



Ramsey Gateway Highway 10 Project

Existing Conditions Memorandum

Final Draft - March 8, 2019



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I. Introduction

A. Study Purpose

The City of Ramsey, in partnership with Anoka County and MnDOT, has begun an effort to continue to advance improvement plans for Highway 10. Prior to 2014, Highway 10 was studied numerous times over the previous decades, each time furthering the planning for conversion to a full freeway. Traffic volumes and safety concerns warranted a freeway as the proper vision for this corridor. However, current overall state and federal funding levels make it difficult to achieve the vision of a freeway facility on this portion of Highway 10 within the next 20 years. MnDOT, Anoka County and the cities of Ramsey and Anoka realized the price paid for waiting for funding to construct expensive, comprehensive improvements would be continued congestion, numerous conflict points, and continued severe and fatal crashes. The 2014 Highway 10 Access Planning Study identified multiple high-benefit improvement options that are fiscally responsible so that improvements can be funded, programmed, and implemented incrementally.

Since 2014, the City of Ramsey has continued investment and progress in the Highway 10 corridor through completion of multiple frontage road segments. The City and its partners recognize the time is right to continue this momentum by taking the next step to evaluate the multiple combinations of improvement options recommended in the Highway 10 Access Planning Study. The goal of the Ramsey Gateway Project is to develop a single corridor plan for Highway 10 improvements in Ramsey and an implementation schedule to phase improvements into right-size, achievable projects that can be funded through various sources over time.

The goals of the study are to:

- understand the needs and opportunities
- establish goals and objectives
- develop and evaluate alternatives
- reach a consensus on a recommended corridor plan, and
- develop an implementation plan.

The purpose of this memo is to document existing conditions and issues within the project area identified through a technical analysis of land use, pedestrian and bicycle usage, environmental and cultural resources, and traffic and safety operations. This analysis uncovered several key findings that will be documented in a purpose and need framework and used to guide the development of project goals and objectives as well as the development and evaluation of improvement alternatives.

B. Study Area

Figure 1 illustrates the study area which includes Highway 10 from the Ramsey/Elk River border (west extent) to the Ramsey/Anoka border (east extent). It also includes areas north and south of Highway 10 between Bunker Lake Boulevard (County State Aid Highway (CSAH) 116) and the Mississippi River. Below are some of the key components of the study area:

- **Functional Classification** – Highway 10 is a principal arterial that provides a significant transportation connection from Minneapolis-St. Paul to St. Cloud and Greater Minnesota.



Highway 10 serves as a primary route to northern Minnesota and its tourism industry. Three minor arterial county highways connect to Highway 10 in the study area and include: Armstrong Boulevard (CSAH 83), Ramsey Boulevard (CSAH 56), and Sunfish Lake Boulevard (County Road (CR) 57).

- **Average Daily Traffic (AADT)** – Highway 10 carries an average of 35,000 – 50,000 trips per day
- **Regional/Commuter Connection** – 53% trips in the AM and 48% in the PM pass through Ramsey on Highway 10 without stopping. Highway 10 serves as a major commuting route into and out of the core Twin Cities metro region for large portions of Anoka, Sherburne and Wright Counties. In addition, Highway 10 is one of a few key routes that connects the Twin Cities Metro Area to northern Minnesota. Because of this connection, demands on Highway 10 exceed traditional weekday peak hour travel and include weekends during the summer/fall tourism season as well. For example, on average westbound Highway 10 traffic on Fridays during the summer is 7% higher than a typical weekday and eastbound traffic on Sundays is on average 25% higher than Sundays during non-summer months.
- **Roadway Design** – Highway 10 is a four-lane divided highway with a rural section (no curb and gutter) and a speed limit of 65 mph throughout the extent of the project area.
- **Landscaping** features along the highway are sparse and limited. Medians are grass. Roadside features are typically grass with a few sporadic trees.

II. Relevant Plans and Projects

A. Relevant Plans and Funded Projects

Previous to the 2014 Highway 10 Access Planning Study several State, County, and City plans had been consistently planning for future interchanges, additional local roads, and highway access closures that support conversion of Highway 10 to a freeway facility. This planning dates back to the 1999 Statewide Interregional Corridor Plan in which MnDOT identified Highway 10 through Ramsey as part of the high priority interregional corridors within a 2,900-mile system connecting major regional centers around the state.

In 2009/2010 financial realities and other constraints determined that funding the freeway vision, in the near future, would be difficult thereby leading the Metropolitan Council and MnDOT to shift their investment strategy to focus on lower-cost, high-benefit solutions. The 2014 Highway 10 Access Planning Study successfully responded to the shift in investment by developing lower-cost, high-benefit improvement options for the Cities of Ramsey and Anoka.

The following are highlights of planning directions from the Highway 10 Planning Study relevant to Highway 10 within the City of Ramsey:

- At-grade intersection alternatives and local frontage road connections were recommended from Jarvis Street to the Armstrong Blvd (CSAH 83) interchange.
- The realignment of Highway 10 between Ramsey Boulevard and Sunfish Lake Boulevard, with the construction of a northern frontage road, has been identified as an immediate priority for the Highway 10 Corridor and the City of Ramsey. The extension of the northern frontage road would connect Sunfish Lake Boulevard to Anoka Technical College in the City



of Anoka. This project would provide a local connection from Ramsey to this regional destination, removing local trips from Highway 10.

- Long term planning, or beyond 10 years, would include providing grade separations at Sunfish Lake Boulevard and Ramsey Boulevard intersections.
- As safety demands and opportunity presents itself, the following projects were also recommended for consideration:
 - Extension of Veterans Drive north of Highway 10, creating a continuous frontage road
 - Railroad underpasses at Sunfish Lake Boulevard and Ramsey Boulevard

The following are planning direction or policy highlights from other relevant long-range city, county, and state plans:

City of Ramsey 2040 Comprehensive Plan Update (2018)

- Planned future land uses along the Highway 10 corridor are diverse, ranging from low density residential to commercial to park space. The construction of a business park is a key goal for the City moving forward, as well as removing blight and public nuisances along the corridor.
- The COR (Center of Ramsey) is a mixed-use development surrounding the Ramsey Northstar Transit Station along Highway 10 between Ramsey Boulevard and Armstrong Boulevard. The area is about 50% developed (as of 2018) and is expected to see considerable development over the next 10 years. Planned development is expected to be a combination of office, retail, and public uses.
- The City has identified creating both a corridor and a traffic plan for Highway 10 as a key strategy to improve safety and mobility on the Highway. These strategies include establishing a stakeholder group. The city's priorities at this time include the following:
 - Full Access Grade-Separated Interchange at Sunfish Lake Boulevard/CSAH 57
 - Full Access Grade-Separated Interchange at Ramsey Boulevard/CSAH 56
 - Reduced Conflict U-Turn Intersection at Bowers Drive
 - Reduced Conflict U-Turn Intersection at Alpine Drive
 - Removal of uses on the north side of U.S. highway 10/169 west of Ramsey Boulevard
 - Pedestrian Bridge on Central Anoka County Regional Trail at Northstar Commuter Rail – Ramsey Station
 - Frontage Roads to support interchange and removal of private, direct accesses on U.S. Highway 10/169

Anoka County 2040 Transportation Plan (2018)

- The Highway 10 intersection with Sunfish Lake Boulevard is one of the top 10 high crash locations in the County, demonstrating the need for safety improvements. The intersection of Highway 10 and Ramsey Boulevard is 26th is also on the high intersection crash list.
- In modeling 2040 traffic volumes and highway network, the County modeled two scenarios – one baseline and an alternative where US Highway 10 is converted to a freeway. The alternative analysis showed that much of the traffic using adjacent, parallel routes to avoid



congestion would instead remain on Highway 10, alleviating traffic on county and local roads.

