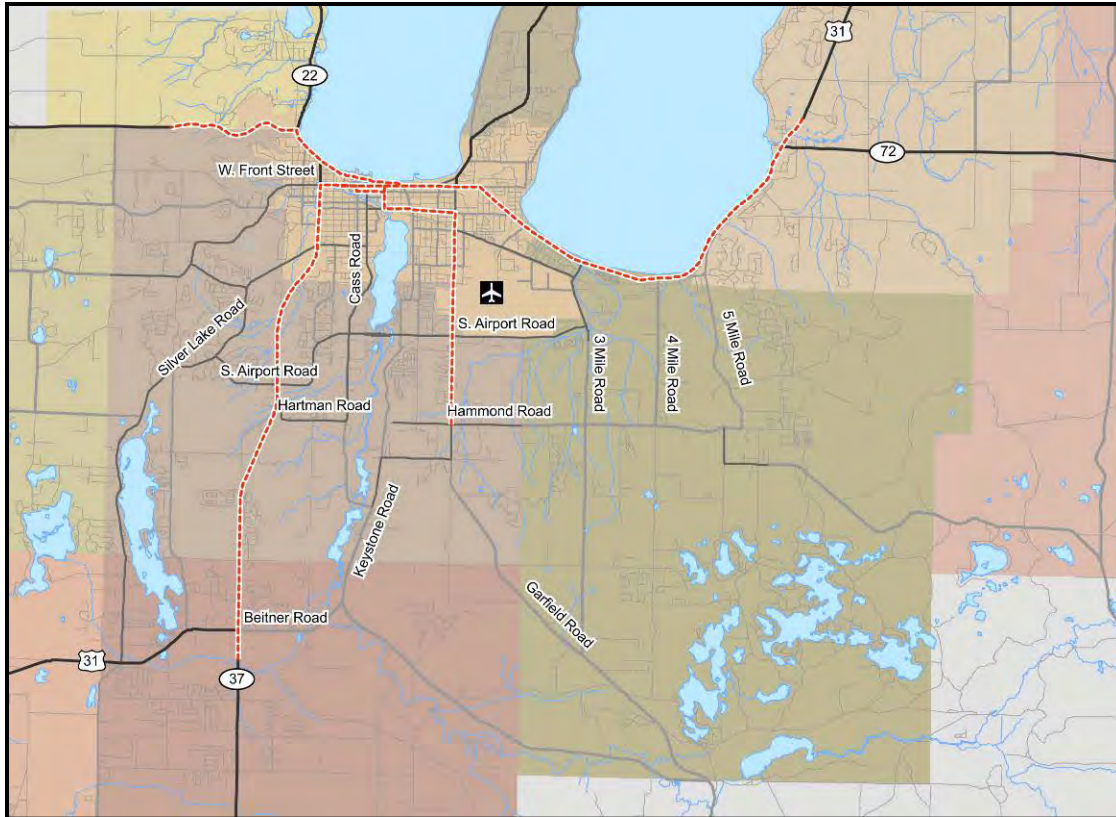


Figure 5.7 Scenario B Transit Lines

Scenario C: This scenario has lower levels of automobile travel and congestion when compared to Scenarios A and B as measured through vehicle miles travelled (VMT), vehicle hours travelled (VHT) and delay time. This scenario places most new development in villages around the region and in village-like nodes at major intersections near Traverse City and around the six-county region in villages including Benzonia, Mesick, Kalkaska, Fife Lake, and Bellaire.

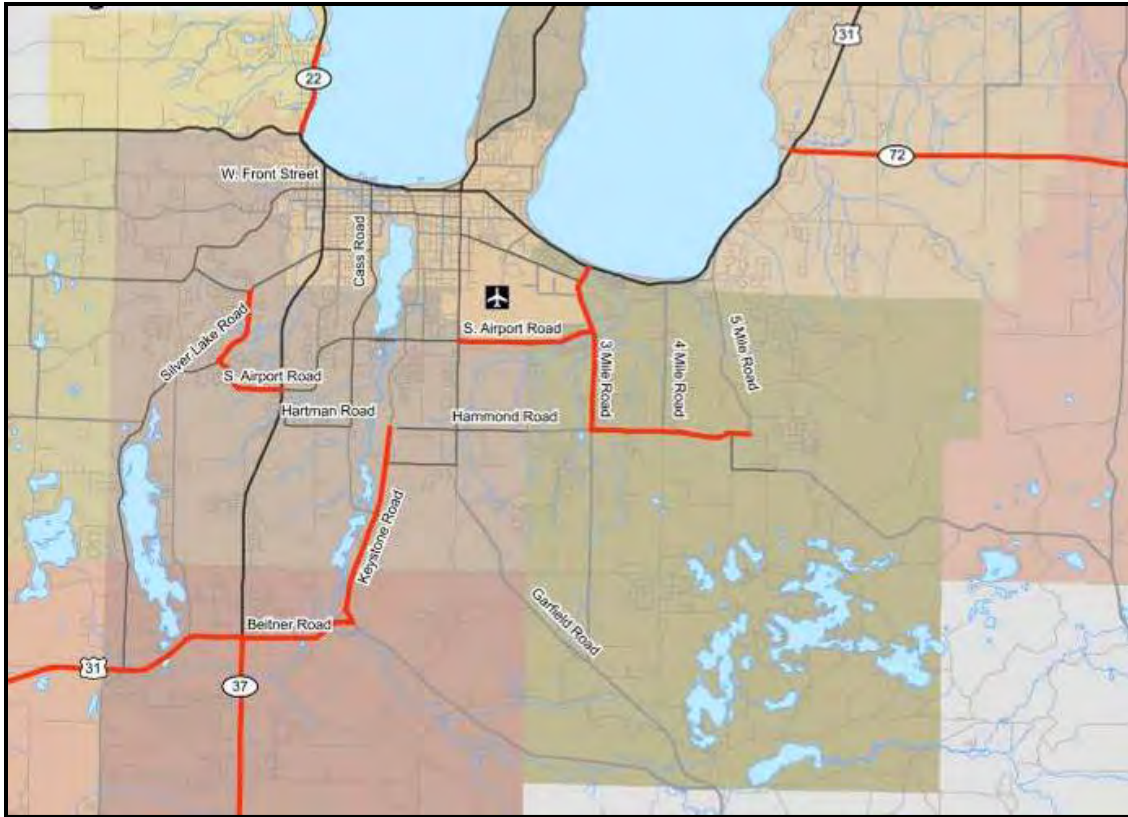


Figure 5.8 Scenario C Roadway Capacity Areas of Concern

Approximately half of the new development in the Villages scenario is located within the limits of the transportation demand model (TDM) and half is located outside of the model limits so some traffic is removed by the location of new development. Also, the village development pattern is well suited to bike and walk trips because of the dense development patterns, an investment in sidewalks and a connected local street network. The addition of transit to the TDM results in a 13.5% reduction in VMT so it is more effective than in Scenarios A and B.

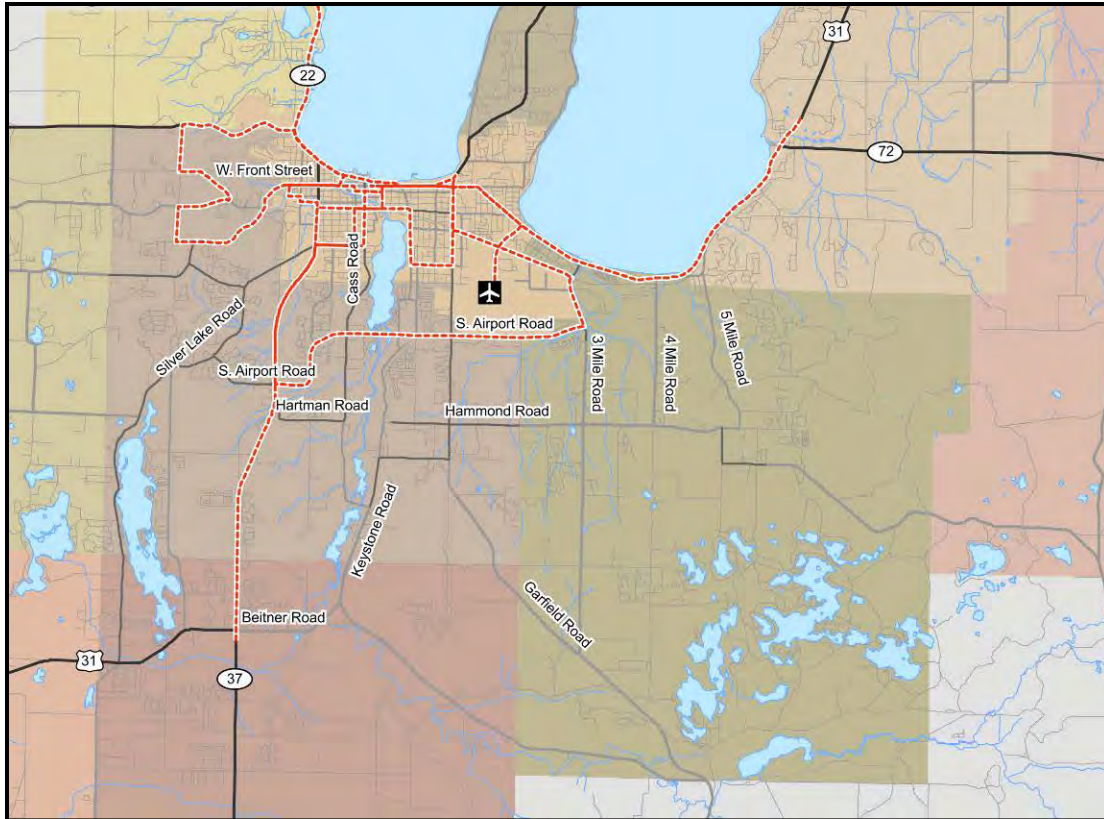


Figure 5.9 Scenario C Transit Lines

Scenario D: This scenario has the lowest levels of automobile travel and congestion when compared to the other scenarios as measured through vehicle miles travelled (VMT), vehicle hours travelled (VHT) and delay time. This city-focused scenario places almost all new development in the region in Traverse City and Cadillac. The new growth assigned to Traverse City is located within the limits of the TDM. From that perspective, higher levels of congestion would be expected.

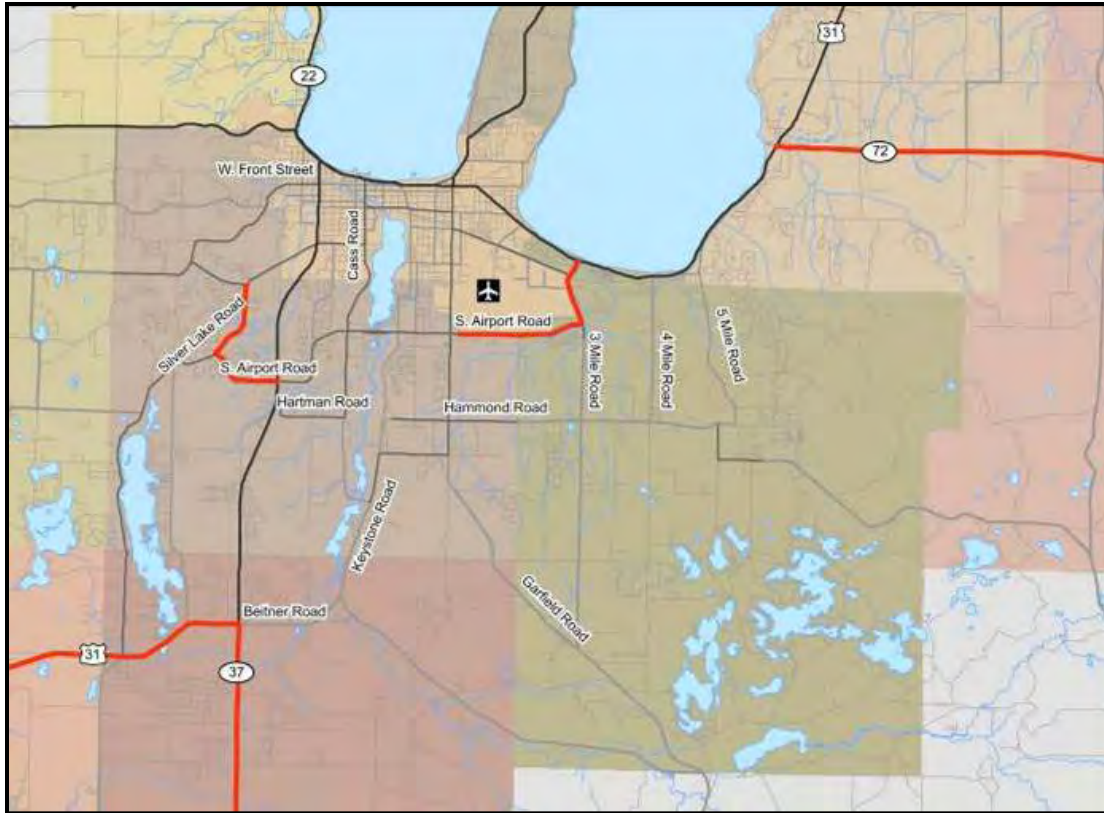


Figure 5.10 Scenario D Roadway Capacity Areas of Concern

However, the dense development pattern in the city-center makes walking, biking and transit more efficient modes of transportation. The land use pattern offers more housing units downtown so those trips from home to work, shopping and services are shorter. Also, trips between work and shopping or services are shorter. In addition to short distances, investment in pedestrian infrastructure adds to the safety of walking trips. There are also higher levels of investment in transit systems providing more regular service and more travel amenities. The addition of transit to the TDM achieves an 18% decrease in VMT which is the highest of any scenario.

