Chapter 10: Transportation

Introduction

The City of Medina's transportation system generally operates well today. The City's multimodal transportation system includes facilities for personal vehicles, freight, walking, and bicycling. Facilities are operated by a number of agencies, including the City of Medina, Hennepin County, Three Rivers Park District, MnDOT, Burlington Northern Santa Fe (BNSF) Railroad and Canadian Pacific (CP) Railroad.

This transportation chapter has been prepared in compliance with state statues and applicable Metropolitan Council guidelines. As part of this plan, the City has reviewed existing and future conditions for each mode and identified safety, operations, and network improvements that will be important to address before 2040. The City has also developed goals, objectives, and strategies to preserve and improve the transportation system.

This transportation plan includes the following information:

1. Summary of Regional Strategies
2. Existing Roadway System
3. Future Roadway System
4. Existing and Planned Non-Motorized Transportation Network
5. Freight
6. Transit
7. Aviation
8. Goals, Objectives and Multimodal Strategies
9. Proposed Short and Long Range Roadway Projects
10. Public Comments
11. Conclusion and Next Steps

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Transportation Glossary

CIP: Capital Improvement Plan – five year plan for capital investments in the transportation system and in other capital assets owned by the City (equipment, buildings, etc.).

CR: County Road – county-owned roadway that does not receive State funding.

Critical Crash Rate: Statistical indicator of a safety problem at a location. If crash rates at a location are above the critical crash rate, it indicates that the location has a crash rate that is statistically significant compared to similar roadways.

CSAH: County State Aid Highway – county-owned roadway that receives State Aid funding.

MnDOT: Minnesota Department of Transportation.

RBTN: Regional Bicycle Transportation Network – existing and planned regional bicycle network established by the Metropolitan Council.

TH: Trunk Highway – State highway owned and operated by MnDOT.

TPP: Transportation Policy Plan – Regional transportation plan for the Twin Cities metropolitan region, developed by the Metropolitan Council.

1. Summary of Regional Strategies

This plan has been prepared to be consistent with the regional transportation strategies outlined in the Metropolitan Council 2040 Transportation Policy Plan (TPP). The TPP is a regional plan that evaluates the existing transportation system, identifies transportation challenges to the region, and sets regional goals, objectives, and priorities to meet the transportation needs of current residents while accommodating the region's anticipated growth. The TPP also guides local agencies in coordinating land use and transportation and established regional performance measures and targets.

The TPP is guided by the following goals:

- **Transportation system stewardship:** Sustainable investments in the transportation system are protected by strategically preserving, maintaining, and operating system assets.
- **Safety and Security:** The regional transportation system is safe and secure for all users.
- **Access to Destinations:** People and businesses prosper by using a reliable, affordable, and efficient multimodal transportation system that connects them to destinations throughout the region and beyond.
- **Competitive Economy:** The regional transportation system supports the economic competitiveness, vitality, and prosperity of the region and State.
- **Healthy Environment:** The regional transportation system advances equity and contributes to communities' livability and sustainability while protecting the natural, cultural, and developed environments.
- **Leveraging Transportation Investment to Guide Land Use:** The region leverages transportation investments to guide land use and development patterns that advance the regional vision of stewardship, prosperity, livability, equity, and sustainability.

Funding is a key constraint that is acknowledged in the TPP. Current transportation revenue will not meet the region's transportation needs through 2040. As a result, the TPP includes two long-term investment scenarios: a fiscally-constrained scenario under current revenue, and an increased revenue scenario that identifies priorities should additional transportation funding become available.

Under the current fiscally constrained revenue scenario, the TPP is focused on operations and maintenance of the existing transportation system. Investments in highway mobility and access are limited to those that address multiple TPP goals and objectives.

The increased revenue scenario would allow additional investments in operations and maintenance, as well as regional mobility, access, safety, and bicycle/pedestrian improvements. However, congestion cannot be greatly reduced under even the increased revenue scenario. Under both scenarios, proposed investments are focused on areas of the metro with the greatest existing and future challenges and anticipated growth.

Medina is classified by the Metropolitan Council under the Emerging Suburban Edge and Diversified Rural community designations. Limited growth is expected in these types of communities. As a result, the TPP does not include any planned regional investments in Medina.

2. Existing Roadway System

The sections below provide information about the existing roadway system in Medina, including existing number of lanes, existing roadway jurisdiction, existing functional classification, existing traffic, existing safety, and access management. This chapter also includes summary recommendations from recent plans and corridor studies.

2.1. Functional Classification

The functional classification system groups roadways into classes based on roadway function and purpose. Functional classification is based on both transportation and land use characteristics, including roadway speeds, access to adjacent land, connection to important land uses, and the length of trips taken on the roadway.

The **functional classification system** organizes a roadway and street network that distributes traffic from local neighborhood streets to collector roadways, then to minor arterials and ultimately the principal arterial system. Roads are placed into categories based on the degree to which they provide access to adjacent land and mobility for through traffic. Functional classification gives an indication of the relative hierarchy of roadways in the transportation network.

Image: MnDOT

Four classes of roadways are included in the Seven-County Metropolitan Area functional classification system: principal arterials, minor arterials, collector streets, and local streets. **Figure 10-1** shows the existing functional classification of each road in the City of Medina and **Figure 10-2** shows existing roadway jurisdiction. The following sections describe each functional class in greater detail and indicate which roadways fall into each classification.

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2.1.1. Principal Arterials

Principal arterials are roadways that provide the greatest level of mobility and access control. Within the metropolitan area, the great majority of principal arterials are under MnDOT jurisdiction. Principal arterials are typically Interstate highways or other state or US freeways or expressways. These facilities are intended to serve trips greater than 8 miles and express transit trips. Spacing of principal arterials varies within developing areas of the metropolitan area. Typically these facilities are spaced between two and six miles apart. These facilities connect regional business and commercial concentrations, transportation terminals, and large institutions within the metropolitan areas. Principal arterials also connect to other cities, regions, and states outside of the metropolitan area.

Principal arterials are intended to maintain average speeds of 40 mph during peak traffic periods. To maintain mobility and speeds on principal arterials, land access and transportation system connections are limited. There is little to no direct land access from principal arterials. Access is limited to interstate freeways, other Principal Arterials, and A Minor Arterials. Access points are typically grade-separated or controlled with a signal and are spaced approximately one to two miles apart.

Within the City of Medina, there are two existing principal arterials. MnDOT Trunk Highway (TH) 55 generally follows the northern boundary of the City, connecting Medina with Plymouth, Corcoran, and Greenfield. US Highway 12 passes through the southwest corner of the City, but does not have any access points within the City. The 2040 Transportation Policy Plan does not propose any additional principal arterials within the City.

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2.1.2. Minor Arterials

Minor arterials maintain a focus on mobility, but provide more land access than principal arterials. Within the City of Medina, all minor arterials are under Hennepin County jurisdiction. Minor arterials are intended to serve trips of four to eight miles in length. Within developing areas of the metro, these facilities are spaced between one and two miles apart. Minor arterials connect cities and towns within the region and link to regional business and commercial concentrations. Access points along minor arterials are generally at-grade and typically controlled with signals or stop signs.

During peak traffic, minor arterials in developing areas are intended to maintain 30 mph average speeds. Land access is limited to concentrations of commercial and industrial land uses. The Metropolitan Council has established a system of "A" Minor and "B" Minor arterials. "A" Minor arterials are eligible for federal funding administered by the Metropolitan Council.

The Metropolitan Council has further split "A" Minor arterials into four types, described below:

- Relievers: Arterials located parallel to congested principal arterials. The purpose of "A" Minor Relievers is to provide additional capacity in congested corridors.
- Augmenters: Arterials that supplement the principal arterials system within urban centers and urban communities.
- Expanders: Arterials that supplement principal arterials in less-densely developed areas of the metro area.
- Connectors: Arterials that provide connections between rural towns and connect rural areas with the principal arterial system.

Given the purpose of "A" Minor Relievers and Augmenters, there are no existing or planned relievers or augmenters within the City. "A" Minor arterials in Medina include the following roadways:

"A" Minor Expanders

- County State Aid Highway (CSAH) 101

"A" Minor Connectors

- CSAH 19
- CSAH 11
- CSAH 24

"B" Minor arterials have a similar focus on mobility above land access. These roadways connect major traffic generators in the region. "B" Minor arterials are not eligible for federal funding. "B" Minor arterials within the City include the following:

- Willow Drive N (between CSAH 24 and Medina-Orono border)
- County Road (CR) 116

2.1.3. Major and Minor Collectors

Major and minor collector roadways provide linkages to larger developments and community amenities. They generally do not link communities to one another. Collector roadways generally favor access to the system over mobility, but try to balance the two competing needs. These roadways are generally lower speed than the principal or minor arterial routes. They are usually owned and operated by cities, although counties operate some of these facilities. Within the City of Medina, most collector roadways are owned and operated by Hennepin County. Collectors are intended to serve trips of one to four miles in length. Collectors link minor arterials, other collectors, and local streets.

Major collectors typically serve higher density residential areas and concentrations of commercial and industrial land uses. These facilities tend to serve longer trips than minor collectors. Major collectors within the City include the following:

- CSAH 115 (Hamel Road)
- CR 210 (Parkview Drive/Homestead Trail)

Minor collectors serve lower trips than major collectors and typically link lower density residential and commercial land uses. Existing Minor collectors within the City include:

- Willow Drive N (between Medina-Corcoran border and TH 55)
- CR 116 (Arrowhead Drive)

2.1.4. Local Roadways

The primary function of local roadways is land access. Local roadways are all roadways that are not arterials or collectors. Local roadways connect individual land parcels with other local roadways and collectors. Trips on local roadways are typically less than two miles and speeds are typically low. Local roadways are under the jurisdiction of the City of Medina.

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2.1.5. Planned Functional Classification

Several functional classification changes are recommended in response to changes in traffic patterns, development patterns, and increased population and employment in the City. Planned functional classification changes are listed below.

Change from **B-Minor Arterial** to **Minor Collector**:

- Willow Drive south of CSAH 24

Change from a **B-Minor Arterial** to **A-Minor Arterial**:

- CR 116

Change from a **local street** to **Minor Collector**:

- Hackamore Road/Arrowhead Drive
- Medina Road
- Hunter Drive
- Brockton Lane (south of TH 55)
- Chippewa Road
- Willow Drive (south of CSAH 24)

Additionally, one jurisdictional transfer is under consideration. Peony Lane in the City of Plymouth has been discussed as a potential new Hennepin CSAH 101 alignment to tie directly into CSAH 101 south of TH 55. The City of Medina should proactively communicate any concerns to the County regarding a potential turn-back of the existing CSAH 101 north of TH 55 to a Medina city street.

Figure 10-3 provides a map illustrating the existing and planned functional classification system for the City of Medina.

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2.2. Existing Roadway Capacity and Safety

Roadway capacity and roadway safety are two key indicators of how well the roadway system is meeting the City's transportation needs. The sections below provide information to better understand capacity and safety issues within Medina.

2.2.1. Existing Roadway Capacity

A roadway's capacity indicates how many vehicles may use a roadway before it experiences congestion. Capacity is largely dependent upon the number of lanes. **Table 1** below lists planning-level thresholds that indicate a roadway's capacity. Additional variation (more or less capacity) on an individual segment is influenced by a number of factors including: amount of access, type of access, peak hour percent of traffic, directional split of traffic, truck percent, opportunities to pass, and amount of turning traffic, the availability of dedicated turn lanes, parking availability, intersection spacing, signal timing and a variety of other factors.

Table 1: Planning-level Roadway Capacity

Roadway Type	Maximum Daily Traffic (two-way)
Two-lane, undivided – urban	8,000 – 10,000 vehicles
Two-lane, undivided – rural	14,000 – 15,000 vehicles
Three-lane – urban	14,000 – 17,000 vehicles
Four-lane undivided – urban	18,000 – 22,000 vehicles
Four-lane divided – urban	28,000 – 32,000 vehicles
Four-lane divided – rural	32,000 – 36,000 vehicles

2.2.2. Existing Capacity Problems on Arterial Roads

At the planning level, capacity problems are identified by comparing the existing number of lanes with current traffic volumes. **Table 2** and **Figure 10-4** illustrate the existing number of lanes on arterial roadways within the City. **Figure 10-5** illustrates existing traffic volumes on Principal Arterial, A-Minor Arterial and other significant roadways within the City.

As shown in the table, TH 55 is the only arterial roadway with four lanes. TH 55 is a rural undivided four-lane roadway within most of the City. As shown in **Table 1**, its capacity is approximately 32,000-36,000 vehicles per day. TH 55 currently experiences some peak hour congestion through Medina, but is currently under capacity.

All other arterial roadways in the City currently have two lanes. Most of these roadways are rural undivided roadways. As described above in **Table 1**, these roadways have a planning-level capacity of 14,000-15,000 vehicles. Two-lane roadways within the City are currently under capacity and are not experiencing major congestion issues.

Table 2: Existing number of lanes on arterial roads

Functional Classification	Roadway Name	Location	Number of Lanes
Principal Arterial	TH 55	CR 116/Arrowhead Drive to Medina-Plymouth border	4
	TH 55	Medina-Corcoran border to CR 116/Arrowhead Drive	2
	US 12	Medina-Orono border to Medina-Maple Plain border	2
"A" Minor Expander	CSAH 101	Medina-Corcoran border to TH 55	2
"A" Minor Connector	CSAH 11	Medina-Independence border to CSAH 19	2
	CSAH 19	Medina-Independence border to TH 55/Medina-Corcoran border	2
	CSAH 24	CSAH 19 to Medina-Plymouth border	2
"B" Minor Arterial	CR 116	Medina-Corcoran border to TH 55	2
	Willow Drive N	CSAH 24 to Medina-Orono border	2

2.2.3. Existing Safety Problems on Arterial Roadways

Roadway safety problems were identified through an analysis of MnDOT crash data for the three-year period from 2012 to 2014. Crash rates were calculated and compared to MnDOT averages for similar roadways. MnDOT has established critical crash rates for different types of roadways. If crash rates at a location are above the critical crash rate, it indicates that the location has a crash rate that is statistically significant. In other words, it indicates that there may be a design issue, signal issue, or some other operational factor negatively impacting safety at a particular location. MnDOT has also established average crash severity rates for different types of roadways. If a location has a severity rate above the average rate, it indicates that crashes result in more severe injuries than at similar locations.

Several intersections in Medina have crash rates that exceed the critical crash rates and severity rate. These intersections include:

- TH 55 & CSAH 19
- CSAH 19 & CSAH 24
- TH 55 & CSAH 101
- TH 55 & Pinto Drive
- Pinto Drive & Clydesdale Trail
- TH 55 & Willow Drive North

Further study is recommended to identify specific safety issues and design, intersection control or other countermeasures that could be effective at reducing the rate and severity of crashes at these locations.