Met Council and MnDOT Principal Arterial Intersection Conversion Study (2017)

- Study considered needs at intersections on non-freeway principal arterials, like Highway 10, to set priorities for grade separations.
- High-priority intersections are those that often exhibit needs that can justify high-capacity at-grade improvements or grade-separation. Highway 10/Sunfish Lake Boulevard was identified as a high-priority intersection.
- Low-priority intersections generally do not require major changes or projects based on current demand and any problems can most likely be addressed with at-grade projects. However, some low-priority intersections are located on corridors near medium- and high-priority intersections or may be in growth areas. Highway 10 at Ramsey Boulevard was identified as a low-priority intersection.

MnDOT Rail & Safety Coordination

- MnDOT does not specifically rank railroad grade separation priorities, but to identify a tier of initiatives, they consider project readiness, available funding streams, and constructability as the driving factors that would lead to project construction.
- With that understanding, the MnDOT rail safety department, has identified both Ramsey Boulevard (second place) and Sunfish Lake Boulevard (third place) as in the top tier of currently unfunded railroad grade separations.
- Ferry Street (TH 47) is currently at the top of the tier because of a recent feasibility study and current political efforts.

B. Funded Projects

It is anticipated that by 2022 the following funded projects will be under construction. Each is described below and have been incorporated into the future traffic operations analyses.

1. **Anoka Highway 10 Project** is planned to begin in 2022. Project elements include (see **Appendix B**):
 - Thurston Avenue traffic signal will be removed and replaced with an interchange
 - Fair Oak Avenue traffic signal will be removed and replaced with an underpass
 - West Main Street will be extended
 - All other access points on the highway within the project area will be removed
 - Local frontage roads will be improved to provide connectivity for local trips
2. **Elk River Highway 169 Freeway Vision** was recently awarded funding through the Corridors of Commerce program. See **Appendix B** for the preferred alternative that transitions Highway 169 from the existing at-grade expressway facility to a limited access grade-separated freeway facility between Highway 10 in Elk River and CSAH 4 in Zimmerman, including redesign of Highway 10/101/169 system interchange. The project also includes improvements to Highway 101 from Highway 169 in Elk River to CSAH 39 in Otsego, with reconstruction of the Highway 101 bridge over the Mississippi River. A system of interchanges, overpasses, and frontage/backage roads will replace existing at-grade intersections. Interchanges will be constructed at the following locations: Main Street,

School Street, Jackson Avenue/193rd Avenue/197th Avenue, and 221st Avenue in Elk River; at CSAH 25/19 in Livonia Township; and at CSAH 4 in Zimmerman. This project will result in consolidation and closure of other access locations along Highway 169. Additionally, the City of Ramsey secured \$3.5M for design of railroad grade separation at Ramsey Blvd. The timing of construction is unknown but will be considered along with roadway improvements in this study.

C. Other Relevant Projects

1. The Anoka County 2040 Transportation Plan identifies a potential **turnback of CSAH 5** from CR 57 to Highway 47. This is identified as a long-term potential jurisdictional transfer in the year 2030+. The city has expressed the desire to jointly complete a corridor study to achieve a long-term plan prior to any potential jurisdictional transfer of this corridor south/east of Sunfish Lake Boulevard/CSAH 57. The Ramsey Gateway Project will consider this turnback as traffic forecasting is completed to identify any potential impacts on Ramsey Boulevard and Sunfish Lake Boulevard traffic patterns.
2. A **potential future Dayton-Ramsey river crossing** has been previously discussed for many years. Ramsey's Transportation Plan aligns Armstrong Boulevard/CSAH 83 to serve as the corridor for the future Mississippi River Crossing, and coincides with Zanzibar Lane in the City of Dayton. MnDOT and the communities are no longer identifying right-of-way preservation for this river crossing due to lack of available funding. The timeframe for implementing this future river crossing is beyond the 2045 planning horizon of the Ramsey Gateway project. Therefore, the crossing is not included in the 2045 traffic forecasting assumptions.
3. The proposed **Regional Mississippi Skyway Multiuse Bridge** (see *Appendix B*) is an extension of an existing skyway that connects over Veteran's Drive between an 800-stall public parking ramp and the rail station. The proposed pedestrian and bicycle bridge would establish a new north-south bikeway across Highway 10 in the center of Ramsey, consistent with a planned regional bikeway. Anoka County worked jointly with the city to realign the Central Anoka County Regional Trail to utilize the bridge to safely connect CSAH 116 (Bunker Lake Boulevard), the Ramsey Northstar Station, and the MRT – through the center of the COR. The schedule for developing the proposed pedestrian and bicycle bridge is unknown and will depend upon funding availability.
4. The **Resilient Communities Project (RCP)** is a program at the University of Minnesota's Center for Urban and Regional Affairs (CURA) that connects University faculty and students with Minnesota communities to address strategic projects that advance local resilience and sustainability. The RCP partnered with City of Ramsey Staff and community stakeholders to study Highway 10 Corridor Planning issues and needs. The goal of the project was to assist with ongoing development of the City's U.S. Highway 10 Corridor Plan by assessing potential future land uses in the corridor, investigating incentive-based approaches to encourage building and site improvements, and identifying existing and emerging models for multimodal highway corridor planning.
5. In 2016, a joint study for **Trunk Highway 47** was initiated covering the cities of Ramsey and Anoka. This plan was never fully adopted, and many of these alternatives are no longer valid. The city recommended Anoka County take the lead on reviving this study in 2019 to advance alternatives. Recently, Anoka County applied for STIP funds for the intersection of



Bunker Lake Boulevard/CSAH 116 and Saint Francis Boulevard/TH 47. The results of the application are unknown at this time.

III. Demographics

The City of Ramsey had a population of 18,510 at the 2010 US Census reporting period. The American Community Survey (ACS) estimates the 2016 population at 26,251. Based on forecasts by the Metropolitan Council, the 2040 population of Ramsey is projected to be approximately 35,000.

The Minnesota Department of Employment and Economic Development (DEED) estimates approximately 6,334 jobs exist in the City of Ramsey as of 2016.

General demographic information from the City's Draft 2040 Comprehensive Plan is summarized below in *Table 1* below:

Table 1. Ramsey Population and Employment Information

		2016	2020	2030	2040 Forecast	2040 Amended Request
Households		8,973	9,500	11,500	13,000	13,500
Population		26,251	27,550	33,350	34,700	39,150
Employment		6,334	6,900	7,800	7,600	8,400

The City of Ramsey and Metropolitan Council are currently working on developing an agreement for 2040 population, households and employment forecasts. Both agree the 2040 forecasts are likely low based on the rate of recent growth. The 2040 amended request forecasts are the latest proposed by the City and are awaiting Metropolitan Council approval.

Figure 2 shows Ramsey as having areas of medium to high population density by 2040 as identified by the Anoka County 2040 Transportation Plan.

Elk River is located adjacent to the western portion of the study area and is projected to see significant growth over the next few decades as well. Elk River's 2015 population was 23,172 and is projected to grow to 34,890 by 2035. Sherburne County as a whole has also experienced unprecedented growth over the past decade and is projected to continue to grow from a county population of 88,499 to 122,000 by 2030, according to the County's Comprehensive Transportation Plan.

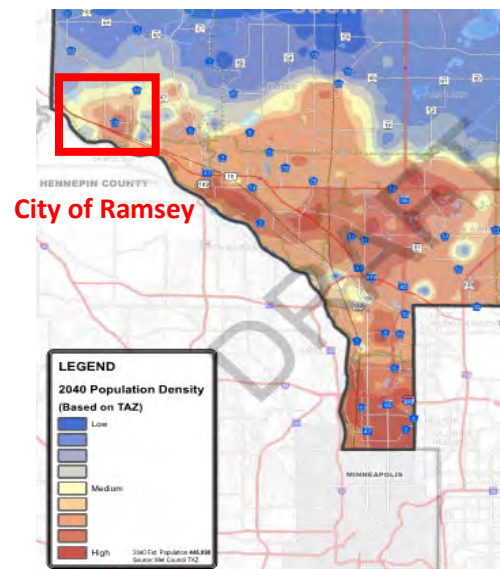


Figure 2 - Anoka County 2040 Population Density

IV. Land Use

Existing and future land uses in the study area are shown on *Figures 3 and 4*, and described below.