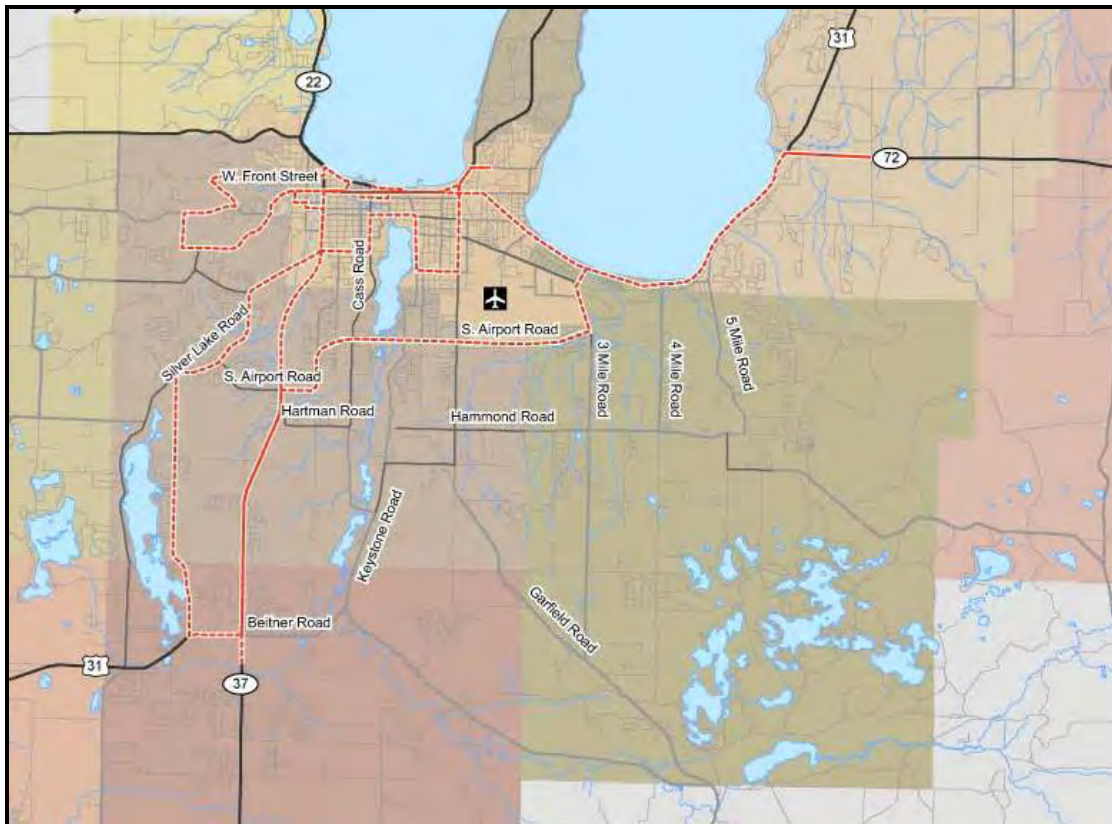


Figure 5.11 Scenario D Transit Lines

5.2 Anticipated roadway capacity issues and transit services by corridor and scenario

As shown in **Section 5.1**, each scenario carries with it a distinct land use pattern and, consequently, a unique set of associated transportation related issues. In this section, each of these regional growth scenarios is analyzed in terms of corridor-level capacity issues and transit policies that would logically stem from the anticipated development pattern. This analysis is based on the TDM developed for the scenario analysis and is meant to provide a generalized guide to locations within each corridor where travel delay issues would be expected to be present. This analysis does not identify any specific projects, but rather is meant to be used as a tool for use in future tasks that will identify specific projects.

Numerous existing studies have been completed within the region. Where these studies are applicable to specific corridors, they are noted in each section below.

Corridor 1 – M-72

The M-72 corridor transects the regional population center to form the region's major east-west route. It provides a direct connection to the interstate system to the east via I-75 in Graying. To the west, it is the primary access point to the regional population center from Leelanau County. In the center section, it provides access to the Grand Traverse Bay, numerous businesses, downtown Traverse City, and Northwest Michigan College. The corridor is significant because it provides a primary connection beyond

the regional limits, a primary east-west route through the region, and access to abutting property. Because of these three significant functions, the corridor exhibits high traffic volumes. In addition, these three functions are frequently in conflict along the corridor. As expected, these conflicted functions have potential to cause significant delay and congestion along the corridor.

The significance of this corridor is also exhibited in the scenario TDM in each of the four scenarios due to its geographic location and the connections it provides. In each scenario, capacity issues are expected to arise east of Acme and west of Williamsburg. Because the corridor is situated in the densest and most heavily traveled area of the region, some form of transit is supported in all scenarios. Transit options are summarized in the table below.

Table 5.2 Anticipated Roadway Capacity Issues by Scenario

Scenario A	from Williamsburg to US-31
Scenario B	from Williamsburg to US-31
Scenario C	from Williamsburg to US-31
Scenario D	from Williamsburg to US-31

Table 5.3 Anticipated Transit Facilities by Scenario

Scenario A	Local circulator (bus) line from M-72 to M-22 with fox track technology (streetcar, commuter rail, or light rail) along Front Street
Scenario B	Local circulator (bus) line from M-72 to Bugai Road
Scenario C	Local circulator (bus) line from M-72 to Bugai Road with loop to Silver Lake Road and fox track technology (streetcar, commuter rail, or light rail) along Front Street
Scenario D	Local circulator (bus) line from M-72 to Bugai Road with loop to Silver Lake Road and fox track technology (streetcar, commuter rail, or light rail) along Front Street

As the major east-west route in the region, this corridor has been subject to many studies. Going forward, projects related to this corridor should be coordinated with them. Among the key studies and plans is the City of Traverse City's Master Plan for pedestrian circulation. Any capacity improvements should be coordinated with the Bates Road Relocation project west of Williamsburg. The Acme Township shoreline acquisition plan should also be coordinated with any future improvements. The M-72 median study in Whitewater and Acme Townships should be coordinated as any plans for capacity improvements are developed. These existing studies and plans are summarized in the Existing Transportation and Land Use Trends Report.

Corridor 2 – S. Airport Road

The S. Airport Road corridor provides significant east-west movements in the core population center. However, unlike the M-72 corridor it does not provide direct access to points outside of the region. On its east end, the corridor provides direct access to the Cherry Capital Airport. On the west, it's situated next to and provides access to the Grand Traverse Mall. The corridor forms a crucial link across the Boardman River between these two regionally significant centers. In addition, South Airport Road

provides local access primarily to businesses in between the mall and the airport while serving through movements from residential areas on its extreme east and west termini. As in the M-72 corridor, these conflicting functions can cause delay and congestion.

As shown in the TDM summary in section 5.1, Airport Road could exhibit differing congestion situations depending on the growth scenario. In the trend, village, and city scenarios, potential capacity issues will arise at the east and west termini as the corridor begins to serve more east-west trips between the anticipated residential developments west of M-37 and east of 3 Mile Road. The rural cluster development, with its more dispersed development pattern, does not concentrate as much residential development in these areas. Consequently, only the western end segment exhibits congestion. The denser, walkable development styles associated with the village and city scenarios would support a local circulator bus line along the corridor.

Table 5.4 Anticipated Roadway Capacity Issues by Scenario

Scenario A	from 3 Mile to Garfield and Division to Silver Lake Road
Scenario B	from Division to Silver Lake Road
Scenario C	from 3 Mile to Garfield and Division to Silver Lake Road
Scenario D	from 3 Mile to Garfield and Division to Silver Lake Road

Table 5.5 Multi-Modal Impacts

Scenario A	No proposed transit
Scenario B	No proposed transit
Scenario C	Local circulator (bus) line
Scenario D	Local circulator (bus) line

Corridor 3 – M-37

The M-37 corridor provides the most direct north-south movement through the core of the region. It also provides a critical connection to points south of the region. As it connects downtown Traverse City to the south of the region, it provides access to other significant regional activity centers including the Grand Traverse Commons, the Grand Traverse Mall, and Chum's Corners. The corridor is significant because it provides a primary connection beyond the regional limits, a primary north-south route to the regional core, and access to abutting property. Because of these three significant functions, the corridor exhibits high traffic volumes. In addition, these three functions are frequently in conflict along the corridor. As expected, these conflicted functions have potential to cause significant delay and congestion along the corridor.

The significance of this corridor is also exhibited in the scenario TDM in each of the four scenarios due to its geographic location and the connections it provides. In each scenario, capacity issues are expected to arise from Chum's Corners to the south regional border. In the village and city scenarios, denser, more walkable developments along the corridor will support a local circular bus that could potentially evolve into a fixed guideway transit system.

Table 5.6 Anticipated Roadway Capacity Issues by Scenario

Scenario A	from M-113 to Bietner Road
Scenario B	from M-113 to Bietner Road
Scenario C	from M-113 to Bietner Road
Scenario D	from M-113 to Bietner Road

Table 5.7 Anticipated Transit Facilities by Scenario

Scenario A	Local circulator (bus) line
Scenario B	Local circulator (bus) line
Scenario C	Local circulator (bus) line plus fox track technology (streetcar, commuter rail, or light rail) from 14 th Street to S. Airport Road
Scenario D	Local circulator (bus) line plus fox track technology (streetcar, commuter rail, or light rail) from S. Airport Road to Beitner Road

The segment of Division Street from 14th Street to Grandview Parkway is currently the focus of an in-depth study by the City of Traverse City in conjunction with the Michigan Department of Transportation. This segment of Division Street will always present challenges because it is a direct route to the regional population center and the Grand Traverse Bay and is constrained in its right-of-way.

Corridor 4 – West US-31, Beitner, Keystone

When considered in conjunction with the Hammond Road corridor, corridor 4 provides an east-west movement through the region. The West US-31 portion of the corridor also provides a key connection to Benzie County. The corridor also provides access to business and residential centers in Interlochen and Chum's Corners. The corridor also provides a crossing of the Boardman River, making it a vital to the overall east-west movement in the region. With the exception of Chum's Corners, the corridor generally traverses less developed land uses and is currently relied on more for its regional connectivity than for its local access.

Per the scenario TDM analysis, the corridor exhibits anticipated congestion / delay from the Benzie county line to Hammond Road in the trend, rural cluster, and village scenarios. The city scenario, with its focus more on the existing population centers, does not exhibit congestion from the M-37 corridor to Hammond Road. Because of its location well south of dense anticipated population centers and because of a lack of direct connectivity to a regional activity center on the east end, transit is not anticipated in any of the proposed scenarios.

Table 5.8 Anticipated Roadway Capacity Issues by Scenario

Scenario A	from Benzie CL to Hammond
Scenario B	from Benzie CL to Hammond
Scenario C	from Benzie CL to Hammond
Scenario D	from Benzie CL to M-37

Table 5.9 Anticipated Transit Facilities by Scenario

Scenario A	No proposed transit
Scenario B	No proposed transit
Scenario C	No proposed transit
Scenario D	No proposed transit

Any future road improvements in Interlochen should be coordinated with Green Lake Township where there is a local master plan for development at the intersection of M-137 and US-31.

Corridor 5 – Garfield Road

Garfield Road provides a non-trunkline alternative to corridor three's north-south movement, connecting the Village of Kingsley with US-31 just east of the core population center. It provides a connection to the airport as it passes directly west of it. The corridor also provides a secondary connection to points to the south of the region, via M-113 and US-131. From Kingsley north to Hammond Road, the roadway traverses more sparsely developed land and provides more of a through movement than local access. From Hammond Road north, the through movement from the south becomes intermingled with local traffic as development becomes denser. It's in this northern section that most potential for future congestion lies.

In scenario A, the development pattern currently exhibited to the south of Birmley Road would continue spreading southward toward Kingsley, eventually causing congestion. The rural cluster, village, and city scenarios would alter the trend and reduce pressure on the Garfield Road corridor. The northern portions of the corridor adjacent to developed areas would support transit in the future. The trend scenario with a local circulator at the extreme northern end, and the other scenarios as noted in the chart below.

Table 5.10 Anticipated Roadway Capacity Issues by Scenario

Scenario A	from River Road to Hammond Road
Scenario B	None at corridor level
Scenario C	None at corridor level
Scenario D	None at corridor level

Table 5.11 Multi-Modal Impacts

Scenario A	Local circulator (bus) line from Hammond Road to US-31 plus fox track technology (streetcar, commuter rail, or light rail) from Carver Street to 8 th Street
Scenario B	Local circulator (bus) line from Hammond Road to 8 th Street
Scenario C	Local circulator (bus) line from Carver Street to US-31
Scenario D	Local circulator (bus) line from Carver Street to US-31

Corridor 6 – Hammond Road

Corridor 6 primarily provides local east-west movements. When considered in conjunction with the West US-31, Beitner, Keystone corridor, the Hammond Road corridor also facilitates a more regional east-west movement. Because it does not provide immediate access to a regionally significant center, Hammond

Road is relied on primarily to provide access from less populated residential and local commercial centers to other corridors.

In the city scenario, more of the regional population in the city center will cause Hammond Road travel demand to remain lower. In the trend, rural cluster, and village scenario less dense development in the city center will allow some development in the immediate Hammond Road vicinity and thus cause some congestion issues from 5 Mile Road to 3 Mile Road. The trend scenario would see the most development in the Hammond Road area, so it could support a local circulator bus connection from 3 Mile Road to the Garfield Road corridor. The remaining scenarios would not exhibit the necessary population near the corridor to warrant a Hammond Road transit line.

Table 5.12 Anticipated Roadway Capacity Issues by Scenario

Scenario A	from 5 Mile to 3 Mile
Scenario B	from 5 Mile to 3 Mile
Scenario C	from 5 Mile to 3 Mile
Scenario D	None at corridor level

Table 5.13 Anticipated Transit Facilities by Scenario

Scenario A	Local circulator (bus) line from 3 Mile Road to Garfield Road
Scenario B	No proposed transit
Scenario C	No proposed transit
Scenario D	No proposed transit

Corridor 7 – 3 Mile Road

3 Mile Road provides a localized north-south movement from Garfield Road to US-31. There are no direct connections to significant traffic generators, though the northern segment of the corridor provides access from US-31 to Cherry Capital Airport via S. Airport Road. Other than this connection, 3 Mile Road's primary function is to provide access from its immediate vicinity to other corridors.

Because of the connection to the heavily travelled US-31 and to the airport, the northern portion of corridor 7 exhibits some level of congestion in all scenarios. The trend, rural cluster, and village scenario, with their less intensive focus on the city center, have varying degrees of increased development along the corridor. For this reason, congestions the TDM predicts congestion from Hammond Road to US-31. The city scenario, with more intense focus closer to the center of Traverse City, would exhibit congestion only from S. Airport Road to US-31. For similar density-related reasons, scenarios A and B would not support transit, but scenarios C and D would support a local circulator bus line to serve the expected denser, more walkable community developments.

Table 5.14 Anticipated Roadway Capacity Issues by Scenario

Scenario A	from US-31 to Hammond
Scenario B	from US-31 to Hammond
Scenario C	from US-31 to Hammond
Scenario D	from US-31 to South Airport Road

Table 5.15 Anticipated Transit Facilities by Scenario

Scenario A	No proposed transit
Scenario B	No proposed transit
Scenario C	Local circulator (bus) line from S. Airport Road to Parsons Road
Scenario D	Local circulator (bus) line from S. Airport Road to Parsons Road

The segment of Three Mile Road from S. Airport to Hammond has been designed for widening to four lanes. The plans are ready for bidding upon funding availability.

Corridor 8 – M-22

M-22 runs from the M-72 intersection north to the north Elmwood Township line. It is the gateway to Traverse City from such Leelanau County communities including Suttons Bay, Northport, and Leland. In addition to providing through traffic movements to and from these communities, it also provides local access to adjacent businesses. Similar to other corridors, roadway congestion is to be expected due to the dual purpose of the corridor.

The trend scenario presents the most widespread congestion issues for this corridor. If, as would be expected in this scenario, low density development moves north from Elmwood Township, the corridor will be pressed into serving more local access in addition to through movements. In the trend scenario, congestion would be exhibited for the entire length of the corridor and beyond toward Sutton's Bay. Scenarios B and C have a similar effect, although with the more controlled rural nodes of scenario B and the higher density development of scenario C, the congestion could be less severe and limited to Cherrybend Road on the north. The city-focused scenario would have the most dramatic effect on M-22's anticipated congestion levels, as the TDM shows no capacity issues for this scenario.

