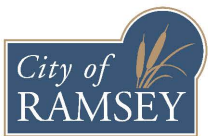


Ramsey Gateway US Highway 10/169 Project

Final Report

October, 2019



Anoka County
MINNESOTA
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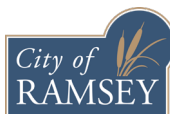


**BOLTON
& MENK**



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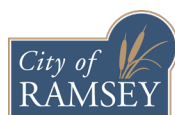
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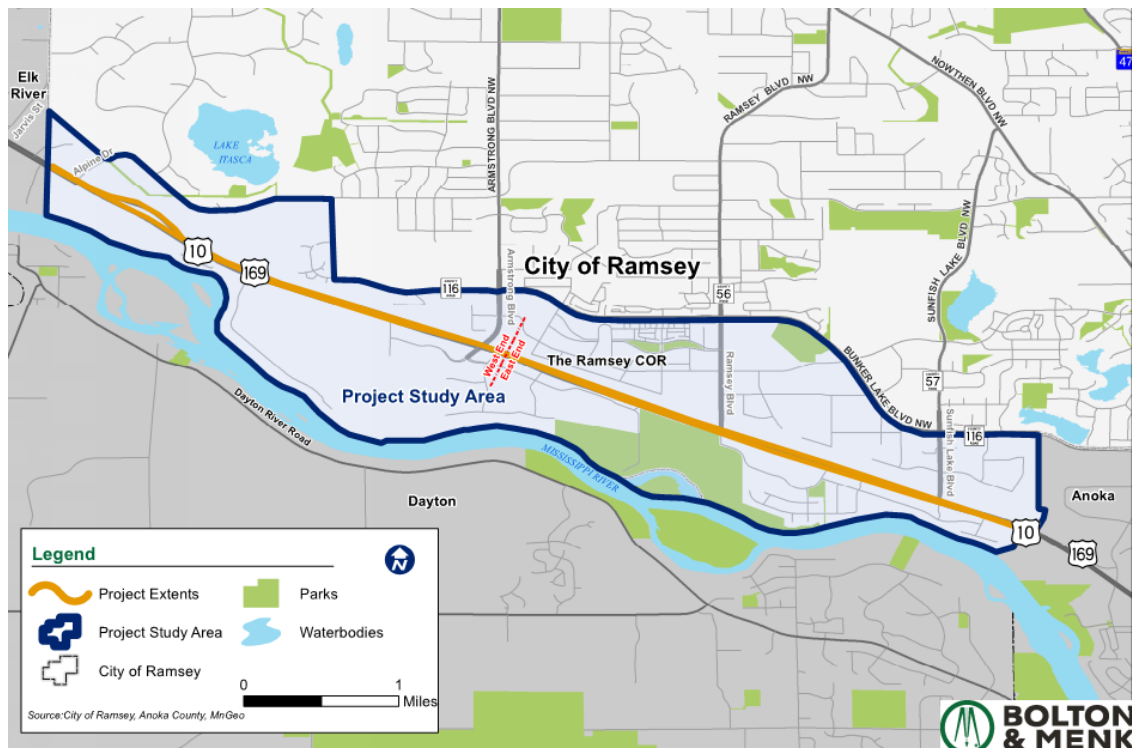


I. Introduction

The Highway 10 corridor through the Cities of Ramsey, Anoka, and Elk River has been studied numerous times over the past twenty-years. The most recent, 2014 Highway 10 Access Planning Study left property and business owners frustrated because there were still multiple options under consideration. The Ramsey Gateway Highway 10 Project was initiated to further the analysis started in the 2014 study in order to develop a preferred vision for Highway 10 improvements in Ramsey. This vision could then be used by project partners to secure funding and ultimately move forward into design and construction of improvements. The vision would also remove the uncertainty for businesses and property owners in areas that may or may not be needed for right-of-way and to encourage reinvestment in the corridor.

Figure 1 illustrates the overall study area and the focus areas; the East End (Sunfish Lake Boulevard and Ramsey Boulevard intersections with Highway 10) and the West End (Alpine Drive and Jarvis Street intersections with Highway 10).