A. Existing Land Use

Ramsey

The City of Ramsey encompasses approximately 29 square miles, approximately 8,000 acres of land is developed with over 1,000 acres of land open for development as per the City's Draft 2040 Comprehensive Plan. Land use along the Highway 10 Corridor ranges from commercial, industrial, and institutional in the more densely developed east and central segments to commercial development interspersed with agricultural uses and open space in the west. Residential uses exist immediately beyond the commercial and industrial uses both north and south of the corridor. A large, centrally located, portion of land north of the corridor and the railroad is undeveloped.

While planning for a conversion of Highway 10 to a freeway, the city had completed several plans, adopted official maps and advanced the purchase of over \$8 million worth of right-of-way needed for access improvements and expansion of Highway 10. Properties purchased by the City of Ramsey through the Metropolitan Council's Right-of-Way Acquisition Loan Fund (RALF) for future Highway 10 related right-of-way needs are illustrated in *Figure 5*. Many businesses and potential developers interested in property along Highway 10 in Ramsey are uncertain whether or not to invest further into these areas until right-of-way needs for future roadway improvements are known.

Elk River

Existing land uses along Highway 10 in Elk River (adjacent to the study area) include a mix of highway business, industrial, undeveloped lands and rural residential units along the river.

B. Future Land Use

The future (planned) land use map is referenced from the City of Ramsey 2040 Comprehensive Plan Update and illustrates several proposed shifts in land use.

1. Beginning on the eastern end of the corridor, the map identifies a shift from commercial to business park and also conversion of low density residential and undeveloped land to mixed use.
2. The property containing the manufactured home park is guided for commercial use.
3. The centrally located, undeveloped land north of the corridor is guided for mixed-use development from its current undeveloped state.
4. Current agricultural uses south of the corridor on the western end are guided for low density residential and some mixed-use.
5. A shift from agricultural to business and medium density residential is identified north of the corridor on the west end.

Opened in the fall of 2012, the Ramsey station on the Northstar Commuter Rail line is just north of the corridor between Armstrong Boulevard and Ramsey Boulevard became the catalyst for a large amount of ongoing development and potential redevelopment on the west side of the city. The



COR development is a 400-acre area which is planned to include residential, commercial, retail, educational, and recreational land uses. It is intended to serve as the downtown of Ramsey. A conceptual map of the COR development developed by the City of Ramsey is attached in **Appendix B**. Development of the COR site is underway, including government, commercial, and residential buildings. *Table 2* breaks down the City projections for land use development for the full COR site:

Table 2. Planned Land Use in COR Site

Use	Acres
Parks and amenities	45
Retail	70
Mixed Use	28
Business Park	15
Residential	16
Other Commercial	30
Other Residential	27
<i>Total Developable</i>	231

The 2040 Draft Comprehensive Plan notes The COR development status is; 70% of residential units built, 35% of office built, 15% of retail built, and 35% of public spaces built.

Elk River

Future land use along the portion of Highway 10 in Elk River adjacent to the study area is projected to continue to see highway business and industrial uses along with low-density residential uses near the river. City of Elk River staff report this area is outside of the city's current sewer capacity service area and therefore will be limited in development density until it can be served at a future date.

V. Environmental Screening

A social, environmental, and economic (SEE) scan of the study area was conducted to identify existing built and natural resources that require consideration as transportation alternatives are developed and evaluated. This scan was conducted to identify issues at a screening level and to document big picture or fatal-flaw constraints that may influence development of alternatives.

A. Cultural Resources

MnDOT's Cultural Resource Unit was contacted to provide a historical/archaeological review of the project area. A preliminary literature review identified the following archaeology and architectural history resources within the study area:

1. A survey conducted by the 106 Group in 2008 recommended that the St. Paul & Northern Pacific Railroad/BNSF Railroad - Sauk Rapids to Minneapolis (SHPO no. AN-RMC027) is eligible for the National Register of Historic Places (NRHP) for its significant role in the development of the railroad transportation system in Minnesota.
2. There are 20+ properties known to be of historical significance within the project area according to the State Historic Preservation Office (SHPO) database. *Figure 6* illustrates



these locations including locations with the following historical contexts:

- a. Early Agricultural and River Settlement 1840 -1870
- b. Railroad Development in Minnesota 1862 – 1956
- c. Railroads and Agricultural Development 1870 - 1940

It is possible that additional survey and evaluation efforts may be needed to understand the potential for impacts to these resources with individual projects.

B. Environmental Justice

Oak Terrace Estates, a manufactured home park, is located at Highway 10 and McKinley Street and represents potential for low income and/or minority populations. Population statistics are aggregated to the "Place" level limiting the extent to the entire city of Ramsey. The city exhibits the following characteristics; 8.8% of the population is 65 and over and 8.5% of the population is non-white. Any potential impacts to environmental justice populations will be considered in future environmental review.

C. Parks and Recreation Areas (Section 4f/6f Resources)

1. Section 4(f) resources in the Study Area are shown on *Figure 6* and include parks and recreation areas, school playgrounds, wild and scenic rivers, trails, and public golf courses.
2. One Section 6(f) resource lies adjacent to the southeast edge of the Study Area as shown on *Figure 6*. These recreational facilities have been funded with Land and Water Conservation (LAWCON) funds and/or state recreation grant funds from the Minnesota Department of Natural Resources (MNDNR) requiring compliance with LAWCON grant guidelines, including sole use for outdoor recreation. Conversion from recreational use requires replacement. The Mississippi River Community Park is the only Section 6(f) property near the project area located in the city of Anoka.

D. Water Resources

The Mississippi River within the Study Area is part of the Mississippi National River & Recreational Area (MNRRA) Critical Area Corridor. The MNRRA is administered by the National Park Service with oversight of the Minnesota Critical Area delegated to the Minnesota Department of Natural Resources (MNDNR). Local units of government within the critical area are required to adopt critical area plans and regulations that comply with state critical area standards and guidelines. Local critical area plans and ordinances are subject to the review and approval of the MNDNR and the Metropolitan Council. See *Figure 7* for illustrated water resources and protected waters in the study area.

Wetlands and surface water resources in the Study Area are shown on *Figure 7*. There are no large lakes within the Study Area. However, wetland habitat, including Public (Protected) Waters and Protected Water Wetlands, is extensive throughout the northern portion of the Study Area and along the riparian river corridors. The developed areas immediately along the Highway 10 corridor have little remaining wetland habitat.

E. Wells and Potential Contamination

1. Known history of contamination in the project area. MPCA "What's in My Neighborhood?"



sites that are located near the corridor can be seen in *Figure 8*. More detailed investigations may be recommended for properties with existing/past land uses that may have used hazardous/chemical waste as improvement projects are identified.

2. The Study Area is located in the Anoka Sand Plain, characterized by thick surface deposits of sand and gravelly sand providing a ready supply of groundwater for irrigation and a drinking water supply. The City of Ramsey has two Wellhead Protection Areas (WHPA) in the project area as well as the city's Drinking Water Source Management Area (DWSMA). *Figure 8* shows these areas and the existing wells in the Study Area.

F. Utilities

Public and private utilities are located throughout the project area. Common utilities in the project area include phone, electric, gas, water, storm sewer, sanitary sewer, and cable television. Utility information will be considered as alternatives are developed and evaluated.

G. Natural Plant Communities

1. Several Regionally Significant Ecological Areas (RSEAs) have been identified in the Study Area as shown on *Figure 6*. GIS data delineating MNDNR, Division of Wildlife Management Areas (WMA) show that WMA's are non-existent within the project area.
2. The project area is generally dominated by developed industrial and commercial uses with altered vegetation. One MnDNR Native Plant Community is located south of the project corridor on an island on the Mississippi River which is unlikely to be affected by corridor improvements. This can be seen in *Figure 6*.