As shown on the maps in section 5.1 and summarized below, scenarios A and C would support a local bus circulator, while scenarios B and D would not. The trend scenario supports a local circulator bus to service the anticipated development and is sprawls to the north. The village scenario, with proposed high density, walkable population centers to the north would support a bus route along the corridor. The rural cluster scenario would situate residential areas too far from the corridor to provide an effective transit connection. The city focused scenario would concentrate development further south toward downtown Traverse City, leaving the less dense M-22 corridor with fewer transit options.

Table 5.16 Anticipated Roadway Capacity Issues by Scenario

Scenario A	from M-72 and Cherrybend Road and beyond
Scenario B	from M-72 and Cherrybend Road
Scenario C	from M-72 and Cherrybend Road
Scenario D	None at corridor level

Table 5.17 Anticipated Transit Facilities by Scenario

Scenario A	Local circulator (bus) line along corridor and beyond
Scenario B	No proposed transit
Scenario C	Local circulator (bus) line along corridor and beyond
Scenario D	No proposed transit

Elmwood Township has commissioned a series of detailed studies for this corridor beginning in 2003. Key reports to reference when considering improvements to this corridor are: R. Clark & Associates' 2004 Greilickville Waterfront Area Study; Elmwood Townships' 2006 Community Parks & Recreation, Open Space, and Greenway Plan; Gosling Czubaks' 2007 Greilickville Harbor Park Marina Improvements Plan.

Key components of Elmwood Township's vision for this corridor include connectivity with the regional non-motorized trail network, township park improvements, a signalized intersection at Brewery Creek Lane, access management plans, extending the boulevard section from M-72 to Brewery Creek Lane, and expansion of the Discovery Great Lakes waterfront facility. Also under consideration is a parallel service road along the existing railroad corridor.

A corridor task force has been formed for M-22 in Elmwood Township. Any future corridor improvement projects should be coordinated with this group.

Existing features that make this corridor regionally significant are the region's only deepwater port and oil terminal, widely utilized boat launching facility for the West Arm of the Grand Traverse Bay.

Corridor 9 – W. Silver Lake Road

Corridor 9 winds its way from the southwest to the center of the region via West Silver Lake Road, 14th Street, Cass Street, and 8th Street. Its primary function is to provide access to the surrounding businesses and residences and to connect them to the more heavily utilized corridors in the region. Corridor 9 is significant because it intersects with 7 of the other corridors of significance. This connectivity with other corridors provides redundancy in the transportation network. It's also noteworthy because it's one of 5 corridors that cross the Boardman River.

The trend scenario and the rural cluster scenario spread development across the region, making each trip more dependent on the automobile. This is exhibited by the anticipated congestion within this corridor on Cass Street from 14th Street to 8th Street as more vehicles from the sprawling developments make their way to the core population center. In scenarios C and D, denser, more walkable development allows alternatives to vehicle trips so the corridor exhibits less congestion. The portion of corridor 9 within

Traverse City would support some form of transit in all of the growth scenarios. The specific transit options for each scenario are summarized in the table below.

Table 5.18 Anticipated Roadway Capacity Issues by Scenario

Scenario A	on Cass from 14 th Street to 8 th Street
Scenario B	on Cass from 14 th Street to 8 th Street
Scenario C	None at corridor level
Scenario D	None at corridor level

Table 5.19 Anticipated Transit Facilities by Scenario

Scenario A	Local circulator (bus) line from M-37 to Garfield Road
Scenario B	Local circulator (bus) line on 8 th Street from Boardman Ave. to Garfield
Scenario C	Local circulator (bus) line from M-37 to Garfield Road and some fox track technology (streetcar, commuter rail, or light rail) at M-37 and on some parts of 8 th Street
Scenario D	Local circulator (bus) line from M-37 to Garfield Road

Corridor 10 – N. Long Lake Road

The North Long Lake Road corridor connects the Lake Ann area Traverse City. The corridor serves primarily local traffic from northeast Benzie County and northwest Grand Traverse County.

None of the modeled scenarios exhibit future congestion conditions along the corridor. Because of the relatively low population density surrounding this corridor, none of the scenarios support transit routes.

Long Lake Township currently has plans to encourage a higher density, more walkable town center at the intersection of North Long Lake Road and Strait Road. The style of this development is in keeping with the preferred regional vision. Regional traffic modeling suggests that this style of development will have less impact on future roadway capacity and should allow for the current lane configuration to adequately serve as a multi-modal connection to Traverse City.

Table 5.20 Anticipated Roadway Capacity Issues by Scenario

Scenario A	None at corridor level
Scenario B	None at corridor level
Scenario C	None at corridor level
Scenario D	None at corridor level

Table 5.21 Anticipated Transit Facilities by Scenario

Scenario A	No proposed transit
Scenario B	No proposed transit
Scenario C	No proposed transit
Scenario D	No proposed transit

Corridor 11 – Cass Road

The Cass Road corridor begins at Keystone Road on the south and terminates at 14th Street in Traverse City. Though the corridor itself runs primarily north-south, its Boardman River crossing near Keystone facilitates a critical east-west movement. In conjunction with Hammond Road and Keystone Road, the river crossing provides an alternative crossing for both S. Airport Road and Bietner Road. This alternative provides convenience for some trips, but more importantly provides an emergency alternative should either the S. Airport or Bietner crossings become unusable.

In the less city-focused scenarios, the corridor exhibits future congestion from Hartman Road to 14th Street as development moves south from the core area. In the village and city scenario, the Cass Road corridor does not experience as much low density development, and hence does not exhibit any modeled congestion. None of the scenarios support transit along the corridor due to low density development.

Within corridor 11, it is important to maintain a connection at Cass Road and Keystone Road, along with a crossing of the Boardman River. The existing river crossing is at a dam location and is a one-lane, one-way traffic signal controlled crossing. Because the other existing and anticipated Boardman River crossings are at Bietner Road to the south and Airport Road to the north, this crossing is a critical link in the regional transportation network and should be maintained. The benefits of maintaining this crossing include providing emergency access in the event one of the other structures is closed, providing an alternate route for local traffic to cross the river, and providing non-motorized connectivity.

NOTE: For purposes of this study, it has been assumed that the Cass Road crossing of the Boardman River will be replaced with a two-lane, two-way bridge as part of the Boardman River Dam Removal project. The current cost estimate for the bridge replacement and related roadway approach work is \$8.4 million. This project is not included in the regional transportation plan because anticipated funding is from outside of the Federal surface transportation program. The NEPA process for this dam removal project will be underway in the near future.

Table 5.22 Anticipated Roadway Capacity Issues by Scenario

Scenario A	from Hartman to 14 th Street
Scenario B	from Hartman to 14 th Street
Scenario C	None at corridor level
Scenario D	None at corridor level

Table 5.23 Anticipated Transit Facilities by Scenario

Scenario A	No proposed transit
Scenario B	No proposed transit
Scenario C	No proposed transit
Scenario D	No proposed transit

6.0 Impacts, Mitigation Techniques, and Permitting

6.1 Regional Impacts by Scenario

Evaluations by scenario for environmental impacts include observations on impacts to noise, air, and water quality under each scenario. Because the measurements for these metrics were done on a system-wide scale, the environmental impact section is not corridor specific. Some of the analysis is based on the results of the Grand Vision transportation demand modeling (TDM) performed by Kimley-Horn Associates. The limits of the TDM include Traverse City and nine surrounding townships. The measures of delay time and gallons of fuel wasted annually are indicators of noise impacts from the TDM. The measures of CO₂ from the “air quality per day” are indicators of the impact on air quality from the TDM. Water quality impacts are evaluated based on the measure of forest and farm lands consumed by scenario and the acres of new development from the land use model done by Fregonese Associates, which covers the whole six-county region.

6.1.1 Noise Impacts

The consideration of noise impacts by scenario here will be based on the amount of congestion present in each scenario. Congestion levels are expressed through measurements of delay time and gallons of fuel wasted. These metrics were chosen based on the connection between higher levels of congestion and traffic delay with the associated traffic noise. There were no specific noise metrics or measurements conducted as part of the Grand Vision. Measurements are provided for the base transportation model output and then with the 4-D processing to incorporate transit and non-motorized trips.

Table 6.1 Noise

	Delay Time (hours per year)		Gallons of Fuel Wasted (per year)	
	Base Model	With 4-D Processing	Base Model	With 4-D Processing
Scenario A	4,900	3,400	1,070,000	740,000
Scenario B	4,000	2,900	880,000	640,000
Scenario C	3,600	2,700	790,000	590,000
Scenario D	3,600	2,100	790,000	460,000

In Scenario A, the Trend scenario, the delay time measured in hours and gallons of fuel is the highest of the four scenarios. The noise level overall would also be expected to be highest in this scenario. The land use pattern in this scenario also supports this association. Most of the new development through 2025 is located within the limits of the transportation model placing most of the new trips in this area as well. There is a reduction in delay time and wasted fuel of approximately 30% with the addition of the 4-D model to incorporate transit and non-motorized trips. But other scenarios experience the same type of reduction with the 4-D processing so this scenario is expected to have the highest noise level of any scenario.

In Scenario B, the Rural by design scenario, there is less congestion than in the Trend scenario but more than in the other two scenarios both with and without the 4-D processing. The land use pattern places most of the new development through 2025 in rural areas around the region outside of the transportation

demand model area. The congestion in the TDM is from existing development and from trips between the rural areas to the urbanized area around Traverse City. Although it was not modeled, there is likely more traffic and also more noise on major regional transportation corridors outside of the model area.

In Scenario C, the Villages scenario, there is less congestion and fewer gallons of fuel wasted than in the Trend and Rural by design scenarios but more than in the City focused scenario. As a result, this scenario is expected to produce less traffic noise than Scenarios A and B but more than Scenario B. Most of the new development is located in villages around the region outside of the TDM so there are fewer trips overall into the urban center. Also, in the villages, there are more opportunities to walk, bike and use transit which would lower congestion and transportation noise levels in the villages. Conversely, noise in the villages and urban development nodes might increase from other sources. In this scenario, more people travel outside of enclosed vehicles and public spaces are used for sales, performances and other outdoor events.

In Scenario D, the City focused scenario, most of the new development in the region is placed in a compact development pattern in and around downtown Traverse City and Cadillac. Development in the Traverse City area is reflected in the TDM metrics for delay and gallons of fuel wasted. Although development density is the highest, there is the lowest amount of traffic congestion. This would correspond to the lowest level of transportation noise of all four scenarios. Like the Villages scenario, however, the vibrant downtown area would produce noise from people and events in the improved public space.

6.1.2 Air Quality Impacts

Air quality observations are based directly on the metric “Air Quality (per day) measured in CO₂.” In the TDM, this number is calculated directly from the VMT calculation for each scenario. The higher the number of vehicle miles driven, the larger the amount of CO₂ released into the air. While this number is not a comprehensive indicator of all air quality impacts, it is a metric that provides a basis for comparison of air quality impacts between the scenarios.

Table 6.2 Air Quality (per day) measured in CO₂ (g)

		With 4-D Processing
Scenario A	18,100	14,700
Scenario B	17,100	13,900
Scenario C	16,700	13,700
Scenario D	15,900	12,600

In Scenario A, the Trend scenario, the level of CO₂ emissions is the highest of all four scenarios. This equates to the largest negative impact on air quality. The addition of the 4-D processing reduces the CO₂ levels, but it is still the highest of the four scenarios. The new development in this scenario is largely auto oriented and located in and around Traverse City. So most trips—even short ones—are made in an automobile within the limits of the model area. These observations correspond with the higher levels of CO₂ produced by the TDM.

In Scenario B, the Rural by design scenario, the level of CO2 emissions is less than the Trend scenario but higher than the Villages or City focused scenarios. The impact on air quality can be described the same way—less than Scenario A but more than Scenarios C and D for the TDM area. Most of the new development in this Rural by design scenario is located in rural areas in a more dispersed pattern around the region. Some walk and bike trips can be made within the rural cluster development, but other trips from rural homes to urban areas are longer and not captured by the TDM. The air quality of Scenario B may be higher at the regional level than it appears from the TDM results.

In Scenario C, the Villages scenario, the level of CO2 emissions is lower than Scenarios A and B but higher than Scenario D in the TDM area. The impact on air quality can be described the same way. Some of the new development within the TDM occurs in nodes at major urban intersections. Other new development is spread out in villages around the region in compact, walkable patterns. Scenarios B and C both place new development outside of the TDM, but the compact nature or higher density of the Villages development patterns would likely produce lower air quality impacts at the regional scale as well.

In Scenario D, the City focused scenario, the level of CO2 emissions is the lowest of any of the four scenarios. This means that this scenario has the least amount of impact on air quality. At the same time, most of the regional development is located within the downtown areas of Traverse City and Cadillac in dense, walkable urban development patterns. It is this land use pattern that facilitates the reduction in the vehicle miles travelled which in turn reduces the amount of CO2 emissions. There is very little development in other places around the region so this scenario would likely have the least amount of impact on air quality at a regional scale as well.

6.1.3 Water Quality Impacts

Water quality impacts are directly related to the amount of “vacant” land converted to urbanized uses. Vacant land includes any land not used for urbanized uses including environmentally sensitive areas, forest land and farm land. This metric was selected based on a report published by the Environmental Protection Agency in January 2006 entitled “Protecting Water Resources with Higher Density Development¹.” The report was the result of three different scenarios modeled at three different time series. The report concluded that the higher-density scenarios generate less stormwater runoff per house at all scales and time series; that for the same amount of development, higher-density development produces less runoff and impervious cover than low-density development; and for a given amount of growth, lower-density development impacts more of the watershed. Also, the loss of forestland has a disproportionately high impact on water quality as the forest cover offers exceptional water quality benefits due to the foliage and the root systems of the trees.

¹ “Protecting Water Resources with Higher Density Development,” U.S. Environmental Protection Agency, Washington DC, January 2006.

Table 6.3 Water Quality Impacts

	Acres of Farm	Acres of Forest	Total Vacant Acres
Scenario A	6,566	7,460	19,005
Scenario B	8,244	14,342	30,896
Scenario C	2,079	2,469	6,744
Scenario D	1,968	2,173	5,766

Scenario A, the Trend scenario has the second highest number of vacant acres converted to urbanized uses. It impacts forestland and farmland in almost equal amounts. The impact to water quality would be high in this scenario when compared to Scenarios C and D but less than the impacts of Scenario B.

Scenario B, the Rural by design scenario, has the highest number of vacant acres converted to urbanized uses of any of the four scenarios. It measures 1.5 times the amount of the Trend scenario and 5 or 6 times more than the Villages and City focused scenarios. Note also that its impact on forestland is more than 150% of that on farmland. This scenario would have the largest negative impact on water quality of any of the four scenarios.

In Scenario C, the Villages scenario, most of the new development is accommodated through a combination of infill development, redevelopment and compact development adjacent to existing villages in the region. The Villages scenario has the second-lowest impact on water quality based on the number of vacant acres converted to urbanized uses. There is some impact to both farmland and forestland, but it is approximately one-third of the Trend scenario. This scenario has a low impact on water quality when compared to Scenarios A and B and its impact is only slightly higher than Scenario D.

In Scenario D, the City focused scenario, most of the new development is accommodated through infill development, redevelopment and compact new development adjacent to the existing urbanized centers of Traverse City and Cadillac. There is some impact to both farmland and forestland, but it is even smaller than the impact of the Villages scenario. This scenario has the smallest amount of vacant land converted to urbanized uses and therefore the lowest impact on water quality.