2.3. Access Management

The purpose of access management is to provide adequate access to adjacent land development while maintaining acceptable traffic flow on higher level roadways. Management consists of carefully controlling the spacing and design of public street intersections and private access points to the public roadway system. Arterials, being designed for higher speed, longer distance trips, generally have reduced or restricted access, while local streets can accommodate much greater access. Collector roadways fall in between arterials and local roadways regarding the amount of access that is permitted.

The agency with jurisdiction over a roadway sets access management guidelines. Access to TH 55 and US 12 must meet MnDOT access management guidelines and is permitted subject to conditions. See **Tables 3.1** and **3.2** for MnDOT Access Management Guidelines. Given the vision of TH 55 as a future freeway, additional direct access to TH 55 is discouraged, and existing direct access should be redirected to a frontage/backage road system as opportunities present themselves.

Hennepin County has established access management guidelines for urban (areas within the 20-year MUSA boundary) and rural areas (areas outside the MUSA boundary). Hennepin County access management guidelines are displayed in **Table 4**. Hennepin County requires permits for new driveway access to county roads and when land uses change at a site adjacent to a county road. Hennepin County typically requires that new access points meet its guidelines; however, the county can make exceptions to the guidelines with sufficient justification.

The City of Medina also has access management guidelines for city streets, as displayed in **Table 5**. The City uses these guidelines when permitting new access to city streets.

It should be noted that there are existing access points that do not meet City, County, and MnDOT access spacing guidelines. In many cases these access points were established prior to agency access spacing guidelines. In other cases the agency has granted an exception to the existing guidelines. As roadways are reconstructed, each of these agencies generally works to modify and/or relocate access points that do not meet current access spacing guidelines.

MnDOT Access Management Manual

Table 3.1 – Summary of Recommended Street Spacing for IRCs

Category	Area or Facility Type	Typical Functional Class	Public Street Spacing		Signal Spacing
			Primary Full-Movement Intersection	Secondary Intersection	
1	**High Priority Interregional Corridors & Interstate System (IRCs)**				
1F	Interstate Freeway	Principal Arterials	Interchange Access Only		⊘
1AF	Non-Interstate Freeway		Interchange Access Only (see Section 3.2.7 for interim spacing)		See Section 3.2.5 for Signalization on Interregional Corridors
1A	Rural		1 mile	1/2 mile	
1B	Urban/Urbanizing		1/2 mile	1/4 mile	
1C	Urban Core		300-660 feet dependent upon block length		
2	**Medium Priority Interregional Corridors**				
2AF	Non-Interstate Freeway	Principal Arterials	Interchange Access Only (See Section 3.2.7 for interim spacing)		See Section 3.2.5 for Signalization on Interregional Corridors
2A	Rural		1 mile	1/2 mile	
2B	Urban/Urbanizing		1/2 mile	1/4 mile	
2C	Urban Core		300-660 feet, dependent upon block length		¼ mile
3	**Regional Corridors**				
3AF	Non-Interstate Freeway	Principal and Minor Arterials	Interchange Access Only (see Section 3.2.7 for interim spacing)		Interim
3A	Rural		1 mile	1/2 mile	See Section 3.2.5
3B	Urban/Urbanizing		1/2 mile	1/4 mile	1/2 mile
3C	Urban Core		300-660 feet, dependent upon block length		1/4 mile

Table 3.2 – Summary of Recommended Street Spacing for Non-IRCs

Category	Area or Facility Type	Typical Functional Class	Public Street Spacing		Signal Spacing
			Primary Full-Movement Intersection	Secondary Intersection	
4	**Principal Arterials in the Twin Cities Metropolitan Area and Primary Regional Trade Centers (Non-IRCs)**				
4AF	Non-Interstate Freeway	Principal Arterials	Interchange Access Only (see Section 3.2.7 for interim spacing)		Interim
4A	Rural		1 mile	1/2 mile	See Section 3.2.5
4B	Urban/Urbanizing		1/2 mile	1/4 mile	1/2 mile
4C	Urban Core		300-660 feet dependent upon block length		1/4 mile
5	**Minor Arterials**				
5A	Rural	Minor Arterials	1/2 mile	1/4 mile	See Section 3.2.5
5B	Urban/Urbanizing		1/4 mile	1/8 mile	1/4 mile
5C	Urban Core		300-660 feet, dependent upon block length		1/4 mile
6	**Collectors**				
6A	Rural	Collectors	1/2 mile	1/4 mile	See Section 3.2.5
6B	Urban/Urbanizing		1/8 mile	Not Applicable	1/4 mile
6C	Urban Core		300-660 feet, dependent upon block length		1/8 mile
7	**Specific Area Access Management Plans**				
7	All	All	By adopted plan		

Table 4: Hennepin County Access Spacing Guidelines

Access Type	Movements Allowed	Rural Arterial			Urban and Urbanizing Arterial		
		Greater than 7,500 ADT	Less than 7,500 ADT	Collector	Undivided	Divided	Collector
Single family residential driveway or farm field entrance	Full movements allowed	1/4 mile (1,320 feet)	1/8 mile (660 feet)	1/8 mile (660 feet)	Not allowed	Not allowed	1/8 mile (660 feet)
	Limited access	Not allowed	Not allowed	Not allowed	Not allowed	Not allowed	1/16 mile (330 feet)
Low Volume Driveway (less than or equal to 500 trips per day)	Full movements allowed	1/4 mile (1,320 feet)	1/8 mile (660 feet)	1/8 mile (660 feet)	Not allowed	Not allowed	1/8 mile (660 feet)
	Limited access	Not allowed	Not allowed	Not allowed	Not allowed	1/8 mile (660 feet)	1/16 mile (330 feet)
High Volume Driveway (greater than 500 trips per day)	Full movements allowed	1/4 mile (1,320 feet)	1/4 mile (1,320 feet)	1/8 mile (660 feet)	1/4 mile (1,320 feet)	1/4 mile (1,320 feet)	1/8 mile (660 feet)
	Limited access	Not allowed	Not allowed	Not allowed	Not allowed	1/8 mile (660 feet)	Not allowed
Low Volume Public Street (less than or equal to 2,500 ADT)	Full movements allowed	1/4 mile (1,320 feet)	1/4 mile (1,320 feet)	1/8 mile (660 feet)	1/4 mile (1,320 feet)	1/4 mile (1,320 feet)	1/8 mile (660 feet)
	Limited access	Not allowed	Not allowed	Not allowed	Not allowed	1/8 mile (660 feet)	Not allowed
High Volume Public Street (greater than 2,500 ADT)	Full movements allowed	1/2 mile (2,640 feet)	1/4 mile (1,320 feet)	1/4 mile (1,320 feet)	1/4 mile (1,320 feet)	1/4 mile (1,320 feet)	1/4 mile (1,320 feet)
	Limited access	Not allowed	Not allowed	Not allowed	Not allowed	1/8 mile (660 feet)	Not allowed

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Table 5: City of Medina Access Spacing Guidelines

Functional Class	Median Treatment	Existing and Proposed Land Use	Typical Posted Speed (mph)	Full Median Opening Spacing (miles)	Minimum Signal Spacing (miles)
Minor Arterial	Divided	Rural	55	1/2	1/2
		Urban	40+	1/2	1/2
		Urban Core	30-35	1/4	1/4
	Undivided	Rural	55	NA	1/2
		Urban	40+	NA	1/2
		Urban Core	30-35	NA	1/4
Collector	Divided	Urban	40+	1/4	1/4
		Urban Core	30-35	1/8	1/8
	Undivided	Rural	55	NA	1/2
		Urban	40+	NA	1/4
		Urban Core	30-35	NA	1/8
County Road	Undivided	Rural	40+	NA	1/2
		Urban	30-35	NA	1/4

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2.4. Recommendations from Recent Plans and Studies

Three roadways within the City have been the subject of recent plans and studies. In 2013, the City led a traffic analysis study of CR 116 from north of Hackamore Road to south of Meander Road and Hackamore Road from west of CR 116 to east of CSAH 101. Additionally, the City was a key partner with MnDOT in developing a preliminary corridor design concept for TH 55. The recommendations of these plans and studies are summarized in the sections below.

2.4.1. CR 116/Hackamore Road Traffic Analysis Study

In 2013, the City led a traffic analysis study of CR 116 and Hackamore Road, in response to several recent and planned residential developments in the area. The study recommendations included the following modifications to CR 116 and Hackamore Road:

- Addition of a southbound and northbound through lane, eastbound and westbound left and right turn lanes at the CSAH 101/Hackamore Road intersection
- Addition of protected-permissive or flashing yellow arrow left turn phasing for eastbound and westbound left turns at CSAH 101/Hackamore Road
- Reconstruction of CR 116 as a four-lane roadway with right and left turns lanes at all intersections south of Meander Road to north of Hackamore Road
- Addition of left- and right-turn lanes eastbound and westbound at Hackamore Road/Hunter Road and Hackamore Road/Bergamot Drive intersections.

Additional right-of-way will be needed for the recommended roadway projects. A 120 foot proposed right-of-way on CR 116 and a 100 foot proposed right-of-way on Hackamore Road centered on the existing right-of-way will provide adequate space for the road with a few exceptions for the proposed trail near several intersections. It is also recommended that a 5-10 foot permanent easement be included to account for the trail meeting ADA requirements at the intersections along CR 116. The permanent easements are recommended to be dedicated with new development or redevelopment adjacent to CR 116 or purchased from property owners in areas that are not being newly developed or redeveloped.

2.4.2. TH 55 Corridor Expansion Preliminary Design Concept

In 2007, MnDOT completed a preliminary corridor design concept for TH 55 from I-494 in Plymouth to the Crow River in Rockford. An EA/EAW was completed in 2008. Funding has not yet been identified to advance right-of-way acquisition or construction. The City was a key partner in developing the concept and is supportive of TH 55 expansion to address existing and future congestion on the highway.

Within Medina, the concept is to convert TH 55 into a four-lane expressway west of CR 116. East of CR 116, TH 55 would be converted into a hybrid freeway/expressway, with grade separation at key intersections and an expressway design that minimizes right-of-way and fits well within existing development.

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3. Future Roadway System

This section addresses future roadway improvement needs and roadway design guidelines.

3.1. Roadway Capacity – Traffic Forecasting

To determine future roadway capacity needs, year 2040 traffic forecasts were prepared using the Metropolitan Council travel demand model. The model was refined for application specifically for Medina. The 2040 projections were compared against the assumed 2040 roadway network to see where roadway segment capacity deficiencies may result. The 2040 roadway network assumed for this analysis is the same as the current roadway network, as the City and County Capital Improvement Plans (CIPs) do not include any projects that add significant capacity to the roadway network.

While the travel demand model is a valuable tool for identifying future traffic based on the proposed land use impacts, it is not meant for use in detailed traffic operations studies. For a more accurate representation of the transportation impacts from specific developments, detailed traffic studies should be conducted to determine the operational impacts on adjacent roadways and intersections.

A central concept of travel demand forecasting is the use of Transportation Analysis Zones (TAZs). Each forecast study area, in this case the City of Medina, is divided into a series of TAZs. Each TAZ has land use data which indicates trip generation and trip attraction including population, household, and employment data. **Figure 10-6** displays Metropolitan Council TAZs within Medina.

The results of the Medina modeling process are summarized on **Figure 10-7**, which displays 2040 projected average daily traffic volumes compared to the Hennepin County 2030 forecast and 2013/2014 traffic volumes. In most cases, the Hennepin County 2030 forecast volumes are greater than the 2040 projected volumes. The 2030 forecasts were prepared in 2005-2007, when development pressure was high and the City and region were experiencing high growth in emerging suburban communities. Development slowed significantly due to the 2008 recession and mortgage crisis. Additionally, in the ten years since 2030 forecasts were prepared; the Metropolitan Council shifted the distribution of regional growth to urban and developed suburban communities. As a result, the 2040 population and employment forecasts are approximately 20 percent lower than the 2030 forecasts and therefore 2040 traffic forecasts are generally lower than 2030 forecasts.

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Table 6: Medina Forecasted Demographic Growth by TAZ

	2010 Met Council Travel Model Data			2040 Growth (2010 – 2040)			2030 Growth (2010 – 2030)			2020 Growth (2010 – 2020)		
TAZ	Population	Households	Employment	Population	Households	Employment	Population	Households	Employment	Population	Households	Employment
639	1,790	694	570	585	225	275	386	149	182	193	74	91
640	2,047	640	1,660	2,033	782	635	1,342	516	419	671	258	210
641	1,216	461	1,448	1,516	583	906	1,001	385	598	500	192	299
642	489	176	6	0	0	0	0	0	0	0	0	0
Totals	**5,542**	**1,971**	**3,684**	**4,134**	**1,590**	**1,816**	**2,729**	**1,049**	**1,199**	**1,364**	**525**	**600**

Table 6 above provides a summary of existing and forecasted demographic growth by TAZ for the City of Medina through the year 2040. Allocated demographic growth and associated land use was generally split evenly north and south of TH 55. High density residential was allocated in the northeast corner of U.S. Highway 12 and CSAH 19 and mixed residential was allocated the northwest corner of Medina Road and Brockton lane. Additional future mixed residential was allocated along future Tamarack Road and along Hamel Road. For more information about the demographic allocation and associated land use forecast, please refer to the Medina Land Use Plan in Chapter 5 of the Medina Comprehensive Plan.

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3.2. 2040 Future Roadway Capacity Improvement Needs

To identify the need for potential future capacity improvements, 2040 forecasts were compared to planning-level roadway capacities (shown in **Table 6** below). Nearly all roadways in the City have adequate capacity to handle forecast 2040 traffic volumes with little to minimal congestion. These roadways are expected to function well with two lanes through the 2040 planning horizon.

Table 7: Planning-Level Roadway Capacity

Roadway Type	Maximum Daily Traffic (two-way)
Two-lane, undivided – urban	8,000 – 10,000 vehicles
Two-lane, undivided – rural	14,000 – 15,000 vehicles
Three-lane – urban	14,000 – 17,000 vehicles
Four-lane undivided – urban	18,000 – 22,000 vehicles
Four-lane divided – urban	28,000 – 32,000 vehicles
Four-lane divided – rural	32,000 – 36,000 vehicles

Two roadways within the City are expected to reach or exceed capacity by 2040. Rural two-lane undivided roadways are assumed to have a maximum capacity of 14,000-15,000 vehicles per day. Traffic volumes on CR 116 are expected to reach 17,450 vehicles per day in 2040. Traffic volumes on TH 55 west of Arrowhead Drive (two-lane section) are forecast to reach 21,000 vehicles per day. These two-lane roadways will become congested if they are not expanded by 2040. These needs were confirmed in the CR 116/Hackamore Road Traffic Analysis Study and the TH 55 Corridor Expansion Planning described above in Section 3.4. Other roads to monitor congestion levels on include CSAH 101 and CSAH 19 with forecasted 2040 volumes of 13,350 and 13,700 respectively.