H. Air Pollution

The project area is located in a Maintenance Area for Carbon Monoxide (CO) and Sulfur Dioxide (SO₂). The area is in attainment for the other four criteria pollutants (O₃, NO₂, lead, and particulate matter).

I. Noise

There are several potential noise receptors adjacent to the corridor consisting of single and multi-family residential (including a manufactured home community), recreation areas, Section 4(f) sites, among others. Potential noise receptors were identified using criteria outlined in the Analysis and Abatement Guidance for Highway Traffic Noise Regulation provided by the Federal Highway Administration (FHWA). Potential noise receptors are illustrated in *Figure 6*. The need for a noise analysis will be determined once individual improvement projects are identified.

J. Wildlife, Threatened and Endangered Species

The US Fish and Wildlife Service (USFWS) identifies two federally protected species known to be in all MN counties that require review and potential mitigation per USFWS guidance. Species include the northern long-eared bat and the rusty-patched bumble bee. Various other rare species are also present near the corridor as identified through the Natural Heritage Information System (NHIS) maintained by the MnDNR.

VI. Existing Traffic Conditions

Traffic operations and safety existing conditions along TH 10 are documented in detail in a project memorandum located in **Appendix C, Ramsey Highway Existing Traffic Conditions Memo**. Key points from the memo are provided below.

A. Function

Highway 10 throughout the City of Ramsey is classified as a Principal Arterial. It provides direct and relatively high-speed service for vehicles. The existing AADT ranges from 35,000 vehicles on the west end and 51,000 vehicles per day on the east end of the City of Ramsey. To the east Highway 10 in Anoka is planned to be converted from an expressway to a freeway in 2022 with the grade separation of Fair Oak Avenue and Thurston Avenue at Highway 10. To the west of the project in Elk River TH 169 is also planned to be converted to a freeway.

B. Access Inventory

The number of access points along Highway 10 is greater than what is allowed by MnDOT's access spacing guidelines for principal arterials. There is a direct relationship between the density of access points and the safety of an arterial corridor. Currently, there are a total of 73 accesses along the study corridor, impacting the safety and mobility of the corridor. A total of 55 properties have direct access to Highway 10, some with multiple access points to the highway.

Highway 10 is defined as a Non-Interstate Freeway throughout the study area according to the Minnesota Department of Transportation (MnDOT) Access Management Manual. A Non-Interstate Freeway Corridor is identified as Category 1AF based on the functional classification of the roadway. A primary intersection refers to a junction between two roads in which all movements are maintained. The recommended minimum spacing between two at-grade, full movement intersection on a 1AF highway is one mile. The desirable spacing between an at-grade intersection and the merge point of the closest ramp should be a minimum of one-half mile. *Table 3* displays the existing primary intersections and which ones meet spacing requirements.

Table 3. Distance Between Primary Intersections

Primary Intersections	Miles	Meets Spacing Recommendation
Jarvis St to Alpine Dr	0.44	No
Alpine Dr to Bowers Dr	1.01	Yes
Bowers Dr to Armstrong Blvd	1.15	Yes
Armstrong Blvd to Ramsey Blvd	1.20	Yes
Ramsey Blvd to Sunfish Lake Blvd	1.09	Yes

A secondary intersection refers to a junction between a major road and a minor road or a local street and are located between primary intersections. Interim spacing requirements for a Category 1AF roadway in transition does not specifically recommend secondary intersection spacing so these intersections were evaluated using a spacing of ½ mile. Tables 4 and 5 below show the what spacing recommendations are met throughout the corridor for secondary intersections.

Table 4. Distance between Secondary Intersections (Eastbound)

Secondary Intersections	Distance Between Secondary Intersections	Category 1B
Jarvis St - Adams St (Full Access)	0.25	FAIL
Adams St (Full Access) - Alpine Dr	0.20	FAIL
Alpine Dr – 153 rd Ave (Full Access)	0.20	FAIL
153 rd Ave (Full Access) - Beatty St (Full Access)	0.55	PASS
Beatty St (Full Access) - Bowers Dr	0.30	FAIL
Bowers Dr - Farmer Access (Full Access)	0.10	FAIL
Farmer Access (Full Access) - Armstrong Blvd	1.10	PASS
Armstrong Blvd - Ramsey Blvd	1.15	PASS
Ramsey Blvd - Feldspar St (3/4 Access)	0.55	PASS
Feldspar St (3/4 Access) - Dolomite St (RIRO)	0.15	FAIL
Dolomite St (RIRO) - McKinley St Median Opening	0.10	FAIL
McKinley St Median Opening - Sunfish Lake Blvd	0.25	FAIL
Sunfish Lake Blvd - Tungsten St (RIRO)	0.25	FAIL
Tungsten St (RIRO) - Business Access (Full Access)	0.14	FAIL

Table 5. Distance between Secondary Intersections (Westbound)

Secondary Intersections	Distance Between Secondary Intersections	Category 1A
Business Access (Full Access) - Sunfish Lake Blvd	0.40	FAIL
Sunfish Lake Blvd - Oak Terrace Median Opening	0.25	FAIL
McKinley St (Full Access) - Feldspar St (3/4 Access)	0.30	FAIL
Feldspar St (3/4 Access) - Ramsey Blvd	0.55	PASS
Ramsey Blvd - Armstrong Blvd	1.15	PASS
Armstrong Blvd - Farmer Access (Full Access)	1.10	PASS
Farmer Access (Full Access) - Bowers Dr	0.15	FAIL
Bowers Dr - Beatty St	0.25	FAIL
Beatty St - 153 rd Ave (Full Access)	0.55	PASS
153 rd Ave (Full Access) - Alpine Dr	0.20	FAIL
Alpine Dr - Adams St (RIRO)	0.20	FAIL
Adams St (RIRO) - Jarvis St	0.25	FAIL

Only four of 14 distances between the secondary intersection along eastbound Highway 10 meet the spacing recommendation. Only four of 12 distances between the secondary intersection along westbound Highway 10 meet the spacing recommendation.

A gap analysis was completed for the secondary intersection along the Highway 10 corridor according to the procedure provided in the MnDOT Access Management Manual. Secondary intersections that are shown to have low risk may be maintained. The results show that the business access is a high-risk intersection along both eastbound and westbound Highway 10. Intersection sight distance was also analyzed at the secondary intersections. All intersections met the necessary sight distance.

Both primary and secondary intersections were analyzed to determine if recommended spacing from the intersection to the closest driveways are satisfied. Driveways lying within any of these distances are within the intersection functional area meaning safety may be compromised. Due to the high number of accesses along this corridor, most locations have a least one failing spacing distance due to one or more driveways being placed too close. Future designs should attempt to relocate, combine, or eliminate driveways as recommended by the MnDOT Access Management Manual.

C. Safety Analysis

Crash History

A crash review was completed for the intersections in the project area for the previous five years (2013-2017). *Figure 9* summarizes all of the crashes in the project area. There was a total of 277 crashes along Highway 10 within this timeframe. Rear end crashes were the most common accounting for 158 of the 277 total crashes. These rear end crashes are likely caused from queueing along Highway 10 at the Ramsey Blvd and Sunfish Lake Blvd signals.

The observed crash rate at the TH 10 and Sunfish Lake Blvd intersection exceeded the statewide average. Over the past five years there have been 89 crashes that have occurred at this intersection. Rear end crashes were the most common at the intersection with 64 of the 71 rear end crashes occurring along Highway 10. These rear ends are likely caused from excessive queuing at the signal. The observed crash rate was found to be 0.89. The state-wide average for similar intersections is 0.45 which indicates that the crash rate at TH 10 and Sunfish Lake Blvd is almost twice the average. The critical index was found to be 1.41 which shows that the intersection is operating outside the normal range when compared to similar intersections statewide. The number of crashes at this intersection would need to be reduced by 25 crashes over a five-year period to perform within the normal range.