6.2 Social Impacts

Social impacts in this section refer to two concepts that are part of the social, economic, and environmental (SEE) impacts list of consideration: the relocation of people or businesses and environmental justice. Because this report precedes the selection of specific projects, both items will be considered here from a policy perspective related to the larger Grand Vision process rather than in relation to the scenarios and corridors. Reference will also be made to the application of these two best practices to specific projects as they are selected in the future.

6.2.1 Relocation of people or businesses

When the Grand Vision project was being formulated through a written scope of services, there were many things that were unknown. When the corridors of significance were formulated, the scope language was written to include the possibility that some or all of the corridors might be missing links in the

transportation system. More specifically, the scope language was written to address the possibility that the corridors might call for the acquisition of right of ways for new road construction. This was the primary reason for considering the relocation of people or businesses as part of the scope language.

Now that the corridors have been identified, we know that each corridor contains an existing roadway within a public right of way. Although the specific projects have not been identified, it is now likely that any improvement will be made within existing right of ways. As a result, there will be no need to relocate existing people or businesses. If it happens that a proposed project will require the acquisition of additional right of way, design alternatives will be weighed with consideration given to whether people or businesses are relocated. Preference will be given on that scale to any that minimize or eliminate the need for relocation.

6.2.2 Environmental Justice

This definition of environmental justice was taken from the website of the Federal Highway Administration (FHWA):

There are three fundamental environmental justice principles:

- *To avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations.*
- *To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process.*
- *To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations.*

<http://www.fhwa.dot.gov/environment/ej2000.htm>

The Grand Vision in many ways is a best practice model of environmental justice. The community participation and outreach activities were extensive, open, and welcoming. The Public Involvement Committee met on a weekly basis. The group regularly discussed ways to reach more people in the community. Some of the considerations were language barriers, transportation to on-site workshops, access to a range of communication methods including internet access, and childcare needs. Extra efforts were made to reach populations that are traditionally disconnected or underserved by public involvement activities.

The issue of “environmental justice” will continue to be important in the transportation planning process in the region. Now that the corridors have been selected, the next step in the Grand Vision process will be to determine specific projects along each corridor. The meetings of the Technical Committee and the TALUS Board are public meetings and open to members of the public. These groups should consider whether the public is being informed of the meetings in a way that offers citizens the opportunity for meaningful involvement in the process as it moves forward. The Grand Vision working groups may offer a range of communication tools within the community to encourage continued public outreach and opportunities for meaningful public involvement.

6.3 Physical Impacts Mitigation and Permitting

The physical impacts identified on the corridor maps in **Section 4.0** are based on the items that are evaluated through the National Environmental Policy Act (NEPA) review process. This inventory activity is in no way intended to satisfy NEPA requirements, and it does not eliminate the need to complete a NEPA analysis for a transportation improvement project. Rather, it is intended to provide information that will help guide the selection of transportation projects with consideration of sensitive environmental and cultural resources.

NEPA is designed to protect all aspects of the environment and to make sure that the decisions made by Federal agencies are environmentally sound. NEPA encourages early consideration of environmental impacts, in an open manner, with meaningful public participation. NEPA requires review of the effects of all federally assisted projects which will include all county and state road improvement projects as part of the permitting process.

The text provided here provides information about the regulating and permitting agency for each resource. For some items, information is also provided about standard mitigation practices.

6.3.1 Wild and Scenic Rivers / Natural Rivers

The Boardman River is considered a state designated Natural River. This resource is protected and regulated by the Michigan Department of Natural Resources and Environment (MDNRE). Wild and scenic rivers are also protected and regulated by local zoning regulations. Any road construction project that may have an impact on the Boardman River should have early coordination with the MDNRE. If it is determined that there are impacts to the Boardman River, design standards and appropriate mitigation measures will be regulated by the MDNRE. In most cases, appropriate design measures can avoid or minimize any adverse project impacts.

6.3.2 Threatened and Endangered Species

The MDNRE and the U.S. Fish and Wildlife Service (USFWS) regulate threatened and endangered species. An assessment of threatened and endangered species is performed as part of the NEPA process. It may result in a finding that either 1) potential threatened and endangered habitat exists within portions of the project corridor, or 2) threatened and endangered species have been found by a qualified observer in the corridor.

Early consultation with the MDNRE and the USFWS is recommended to obtain the target species list and discuss required biological or habitat studies. If it is confirmed that an actual species exists, the MDNRE and USFWS will determine the required mitigation through the Section 7 process. Usually, impacts to threatened and endangered species are avoidable. Many times, mitigation is as simple as additional design modifications to avoid potential impacts.

6.3.3 Prime and Unique Farmland Soils

Any proposed road project with farmland impacts or the conversion of farmland soils to non-agricultural uses will require the completion of a Farmland Conversion Impact Rating form. This form will be completed in cooperation with the Natural Resource Conservation Services (NRCS) of the U.S.

Department of Agriculture. The NRCS uses this form to evaluate the impacts of the proposed improvements on farmland in the area. Specific mitigation will be determined by the NRCS, but demonstrating that no other prudent or feasible alternative exists that will avoid or minimize impacts to farmland will also be required.

6.3.4 Section 4(f) and 6(f)

Section 4(f) and Section 6(f) of the DOT Act of 1966 is triggered by projects funded or approved by a U.S. DOT agency that propose the use of historic property or land from a publicly owned park, recreation area, or refuge. This review and determination is part of the NEPA review process. If there are impacts to any historic or recreational resource, the applicant must demonstrate that no other prudent or feasible alternative exists that avoids impacts to the 4(f) or 6(f) properties. If there are no alternatives, mitigation will be required by the FHWA. Consultation with the Federal Highway Administration (FHWA) and MDNRE should be started early to determine appropriate mitigation and avoid project delays.

6.3.5 Flood Prone Areas

The National Flood Insurance Program (NFIP) is a program of the Federal Emergency Management Agency (FEMA). The federal floodplain program is administered in Michigan through the MDNRE and may also be regulated by the local community. Early consultation will be required if a proposed road project may impact a regulated floodplain area. Also, a MDNRE floodplain permit will be required prior to any construction activity.

To determine the extent of required mitigation, earthwork calculations are needed in order to determine cut and fill volumes in a flood prone area. It is impossible to estimate the amount of mitigation the MDNRE will require without preliminary design plans and earthwork quantities of the proposed improvements. However, typical MDNRE mitigation requires a compensating cut in the same floodplain as the impact to offset any fill material that is placed in floodplain. A compensating cut is the removal of earth material equal to or greater than the amount of fill material placed in the floodplain required for construction. Often times fill material is needed to raise road grades to obtain proper drainage or match existing pavement elevations.

6.3.6 Coastal Zones and Coastal Barriers

The shoreline of Lake Michigan, the Boardman Lake, and the Boardman River are all considered regulated coastal resources. This resource is protected and regulated by the Coastal Management Unit of the MDNRE. When road construction projects are considered along any of these water resources, it is possible that some coastal resources will be impacted by the proposed improvements. Early coordination with Coastal Management Unit of the MDNRE is required to determine appropriate mitigation if impacts are unavoidable. Typical mitigation will include designs that demonstrate every reasonable attempt was made to avoid and minimize impacts.

6.3.7 Hazardous / Toxic Materials

An analysis of the corridor areas identified many recorded hazardous materials sites. These sites are regulated by the Environmental Protection Agency (EPA) and the MDNRE. In any proposed road construction project where a hazardous materials site may be impacted, early coordination with the

Environmental Protection Agency (EPA) and the MDNRE should be initiated and a Phase I Environmental Site Assessment (ESA) should be completed. The purpose of a Phase I ESA is to evaluate the potential for contamination on or adjacent to a specific property. This will be the first step in satisfying regulatory concerns and identifying appropriate mitigation strategies.

Depending on the results of the Phase I ESA and the type of contamination present, mitigation may include soil testing, removing contaminated soils prior to construction, safety equipment for workers, and the installation of monitoring wells. A Phase II ESA may be required if specific recognized environmental conditions are found at a site and an accurate assessment of the contamination proves difficult.

6.3.8 Navigational Rivers or Streams

Lake Michigan and the Boardman River are both classified by U.S. Army Corps of Engineers (Corps) as navigable waterways and, as such, are under their jurisdiction. Final engineering plans for any roadway project near a navigable waterway are subject to review by the Corps and the MDNRE. The applicant will be required to demonstrate that the project avoids waterway impacts, especially around the Boardman River. If it is determined that impacts are unavoidable through the alternatives development process, the Corps will determine appropriate mitigation.

6.3.9 Wetlands

As part of the NEPA clearance process, potential impacts to regulated wetlands will be identified. Wetland delineation will then be required to determine the exact locations of each wetland area and verify the types, functions, and values of each complex. If, after the wetland delineation, it is determined that wetland impacts are likely, coordination with the MDNRE will be required to determine exact mitigation requirements. In addition to the NEPA clearance process, a wetland permit from the MDNRE will also be required before construction can begin.

Current mitigation requirements for most wetland impacts include replacing every wetland acre impacted with 1.5 acres of created wetlands at an MDNRE approved site. Forested wetland impacts require 2.0 acres of mitigation for every acre impacted.

6.3.10 Section 106 Historic or Archeological Sites

During the NEPA process, properties along the project corridor will need to be evaluated for historic significance through the Section 106 process. The State Historic Preservation Office (SHPO) is the consulting agency during the Section 106 process. Ultimately, the SHPO will either concur that no historic properties will be impacted by the proposed improvements or determine that adverse impacts are expected. If impacts are expected, coordination with the SHPO will be required to determine appropriate mitigation.

7.0 Activity Centers

Generally, Activity Centers can be described as areas within a community with higher intensity and density land uses. They can also be identified specifically as areas with higher than adjacent concentrations of employment or the highest trip generators from the perspective of Travel Demand Modeling (TDM). For this report, the consultant worked with the Technical Committee to identify ten Activity Centers within the TC-TALUS model boundary based on local knowledge of the area. They are:

1. Cherry Capital Airport
2. Northwestern Michigan College
3. Munson Medical Center
4. Downtown Traverse City
5. Grand Traverse Mall
6. Chums Corners
7. Acme Town Center
8. Interlochen
9. Kingsley
10. Grand Traverse Commons

After the Activity Centers were identified, an analysis was performed to measure the population base within a 40-minute travel time. Additionally, environmental justice populations were identified through basic demographic data for population and income. Since the proposed corridors are not new, there are no potential relocations to consider.

7.1 Activity Center 40-Minute Travel Time Maps and Data

For each Activity Center, a 40-minute travel area was created around each activity center using ArcGIS Network Analyst. This program calculates a 40-minute drive time in a personal vehicle. Then block group boundaries and demographic data were downloaded from www.census.gov. The data set used was the Census 2000 Summary File (SF-3). Every block group that intersected the drive time area was selected in whole. A summed total is provided in each demographic category across all selected block groups. The demographic data and maps are provided on the following pages.

In both the Activity Center analysis and the Census 2000 data, there is very little racial or ethnic diversity in the regional population. Statistically, 98.9% of the population in Grand Traverse County was counted as *White alone* in the 2000 US Census. Each of the drive time areas has at least 98% of the population in that category. The largest category besides “*White alone*” was “*American Indian and Alaska Native alone*.” The most diversity appeared in the Downtown Traverse City and Acme Town Center Activity Centers. The least diversity appeared in the Interlochen and Kingsley Activity Centers.

Household income in the region increased from 1990 to 2000. The 2000 Census reports a decrease in the number of households with incomes of less than \$35,000 between 1990 and 2000. In the category “Less than \$10,000,” there was a decrease of 41%. At the same time, household incomes of \$50,000

and above increased. The median household income increased by 48.7% in Grand Traverse County from 1990 to 2000 and it increase by 14.6% when measured in 1999 dollars.

The household income data for the Activity Centers follows the distribution ratio found in the 2000 Census. The Acme Town Center has the highest number of households overall and has the highest number of households in each income category until the \$60,000 category. After that, the downtown Traverse City Activity Center has the highest number of households in the highest income brackets. The two are close in number across the board. The fewest number of households in the lowest income categories are found in the Kingsley and Interlochen Activity Center geographic areas.

A few general observations can be made about the demographic data. These numbers were summarized by the total drive time area rather than by individual block groups so they provide a snapshot of the whole 40-minute drive time area associated with each Activity Center. Geographically, the boundaries are similar so it is not surprising that the results are also similar. The results of the drive time area data are also similar to Census 2000 data for Grand Traverse County. These observations are general and the conclusion that can be drawn is that there is not a single Activity Center that stands out statistically from the others or when compared to the county as a whole. There are no environmental justice concerns that relate to one Activity Center more than another.

7.2 Activities Centers and the Grand Vision

The 40-minute drive time was selected as an indicator of the geographic distance that people will travel to an Activity Center location to work or shop and also to show the area that the Activity Center looks to for supplies and services. There are several land use and transportation policy implications from the mapping exercise that can be connected to the Grand Vision.

An Activity Center is an ideal location to develop a village center or smaller node of mixed-use development. Most Activity Centers are already major employers and almost all are served by transit. Most, however, lack housing and neighborhood services to fill out the mix of uses within a 15 minute walking distance.