4. Existing and Planned Non-Motorized Transportation Network

This section addresses network needs for walking and bicycling within the City of Medina. This section also addresses the needs of people using wheelchairs and assistive mobility devices such as mobility scooters, as they are considered pedestrians.

Enhancing the non-motorized elements of Medina's transportation system is a key goal in terms of improving transportation sustainability in the City and in the region. This approach gives residents an alternative to driving, supports transportation options for people who do not have consistent access to a personal vehicle, and encourages healthy activities and lifestyles.

This section includes information on the existing non-motorized transportation network within Medina, connections to land use planning, the planned local non-motorized transportation network, and the planned regional non-motorized transportation network. This section also includes recommendations for intersection improvements and design best practices.

4.1. Existing Non-Motorized Transportation Network

The existing non-motorized transportation system consists of sidewalks, multi-use paved trails, turf trails, and paved shoulders.

Sidewalks are generally located within residential developments, including those off of Arrowhead Drive, Meander Road, and Hunter Lane. There is also a sidewalk along Hamel Road, between Hunter Road and Brockton Lane.

Local multi-use paved trails are located along CR 116, CSAH 101, Sioux Drive, Hunter Drive, Red Oak Drive, and portions of Meander Drive and Willow Drive. Regional multi-use trails are located along CSAH 19 and within Baker Park Reserve. These trails are collectively known as the Lake Independence Regional Trail and are owned and operated by Three Rivers Park District.

Existing turf trails are located off Bridgewater Road, east of the Bridgewater development.

Paved shoulders for bicycling and walking are located along CR 115/Hamel Road, Medina Road, and CSAH 24. There are also paved shoulders along TH 55; however, bicycling and walking along TH 55 is not recommended due to high speeds and traffic volumes.

4.2. Connections to Land Use Planning

The City of Medina has development patterns consistent with its designation as an Emerging Suburban Edge and Rural Diversified community. Existing residential development is low density and commercial land uses are separated from residential land uses. This means that people walking and bicycling must cover greater distances to reach commercial areas from their homes. The development patterns in the City are better suited to bicycling than walking, due to the distance between residential and commercial areas of the City. There are also commercial and institutional destinations in Plymouth and Orono that are within biking distances of most residences in Medina, including Wayzata High School, Orono High School, and commercial areas in the western portion of Plymouth.

There are currently limited facilities for walking and bicycling in the City, and these facilities serve recreational uses better than transportation uses. There is not currently a connected network in place to serve the needs of people bicycling and walking for transportation.

The City's land use planning and coordination with developers can help improve opportunities for walking and bicycling for transportation. The City can encourage mixed-use development that situates residents within a short walk of commercial destinations. The City can also work with developers to construct sidewalks and trails within developments. Additionally, the City can require pedestrian and bicycle connections in areas where the roadway network does not connect, such as cul-de-sac connector trails that provide shortcuts for people walking and bicycling.

4.3. Planned Local Non-Motorized Transportation Network

The City's planned local non-motorized transportation network includes paved multi-use trails, turf trails, and paved shoulders along most roadways. When the network is complete, it will link residential areas with commercial, institutional, and recreational development within the City. The network will improve options for people to walk and bicycle for transportation within the City, and facilitate regional connections (described in greater detail in the following section). The proposed network is shown in **Figure 10-7**.

4.4. Planned Regional Non-Motorized Transportation Network

Several existing and planned trails and shoulders will be key links in the expanding regional non-motorized transportation network. The Metropolitan Council established a Regional Bicycle Transportation Network (RBTN) in 2015. The RBTN establishes regional priorities for bicycle transportation so that regional destinations are accessible by bicycle.

The Metropolitan Council established RBTN alignments in areas where existing facilities created a clear connection between regional destinations. RBTN corridors were identified in areas where there are several options for connections between regional destinations. The RBTN is further divided into two tiers. Tier 1 alignments/corridors are expected to attract the most bicycle use and are the highest priority for regional investments. Tier 2 alignments/corridors are the second priority for regional investments.

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The Lake Independence Regional Trail and portions of CSAH 101 have already been identified as Tier 2 RBTN Alignments. As part of the comprehensive planning process, the Metropolitan Council requests that the City of Medina select specific alignments for the Tier 2 RBTN Corridors that have been identified within the City. The City identifies the following existing and planned facilities are Tier 2 RBTN Alignments:

- Existing shoulder on CSAH 24
- Existing shoulder on Medina Road, between Tamarack Drive and Hunter Drive
- Existing trail along Hunter Drive
- Planned trail along Tamarack Drive between Medina Road and Medina-Orono boundary
- Planned trail between Tamarack Drive and Medina Road
- Planned trail along Sioux Drive and Hamel Road
- Planned trail along TH 55, between CSAH 101 and Wayzata High School

These alignments will have priority over other connections if the City applies for Federal non-motorized transportation funding administered by the Metropolitan Council. Hennepin County and Three Rivers Park District will also be valuable partners as the City works to implement RBTN connections, as several of these alignments appear on county and park district plans.

The Metropolitan Council Parks Policy Plan also identifies two Regional Trail Search Corridors within the City. Regional Trail Search Corridors indicate the desire for a regional trail within a broad area, with the exact alignment to be determined through the trail master planning process. The North-South 1 Regional Trail Search Corridor is identified as a north-south connection in the eastern portion of the City. The Lake Sarah Extension Regional Trail Search Corridor is an east-west connection that roughly follows CSAH 115. It is expected that Three Rivers Park District will lead the alignment selection and master planning process for both of these trail search corridors. Regional trails are designed to provide more of a recreational experience; however, many regional trails also serve valuable transportation purposes for pedestrians and bicyclists.

4.5. Intersection Improvements for Bicycling and Walking

TH 55 is a barrier for people walking and bicycling within the City. TH 55 also limits pedestrian and bicycle connections to Corcoran. Currently, there are 7 at-grade pedestrian and bicycle crossings of TH 55:

- CSAH 19
- Pioneer Trail
- Willow Drive
- Arrowhead Drive
- CSAH 116/Pinto Drive
- Clydesdale Trail
- CSAH 101/Sioux Drive

These crossings are challenging for pedestrians and bicyclists due to lengthy crossing distances, long signal cycles that result in extended waits to cross TH 55, and the lack of sidewalk or trail on roadways that cross TH 55.

The City should work with MnDOT to explore opportunities to improve crossing opportunities for pedestrians and bicyclists to cross TH 55. Grade-separated crossings may be a possible consideration; however, these should be designed carefully so that they do not greatly increase the time and distance for pedestrians and bicyclists to cross TH 55. Other design solutions include constructing pedestrian refuge medians and reducing turning radii to shorten crossing distances.

4.6. Non-Motorized Transportation Design Considerations

Design dimensions for sidewalks are recommended to be five-feet or wider, with a minimum of a four-foot wide boulevard between the sidewalk and the curb. Increased separation improves pedestrian comfort and provides space for street signs and snow storage.

Multi-use trails are recommended to be a minimum of eight-feet wide. Regional trails are recommended to be a minimum of ten-feet wide due to higher use and the design requirements to comply with federal funding. Trails must have a two-foot wide clear zone on either side to reduce hazards for bicyclists and provide a recovery zone if a bicyclist leaves the edge of the trail. The clear zone can be paved or turf surface. No signs, furnishings, trees, or other obstructions can be in the clear zone.

Paved shoulders should be a minimum of four-feet wide if intended for bicycle and pedestrian use. Four-foot wide shoulders are adequate on streets with traffic volumes below 1,000 vehicles per day. Six- to eight-foot shoulders are recommended when traffic volumes exceed 1,000 vehicles per day. A wider shoulder improves pedestrian and bicyclist safety and comfort when vehicle traffic speeds and volumes are higher.

As non-motorized facilities are planned and designed, the City should consult additional planning and design resources, including:

- Hennepin County Bicycle Transportation Plan
- Hennepin County Pedestrian Plan
- MnDOT Bikeway Facility Design Manual
- Minnesota Manual on Uniform Traffic Control Devices
- Guide for the Development of Bicycle Facilities – American Association of State Highway and Transportation Officials
- Guide for the Planning, Design, and Operation of Pedestrian Facilities – American Association of State Highway and Transportation Officials
- Public Rights of Way Accessibility Guidelines (PROWAG) – US Access Board

Accessibility is a very important consideration for non-motorized design. All new pedestrian and bicycle facilities must meet the ADA (Americans with Disabilities Act) accessibility guidelines established in PROWAG. The guidelines in PROWAG address the design needs of people with physical and/or visual impairments. Accessibility will become increasingly

important over the next 20 years due to demographic changes. Baby boomers are aging and the population over age 65 is increasing. People over 65 are more likely to have physical and/or visual impairments that affect their ability to get around. To address accessibility issues, it is recommended that the City develop and implement an ADA transition plan to bring sidewalks, trails, and intersections into compliance with ADA.

Existing and proposed Bicycle and Pedestrian Network facilities are illustrated in **Figure 10-8.**

5. Freight

Freight transportation in Medina is primarily served by two rail lines and two principal arterial highways. **Figure 10-9** shows the City's freight system and potential freight generators. A Canadian Pacific (CP) rail line passes through the northern portion of the City and is parallel to TH 55 for a portion of its route. A Burlington Northern Santa Fe (BNSF) rail line is parallel to US 12 and passes through the southwest corner of the City.

There are no large freight traffic generators within the City. Most truck and rail traffic is passing through Medina on trips to, from, and through the Twin Cities. Freight traffic generators are located along TH 55 and portions of the CP rail line. There are concentrations of industrial land uses near Willow Drive and Arrowhead Drive. The Hennepin County Public Works facility is also located near Arrowhead Drive and generates heavy vehicle traffic due to roadway maintenance and plowing operations. Commercial land uses generate some freight traffic along TH 55, between Pinto Drive and CSAH 101. Within the City of Medina, there are no freight generators along the BNSF rail line and US 12.

Figure 10-10 shows Heavy Commercial Average Annual Daily Traffic (HCAADT) within Medina. TH 55 carries the greatest number of heavy commercial vehicles (500-2,499 vehicles per day). Additionally, TH 55 is a house mover route. CSAH 19 also carries a substantial amount of heavy commercial traffic, with heavy vehicles composing 8-10 percent of all traffic.

As of January 2015, the CP rail line carries approximately 20 trains per day and the BNSF rail line carries approximately 17 trails per day. The 2040 TPP notes that freight rail traffic has increased substantially since 2010, both regionally and nationally. Increases in freight rail traffic are expected, especially as the Twin Cities population continues to grow.

The BNSF rail line does not cross any roadways within the City. There are five locations in the City where the CP rail line crosses public roadways at-grade. The CP rail line crosses the following roadways:

- Pioneer Trail
- Willow Drive
- Arrowhead Drive – crossing includes overhead flashers
- Pinto Drive – crossing includes overhead flashers
- Sioux Drive

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All public rail crossings in the City are controlled by flashing lights and gates. The rail line also crosses several driveways at grade. Rail crossings of driveways are signed with cross bucks and stop signs directed driveway traffic.

The 2040 TPP acknowledges several freight challenges that impact the City and the region. As mentioned above, freight traffic and congestion are expected to increase and place pressure on the region's highway and rail systems. East-west traffic on the CP and BNSF lines has increased in part due to growth in the Bakken oil fields of North Dakota and Montana. Safety is also an increasing concern, particularly rail safety related to increases in Bakken crude oil being transported through the region on the CP and BNSF lines.

Additionally, there are concerns about compatibility between freight traffic and adjacent land use. While land use adjacent to the City's primary freight routes is generally compatible with existing land uses, it will be important to ensure that future development is also compatible with freight operations. While residential areas are generally not located adjacent to rail crossings, residents have reported concerns about noise from train horns. As rail traffic grows, the City can consider opportunities to develop Quiet Zones at rail crossings. Quiet Zones are segments of rail lines where horns are not routinely sounded at crossings. Quiet Zones must meet specific design criteria and safety measures to minimize risk at rail crossings.

There are also traffic concerns, related to crossings of the CP rail line. As noted above, the CP rail line is parallel to TH 55 for much of its route through Medina. When trains cross Arrowhead and Pinto Drives, traffic will sometimes back up on TH 55 as vehicles are unable to make southbound turns off TH 55. Additionally, traffic will also back up when trains cross CSAH 19 in Loretto. Backups sometimes extend south to CSAH 11, creating traffic problems within Medina. The City should continue to monitor traffic concerns related to rail crossings and partner with MnDOT, Hennepin County, and CP Rail to resolve issues related to traffic congestion and safety.

Two strategies are recommended to preserve and improve freight conditions in Medina. The first is to work with MnDOT to preserve overhead clearance on TH 55 so it can continue to function as a house mover route. The second is to work with MnDOT and CP Rail to study the feasibility of rail crossing quiet zones to reduce train noise in residential areas.

6. Transit

The City of Medina is not in the Transit Capital Levy District as shown in the 2040 TPP. The City is located within Transit Market Area V, which indicates that the City has very low population and employment densities. For this reason, there are no existing or planned transit routes, transit stations or centers, or park and ride facilities. No high frequency transit routes, express bus corridors, or transit advantages are planned for the City.

The City is served by Hennepin County Transit Link, a dial-a-ride service for the general public. Transit Link provides connections to destinations within Hennepin County. Transit Link also connects to regular route transit for trips within the metro area, including outside of Hennepin County. Medina residents also have opportunities to participate in the Metro Vanpool program. This program provides financial assistance for vanpools to serve areas with limited regular-route transit service.

It is recommended that the City periodically consider whether to extend TH 55 express bus service to Medina. Plymouth Metrolink and possibly Maple Grove Transit would be partners in expanding transit service. Participating in transit service would require Medina to participate in the regional transit capital levy, which would require coordination with the Metropolitan Council.

7. Aviation

There are currently no existing or planned aviation facilities within the City of Medina. However, the City is responsible for airspace protection in order to reduce hazards to air travel within the region. The closest airports to Medina are:

- Buffalo Municipal Airport, approximately 14 miles northwest of Medina
- Minneapolis Crystal Airport, approximately 9 miles east of Medina

Given the distance to the nearest airports, there are no radio beacons or other air navigation aids located in off-airport locations in Medina. The City is not within the area of influence of any of the airports identified above, and is therefore not subject to associated land use restrictions.

Any person or organization who intends to sponsor the construction or alteration of a structure affecting navigable airspace as defined in Federal Regulation Title 14; Part 77 needs to inform the Federal Aviation Agency (FAA) of the project. This notification is accomplished through the completion and submittal to FAA of Form 7460-1, Notice of Proposed Construction or Alteration. In Medina, this requirement applies to any construction or alteration exceeding 200 feet above ground level. The City's zoning code allows a maximum structure height of 40 feet; therefore it is unlikely that any structures in the City will require FAA notification.