The crash issue at TH 10 and Sunfish Lake Blvd is anticipated to get worse with the completion of the grade separations of TH 10 at Fair Oak Ave and Thurston Ave in Anoka. A five-year analysis (2011-2015) at the intersections of TH 10 at Fair Oak Ave and Thurston Ave was completed with the TH 10 Improvements project. This analysis showed that there were 192 rear end crashes at Fair Oak Ave and 76 rear end crashes at Thurston Avenue. Once the project in Anoka is completed Sunfish Lake Blvd will be the first signal for westbound traffic which would likely shift these rear end crashes to the TH 10 at Sunfish Lake Blvd intersection.

Fatal Crashes

A ten-year crash analysis (2008-2017) was also completed for fatal crashes throughout the project area. It was found there were five fatal crashes. Two of the fatalities were vehicular crashes. One was a left turn crash located at the intersection of Highway 10 at Alpine Drive. The other was a

right-angle crash at the intersection of Highway 10 and McKinley St. There were three fatal pedestrian crashes between 2008 and 2017. These crashes took place at the intersections of Highway 10 and Ramsey Blvd, Highway 10 at Sunfish Lake Blvd and at the business access along Highway 10 between Sunfish Lake Blvd and Thurston Avenue that provides access to Two Rivers Vineyard & Winery, Signs by RSG and Lano Equipment.

Bicycle and Pedestrian Crashes

Bike and pedestrian crashes were analyzed over a five-year period (2013-2017). There was one non-incapacitating injury pedestrian crash at the intersection of Ramsey Blvd and Bunker Lake Blvd. There were two bicycle crashes recorded. One was a property damage crash at the intersection of Sunfish Lake Blvd and Bunker Lake Blvd and the other was a non-incapacitating injury crash at the intersection of Armstrong Blvd and Alpine Dr. Additionally, there were three right angle crashes at Armstrong Blvd and Alpine Dr that were noted to be caused by vehicles avoiding hitting a pedestrian in the crosswalk.

D. Existing Traffic Conditions

Figure 10 shows the existing peak hour turning movement counts. Existing traffic volumes for the area were collected in May of 2018 for all intersections except Highway 10 at Sunfish Lake Blvd and Highway 10 at Ramsey Blvd which were collected in May 2017 for the Highway 10 Improvements project in Anoka. The AM and PM peak periods were found to be 7-8 AM and 4:15-5:15 PM, respectively.

A level of service (LOS) analysis of the peak hours was completed using the existing turning movement counts. The LOS results are based on average delay per vehicle. Intersections and each intersection approach are given a ranking from LOS A through LOS F. LOS A indicates the best traffic operation, with vehicles experiencing minimal delays. LOS A through D is generally perceived to be acceptable to drivers. LOS E indicates that an intersection is operating at, or very near, its capacity and that drivers experience considerable delays. LOS F indicates an intersection where demand exceeds capacity and drivers experience substantial delays.

The existing AM and PM peak traffic volumes were analyzed with the current geometry along Highway 10. Operational results for the major intersections in the project area along Highway 10 are shown in *Table 6* on the next page and described further in the text that follows.

Table 6. Existing (2018) No-Build Operational Analysis

Location	Peak Hour	Intersection Delay- LOS		Maximum Delay-LOS**		Limiting Movement ***	Max Approach Queue		
							Direction	Average Queue (ft)	Max Queue (ft)
TH 10 at Jarvis St <i>Stop Controlled</i>	AM	3	A	235	F	SBT	SBL/T/R	25	125
	PM	3	A	127	F	SBT	SBL/T	25	150
TH 10 at Alpine St <i>Stop Controlled</i>	AM	2	A	27	D	SBL	EBL	25	100
	PM	5	A	63	F	SBL	EBL	50	175
Armstrong Blvd at Alpine St. <i>Stop Controlled</i>	AM	5	A	26	D	WBL	NBL	25	150
	PM	10	B	30	D	WBL	NBL	25	150
Armstrong Blvd at Bunker Lake Blvd <i>Signalized Intersection</i>	AM	14	B	47	D	WBL	SBL	50	275
	PM	12	B	40	D	EBR	NBT	25	150
Armstrong Blvd at 147th St <i>Signalized Intersection</i>	AM	7	A	33	C	EBL	WBR	25	150
	PM	12	B	26	C	SBL	WBR	25	150
WB TH 10 Ramps at Armstrong Blvd <i>Signalized Intersection</i>	AM	13	B	26	C	WBR	SBL	25	100
	PM	5	A	43	D	WBL	SBR	25	150
EB TH 10 Ramps at Armstrong Blvd <i>Stop Controlled</i>	AM	8	A	15	C	EBL	EBL	25	150
	PM	2	A	14	B	EBL	EBL	25	150
Bunker Lake Blvd at Ramsey Blvd <i>Signalized Intersection</i>	AM	20	C	38	D	WBL/EBL	SBL/EBT	25	150
	PM	20	B	35	C	SBL	WBT	50	225
Sunwood Dr at Ramsey Blvd <i>Signalized Intersection</i>	AM	21	C	40	D	EBL	NBL	25	225
	PM	25	C	45	D	NBL	NBL	25	225
TH 10 at Ramsey Blvd <i>Signalized Intersection</i>	AM	29	C	351	F	SBT	EBT	125	875
	PM	25	C	131	F	EBL	WBT	50	500
Bunker Lake Blvd at Sunfish Lake Blvd <i>Signalized Intersection</i>	AM	28	C	42	D	EBT	EBT	75	400
	PM	23	C	39	D	EBT	WBT	50	250
McKinley St. at Sunfish Lake Blvd <i>Stop Controlled</i>	AM	3	A	26	D	WBL	WBR	25	125
	PM	20	C	113	F	WBL	WBT	125	600
TH 10 at Sunfish Lake Blvd <i>Signalized Intersection</i>	AM	26	C	139	F	NBL	WBT	100	600
	PM	38	D	152	F	EBL	WBT	275	2250
Riverdale Dr at Sunfish Lake Blvd <i>Stop Controlled</i>	AM	2	A	10	A	SBL/R	SBL/R	25	75
	PM	6	A	11	B	SBL/R	SBL/R	25	100

*Delay in seconds per vehicle

**Maximum delay and LOS on any approach and/or movement

***Limiting Movement is the highest delay approach

AM Delay

- Currently all intersections operate acceptably with LOS C or better during the AM peak hour.
- TH 10 at Jarvis St
 - All northbound movements operate with failing LOS
 - Southbound left and through movements operate with failing LOS
- TH 10 at Ramsey Blvd
 - Northbound, southbound and eastbound left turn movements operate with failing LOS

- Northbound and southbound through movements operate with failing LOS
- Average delay is over two minutes per vehicles for the southbound approach
- TH 10 at Sunfish Lake Blvd
 - Northbound, southbound, and westbound left turn movements operate with failing LOS
 - Southbound through movement operate with failing LOS
 - Average delay is 102 sec/veh for the southbound approach

PM Delay

- Currently all intersections operate acceptably with LOS D or better during the PM peak hour.
- TH 10 at Jarvis St
 - The left and through movements for the north and southbound approaches operate with failing LOS
- TH 10 at Ramsey Blvd
 - All left turn movements operate with failing LOS
 - Northbound and southbound through movements operate with failing LOS
 - Average delay is 111 sec/veh for the southbound approach
- McKinley St at Sunfish Lake Blvd
 - Westbound left and right turn movements operate with failing LOS
 - Average delay is 101 sec/veh for the westbound approach
- TH 10 at Sunfish Lake Blvd
 - All left turn movements operate with failing LOS
 - Northbound and southbound through movements operate with failing LOS
 - Southbound right movement operates with failing LOS
 - Average delay is 142 sec/veh for the southbound approach
 - Average delay is over two minutes for the southbound, eastbound and westbound left turn movements