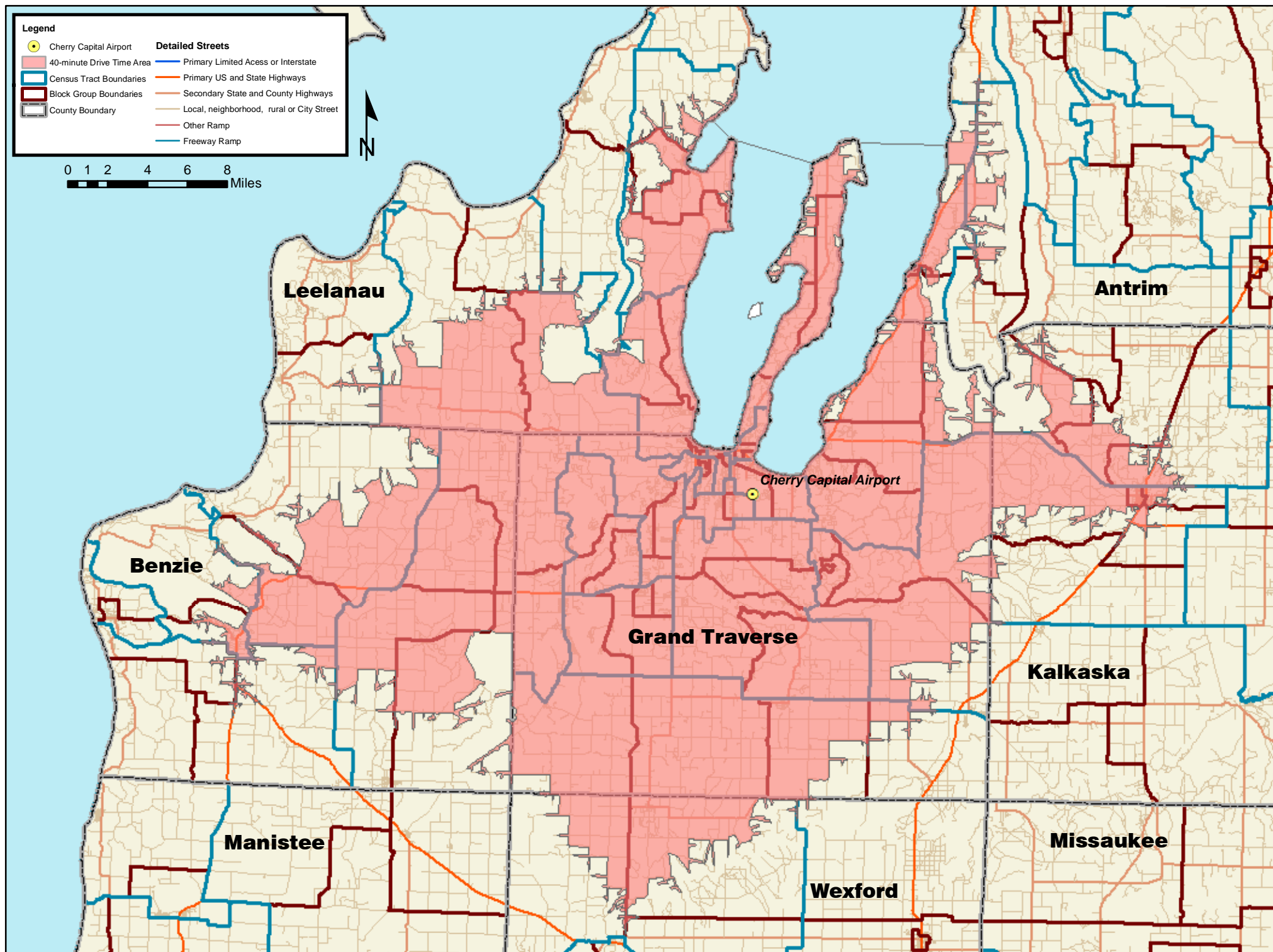
Activity Centers are major employers in the region and the maps indicate a significant overlap in the labor market for all of them. This is an indication that they are competing with each other to find talented, skilled and dependable workers. A greater number of housing units overall with a mix of affordable units will benefit employers by increasing the available labor pool. It will also benefit employees by placing housing choices closer to jobs resulting in shorter travel times and lower transportation costs.

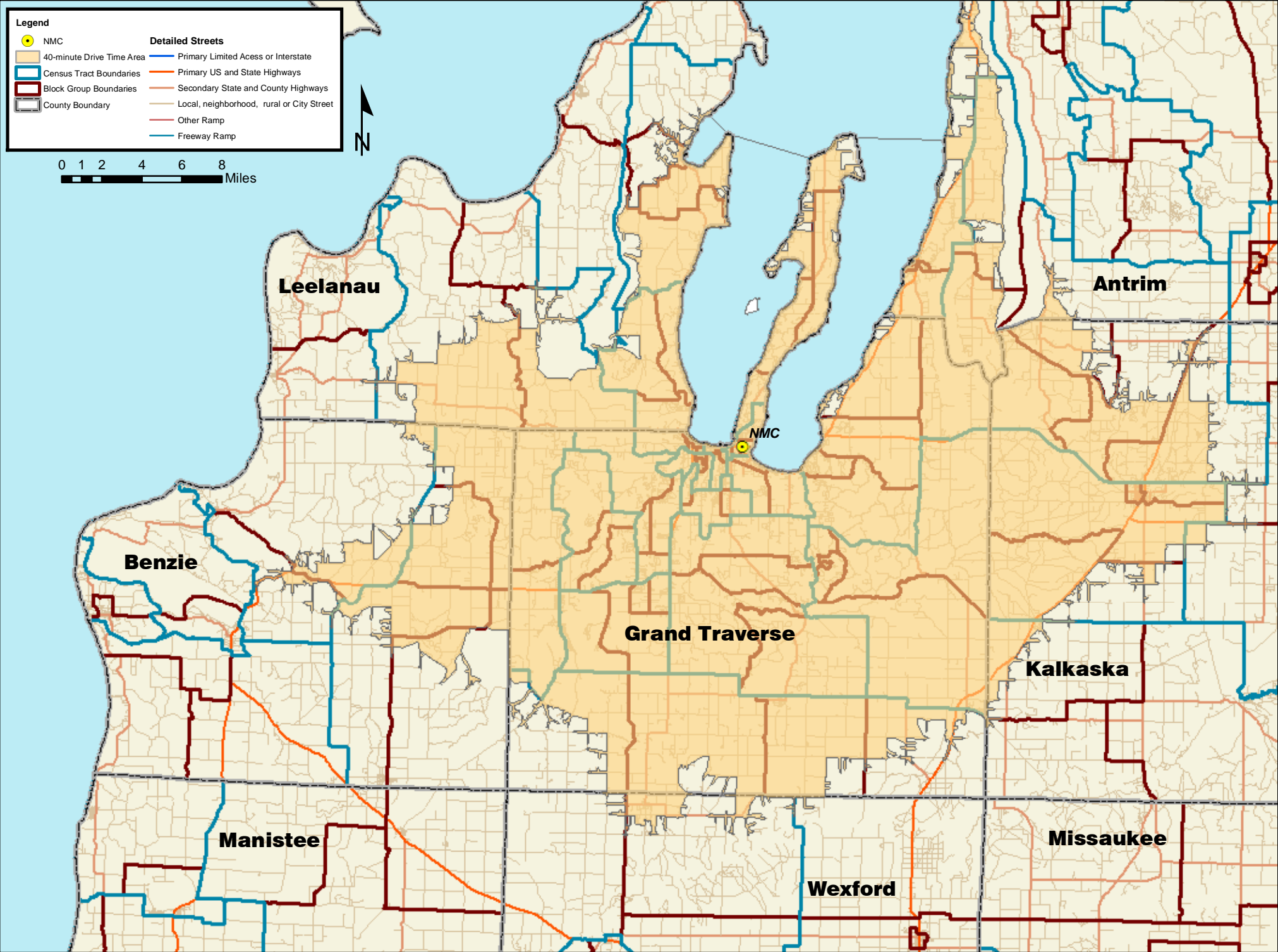
The areas outside the 40-minute drive areas may be as significant as those inside. Some of the Villages shown on the Grand Vision map are outside of most of the travel footprints. These include Leland, Empire, Frankfort, Thompsonville, Fife Lake and Bellaire. The economic development strategies for these areas will be understandably different from those areas. Some may be more closely associated with other market areas like Cadillac, Gaylord, Petoskey and Charlevoix. Others may be more distant

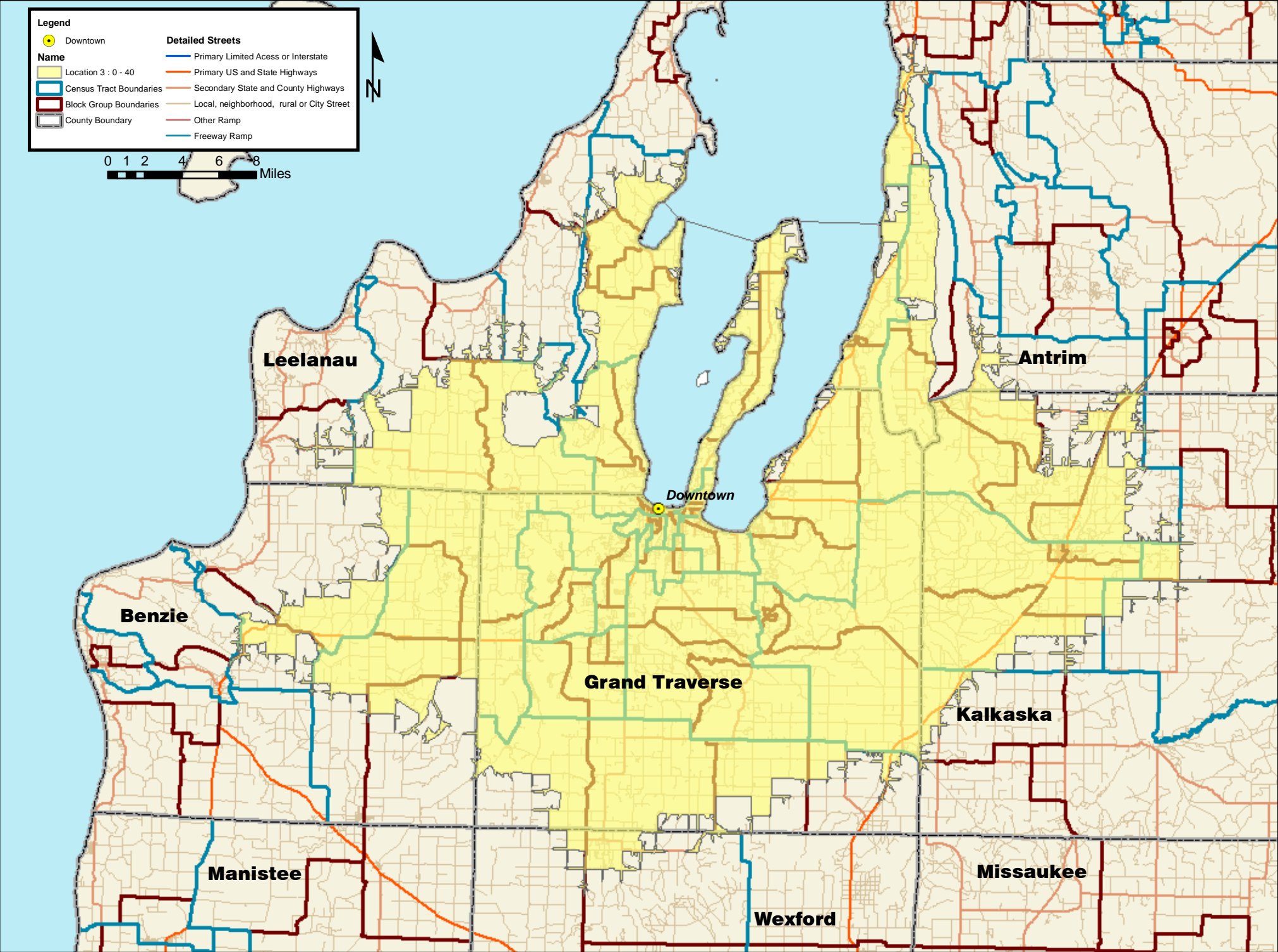
from major employment centers. For businesses located in these areas, it may be inefficient or too costly to provide sales and services to the Activity Centers.

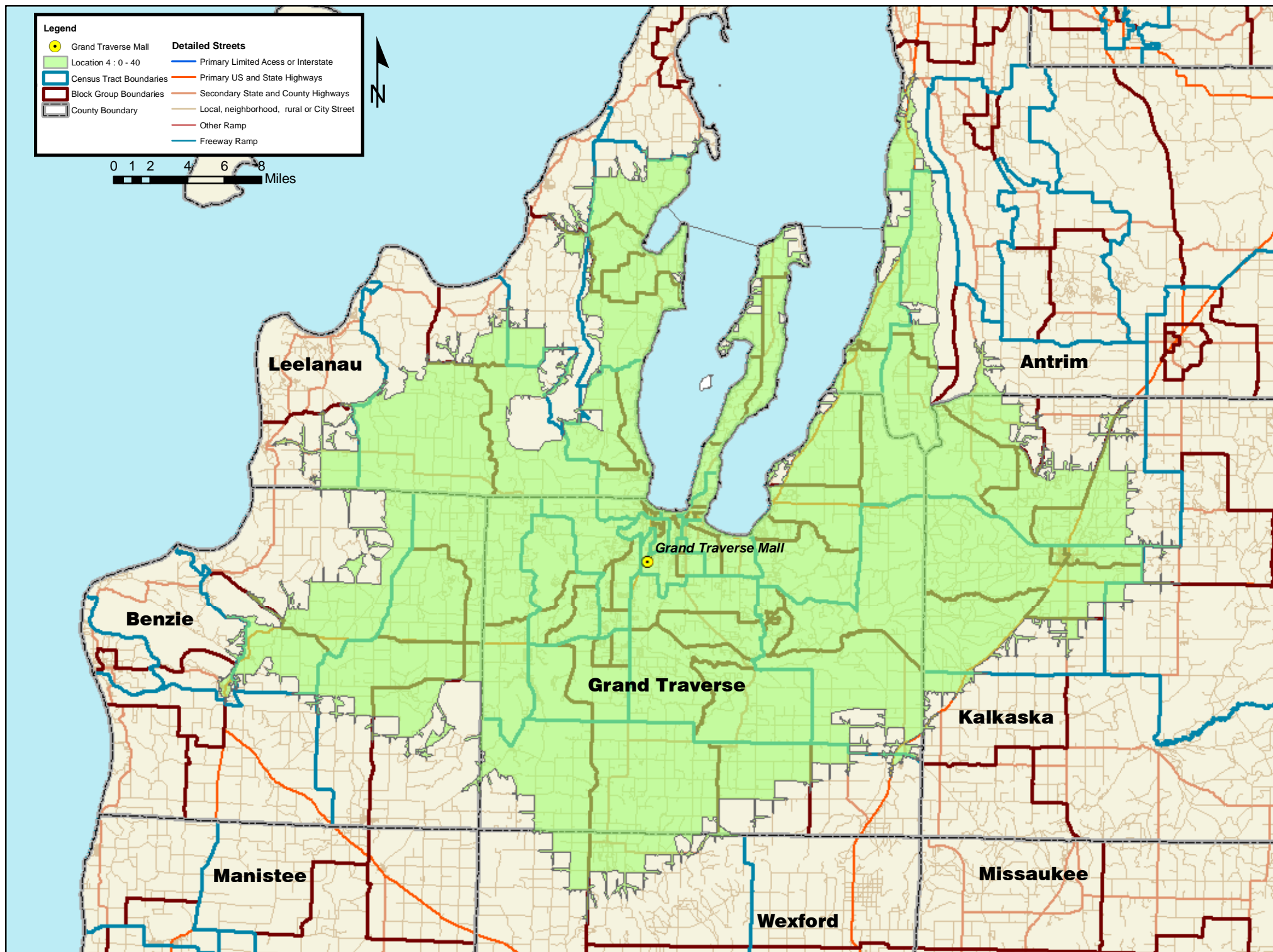
Activity Centers overall are employment nodes. They are destination location for employees travelling to work each day. An increase in the number and density of housing units within the 40-minute drive time would increase the number of origin points which would in turn increase the effectiveness of transit. Almost all of the Activity Centers are served by BATA's transit service. The Acme Town Center and Interlochen are prime candidates for BATA's Village connector service.