MnDOT has authorized seaplane operations on Lake Independence on the western edge of the City. There are no seaplane bases located within the City. There are currently no heliports in Medina or any known plans to construct one.

8. Goals, Objectives, and Multimodal Strategies

This Plan, and the City's actions over the next 20 years, will be guided by the following transportation goals, objectives, and strategies.

8.1. Goals and Objectives

Table 8 displays the goals and objectives of the Medina Transportation Plan. The goals listed below represent the City's overall vision for transportation over the next 20 years. The objectives listed below provide guidance that the City can use to reach the transportation goals.

8.2. Multimodal Strategies

The multimodal strategies listed in this section are specific, actionable steps that the City can take in support of the goals and objectives of this Plan. These strategies are based upon existing and future transportation needs as described in detail in the previous sections of this Plan.

The multimodal strategies are broken into several categories:

1. Roadway Safety/Operations/Capacity
2. Roadway Functional Classification
3. Roadway – Specific to TH 55
4. Transit
5. Bicycle/Pedestrian
6. Freight

Each strategy is tied to one or multiple objectives. **Tables 9** thru **14** on the following pages describe each strategy, note which objective(s) is/are related to each strategy and the lead agency for the strategy. **Figure 10-11** and **Figure 10-12** following the tables illustrate the strategies geographically with reference numbers tied back to the table information.

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Table 8: City of Medina Transportation Goals and Objectives

Goals	Objectives
1. Facilitate efficient movement of people within and through the City	1.1. Improve local roadway system connectivity to county roadways and state highways.
	1.2. Provide safe and efficient routes for emergency and public safety vehicles.
	1.3. Provide adequate capacity to relieve congestion.
	1.4. Encourage sound access management.
	1.5. Preserve necessary rights-of-way for the 20-year planning horizon and beyond.
2. Facilitate efficient movements of goods within and through the City	2.1. Maintain a safe and effective network of roadways for freight movement.
	2.2. Coordinate with MnDOT and CP Rail/BNSF Rail to proactively address freight and rail safety.
3. Provide a transportation system that is integrated with land use and development	3.1. Coordinate transportation system investments with the Medina Land Use Plan.
	3.2. Connect land use districts and provide safe access to major activity areas.
	3.3. Design, construct, and maintain roadways that fit the character of the adjacent land use (rural vs. urban development areas).
	3.4. Require private residential streets be designed to City standards.
4. Improve transportation safety for all users and modes of transportation	4.1. Implement safety improvements to address high crash locations
	4.2. Proactively address bicycle and pedestrian safety concerns along roadways and at crossings.
	4.3. Bring sidewalks, trails, and intersections into compliance with ADA.
	4.4. Support traffic calming and design to minimize speed on minor City collectors and local roadways.
5. Develop a safe and convenient multimodal transportation system	5.1. Invest in multi-modal transportation solutions including bicycle and pedestrian infrastructure.
	5.2. Preserve adequate right of way for sidewalk and trail construction.
6. Conserve and enhance environmental resources	6.1. Support investments in bicycle, pedestrian, and transit infrastructure to reduce environmental impacts of transportation.
	6.2. Manage storm water effectively and minimize the construction of new impervious surfaces.
	6.3. Support native plant landscapes along roadways.
	6.4. Design new roadways to preserve natural features.
7. Maintain the Existing Transportation System	7.1. Regularly assess transportation maintenance needs and include roadway, trail pavement, and other transportation infrastructure maintenance in the Medina Capital Improvement Plan.

Table 9: Roadway Strategies - Safety/Operations/Capacity

Roadway – Safety/Operations/Capacity					
Location	**Type of Improvement**	**Strategy**	**Map Reference**	**Lead Agency**	**Objective(s)**
TH 55 & CSAH 19	Safety/operations	Study solutions to reduce 1.25 calculated crash rate below 0.65 critical crash rate	2	MnDOT/Hennepin County	4.1
CSAH 19 & CSAH 24	Safety/operations	Study solutions to reduce 0.79 crash rate below 0.58 critical crash rate	5	Hennepin County	4.1
TH 55 & CSAH 101	Safety/operations	Study solutions to reduce 0.67 crash rate below 0.60 critical crash rate	2	MnDOT/Hennepin County	4.1
TH 55/CR 116	Safety/operations	Construct 2017 programmed project, including raised concrete medians and backage frontage road north of TH 55	2	MnDOT/Hennepin County	4.1
TH 55 & Willow Drive	Safety/operations	Study solutions to reduce 0.80 crash rate below 0.69 critical crash rate	2	MnDOT/City of Medina	4.1
TH 55 & Mohawk Drive	Safety/operations	Study options to improve safety and operations at the intersection of TH 55 and Mohawk Drive.	2	MnDOT/City of Medina	1.1
TH 55 & Tamarack Drive	Safety/operations	Discuss options for a future traffic signal at TH 55 and Tamarack Drive to safely accommodate planned future growth in the vicinity of this intersection, north and south of TH 55.	2	MnDOT/City of Medina	1.1

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Roadway – Safety/Operations/Capacity					
Location	**Type of Improvement**	**Strategy**	**Map Reference**	**Lead Agency**	**Objective(s)**
CSAH 19 Railroad Crossing	Safety/operations	Continue to explore alternatives to improve safety, operations and impediments to traffic flow resulting from the existing at-grade railroad crossing of Hennepin CSAH 19 in the City of Loretto. Although this project does not reside in the City of Medina, traffic problems related to this crossing back up along CSAH 19 into Medina and affect traffic flow and safety within the City of Medina.	5	Hennepin County	1.3, 2.2
Brockton Lane: Hamel Road to Medina Road	Safety/operations	As this corridor develops and reconstruction becomes necessary to improve safety, operations and to accommodate bicyclists and pedestrians, the cities of Medina and Plymouth will need to cooperatively develop a shared design vision for Brockton Lane.	8	City of Medina/City of Plymouth	3.3, 5.1
Hackamore Road: Arrowhead Drive to Brockton Lane/CSAH 101	Safety/operations	Hackamore Road is beginning to urbanize and the corridor is likely to experience significant growth in the future. As this corridor develops and reconstruction becomes necessary to improve safety, operations and to accommodate bicyclists and pedestrians, the cities of Corcoran and Medina will need to cooperatively develop a shared design vision for Hackamore Road.	9	City of Medina/City of Corcoran	3.1, 3.3

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Roadway – Safety/Operations/Capacity					
Location	**Type of Improvement**	**Strategy**	**Map Reference**	**Lead Agency**	**Objective(s)**
Sioux Drive: TH 55 to Hamel Road	Safety/operations	The City of Medina should undertake a detailed traffic/operations study along Sioux Drive from TH 55 to Hamel Road to explore safety and operations improvement options.	5	City of Medina	1.3, 2.2, 4.1
Hennepin CR 116	Capacity	Explore potential capacity expansion options as part of County Plan update.	3	Hennepin County	1.3
CSAH 101 & CR 116	Met Council Principal Arterial Study	City of Medina and Hennepin County should monitor and participate in, as warranted, an ongoing Met Council Principal Arterial Study for the Twin Cities Metro Area that involves review of the TH 55 intersections with Hennepin CSAH 101 and Hennepin CR 116.	n/a	Met Council	4.1
Tamarack Drive	New/Improved Roadway	The City of Medina should improve the existing gravel Tamarack Drive from Hamel Road to TH 55 to a State-Aid standard two lane roadway. A new alignment of Tamarack Drive should also be constructed to State Aid standards north of TH 55 to Meander Road. These improvements to Tamarack Drive are required to accommodate future land use growth planned in the vicinity of Tamarack Drive, north and south of TH 55.	2	City of Medina	3.1

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Roadway – Safety/Operations/Capacity					
Location	**Type of Improvement**	**Strategy**	**Map Reference**	**Lead Agency**	**Objective(s)**
Between CSAH 101 & CSAH 19 - South of TH 55	New North - South Roadway	Discuss merits, feasibility and need of a new north – south roadway somewhere between CSAH 101 and CSAH 19, south of TH 55	n/a	City of Medina	1.1, 1.2,1.5, 2.1
CSAH 101	Road Realignment	Peony Lane in the City of Plymouth has been discussed as a potential new Hennepin CSAH 101 alignment to tie directly into CSAH 101 south of TH 55. The City of Medina should proactively communicate any concerns to the County regarding a potential turn-back of the existing CSAH 101 north of TH 55 to a Medina city street.	n/a	Hennepin County	1.3
Various	Roadway design	Design new and reconstructed minor collectors and local roadways to encourage compliance with speed limits.	n/a	City of Medina	3.3, 4.4

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Table 10: Roadway Strategies - Functional Classification

Roadway - Functional Classification					
Location	**Type of improvement**	**Strategy**	**Map Reference**	**Lead Agency**	**Objective(s)**
Willow Drive south of CSAH 24	Functional classification	Change from a B Minor Arterial to a Minor Collector	6	City of Medina	1.3
Hennepin CR 116	Functional classification	Change from a B-Minor Arterial to an A Minor Arterial	4	Hennepin County	1.3
Hackamore Road/Arrowhead Drive	Functional classification	Change from local street to a Minor Collector	7	City of Medina	1.3
Medina Road	Functional classification	Change from local street to a Minor Collector	7	City of Medina	1.3
Hunter Drive	Functional classification	Change from local street to a Minor Collector	7	City of Medina	1.3
Brockton Lane (south of TH 55)	Functional classification	Change from local street to a Minor Collector	7	City of Medina	1.3
Chippewa Road	Functional classification	Change from local street to a Minor Collector	7	City of Medina	1.3

Table 11: Roadway Strategies - Specific to TH 55

Roadway - Specific to TH 55					
Location	**Type of Improvement**	**Strategy**	**Map Reference**	**Lead Agency**	**Objective(s)**
TH 55	Right-of-way preservation/ capacity/ operations/safety	A future preliminary design concept was developed in 2007 to construct a TH 55 four lane expressway from CR 116 in Medina to the Crow River in Rockford. This plan also included a four lane grade separated "hybrid" expressway from CR 116 in Medina and I-494 in Plymouth (see Appendix B). Although MnDOT does not have these improvements identified in its 20 year financially constrained plan, MnDOT, Hennepin County and the City of Medina should cooperatively work to preserve the necessary right-of-way for these improvements, should unanticipated funding become available down the road.	1	MnDOT/City of Medina	1.3
TH 55	Access Management/ Frontage and Backage Road System	MnDOT and the City of Medina should work cooperatively, as redevelopment occurs, to close existing direct access driveways onto TH 55 and relocate direct access to a frontage/backage road system, consistent with the 2007 TH 55 design concept vision.	1	MnDOT/City of Medina	1.4

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Table 12: Freight Strategies

Freight					
Location	**Type of Improvement**	**Strategy**	**Map Reference**	**Lead Agency**	**Objective(s)**
TH 55	Freight	Work with MnDOT to preserve overhead clearance on TH 55 so it can continue to function as a house mover route.	n/a	MnDOT/City of Medina	2.1
CP Rail Line	Freight	Work with MnDOT and CP Rail to study the feasibility of rail crossing quiet zones to reduce train noise in residential areas.	n/a	City of Medina, MnDOT, CP Rail	2.2

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Table 13: Transit Strategies

Transit					
Location	**Type of Improvement**	**Strategy**	**Map Reference**	**Lead Agency**	**Objective(s)**
TH 55	Transit	City of Medina and Plymouth Metrolink and possibly Maple Grove Transit should periodically consider whether to extend TH 55 express bus service to Medina. Participating in transit service would require Medina to participate in the regional transit capital levy, which would require coordination with the Metropolitan Council.	n/a	City of Medina/ Plymouth Metrolink/ Metropolitan Council	6.1

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Table 14: Bicycle and Pedestrian Strategies

Bicycle and Pedestrian					
Location	**Type of Improvement**	**Strategy**	**Map Reference**	**Lead Agency**	**Objective(s)**
CSAH 24	Bicycle	Work with Hennepin County to designate existing shoulder on CSAH 24 as a Tier 2 Regional Bicycle Transportation Network (RBTN) alignment.	13	City of Medina/ Hennepin County/ Metropolitan Council	5.1, 6.1
Tamarack Drive	Bicycle	Designate Tamarack Drive as a Tier 2 RBTN alignment between Medina Road and Medina-Orono boundary and work with Hennepin County to develop a multi-use trail to become part of the Hennepin County bicycle transportation system.	14	City of Medina/ Metropolitan Council	5.1, 6.1
Medina Road	Bicycle	Designate existing shoulder on Medina Road as a Tier 2 RBTN alignment between Tamarack Drive and Hunter Drive	15	City of Medina/ Metropolitan Council	5.1, 6.1
Proposed trail between Tamarack Drive and Medina Road	Bicycle and Pedestrian	Designate proposed trail between Tamarack Drive and Medina Road as a Tier 2 RBTN alignment and work to design and construct a trail in this location.	16	City of Medina/ Metropolitan Council	5.1, 6.1

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Bicycle and Pedestrian					
Location	**Type of Improvement**	**Strategy**	**Map Reference**	**Lead Agency**	**Objective(s)**
Hunter Drive, Hamel Road, Sioux Drive	Bicycle	Designate Hunter Drive, Hamel Road, and Sioux Drive as a Tier 2 RBTN alignment and work to design and construct bikeways on Hamel Road and Sioux Drive.	17	City of Medina/ Metropolitan Council	5.1, 6.1
TH 55	Bicycle and Pedestrian	Designate a connection along TH 55, between CSAH 101 and Wayzata High School, as a Tier 2 RBTN alignment and work with MnDOT, Hennepin County, City of Plymouth, and Wayzata High School to develop a bikeway connection to Wayzata High School.	18	City of Medina/City of Plymouth/ Hennepin County/ Metropolitan Council/ MnDOT/ Wayzata School District	5.1, 6.1
Various	Bicycle	Work with Hennepin County, Three Rivers Park District, and property owners to design and construct planned bikeways within the City of Medina.	n/a	City of Medina/ Hennepin County/Three Rivers Park District/ Metropolitan Council	5.1, 6.1

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Bicycle and Pedestrian					
Location	**Type of Improvement**	**Strategy**	**Map Reference**	**Lead Agency**	**Objective(s)**
North-South 1 and Lake Sarah Extension Regional Trails	Bicycle and Pedestrian	Work with Three Rivers Park District to develop alignments and master plans for the North-South 1 and Lake Sarah Extension Regional Trails.	19	City of Medina/Hennepin County/Three Rivers Park District/ Metropolitan Council	5.1, 6.1
TH 55	Bicycle and Pedestrian	Work with MnDOT to improve pedestrian and bicycle safety and comfort at at-grade crossings of TH 55 and explore off-grade crossing with MnDOT, Three Rivers and the Metropolitan Council.	20	City of Medina/ Hennepin County/ MnDOT	4.2
Various	Pedestrian	Develop and implement an ADA transition plan to bring sidewalks, trails, and intersections into compliance with ADA.	n/a	City of Medina/ Hennepin County/ MnDOT	5.1, 6.1
Various	Bicycle and Pedestrian	Preserve adequate right-of-way for sidewalk and trail construction during the design of new and reconstructed streets.	n/a	City of Medina/ Hennepin County/ MnDOT	5.2

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Bicycle and Pedestrian					
Location	**Type of Improvement**	**Strategy**	**Map Reference**	**Lead Agency**	**Objective(s)**
Various	Bicycle and Pedestrian	Work with developers to construct pedestrian and bicycle connections as part of new residential and commercial development. Encourage developers to construct pedestrian and bicycle shortcuts in areas with cul-de-sacs or curvilinear streets.	n/a	City of Medina	3.1, 5.1

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9. Proposed Short and Long Range Roadway Projects

The sections below identify proposed short and long range roadway projects identified in the City's CIP and based on the capacity and safety analyses described in previous sections of this Plan. This section does not include information on proposed projects from the 2040 TPP, as the TPP does not include any planned improvements to principal arterials in Medina. No interchanges, MnPASS lanes, dedicated busways, or bus-only shoulders are proposed in the 2040 TPP.