Queues

- Queues are acceptable during both peak hours except for the following intersections.
- Sunwood Dr at Ramsey Blvd
 - Maximum eastbound through queues block the left turn lane during both peak hours.
 - Maximum westbound through queues block the left turn lane during the PM peak hour.
- TH 10 at Ramsey Blvd
 - Maximum eastbound through queues block both turn lanes and driveways during the AM peak hour.
 - Maximum eastbound and westbound through queues block the right turn lane and driveways during the PM peak hour.
- Bunker Lake Blvd at Sunfish Lake Blvd
 - Maximum eastbound queues block the right turn lane during the AM peak hour.
 - Queues are acceptable during the PM peak hour.
- McKinley St at Sunfish Lake Blvd

- Maximum westbound queues block driveways during both peak hours.
- TH 10 at Sunfish Lake Blvd
 - Maximum eastbound queues block the right turn lane during both peak hours.
 - Maximum westbound through queues block turn lanes and driveways during the PM peak hour.
 - Maximum southbound right queues extend beyond the channelized turn lane and the railroad crossing during the PM peak hour.

The failing side street movements during both peak hours at the intersection of TH 10 and Jarvis St show that vehicles are not finding adequate gaps in traffic. The gap time vehicles take were decreased in VISSIM from what is recommended in the AASHTO Green Book in order to get more cars through the intersection to match the turning movement count taken in May 2018. With the recommended gap times not enough traffic was getting through the intersection in the peak hours which shows that traffic is taking shorter gaps. Although there is not a current safety issue shown through the crash analysis at this intersection, the traffic analysis shows that these movements are putting vehicles at higher risk as vehicles are observed to take shorter gaps due to excessive delay.

E. Future Traffic Conditions

A no-build analysis was completed to determine future operations if no changes from existing were made throughout project area. It was assumed that the TH 10 project in Anoka would be completed which makes TH 10 at Sunfish Lake Blvd the first signal along westbound TH 10. *Figures 11 and 12* in the *Appendix* show the forecasted turning movement counts for 2025 and 2045, respectively. *Table 7* summarizes the 2025 no build analysis. *Tables A3 and A4* in the *Appendix* show the detailed results.

Table 7. 2025 No Build Operational Analysis

Location	Peak Hour	Intersection Delay- LOS		Maximum Delay- LOS**		Limiting Movement ***	Max Approach Queue		
							Direction	Average Queue (ft)	Max Queue (ft)
TH 10 at Jarvis St <i>Stop Controlled</i>	AM	26	D	1602	F	NBR	NBL/T/R	700	1025
	PM	17	C	1347	F	NBL	NBR	675	1000
TH 10 at Alpine St <i>Stop Controlled</i>	AM	3	A	29	D	SBL	SBL/R	25	125
	PM	10	B	147	F	SBL	EBL/SBL	50	275
Armstrong Blvd at Alpine St. <i>Stop Controlled</i>	AM	24	C	180	F	WBR	EBR	75	400
	PM	11	B	25	D	EBL	EBR	25	200
Armstrong Blvd at Bunker Lake Blvd <i>Signalized Intersection</i>	AM	24	C	49	D	EBL	SBL	125	575
	PM	11	B	40	D	EBL/EBT	NBT/SBL	25	125
Armstrong Blvd at 147th St <i>Signalized Intersection</i>	AM	9	A	30	C	NBL	SBT	25	150
	PM	11	B	26	C	EBL	NBT	25	150
WB TH 10 Ramps at Armstrong Blvd <i>Signalized Intersection</i>	AM	6	A	42	D	WBL	SBR	25	150
	PM	4	A	41	D	WBL	WBL	25	200
EB TH 10 Ramps at Armstrong Blvd <i>Stop Controlled</i>	AM	3	A	19	C	EBL	EBL	25	175
	PM	3	A	32	D	EBL	EBL	50	300
Bunker Lake Blvd at Ramsey Blvd <i>Signalized Intersection</i>	AM	21	C	37	D	WBL	EBT	50	150
	PM	23	C	39	D	WBL	WBT	50	225
Sunwood Dr at Ramsey Blvd <i>Signalized Intersection</i>	AM	23	C	43	D	NBL	NBL	50	425
	PM	26	C	45	D	NBL	NBL	25	250
TH 10 at Ramsey Blvd <i>Signalized Intersection</i>	AM	33	C	480	F	SBT	EBT	150	1050
	PM	27	C	120	F	SBL	WBT	100	1300
Bunker Lake Blvd at Sunfish Lake Blvd <i>Signalized Intersection</i>	AM	29	C	43	D	EBT	EBT	75	450
	PM	24	C	39	D	EBT	WBT	50	275
McKinley St. at Sunfish Lake Blvd <i>Stop Controlled</i>	AM	3	A	27	D	WBL	WBR	25	125
	PM	138	F	726	F	WBL	WBR	1000	1950
TH 10 at Sunfish Lake Blvd <i>Signalized Intersection</i>	AM	32	C	115	F	SBL	WBT	150	850
	PM	84	F	301	F	SBL	WBT	1350	3800
Riverdale Dr at Sunfish Lake Blvd <i>Stop Controlled</i>	AM	2	A	10	B	SBL/R	SBL/R	25	75
	PM	5	A	10	B	SBL	SBL/R	25	150

*Delay in seconds per vehicle

**Maximum delay and LOS on any approach and/or movement

***Limiting Movement is the highest delay approach

2025 AM Delay

- All intersections perform with a LOS D or better in the 2025 AM peak hour.
- TH 10 at Jarvis St
 - Northbound approach operates with over 24 minutes of delay on average per vehicle
 - Southbound approach operates with over six minutes of delay on average per vehicle
 - Westbound left turn movement operates with a failing LOS
- Alpine Dr at Armstrong Blvd
 - Westbound approach operates with a failing LOS
 - Eastbound left turn movement operates with a failing LOS
- TH 10 at Ramsey Blvd

- Northbound, southbound and eastbound left turn movements operate with failing LOS
- Northbound and southbound through movements operate with failing LOS
- TH 10 at Sunfish Lake Blvd
 - Northbound, southbound and westbound left turn movements operate with failing LOS
 - Northbound and southbound through movements operate with failing LOS

2025 PM Delay

- All intersections but the following operate acceptably with LOS C or better during the 2025 PM peak hour.
 - Sunfish Lake Blvd at McKinley St
 - TH 10 at Sunfish Lake Blvd
- TH 10 at Jarvis St
 - Northbound approach operates with over 16 minutes of delay on average per vehicle
 - Southbound approach operates with over two minutes of delay on average per vehicle
 - Eastbound left turn movement operates with failing LOS
- TH 10 at Alpine Dr
 - Southbound left turn movement operates with over two minutes of delay on average per vehicle
- TH 10 at Ramsey Blvd
 - All left turn movements operate with failing LOS
 - Northbound and southbound through movements operate with failing LOS
- Sunfish Lake Blvd at McKinley St
 - The westbound approach operates with over 11 minutes of delay on average per vehicle
 - Eastbound left turn movement operates with failing LOS
- TH 10 at Sunfish Lake Blvd
 - All left turn movements operate with failing LOS
 - Northbound and southbound through movements operate with failing LOS
 - Southbound right movement operates with failing LOS
 - Southbound approach operates with nearly five minutes of delay on average per vehicle

2025 Queuing Issues

- TH 10 at Jarvis St
 - Maximum northbound queue extends past all current businesses on Cleveland St during both peak hours
- TH 10 at Alpine Dr