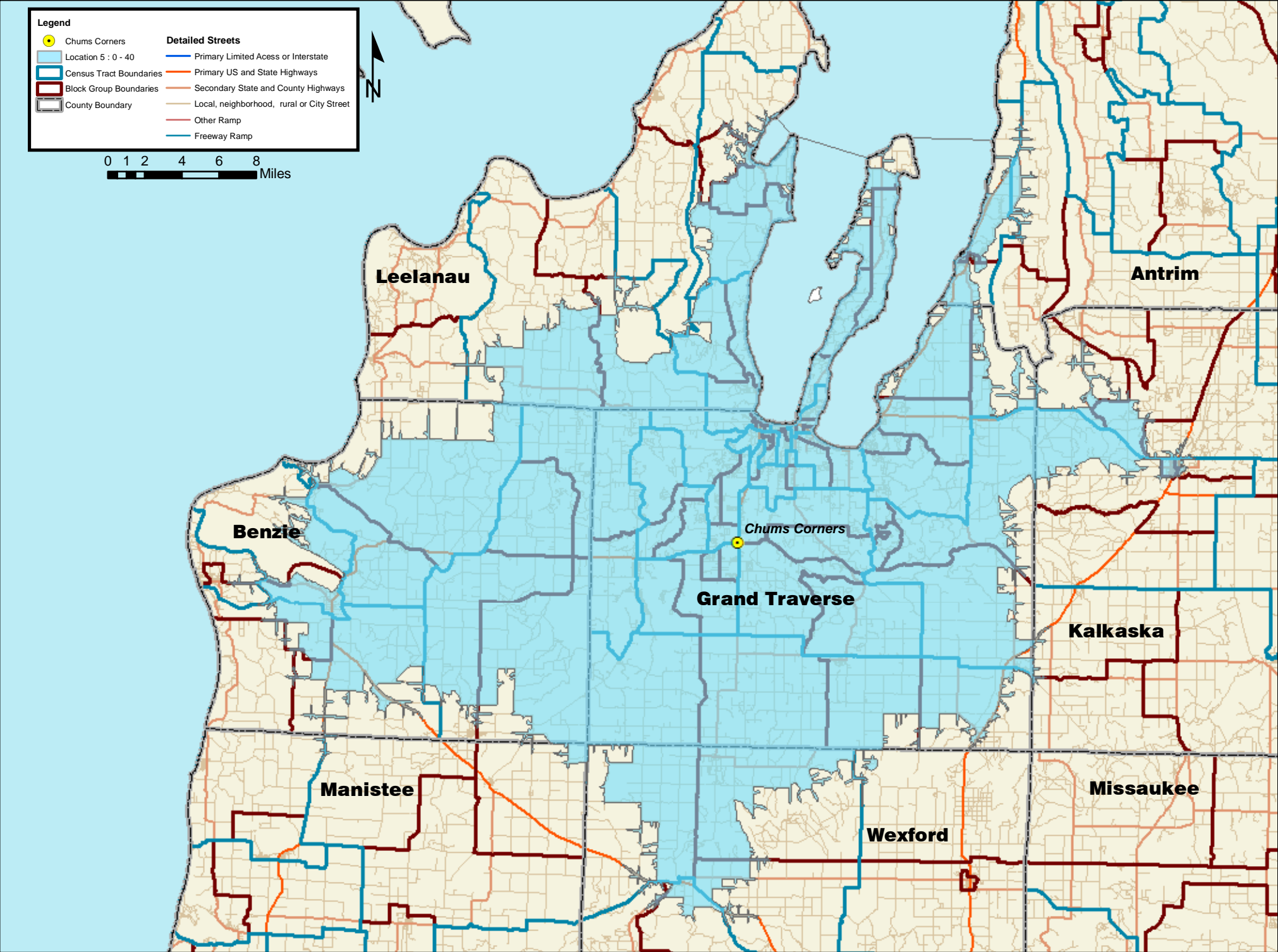
Several Activity Centers are an island on their own and lack an associated local grid street pattern. The addition or expansion of a local street grid around Activity Centers would increase the opportunity to add walkable housing units and other mixed-uses nearby. As activity centers transition to a village or mixed-use node, pedestrian infrastructure will be an important design component.