9.1.1. Proposed Projects from CIP

The City's 2016-2020 CIP identifies several roadway projects. These projects are primarily overlay projects intended to maintain the roadway surface. The exception is the improvements the TH 55/CR 116 intersection. This project is led by Hennepin County with coordination and cost participation from the City of Medina. Construction is planned for 2017. The project will include replacing the existing signal system at TH 55, constructing raised medians on CR 116, modifying accesses, upgrading the railroad crossing, and constructing a multi-use trail on the east side of CSAH 115 between TH 55 and Tower Drive.

9.1.2. Proposed Projects based on Capacity Analysis

As mentioned in Section 3, Future Roadway Conditions, CR 116 and the two-lane segment of TH 55 are the only roadways that are expected to exceed their planning level capacity threshold by the 2040 forecast year. The projects described below are recommended in order to manage congestion within the City. It is recommended that the City, County, and MnDOT continue to monitor traffic conditions on these roadways and plan for future expansion.

The CR 116/Hackamore Road Traffic Analysis Study described in Section 2, Existing Roadway System, recommended expanding CR 116 to a four-lane roadway.

Section 2 also describes the TH 55 Corridor Expansion Plan recommended converting TH 55 into a four-lane expressway west of CR 116. East of CR 116, TH 55 is recommended to be converted into a hybrid freeway/expressway.

Additionally, traffic volumes on CSAH 19 and CSAH 101 should be monitored, with two-lane volumes forecasted in the mid-teens by 2040. The City and County should monitor traffic conditions along these roadways over the 20-year planning horizon.

9.1.3. Proposed Projects based on Safety Analysis

Based on the safety analysis described in Section 2, Existing Roadway System, there are several intersections that have crash rates that exceed the critical crash rates and severity rate. These intersections include:

- TH 55 & CSAH 19
- CSAH 19 & CSAH 24
- TH 55 & CSAH 101
- TH 55 & Pinto Drive
- Pinto Drive & Clydesdale Trail
- TH 55 & Willow Drive North

Further study is recommended to identify specific projects that could be effective at reducing the rate and severity of crashes at these locations. It is recommended that safety projects be pursued at these locations, in partnership with Hennepin County and MnDOT.

Additionally, it is recommended that the City of Medina undertake a detailed traffic/operations study along Sioux Drive from TH 55 to Hamel Road to explore safety and operations improvement options. The Sioux Drive Corridor includes an existing signalized intersection at TH 55, which transitions into a steep grade incline heading south along Sioux Drive into a three-legged intersection at Sioux Drive and Hamel Road. The intersection of Sioux Drive and Hamel Road has stop signs at the east and west Hamel Road approaches and a free flow condition for northbound traffic heading into the intersection along Sioux Drive. The steep uphill grade heading south into the Hamel Road/Sioux Drive intersection creates sight distance problems and an at-grade railroad crossing along Sioux Drive between Hamel Road and TH 55 also is a safety and traffic flow concern.

9.1.4. Proposed Projects based on Land Use and Development

Transportation needs in the City will shift as development occurs. Narrow rural roadways, paved or unpaved, will no longer be suitable in certain areas. Three roadways are recommended for improvement as development occurs: Brockton Lane, Hackamore Road, and Tamarack Drive.

Brockton Lane is currently a two-lane rural roadway with no shoulders that serves as a common boundary between the cities of Medina and Plymouth. The Brockton Lane corridor from Hamel Road to Medina Road is beginning to urbanize and the corridor is likely to experience significant growth in the future. As this corridor develops and reconstruction becomes necessary to improve safety, operations and to accommodate bicyclists and pedestrians, the cities of Medina and Plymouth will need to cooperatively develop a shared design vision for Brockton Lane. This shared vision should be consistent along the corridor and include a cooperative municipal agreement regarding cost sharing and funding for future reconstruction and ongoing regular maintenance.

Hackamore Road is a partially paved/partially gravel two-lane rural roadway with no shoulders that serves as a common boundary between the cities of Corcoran and Medina. Hackamore Road intersects Hennepin CR 116/Pinto Road and Hennepin CSAH 101/Brockton

Lane and curves south on its west end becoming Arrowhead Drive. Hackamore Road is beginning to urbanize and the corridor is likely to experience significant growth in the future. As this corridor develops and reconstruction becomes necessary to improve safety, operations and to accommodate bicyclists and pedestrians, the cities of Corcoran and Medina will need to cooperatively develop a shared design vision for Hackamore Road. This shared vision should be consistent along the corridor and include a cooperative municipal agreement regarding cost sharing and funding for future reconstruction and ongoing regular maintenance.

The City of Medina should improve the existing gravel Tamarack Drive from Hamel Road to TH 55 to a State-Aid standard two-lane roadway. A new alignment of Tamarack Drive should also be constructed to State Aid standards north of TH 55 to Meander Road and south of TH 55 to CSAH 24, with a new signal installed at TH 55. These improvements to Tamarack Drive are required to accommodate future land use growth planned in the vicinity of Tamarack Drive, north and south of TH 55.

10. Public Comments

Draft transportation plan strategies were presented for public comment at May 2016 open house meetings. Meeting attendees were asked to identify their top priorities for the transportation plan and provide comments about specific strategies or transportation issues. Highest priority strategies:

- Improve safety at TH 55 intersection with CR 116
- Plan for a traffic signal at TH 55 and Tamarack Drive
- Explore extension of express bus service to Medina
- Develop a multi-use trail along Tamarack Drive

Comments on roadway strategies:

- Pave the northwest portion of Arrowhead Drive
- Install a traffic signal at CR 116 and Meander Drive

Comments on freight strategies:

- Reduce train noise at Arrowhead Drive
- Reduce train noise at Pinto Drive

Comments on bicycle/pedestrian strategies:

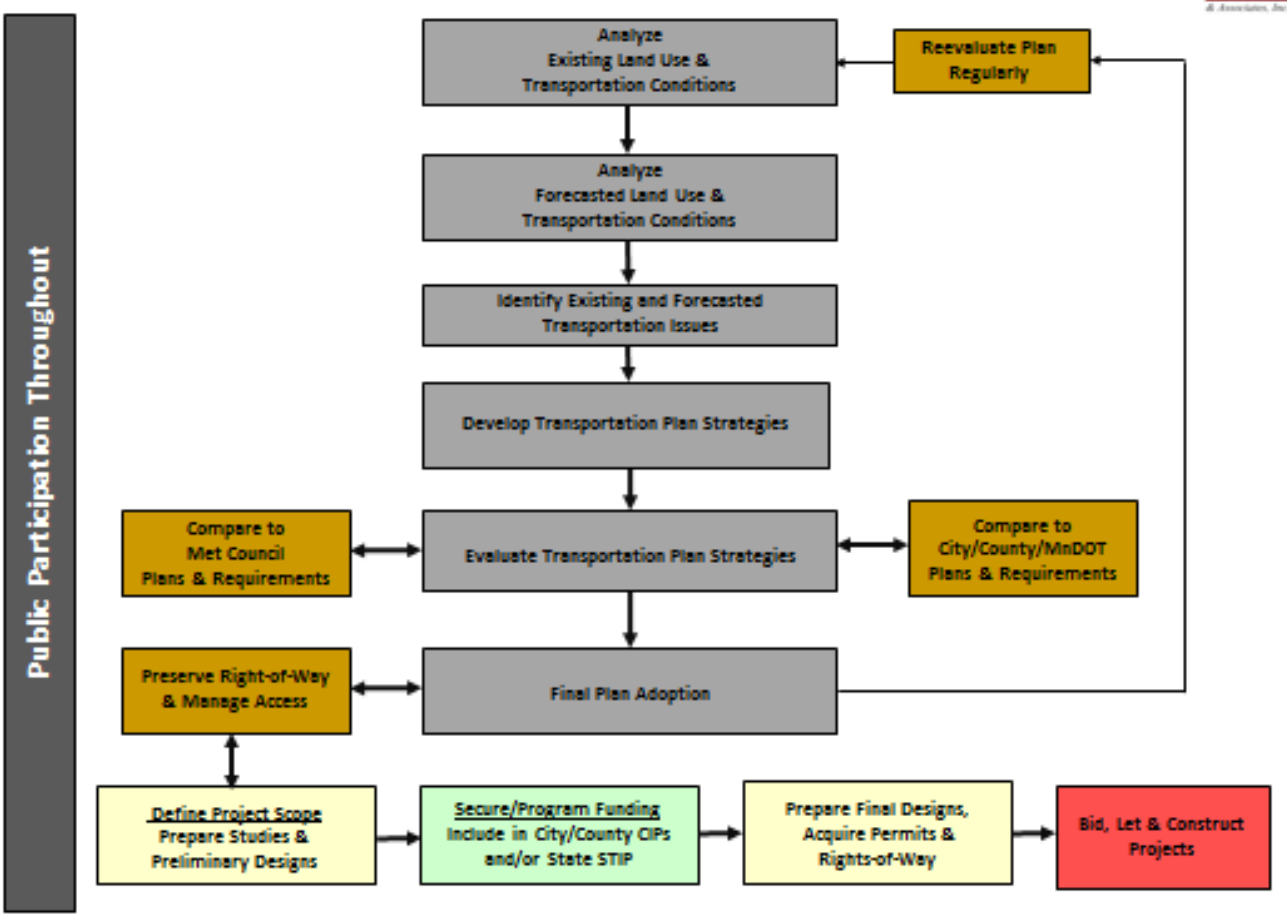
- Opposition to proposed turf trails between Tamarack Drive and Willow Drive, south of CR 115
- General support for pedestrian and bicycle improvements

11. Conclusion and Next Steps

The purpose of this Transportation Plan is to set a multimodal transportation vision for the City of Medina through the year 2040. Goals, objectives and specific strategies have been identified collaboratively by the City, Hennepin County, MnDOT and citizens within the framework of Metropolitan Council requirements. The vision and associated strategies outlined in this Plan were established by considering existing and forecasted conditions, City of Medina priorities, regional travel patterns and a variety of other factors.

As the owners of the transportation network in the City of Medina (i.e. City of Medina, Hennepin County and MnDOT) advance their respective Capital Improvement Programs (CIPs), this Plan is intended to serve as an important resource and reference in establishing priorities and advancing transportation projects for implementation. Advancing these projects from a planning to implementation phase will require collaborative discussions among the City, County, MnDOT, adjacent communities, Met Council, residents and others to conduct traffic studies, finalize designs, preserve rights-of-way, obtain environmental clearances and leverage necessary financial resources. **Figure 10-13** on the following page outlines the entire planning and project development process required for transportation projects from concept plans to construction implementation.

Transportation Planning Process – Figure 13



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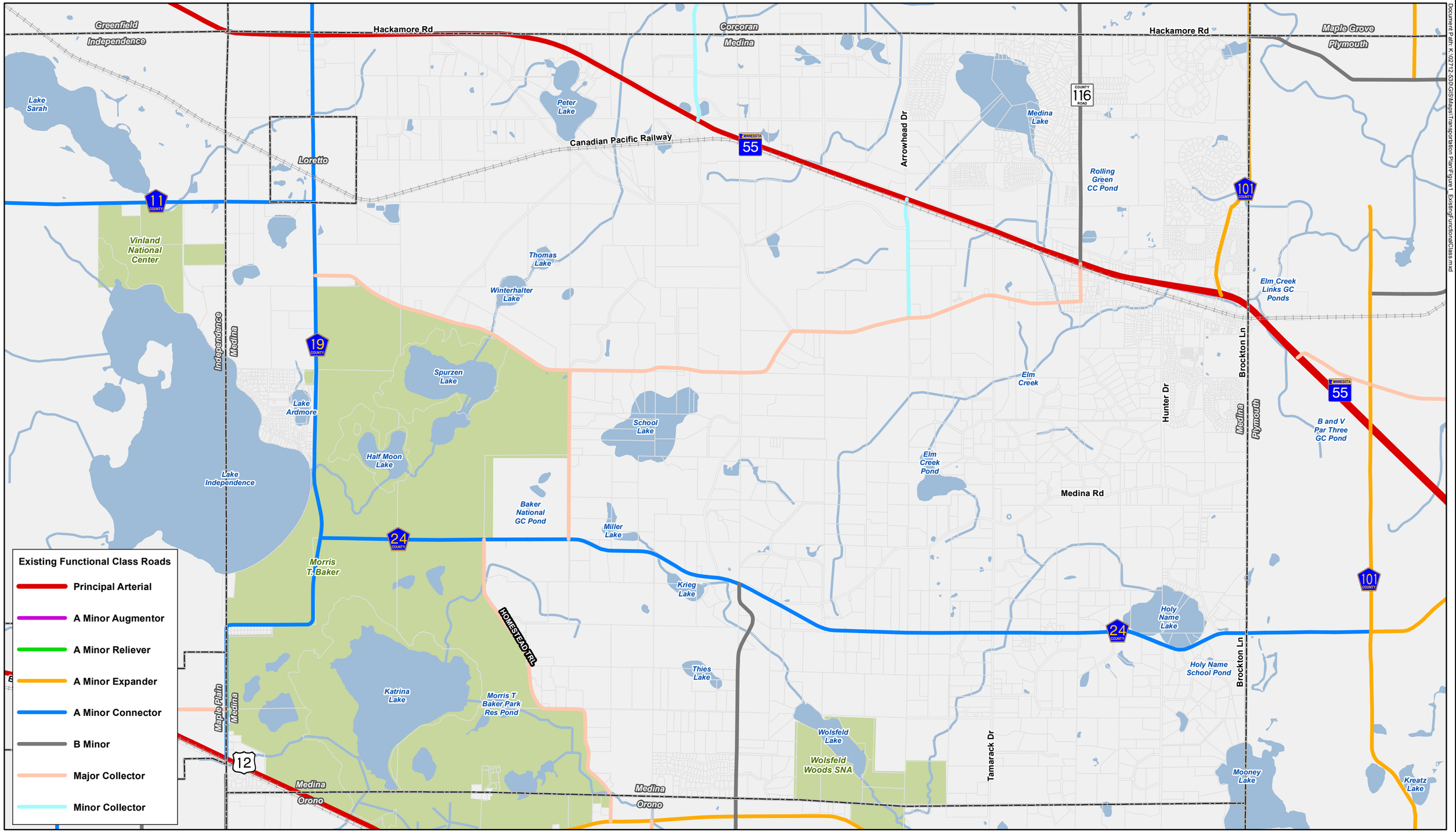