- Maximum southbound queues extend beyond the channelized turn lanes during the PM peak hour
- Armstrong Blvd at Bunker Lake Blvd
 - Maximum southbound left queue extends beyond the channelized left turn lane during the AM peak hour
- Armstrong Blvd at EB TH 10 Ramp
 - Maximum eastbound left queue extends beyond the channelized turn lane during the PM peak hour
- Ramsey Blvd at Sunwood Dr
 - Maximum westbound shared through-right turn queue blocks the left turn lane during the AM peak hour
- TH 10 at Ramsey Blvd
 - Maximum eastbound queues block both turn lanes during both peak hours
 - Maximum westbound queues block both turn lanes during the PM peak hour
- Sunfish Lake Blvd at McKinley St
 - Maximum westbound queues extend past Radium St during the PM peak hour
- TH 10 at Sunfish Lake Blvd
 - Eastbound maximum queue extends past turn lanes during the AM peak hour
 - Westbound maximum queue extends past turn lanes during the AM peak hour and the average queues extend past both turn lanes during the PM peak hour
 - Northbound right turn queue extends beyond the channelized right turn lane during the AM peak hour
 - Southbound left turn queue extends past McKinley St during the PM peak hour

Table 8. 2045 No Build Operational Analysis

Location	Peak Hour	Intersection Delay- LOS		Maximum Delay-LOS**		Limiting Movement ***	Max Approach Queue		
							Direction	Average Queue (ft)	Max Queue (ft)
TH 10 at Jarvis St <i>Stop Controlled</i>	AM	211	F	3749	F	WBL	WBL	10950	18975
	PM	82	F	1937	F	NBL	WBT	1750	2450
TH 10 at Alpine St <i>Stop Controlled</i>	AM	250	F	775	F	WBT	WBT	6250	10900
	PM	170	F	248	F	WBR	WBT	4650	10325
Armstrong Blvd at Alpine St. <i>Stop Controlled</i>	AM	184	F	709	F	EBL	WBR	2225	3650
	PM	115	F	747	F	EBL	EBR	1625	2700
Armstrong Blvd at Bunker Lake Blvd <i>Signalized Intersection</i>	AM	30	C	59	E	NBL	SBL	200	775
	PM	20	B	57	E	NBL	WBR	75	525
Armstrong Blvd at 147th St <i>Signalized Intersection</i>	AM	12	B	30	C	EBT	SBT	25	250
	PM	15	B	33	C	EBT	WBR	25	200
WB TH 10 Ramps at Armstrong Blvd <i>Signalized Intersection</i>	AM	14	B	39	D	WBL	SBT/SBR	25	200
	PM	17	B	40	D	WBL	SBR	25	300
EB TH 10 Ramps at Armstrong Blvd <i>Stop Controlled</i>	AM	31	D	114	F	EBL	EBL	350	1975
	PM	95	F	744	F	EBL	EBL	1000	2700
Bunker Lake Blvd at Ramsey Blvd <i>Signalized Intersection</i>	AM	24	C	43	D	WBL	SBT	50	275
	PM	23	C	38	D	NBL	WBT	50	200
Sunwood Dr at Ramsey Blvd <i>Signalized Intersection</i>	AM	37	D	71	E	SBT	NBL	50	400
	PM	27	C	49	D	NBL	WBT/R	50	300
TH 10 at Ramsey Blvd <i>Signalized Intersection</i>	AM	164	F	793	F	NBR	EBT	4000	6000
	PM	36	D	160	F	SBL	WBT	100	1075
Bunker Lake Blvd at Sunfish Lake Blvd <i>Signalized Intersection</i>	AM	34	C	57	E	NBL	EBT	100	550
	PM	26	C	37	D	EBT	WBT	75	350
McKinley St. at Sunfish Lake Blvd <i>Stop Controlled</i>	AM	4	A	35	D	WBL	WBR	25	150
	PM	192	F	1239	F	WBR	WBR	1850	1875
TH 10 at Sunfish Lake Blvd <i>Signalized Intersection</i>	AM	86	F	310	F	NBT	EBT	4975	6100
	PM	130	F	270	F	WBL	WBT	19150	20225
Riverdale Dr at Sunfish Lake Blvd <i>Stop Controlled</i>	AM	126	F	174	F	EBL	EBL	350	550
	PM	8	A	14	B	SBL/R	SBL/R	25	200

*Delay in seconds per vehicle

**Maximum delay and LOS on any approach and/or movement

***Limiting Movement is the highest delay approach

2045 AM Delay

- The following intersections operate with LOS F during the 2045 AM peak hour:
 - TH 10 at Jarvis St
 - TH 10 at Alpine Dr
 - Armstrong Blvd at Alpine Dr
 - TH 10 at Ramsey Blvd
 - TH 10 at Sunfish Lake Blvd
 - Sunfish Lake Blvd at Riverdale Dr
- All other intersection operates with LOS D or better
- TH 10 at Jarvis St
 - No vehicles on the northbound or southbound approaches were able to go during the entire peak hour
 - All approaches operate with a failing LOS

- Alpine Dr at Armstrong Blvd
 - The eastbound and westbound approaches operate with a failing LOS
 - Eastbound approach operates with over 10 minutes of delay on average per vehicle
- TH 10 at Ramsey Blvd
 - All movements for the northbound, southbound, and eastbound traffic operate with a failing LOS
 - Westbound left turn movement operates with a failing LOS
 - Northbound approach operates with over 10 minutes of delay on average per vehicle
 - Southbound approach operates with over a five minutes of delay on average per vehicle
 - Eastbound approach operates with over two minutes of delay on average per vehicle
- TH 10 at Sunfish Lake Blvd
 - All eastbound and northbound movements operate with failing LOS
 - The southbound left and westbound left movements operate with failing LOS
 - Northbound approach average delay is over four minutes per vehicle
- Sunfish Lake Blvd at Riverdale Dr
 - Eastbound approach fails due to queues extending through the intersection from the northbound approach at TH 10 and Sunfish Lake Blvd

2045 PM Delay

- The following intersections operate with LOS F during the 2045 PM peak hour:
 - TH 10 at Jarvis St
 - TH 10 at Alpine Dr
 - Armstrong Blvd at Alpine Dr
 - EB TH 10 Ramp at Armstrong Blvd
 - Sunfish Lake Blvd at McKinley St
 - TH 10 at Sunfish Lake Blvd
- All other intersection operates with LOS D or better
- TH 10 at Jarvis St
 - Northbound and southbound approaches operate with over 29 minutes of delay on average per vehicle
 - Eastbound and westbound left turn movements operate with failing LOS
- TH 10 at Alpine Dr
 - Westbound and southbound approaches operate with failing LOS
- TH 10 EB Ramp at Armstrong
 - Eastbound approach operates with over four minutes of delay on average per vehicle
- TH 10 at Ramsey Blvd

- The northbound and southbound left and through movements operate with failing LOS
- Eastbound left movement operates with failing LOS
- Sunfish Lake Blvd at McKinley St
 - Eastbound and westbound approaches operate with failing LOS
 - Westbound approach operates with over 20 minutes of delay on average per vehicle
- TH 10 at Sunfish Lake Blvd
 - All left turn movements operate with failing LOS
 - Northbound, southbound, and westbound through movements operate with failing LOS
 - Westbound right movement operates with failing LOS

2045 Queueing Issues

- TH 10 at Jarvis
 - Queues on all approaches are extensive
 - Maximum westbound left turn queue extends over three miles during the AM peak hour
 - Average eastbound queues block both turn lanes during both peak hours
 - Maximum northbound queues extend past all current businesses on Cleveland St during both peak hours
 - Maximum southbound queues extend past the railroad tracks during both peak hours
- TH 10 at Alpine Dr
 - Average queues on all approaches are extensive
- Armstrong Blvd at Alpine Dr
 - Maximum eastbound queue extends over half a mile during both peak hours
- Armstrong Blvd at Bunker Lake Blvd
 - Maximum southbound left turn queues extend beyond channelized turn lane during the AM peak hour.
 - Maximum westbound right turn queues extend beyond the channelized turn lane during the PM peak hour
- Armstrong Blvd at EB TH 10 Ramp
 - Maximum eastbound left queues extend onto the mainline blocking TH 10 through traffic during both peak hours
- Ramsey Blvd at Sunwood Dr
 - Maximum westbound through queues block the left turn lane during both peak hours
 - Maximum eastbound through queues block the left turn lane during the PM peak hour
- TH 10 at Ramsey Blvd