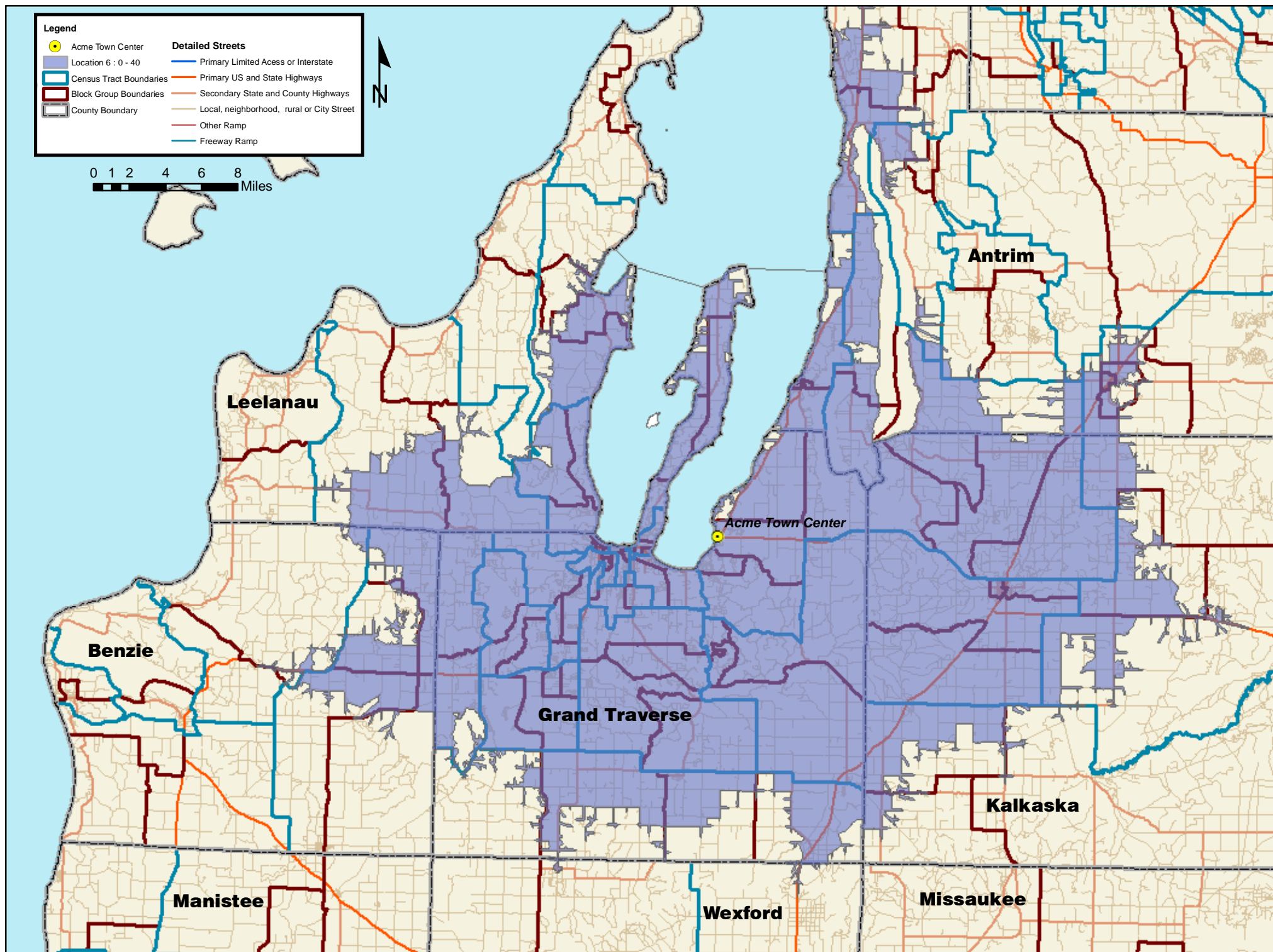


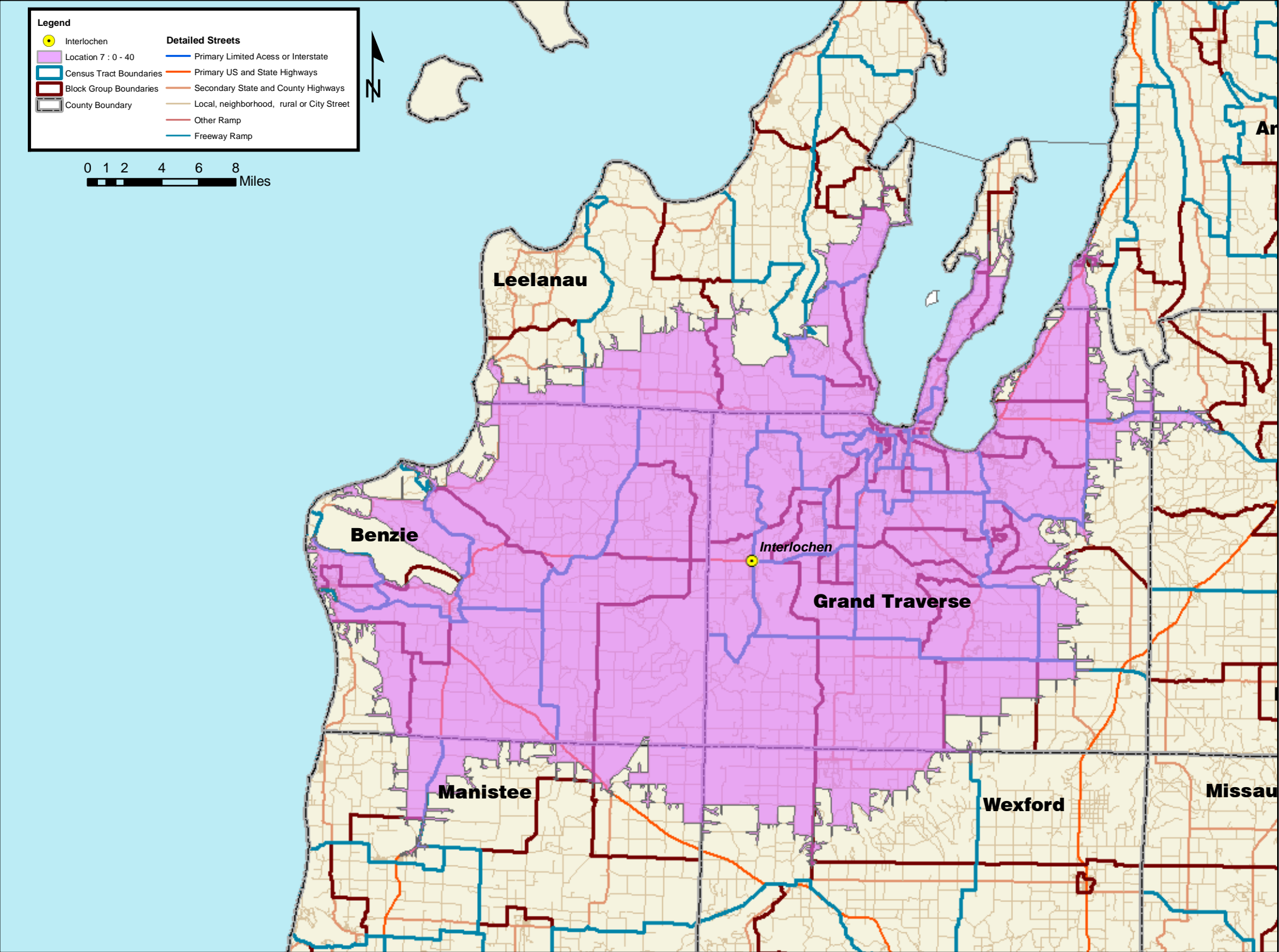


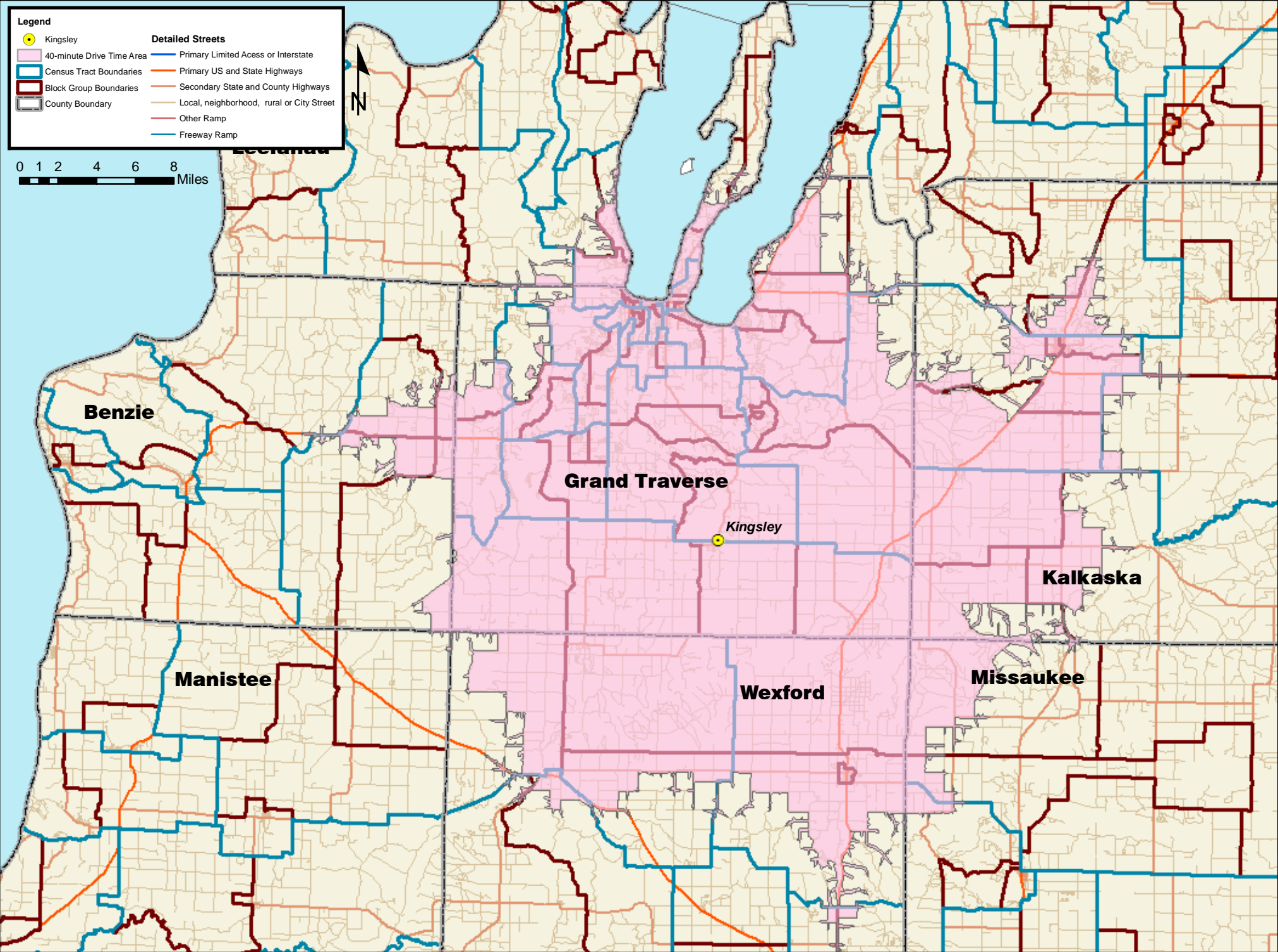


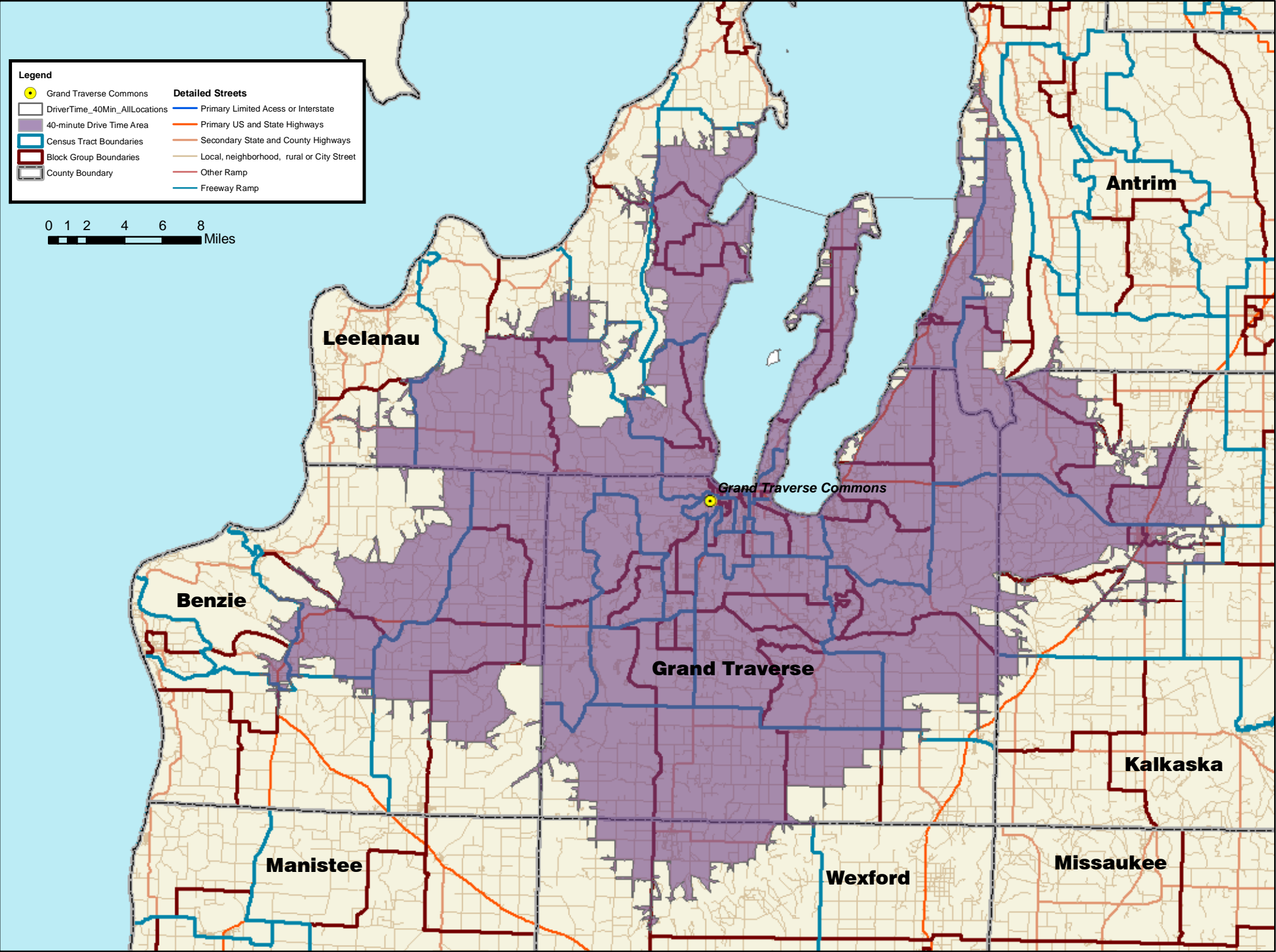


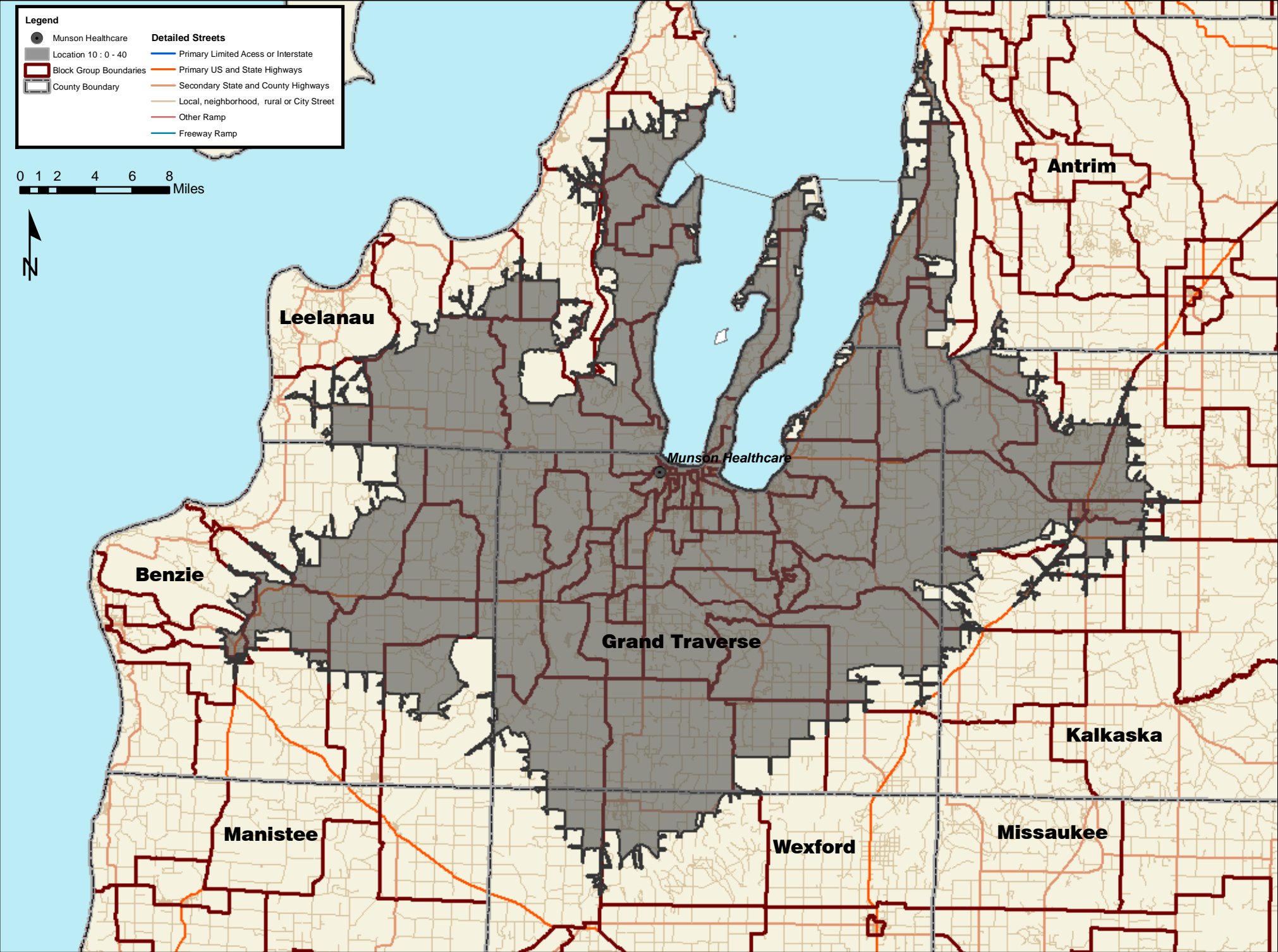












Grand Traverse Census Demographic Analysis
20154-00-07001

P6. Race - Universe: Total Population

Activity Center	# Block Groups	Total Population	Total- White alone	Total - Black or African American alone	Total - American Indian and Alaska Native alone	Total - Asian alone	Total - Native Hawaiian and Other Pacific Islanders alone	Total - Some other race alone	Total - Two or more races
1 Cherry Capital Airport	98	131,082	125,837	458	2,093	438	19	632	1,605
2 Northwestern Michigan College	96	129,531	124,424	461	2,029	439	16	578	1,584
3 Downtown Traverse City	107	141,242	135,732	474	2,204	453	25	653	1,701
4 Grand Traverse Mall	101	134,416	129,039	461	2,167	443	19	647	1,640
5 Chums Corners	103	136,552	131,142	473	2,169	453	23	621	1,671
6 Acme Town Center	110	143,557	138,059	483	2,192	442	34	593	1,754
7 Interlochen	93	123,438	118,982	435	1,509	398	19	563	1,532
8 Kingsley	91	123,741	119,515	452	1,352	402	9	435	1,576
9 Grand Traverse Commons	102	135,520	130,103	461	2,176	443	19	649	1,669
10 Munson Healthcare	102	135,520	130,103	461	2,176	443	19	649	1,669

P52. household income in 1999 - Universe: Households

Activity Center	# Block Groups	Total	Less than \$10,000	\$10,000 to \$14,999	\$15,000 to \$19,999	\$20,000 to \$24,999	\$25,000 to \$29,999	\$30,000 to \$34,999	\$35,000 to \$39,999	\$40,000 to \$44,999	\$45,000 to \$49,999	\$50,000 to \$59,999	\$60,000 to \$74,999	\$75,000 to \$99,999	\$100,000 to \$124,999	\$125,000 to \$149,999	\$150,000 to \$199,999	\$200,000 or more
1 Cherry Capital Airport	98	51,471	2,923	2,785	3,218	3,726	3,571	4,054	3,822	3,431	3,360	5,382	5,864	4,483	2,095	855	834	968
2 Northwestern Michigan College	96	50,768	2,852	2,757	3,155	3,666	3,513	4,013	3,807	3,403	3,313	5,389	5,761	4,412	2,032	941	805	949
3 Downtown Traverse City	107	55,692	3,240	3,052	3,495	4,087	3,892	4,342	4,197	3,726	3,627	5,854	6,282	4,788	2,207	989	875	1,039
4 Grand Traverse Mall	101	53,027	3,039	2,892	3,289	3,879	3,672	4,187	3,935	3,558	3,444	5,556	6,018	4,561	2,158	977	854	1,008
5 Chums Corners	103	53,690	3,208	3,022	3,457	3,990	3,800	4,265	3,948	3,551	3,492	5,559	6,020	4,541	2,084	965	830	958
6 Acme Town Center	110	56,294	3,314	3,148	3,557	4,149	3,934	4,390	4,289	3,797	3,651	5,996	6,251	4,823	2,152	970	869	1,004
7 Interlochen	93	48,765	2,800	2,700	3,066	3,609	3,468	3,780	3,623	3,245	3,153	5,018	5,562	4,220	1,920	893	790	918
8 Kingsley	91	48,022	2,927	2,735	3,082	3,579	3,488	3,834	3,654	3,236	3,077	4,976	5,249	4,091	1,759	808	719	808
9 Grand Traverse Commons	102	53,431	3,063	2,927	3,330	3,899	3,707	4,221	3,965	3,574	3,484	5,604	6,048	4,598	2,164	981	854	1,012
10 Munson Healthcare	102	53,431	3,063	2,927	3,330	3,899	3,707	4,221	3,965	3,574	3,484	5,604	6,048	4,598	2,164	981	854	1,012

Analysis Procedure:

A 40-minute drive time area created around each activity center using ArcGIS Network Analyst
Demographic data downloaded from www.census.gov
Data set: Census 2000 Summary File (SF 3) - Sample Data
Selected for block groups intersecting drive time area
Summed total in each demographic category across all selected block groups
See associated maps of selected block groups for each activity center

7.2.1 Activity Center 1 – Cherry Capital Airport

Accessibility and mobility impacts

The Cherry Capital Airport is a regional transportation hub located on the southeast side of Traverse City. It is the only airport in the six-county region offering commercial air service. As an activity center, it is a destination for air travelers throughout the region and also an arrival point for visitors to the region. It is the regions' largest airport and connects the region to other areas including Chicago, Detroit, Minneapolis and Denver. As a result, it will draw travelers from outside the 40-minute drive time.

Visitors to the commercial terminal building arrive through the main entrance located on S. Airport Road east of Garfield Road. Travelers from around the region can drive to the airport using state highways including M-72 from the east and west; M-31 and M-37 from the south; and M-22 from the north. The airport offers long-term parking adjacent from the terminal building for travelers. In addition to private automobiles, the airport is served by the BATA fixed route service. Private taxi service and shuttles from area hotels are also available. The TART Urban Trail System runs along Parson's Road north of the airport and along 3-Mile Road east of the airport. However, there is a gap in pedestrian and bicycle connections to the airport along S. Airport Road.

Visitors to the general aviation and private businesses located at the airport arrive from the north side of the Airport on Parson's Road. General aviation is located off of Airport Access Road and commercial businesses are located on Aero Park Drive. Parking lots are provided for individual facilities. The TART Urban Trail provides access as far as Parsons Road but non-motorized facilities are not provided on these airport drives.

Labor markets and accessible local delivery markets

In addition to providing transportation services, the Cherry Capital Airport is an employer and a customer for local businesses. The 40-minute travel map covers most of Grand Traverse County except the southeast corner in the Fife Lake area. Additionally, major travel corridors reach the Village of Kalkaska, Elk Rapids, most of the Peninsula, Suttons Bay, the communities on the west end of Crystal Lake in Benzie County, and Buckley in northern Wexford County. Outside of the major corridors, the 40-minute travel map distance does not extend as far. This geographic area describes the capture area for employees and local delivery markets. It does not include Cadillac, the coastal half of the counties on Lake Michigan, and almost all of Antrim County.

7.2.2 Activity Center 2 – Northwestern Michigan College

Accessibility and mobility impacts

Northwestern Michigan College (NMC) is located in northeast Traverse City. It is a college campus that also offers other community resources including the Dennon Museum Center. There are five different campus locations but the activity center analysis is based on the Main Campus location at Front Street and College Drive. NMC offers learning opportunities including (but not limited to) dual high school-college coursework, undergraduate studies, graduate programs, professional development courses and lifelong learning courses. NMC also offers a museum, library, meeting rooms, a restaurant and other resources that are available to the public. As a result, there are people of all ages and mobility levels

travelling to the campus. Perhaps more than any other Activity Center, the labor market and local delivery markets will use a variety of transportation modes.

A variety of travel modes are available to reach the campus. It is possible to travel to the NMC campus in a personal vehicle. Parking areas are located around the campus near major building clusters. Weekday parking is limited to those with permits with some metered parking available. The NMC website promotes the Northwest Michigan Ride Share Connection as an alternative to driving alone. The NMC campus is also served by transit. BATA offers four main campus stops on the East Bay fixed route service and is also served by the Traverse Express stop at the Dennon Museum. The TART Cross Town Bike Route goes by the campus and local sidewalks provide a pedestrian connection from downtown.

Labor markets and accessible local delivery markets

The NMC Campus is located in northeast Traverse City with an entrance point on US-31. As a result, the 40-minute drive time maps reach farther east and northeast geographically than other downtown locations. The area reaches around Grand Traverse Bay to Suttons Bay, west along M-72 into half of Leelanau County, southwest to Honor, south just into Wexford County, east to Kalkaska and beyond and along the west side of Torch Lake in Antrim County. The campus may attract students beyond the local delivery market boundary who don't need to travel daily. Instructional staff and other employees are more likely to locate or be drawn from within the geographic limits. Commercial service providers are also most likely to be found within this boundary.