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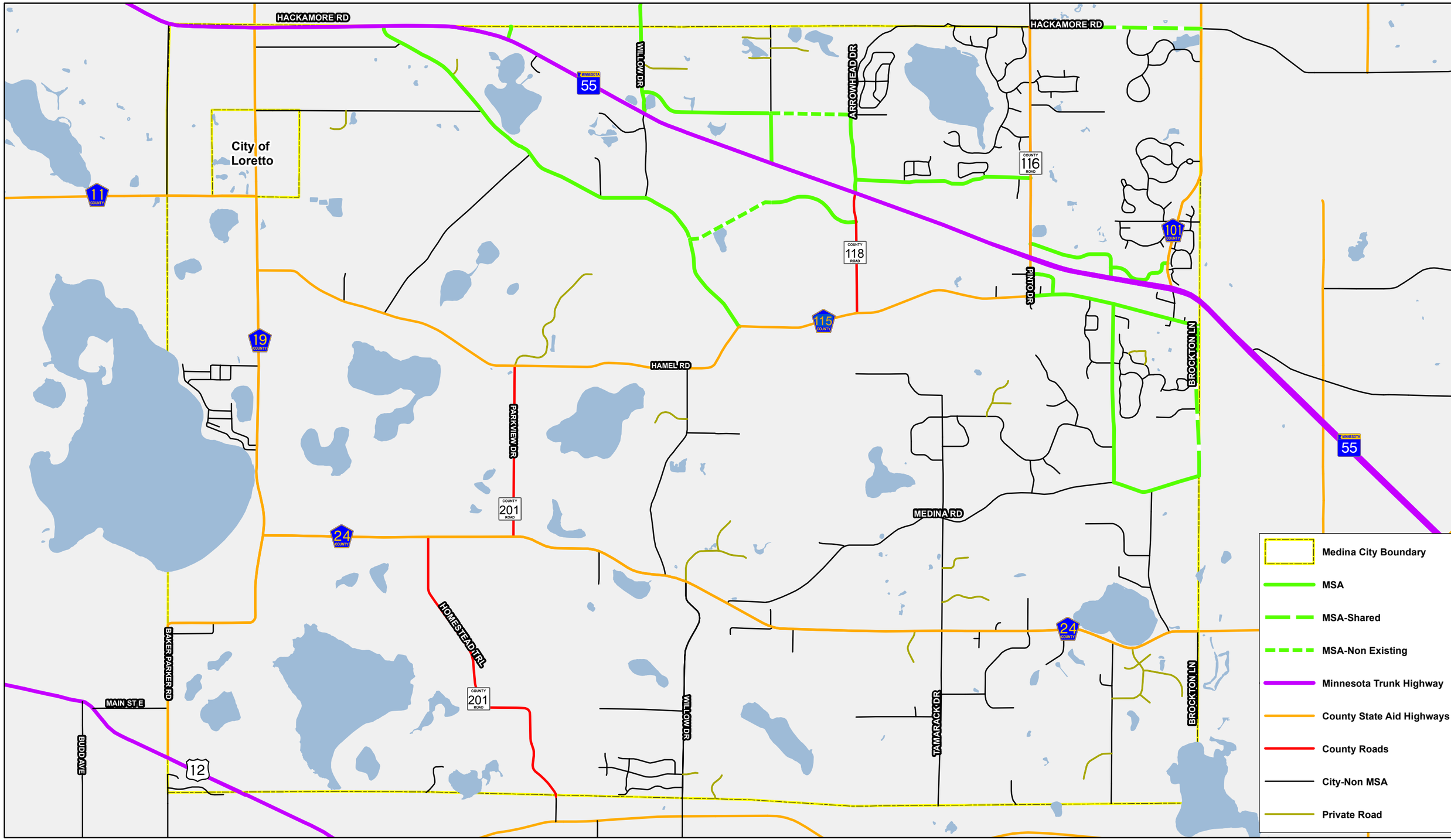
CITY OF MEDINA

Figure 10-1: Roadway Functional Classification (Existing)
Medina Transportation Plan
Medina, MN

WSB



CITY OF MEDINA

Figure 10-2: Existing Roadway Jurisdiction
Medina Transportation Plan
Medina, MN

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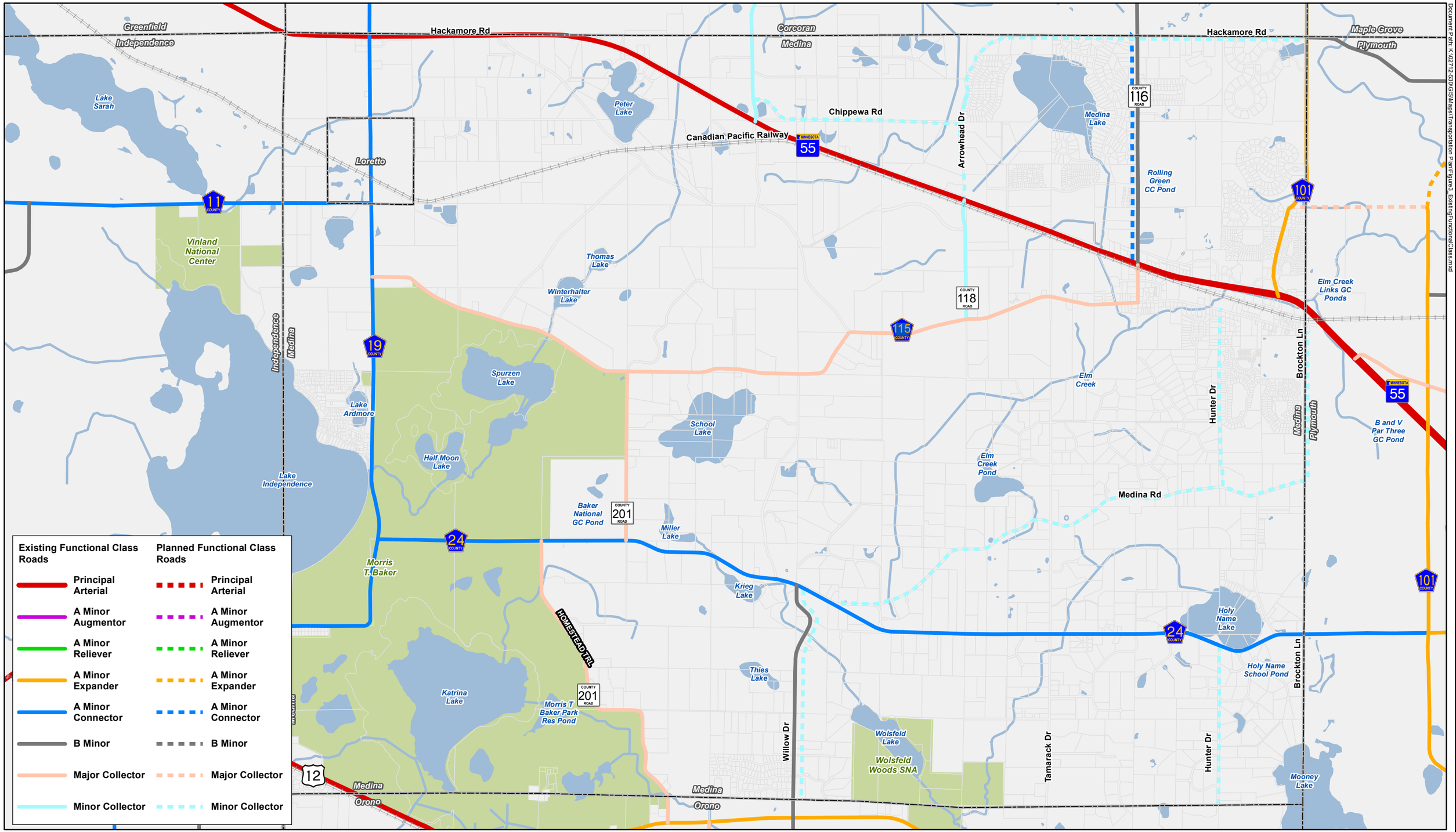

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CITY OF MEDINA

Figure 10-3: Roadway Functional Classification (Existing & Planned)
Medina Transportation Plan
Medina, MN

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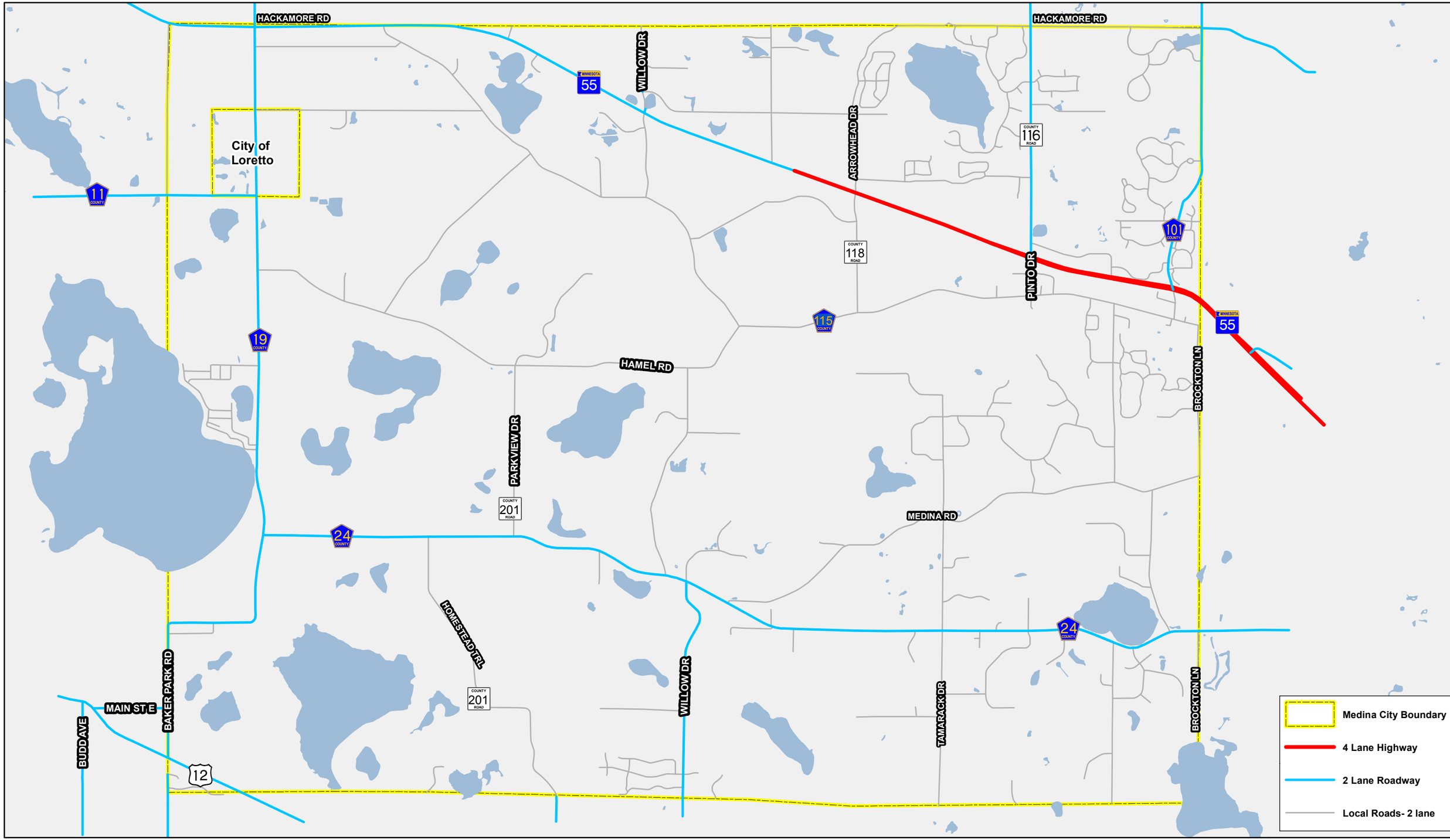

CITY OF MEDINA

Figure 10-4: Existing Roadway Lanes: Principal and Minor Arterials
Medina Transportation Plan
Medina, MN

N

0 2,750 Feet

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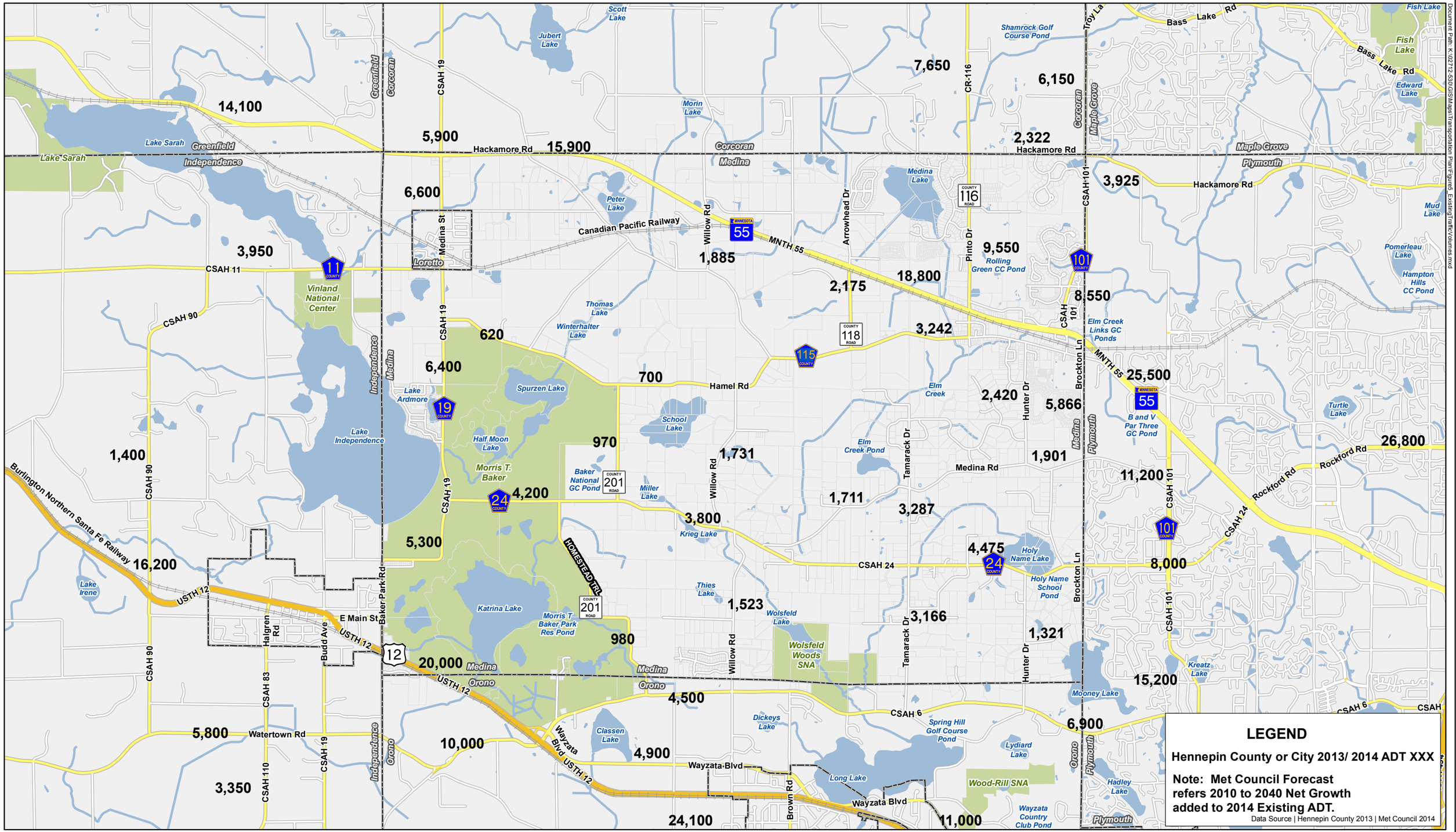