- Maximum eastbound queue extends over one mile during the AM peak hour and blocks both turn lanes during the PM peak hour
- Maximum westbound queues block both turn lanes during the PM peak hour
- Maximum northbound through queue blocks turn lanes during the AM peak hour
- Sunfish Lake Blvd at Bunker Lake Blvd
 - Maximum eastbound through queue blocks turn lanes during the AM peak hour
- Sunfish Lake Blvd at McKinley St
 - Maximum westbound queues extend past Radium St during the PM peak hour
- TH 10 at Sunfish Lake Blvd
 - Eastbound and eastbound maximum queues block turn lanes during both peak hours
 - The maximum westbound through queue extends over three miles during the PM peak hour
 - Maximum eastbound through queue extends beyond Ramsey Blvd during the AM peak hour.
 - Maximum northbound queues extend beyond the turn lanes and onto Riverdale Dr during the AM peak hour
 - Maximum southbound left turn queues extend past McKinley St during the PM peak hour

F. Freight and Transit

The following summarizes freight and transit operations within the study area:

- **Highway Freight** – Highway 10 is identified as a Tier 2 Truck Corridor. A Tier 2 Truck Corridor is the second highest tier of the regional freight network based on a composite score of annual average truck volumes, truck percentage of total traffic, proximity to freight clusters, and proximity to regional freight terminals¹
- Heavy vehicles currently account for approximately **4% of all traffic on Highway 10**. It is likely that most of these vehicles are involved in freight operations except for school buses, transit buses, etc. Several freight generators exist in the City of Ramsey. The percentage of heavy commercial trucks on north-south intersecting roadways with Highway 10 is higher than average. There is an existing weigh station called Daytonport located just east of Alpine Drive that can weigh trucks traveling either direction on Highway 10. Daytonport weigh station operates Monday through Friday.
- **Freight by Rail** – BNSF parallels the north side of Highway 10 in some locations less than 1/8 of a mile off the highway. This is the busiest segment of rail in state with 57-81 freight trains per day at speeds up to 79 mph and an average train length of 2.6 miles. The number of trains fluctuates depending largely upon oil production in North Dakota. As shown in *Figure 13* three out of four of the railroad crossings within Ramsey are at-grade.
- Although trains move through the study area at high speeds, the frequency of trains is high and trains block the connecting county highway and local roadways for approximately two to three hours per day in Ramsey. In the PM peak hour, traffic along both northbound

¹ Regional Truck Highway Corridor Study, May 2017

Ramsey Blvd and Sunfish Lake Blvd queues onto Highway 10 when trains are present. In addition, southbound Sunfish Lake Blvd queues extend 300 feet nearly reaching McKinley Street when trains are present.

- According to the MnDOT Rail Safety and Coordination Office, the Sunfish Lake Blvd and Ramsey Blvd at-grade rail crossings are in the top tier of statewide locations currently identified for grade separation but are currently unfunded. They were both identified in a legislative directed study in 2014 that looked at crude by rail routes as they pass through heavy population areas.
- **Transit** – Metro Transit has three bus routes serving the area. Routes 850 and the 852 Express serve Anoka and Coon Rapids while route 887 Express serves St. Cloud by connecting to the Northstar train at several stops and downtown Minneapolis by bus. The Northstar train, route 888, runs along the BNSF rail line thru Ramsey and Anoka towards Minneapolis. There are 12 trains per day Monday-Friday as well as a few weekend trains which carry approximately 150,000 riders per quarter. Two to three commuter trains run thru the project area during the peak hours. Special event Northstar trains such as for Twins and Vikings games in Minneapolis increase the number of trains through the corridor to coincide with those game times. The Empire Builder Amtrak line also runs along these tracks two times per day.
- **Future Rail (Transit) Considerations** – According to BNSF, the line has additional capacity and has run 70-80+ freight trains per day in the past. The main capacity constriction along this segment is primarily caused by the Northstar train schedule. The only potential system expansion in the area would be to add a second mainline between Big Lake and Becker, which could increase the number of trains per day. However, this is anticipated to be funded mostly by Metro Transit as it would then allow them to service the St. Cloud area. Additionally, any expansion of Northstar would also potentially increase the number of Northstar trains per day through the area.

G. Bicycle and Pedestrian

The following summarizes bicycle and pedestrian facilities and needs within the study area:

- As shown in *Figure 14* the Mississippi Regional Trail and local trails provide a continuous connection along the south side of Highway 10. There are limited pedestrian and bicycle facilities on the north side of Highway 10.
- The Central Anoka Regional Trail follows much of Bunker Lake Boulevard to the north of the highway corridor.
- The project area is within an Regional Bicycle Transportation Network (RBTN) – Tier 1 Priority Corridor which are identified by the Metropolitan Council as the highest priority for regional transportation planning and investment.
- Existing north-south crossings, of Highway 10, are dedicated at-grade on Ramsey and Sunfish Lake Boulevards. See Relevant Projects (pg. 6) for more detail on the planned pedestrian bridge between the Northstar Transit Station and the regional park.
- The planned Mississippi Skyway will connect the existing skyway at the Northstar Rail Station (north) over Highway 10 to the MRT and the regional park (south).
- The City of Ramsey has prioritized important trail connections around the "Circle of Ramsey" connecting the system of community parks. The closest trail in the "Circle" to the project area is along Bunker Lake Blvd. A small connection crosses Highway 10 on the



western edge of "The Draw". The county recently realigned the Central Anoka County Regional Trail to utilize the future Mississippi Skyway.

- There do not appear to be any visual cues for drivers as to the presence of pedestrians at Highway 10 intersections except for the marked zebra crosswalks. There are signs for pedestrians at some intersections that say do not cross, but nothing to warn a motorist in advance of a pedestrian crossing.
- Not all pedestrian crossings are ADA compliant.
- The right turn islands at Sunfish Lake Blvd, and Ramsey Blvd may not be pedestrian friendly.

Impacts to pedestrian and bicycle facilities will be considered during the development of corridor improvements.

VII. Summary of Issues

The following summarizes key findings from the existing and no-build analysis. This summary will serve as the framework for the project's purpose and need and will be used as foundation to establish project goals and objectives and identify and evaluate improvement alternatives.

- Highway 10 is a principal arterial that provides a significant transportation connection for the region. For instance, Highway 10 is an important commuting route for portions of Anoka, Sherburne and Wright County residents passing through the segment in Ramsey daily without stopping. In addition, Highway 10 plays a broader regional role providing a connection from the Twin Cities Metro Area to St. Cloud and northern Minnesota. Because of this connection, the demands on Highway 10 exceed traditional weekday peak hour travel and include weekends during the summer/fall tourism season as well. Highway 10 in Ramsey has numerous public and private accesses that cumulatively degrade the safety and performance of the corridor. Overall, the capacity and mobility demands of the Highway 10 corridor are underserved and the study area will have multiple areas with failing operations as soon as 2025 without improvements. This inhibits both local and regional mobility.
- Safety concerns exist along Highway 10 with high numbers of crashes, including five fatal crashes, occurring on the corridor. Crash trends are anticipated to increase without improvements.
- Highway 10 is an important rail corridor serving freight, transit and a total of 72 trains per day. Heavy rail traffic inhibits the efficient movement of people and goods across the rail.
- Pedestrian and bicycle movement is difficult along and across Highway 10 and the railroad due to lack of facilities and designated crossing locations.
- The Highway 10 corridor includes a wide range of interdependent land uses including a primary business corridor for the City. Strategic and responsible growth is necessary to align land use with a supporting transportation network and to continue to promote economic development.