7.2.3 Activity Center 3 – Downtown Traverse City

Accessibility and mobility impacts

Downtown Traverse City is one of two city centers in the Grand Vision study area. It is located on the northern edge of Grand Traverse County along the Grand Traverse Bay. All of the regional state highways converge in Traverse City. It draws people from around the region to employment, services, entertainment venues and recreation resources. This has both accessibility and mobility impacts.

In downtown areas in general, people traveling in personal vehicles sometimes find congested roads and limited parking. This is expected and tolerated to a higher degree in an urban area. It also encourages and supports a range of transportation alternatives. Dense urban areas offer opportunities to live near employment and shopping destinations so short trips can be made on foot or bicycle. They also support a “park once and walk” approach to personal vehicle travel. Dense urban development patterns support transit by locating more homes, jobs and other destinations within walking distance of fixed route bus stop locations.

In downtown Traverse City, there are several transportation systems in place. The grid street pattern is largely intact except for the Boardman River that runs north and south through the downtown. Several state highways provide regional access to the downtown area. Parking ramps, surface parking lots and on street parking are all available. BATA has its Transit Center at 115 Hall Street in downtown Traverse City. It is the central transfer station for the Village Connector routes, the Traverse Express and four of the five fixed route lines in Traverse City called the Cherriot. These routes connect downtown Traverse City with other points in the city. The TART Trails network downtown includes the TART Trail, the

Boardman Lake Trail and the Cross Town Bike Route. The City of Traverse City provides sidewalks in most locations and dedicated bike lanes in some locations.

Labor markets and accessible local delivery markets

Downtown Traverse City is the employment, service, shopping, cultural and entertainment hub of the county and for much of the six-county region. Organizations located in downtown Traverse City will draw from around the region for employees and operating supplies. The 40-minute travel map is similar to that of NMC as the downtown area is also located on the north end of the county. The travel corridors stretch along major county highways in every direction with a modest buffer area around them. The east-west travel distance is longer in miles than the north-south reach. The travel area reaches very little of Wexford and Antrim Counties and the closest fractions of Leelanau, Benzie and Kalkaska Counties along the major travel routes. Downtown draws a range of people with diverse mobility needs and challenges.

7.2.4 Activity Center 4 – Grand Traverse Mall

Accessibility and mobility impacts

The Grand Traverse Mall is located on the southwest side of Traverse City on S. Airport Road at Division Street (M-37). It is primarily an auto-oriented development that is accessible by personal vehicle from all directions. It is located at the intersection of two major road corridors (S. Airport Road wraps around on the east and south sides), and has an extensive surface parking lot. It is also served by BATA's fixed-route Cherriot system with stops at two internal locations and by the Traverse Express loop. The TART Trail's Mall Trail runs along Division Street from 11th to the Mall providing a connection for bicycles and pedestrians along that stretch. There is no sidewalk in place on South Airport Road.

Labor markets and accessible local delivery markets

The Grand Traverse Mall is a regional shopping destination in the six-county study area. Visitors may travel from beyond the 40-minute travel area to shop at the mall. Suppliers for the mall's national retailers will come from outside the 40-minute travel area from places like Chicago, Detroit and Indianapolis with semi-truck deliveries. Employees and delivery of local supplies will come primarily from the 40-minute driving area. That area again reaches out in all directions along major travel corridors. The more distance portions of Leelanau, Benzie and Kalkaska Counties as well as most of Antrim and Wexford Counties are outside of the area.

7.2.5 Activity Center 5 – Chums Corners

Accessibility and mobility impacts

Chums Corners is an activity center located south of Traverse City at the intersection of M-37 and US-31. This is a classic combination of strip commercial development along the road and the big box at the corner. Other than the major state highways, there has been very little development of local roads near the intersection. It is a regional destination and almost exclusively auto-oriented. The opportunity exists to develop a local grid street pattern in this area to provide for development sites and alternative travel options more closely associated with a village development pattern. TART Trails shows a proposed extension of the Boardman River Trail around this intersection to the east and south with a connection to Interlochen, Thompsonville and the Betsie Valley Trail. There is not currently a BATA connection to this area but it could be served in the future by a regional connector.

Labor markets and accessible local delivery markets

With its location south of Traverse City, the 40-minute driving range from Chums Corners changes slightly from other Activity Centers. The area reaches further into Wexford County as far as Mesick and further into Benzie County including the areas around Beulah and Benzonia compared to the Traverse City Activity Centers. Conversely, to the north and west, the area barely reaches the Villages of Kalkaska and Elk Rapids. Shoppers will travel from outside this area and suppliers for the national chain stores will come from outside the region. Employees for businesses in the area will come primarily from within the 40-minute travel time as will local services and suppliers.

7.2.6 Activity Center 6 – Acme Town Center

Accessibility and mobility impacts

The Acme Town Center is located northeast of Traverse City at the intersection of US-31 and M-72. The area lies on the shores of East Grand Traverse Bay. The development pattern is auto-oriented strip commercial development to the north and south along US-31. At the intersection area, there is the beginning of a grid street pattern in a few locations. To the northeast is the Grand Traverse Resort—a tourism and conference destination drawing visitors from around the region, the state and beyond. The TART Trail currently extends along the railroad parallel to US-31 as far as Bunker Hill Road and an expansion is planned to reach the Acme Town Center. There are no sidewalks along either of the state trunk lines. BATA does not currently provide fixed route service to this area.

Labor markets and accessible local delivery markets

The 40-minute drive area for the Acme Town Center shifts northeast overall. The travel area reaches Mancelona and Ellsworth in Antrim County and buffers US-131 on both sides through Kalkaska County. It reaches Kingsley but does not reach the southern end of Grand Traverse County. It reaches Lake Ann and along an area buffering US-31 to Thompsonville Highway in Benzie County but not as far as Beulah and Benzonia. This area roughly defines the geographic boundaries for employees and local services.

7.2.7 Activity Center 7 – Interlochen

Accessibility and mobility impacts

Interlochen is an unincorporated village center in Green Lake Township. It is located southwest of Traverse City at the intersection of US-31 and M-137. The village area has commercial development in plaza centers at the intersection. South on M-137 there is some additional commercial development and grid street neighborhood developments off of the main corridor. Interlochen Fine Arts Camp and Interlochen State Park are both located on the south side of the village as well as community resources including a library and fire station. M-137 has paved shoulders that provide space for pedestrians and bicycles beside vehicle traffic. There are no pedestrian facilities on US-31. The TART Trail system is planning an extension of the Boardman Trail that will connect to Interlochen, Thompsonville and the Betsie Valley Trail in Benzie County. Transit service is available on a limited basis through BATAs County Ride service. This service offers weekday curb-to-curb service with advance reservations in rural Leelanau and Grand Traverse counties. The Fine Arts Camp offers transportation to campers from the airport and bus station.

Labor markets and accessible local delivery markets

The Fine Arts Camp is a world renowned educational and performance institution. It draws students and visitors from around the globe. The State Park is a recreation destination for travelers from around the state and the region. Chain grocery stores, fast food restaurants and gas station at the main intersection may receive deliveries from freight routes stretching outside the region. For those journeying to work or marketing local goods and services, however, the 40-minute drive time from Interlochen shifts southwest compared to central Traverse City. It covers all of the central Traverse City area but the route north does not reach Suttons Bay, travels only half the length of the Peninsula and just reaches Elk Rapids. To the east, it does not reach the Village of Kalkaska.

7.2.8 Activity Center 8 – Kingsley

Accessibility and mobility impacts

Kingsley is an incorporated Village south of Traverse City at the intersection of Garfield Road (County Road 611) and M-113. Kingsley has a main street commercial area that goes south, east and west from the main intersection. It also has several neighborhood areas and a population of approximately 1,500. It has many of the features associated with a village center development pattern. The downtown area has sidewalks and decorative streetscape elements. There is a grid street network around the intersection. The proposed expansion of TART's Boardman Trail toward Cadillac will pass through Kingsley. BATAs Fife Lake Village Connector route includes three Kingsley stops and provides a scheduled transit connection to Traverse City.

Labor markets and accessible local delivery markets

Kingsley is located approximately 30 minutes south and just east of Traverse City. The 40-minute driving area from Kingsley reaches all of the Traverse City area and goes only slightly north around the Grand Traverse Bay to Greilickville and the lower one-third of the Peninsula. It does not reach Antrim County and reaches little of Benzie and Leelanau Counties. It reaches Manton, Mesick and Buckley in Wexford County and the western half of Kalkaska County. Kingsley residents will likely travel to work and seek services within this 40-minute drive area. In the same fashion, businesses in Kingsley will attract customers and employees from within this area.

7.2.9 Activity Center 9 – Grand Traverse Commons

Accessibility and mobility impacts

The Grand Traverse Commons property is located on the west end of 11th Street beginning on the west side of Division Street. Other borders are Silver Lake Road, Long Lake Road and the Munson Medical Center Campus Drive. Originally developed in the late 1800s as the Traverse City State Hospital, the property includes historic buildings and 480 acres of preserved parkland. The property is located in both Garfield Township and the City of Traverse City and a joint planning commission oversees land use decisions for the Commons. A Master Plan has been developed (currently in draft form) which includes a circulation plan including vehicular, bicycle and pedestrian circulation and connection to the surrounding street network.

The Commons attracts visitors from around the region travelling in personal automobiles. There are surface parking areas on the property and some on-street parking is also available. The property is

adjacent to the Munson Healthcare Center (Activity Center 10) and within walking distance of downtown Traverse City. BATA serves the Grand Traverse Commons with its fixed route Cherriot service. The Commons is a connecting point for TART Trail plans as well. The Mall Trail connects to existing unpaved trails on the Commons property and there are future plans for an expansion of the Buffalo Ridge Trail southwest from there. An existing on-street bike route connects from the north end of the Common's internal trail to the TART Trail on Grandview Parkway.

Labor markets and accessible local delivery markets

The Minervini Group, a private development company, is currently undertaking a revival of the Grand Traverse Commons through adaptive reuse of existing buildings. Current sales brochures report that sixty-seven locally-owned businesses, employing over 350 people and sixty-three residential units are currently occupied. Also, Building 50 has an expansive front lawn that is used for large outdoor events including both community festivals and private events. The trail system is open to the public and the Community Gardens are located on the property. There are more spaces available for all land use types.

The 40-minute drive area reaches out along major transportation corridors in a pattern that is very similar to other Activity Centers in downtown Traverse City. It reaches north past Suttons Bay, the length of the Peninsula, and half the length of Torch Lake. The area extends east to surround the Village of Kalkaska and south just past the Grand Traverse County line to include Buckley in Wexford County. In Benzie County, the area reaches the east end of Crystal Lake to Beulah and Benzonia.

7.2.10 Activity Center 10 – Munson Medical Center, Munson Healthcare

Accessibility and mobility impacts

Munson Medical Center is part of the larger Munson Healthcare System made of seven affiliated healthcare facilities in the region including Cadillac and Kalkaska. Because Munson Medical Center offers an extensive collection of services, it serves patients from around the region. The facility is located in northwest Traverse City, just a few blocks north of the Grand Traverse Commons. Its address is on 6th Street on the north side of the facility. Medical Campus Drive is on the south side and connects to Long Lake Road. The property also includes the Pavilions, a senior housing and care facility with 300 residents, 100 daily program participants and 400 employees. Hospital patients, their visitors and residents at the Pavilions may face mobility challenges at a higher frequency than the general population.

There are several surface parking lots on the property for people arriving in personal vehicles and a shuttle service is available from the parking area. Munson is served by the BATA Cherriot fixed route service and regional bus services bring patients from neighboring counties including Manistee and Benzie Counties. Munson is within walking distance of downtown Traverse City and the City's residential neighborhoods. TARTs Cross Town Bike Route reaches the site.

Labor markets and accessible local delivery markets

The 40-minute drive time map is identical to that of the Grand Traverse Commons. The interpretation, however, is different because the two areas operate differently. The Munson Medical Center is a major employer and a major medical facility. The Munson Medical Center will receive supplies from the airport and from truck cargo delivery. In the downtown area, freight delivery service may sometimes be

challenging in the congested downtown area. Patients arrive from outside the 40-minute drive time map as dictated by medical needs. From a service area standpoint, some may need transportation assistance if they or their caregiver are unable to drive. Another transportation issue is for the labor market. Munson is a major regional employer and access to the labor market is directly tied to recruiting and retaining qualified workers. Safe pedestrian connections to nearby residential areas and regular transit service connect homes to jobs. This expands the available labor force to people who don't drive.

8.0 Conclusion

As a result of extensive public input, four possible future regional growth scenarios were developed for the Grand Vision. Each expressed a development theme that was shared by many participants in regional visioning sessions. One scenario showed business as usual; a second was built around a theme of planned rural development; a third was a series of compact villages and nodes around the region; and a fourth concentrated almost all new growth in the region's largest cities. Although the region has chosen a preferred future development pattern, the four possible future growth patterns are applied here to the Corridors of Significance as an evaluation tool. The general land use and transportation growth concepts in each scenario are applied to the specific corridors. Environmental data was also collected and presented for the area adjacent to the corridors.

This report examines the impact of the regional growth pattern at the corridor level. In each case, the different future growth scenarios result in different land uses adjacent to the corridor. The specific description of the differences creates a connection between the conceptual regional growth scenario and its application to the transportation planning process. Another connection is made between the Travel Demand Model (TDM) and the corridors when the results of each scenario are compared along each corridor. Here the transportation results are expressed through congested links in the road network. In some cases, the different regional growth patterns produce different congestion levels when compared on the same corridor.

In addition to the scenario comparisons, this report considers environmental features along the corridors. The National Environmental Policy Act (NEPA) prescribes an environmental review process required for all proposed transportation projects that have some associated federal funding. The NEPA review process addresses a series of social, economic and environmental (SEE) data. At this step in the process, the transportation focus of the Grand Vision has been narrowed to the eleven Corridors of Significance. Within that defined geographic corridor boundary, the SEE data was collected for the area within a 400' buffer around each corridor. This SEE data will be helpful in the future as specific transportation projects are considered. Environmental data that was not available at the corridor level is also considered from a policy perspective to guide future transportation decisions.

Additional information is provided about regulating agencies, the permitting process and standard mitigation practices in general. It is likely that this task was initially included in the project scope in the event that one or more of the corridors was a new road corridor. In that case, the environmental permitting and review data would be especially significant as some corridor locations might be eliminated based on environmental limitations. As it stands, the information helps to inform decision makers about the complexity of the various environmental review processes.

At this point, the connection between the regional growth pattern and the success of the region's transportation decisions has been firmly established. In some cases, congestion on a Corridor of Significance is not anticipated because of the dense, nodal development pattern of the preferred regional vision. The Grand Vision connects land use and transportation decisions and moves toward the future with a commitment to a continued collaboration. With the land use, transportation and environmental

SEE data provided at the corridor level, the stage is set to move forward and consider specific transportation improvement projects. Those decisions can now be made by people who are informed about land use, environmental and social impacts of transportation decisions.