CITY OF MEDINA

Figure 10-5: Existing Traffic Volumes
Medina Transportation Plan
Medina, MN

WSB

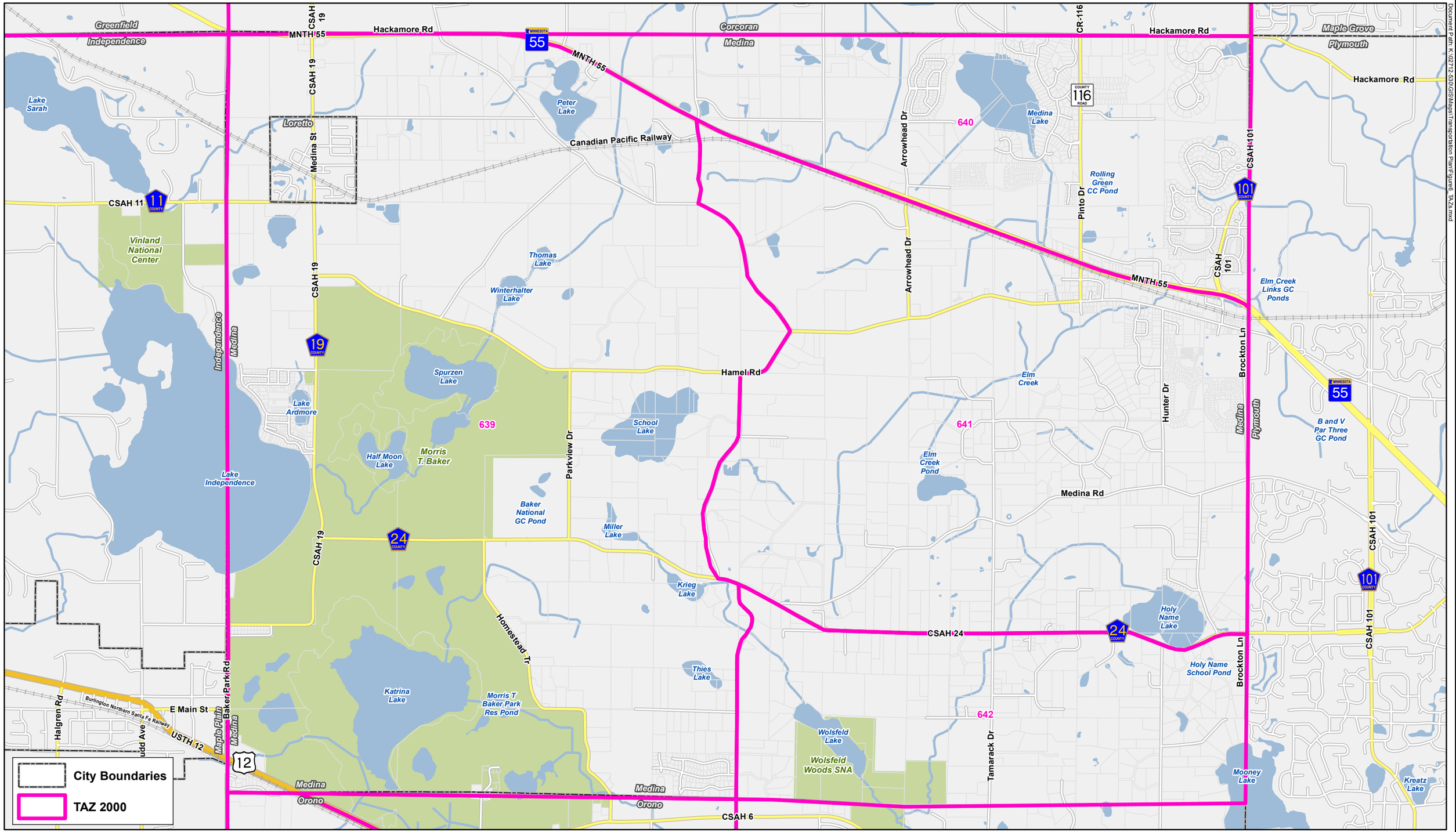

Figure 10-6: Traffic Analysis Zones (TAZs)
Medina Transportation Plan
Medina, MN

N

0 2,750 Feet

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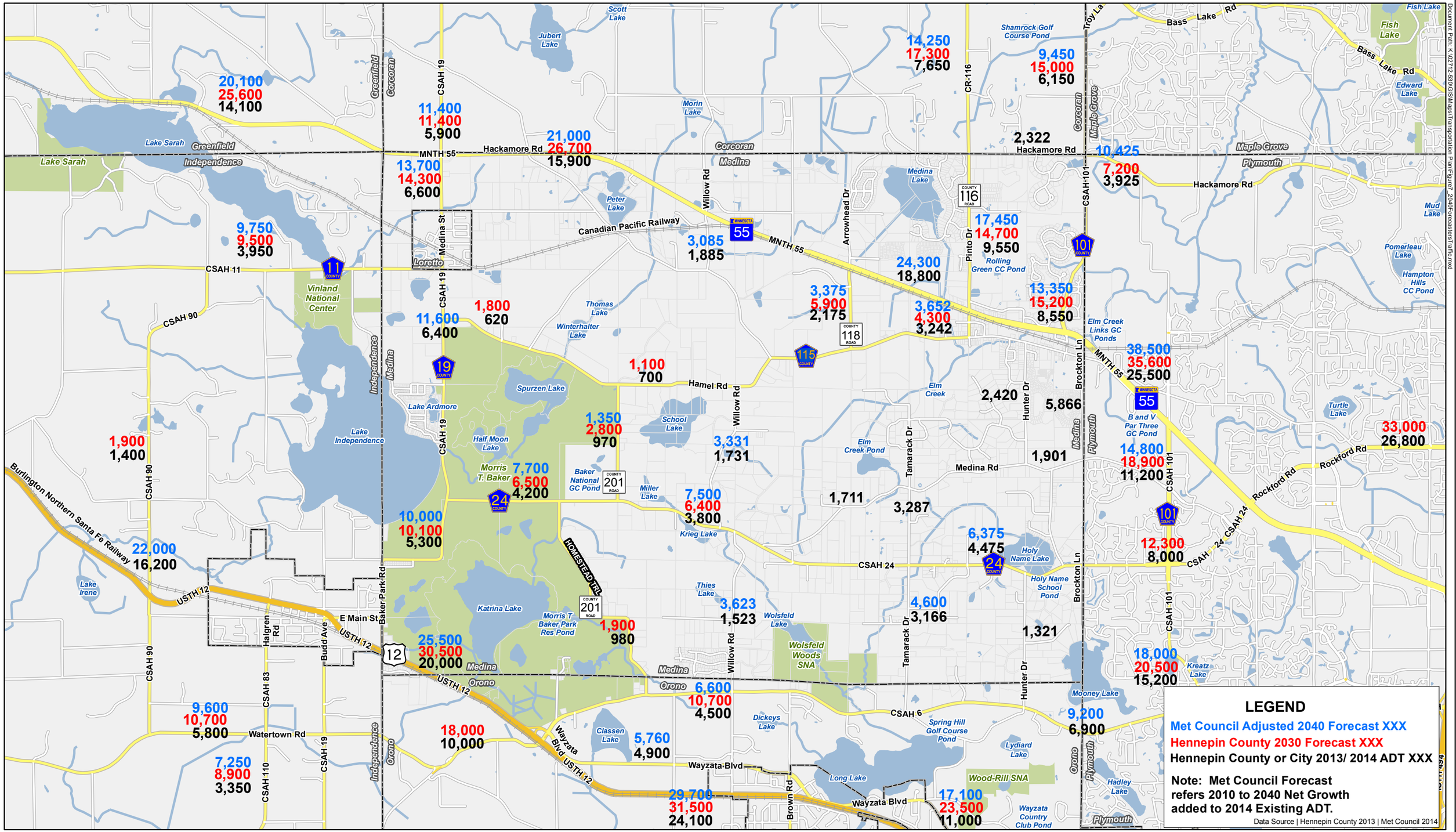


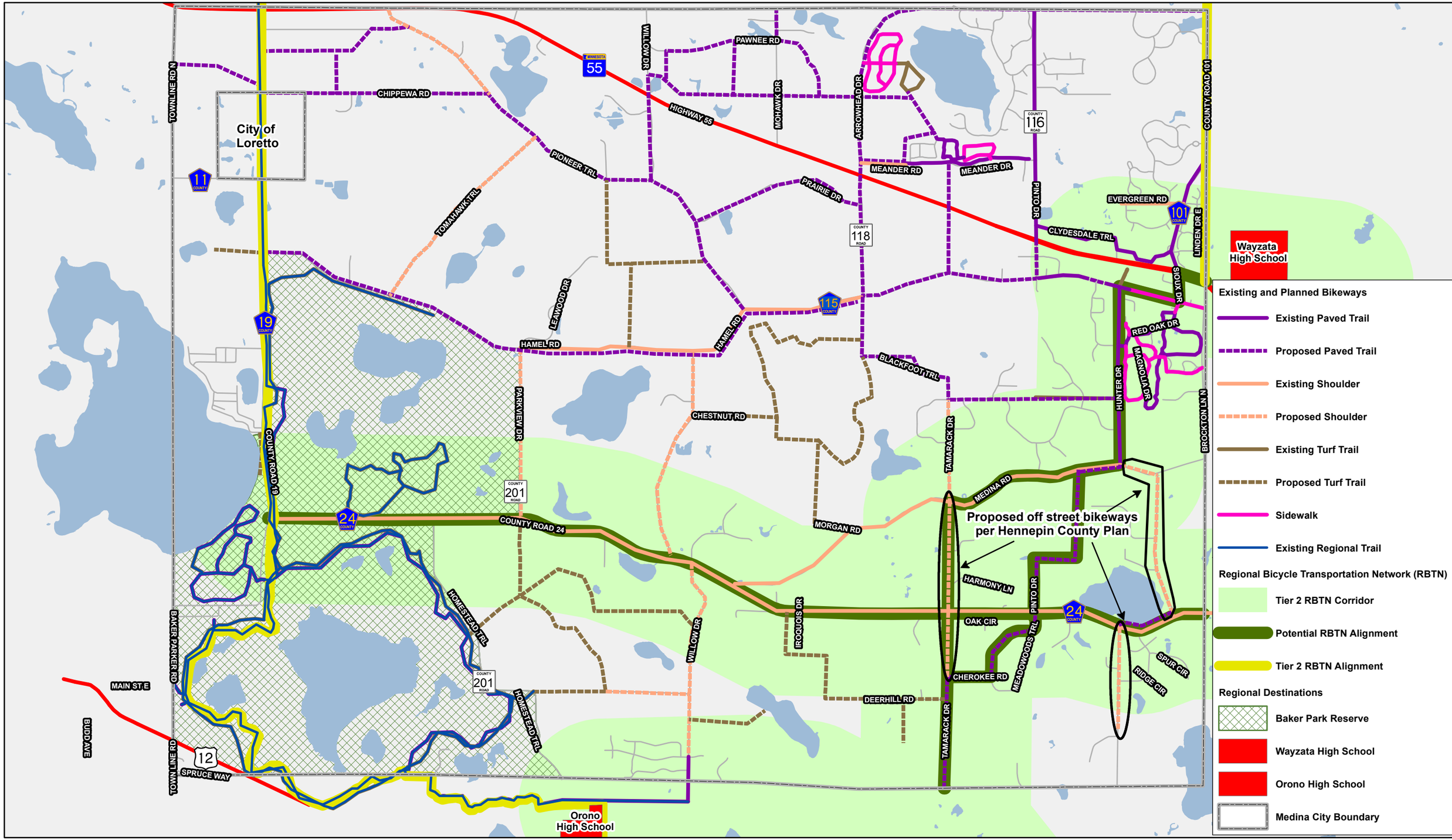
Figure 10-7: 2040 Forecasted Traffic Volumes
Medina Transportation Plan
Medina, MN

CITY OF MEDINA

N

0 4,000 Feet

WSB



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CITY OF MEDINA

Figure 10-8: Existing and Proposed Bicycle and Pedestrian Network
Medina Transportation Plan
Medina, MN

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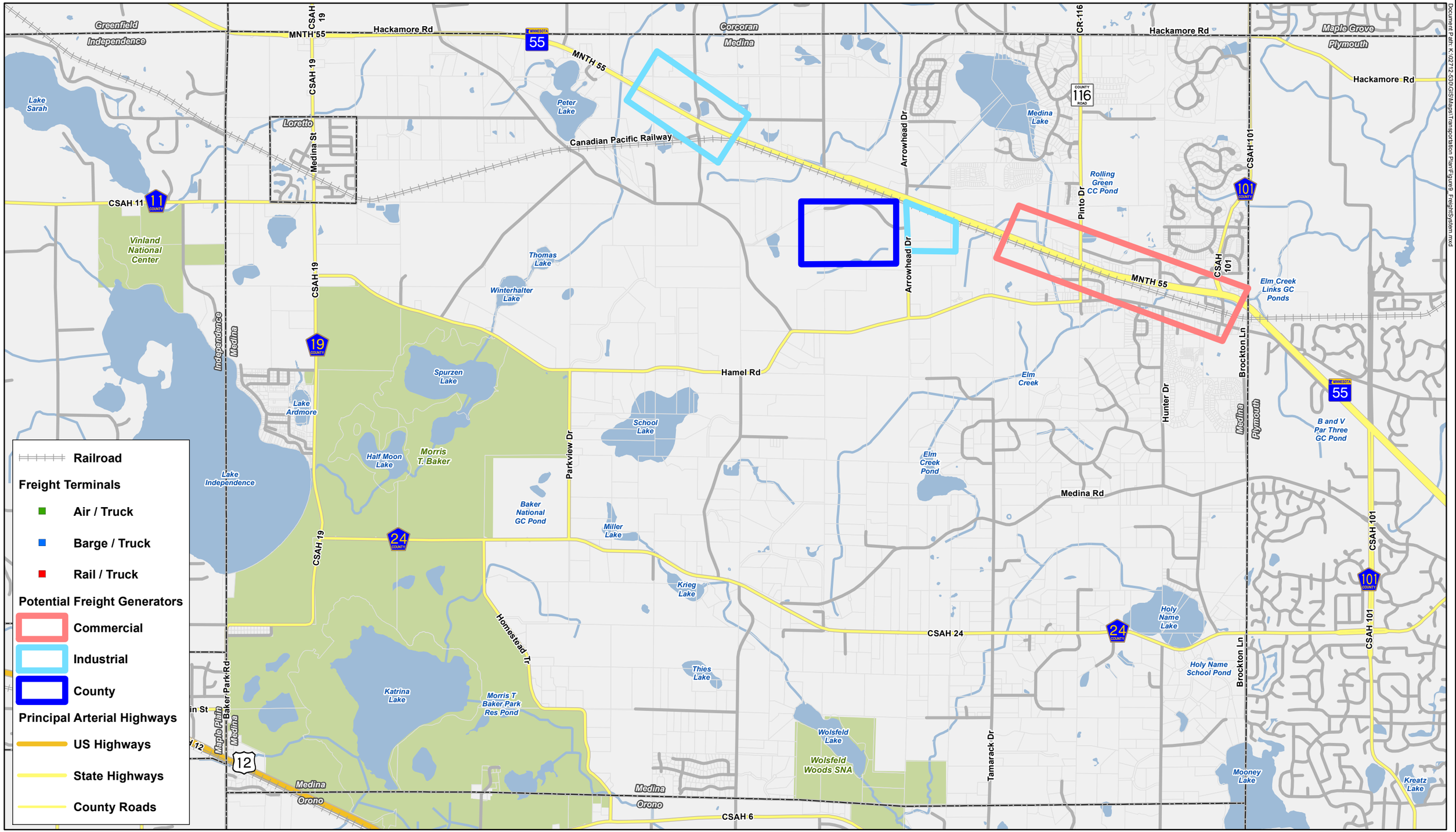

CITY OF MEDINA

Figure 10-9: Freight System
Medina Transportation Plan
Medina, MN

N

0 2,750 Feet

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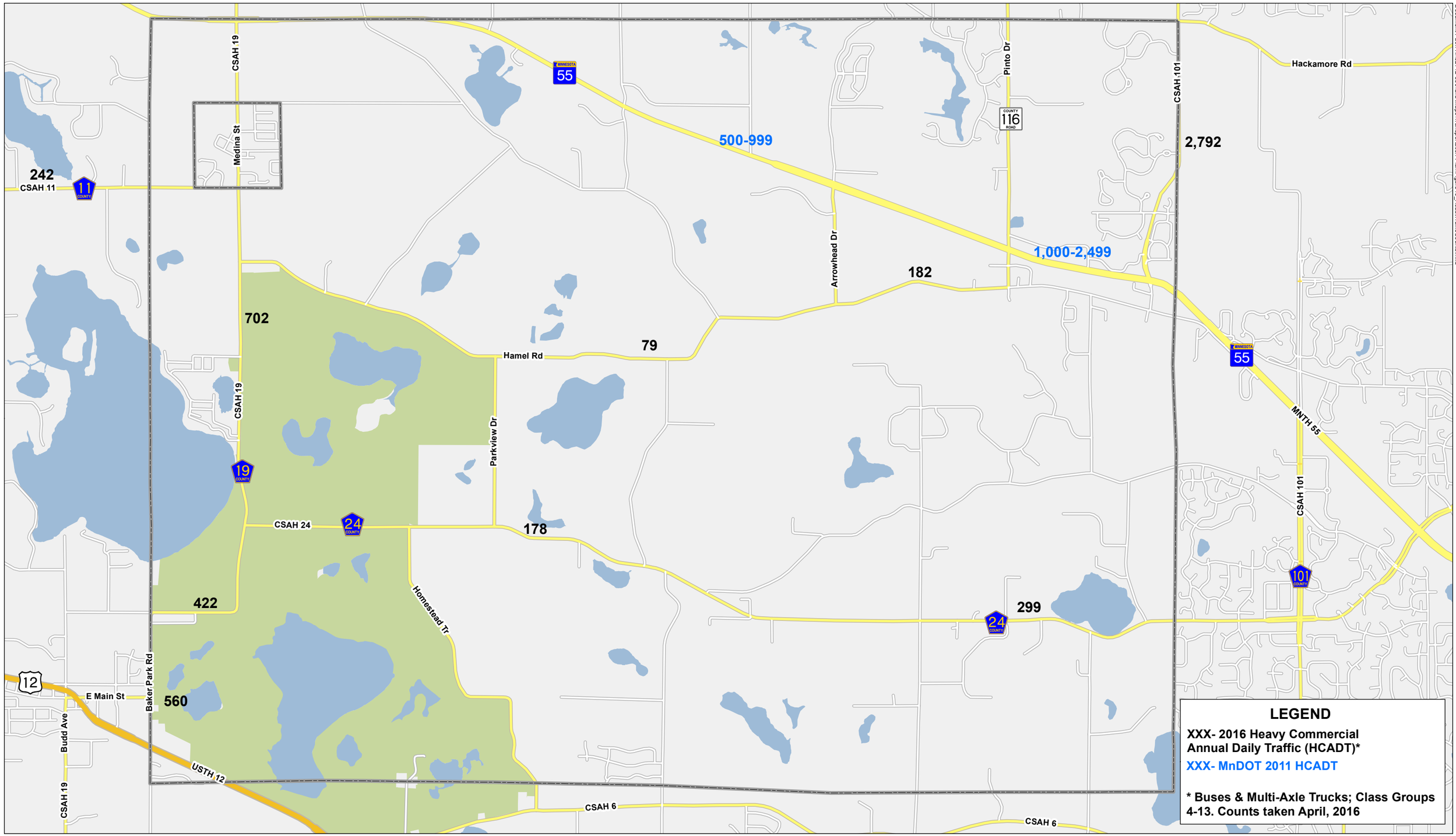

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CITY OF MEDINA

Figure 10-10: Heavy Commercial Vehicle ADT
Medina Transportation Plan
Medina, MN

N

0 3,500 Feet

WSB

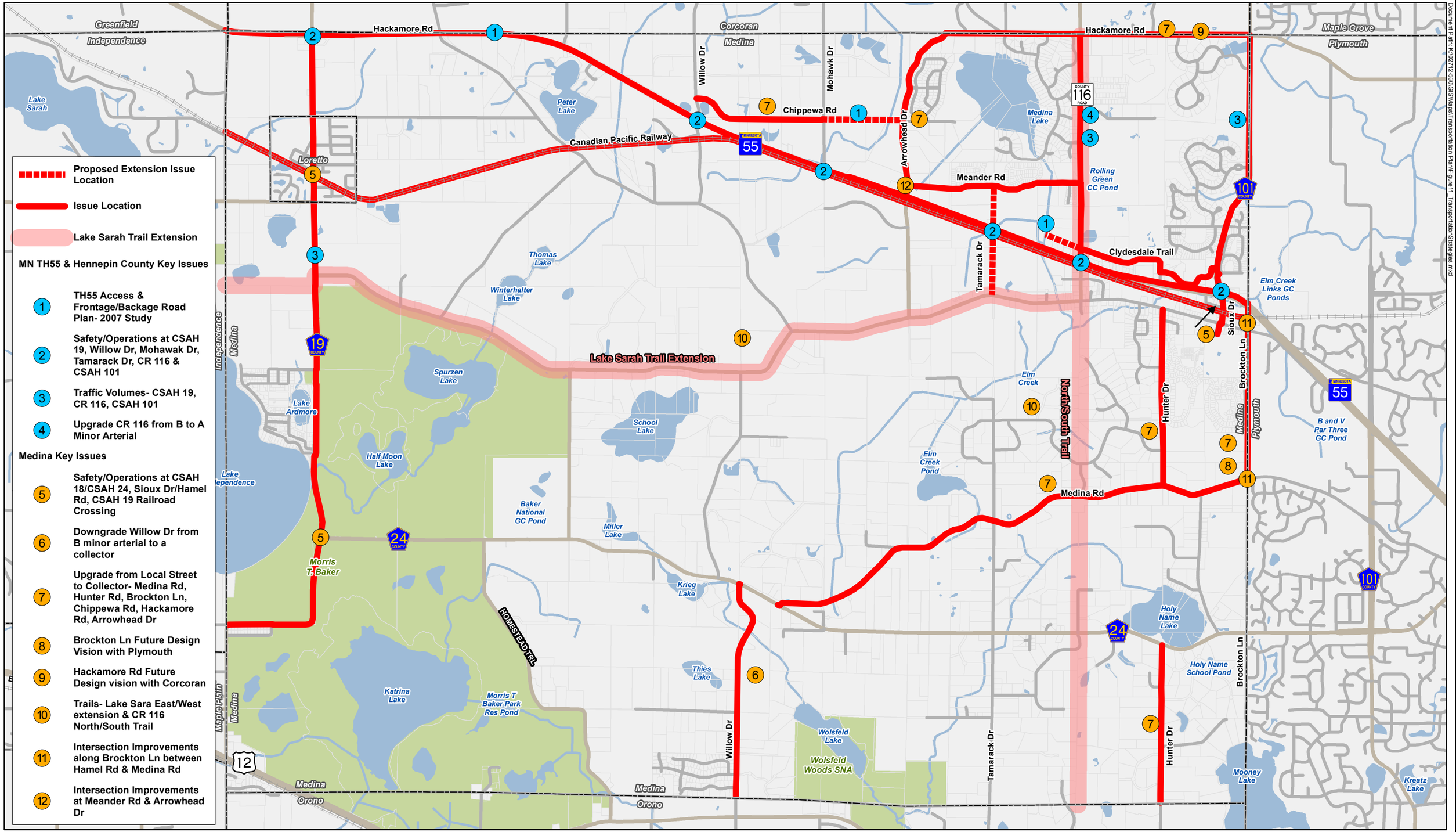

Figure 10-11: Executive Summary of Transportation Strategies
Medina Transportation Plan
Medina, MN

CITY OF MEDINA

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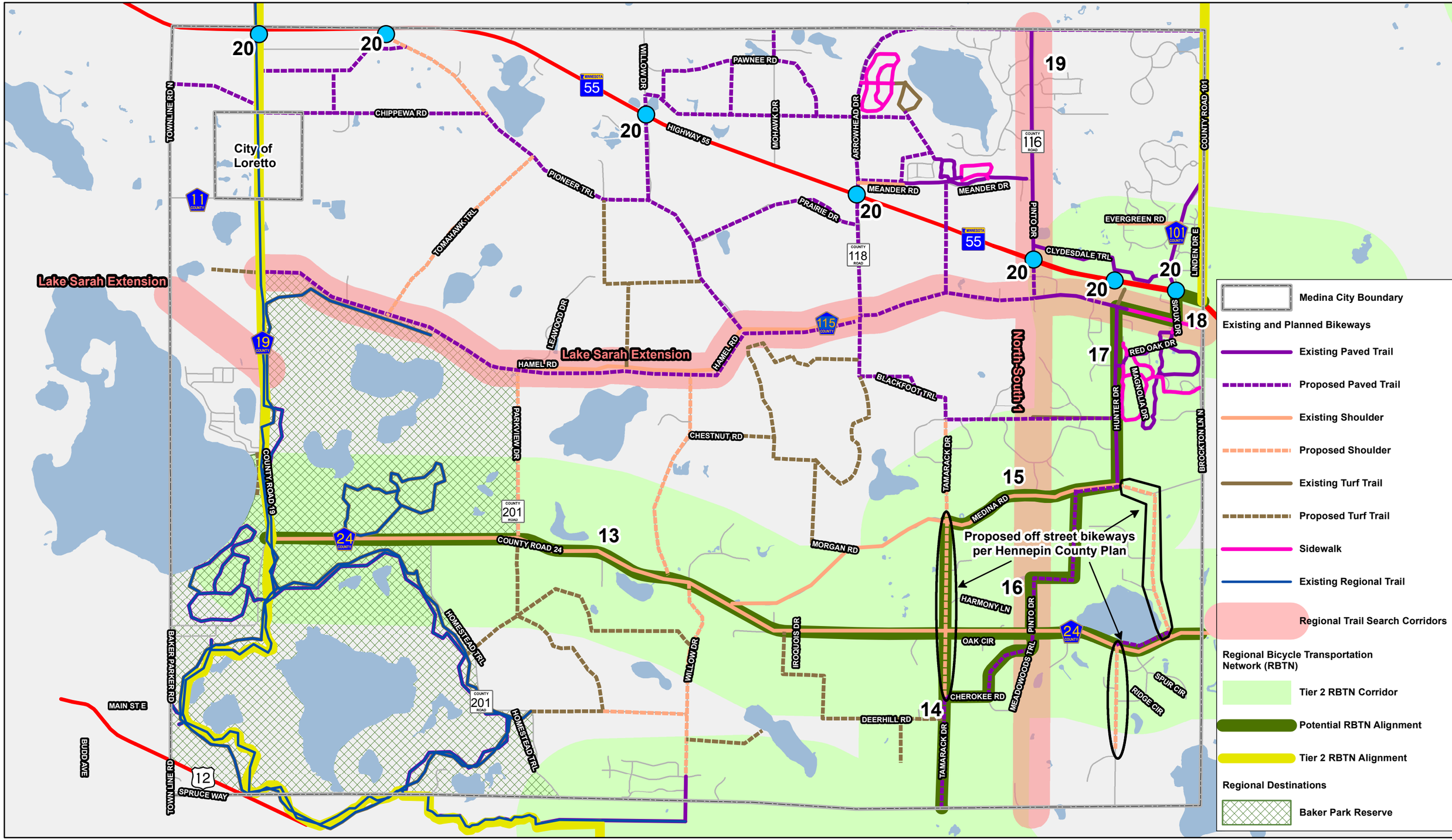

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CITY OF MEDINA

Figure 10-12: Bicycle and Pedestrian Strategies
Medina Transportation Plan
Medina, MN

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