Figure 1 – Study Area

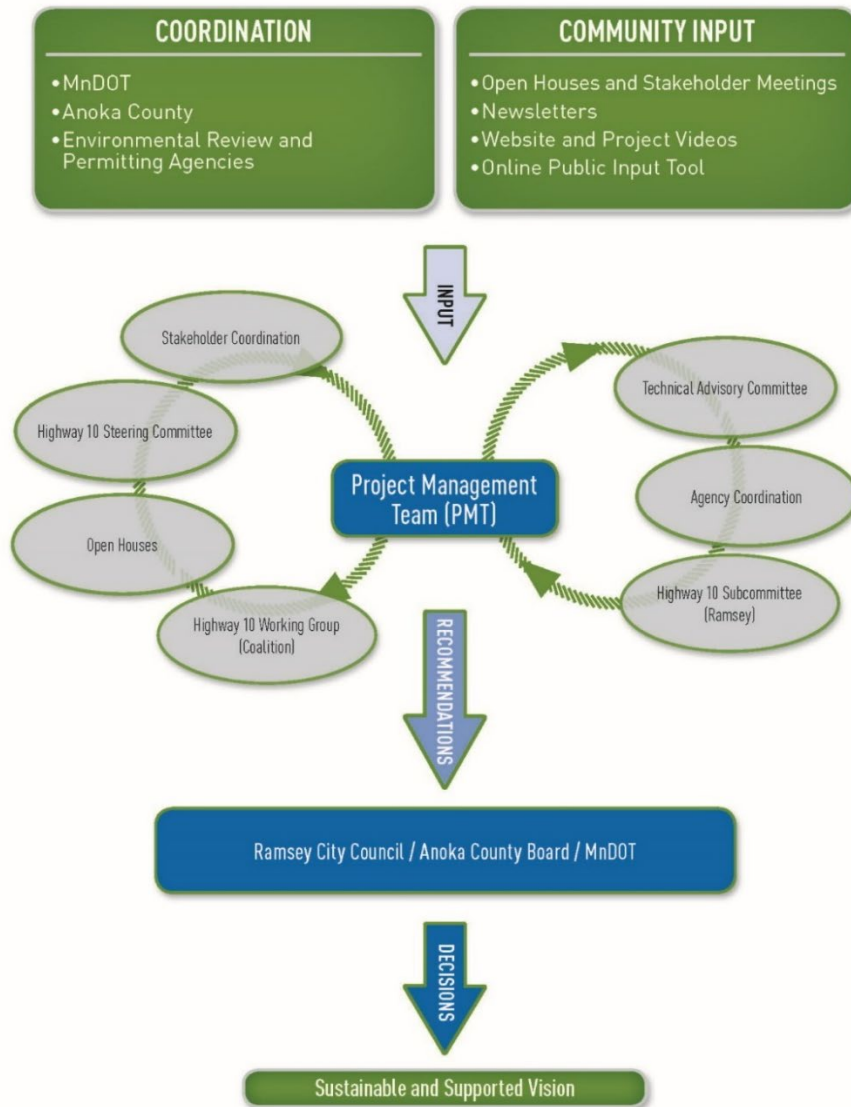


II. Public Involvement

Agency coordination and public involvement were key components to the successful development of the Ramsey Gateway Highway 10 Project. This required early and continuous involvement of all affected interests identified during the initial stages of the project. To document these different agencies, groups and interests and to define their roles and goals in the project, a Public Involvement Plan was developed. The Public Involvement Plan is included in Appendix A.

The study was led by a Project Management Team (PMT) and a Technical Advisory Committee (TAC). The PMT was comprised of City of Ramsey staff and focused study schedule, process and deliverables. The TAC was comprised of planning and engineering staff from the City of Ramsey, City of Elk River, MnDOT, and Anoka County. The TAC met nine times over the course of the 16-month process to review technical analysis and provide recommendations to the Ramsey City Council and Anoka County Transportation Committee. Public and agency input was also important to the study and is described in more detail in Section X and copies of meeting summaries are in Appendix G. The graphic below illustrates the decision-making flow of the study and how public and agency input was considered.

Figure 2 – Decision Making Graphic



III. Existing Conditions

The first step in the study was to develop an Existing Conditions Memorandum to document to existing deficiencies and needs and the future no-build condition. A complete copy of the existing conditions memorandum is included in Appendix B.

IV. Purpose and Need Framework

A. Purpose

The City of Ramsey, in collaboration with Anoka County and MnDOT, has initiated the Ramsey Gateway (Highway 10) Project to identify a long-term transportation improvement plan for Highway 10 and its supporting roadway network within the City of Ramsey.

The goals of the study are to understand the needs and opportunities, establish goals and objectives, develop and evaluate concepts, reach consensus on a recommend vision, and develop an implementation plan.

The purpose of proposed improvements is to:

- Effectively serve all users including vehicular, freight, rail, transit, bicycle and pedestrian
- Reduce delays on Highway 10 and connecting minor arterials such as Ramsey Boulevard and Sunfish Lake Boulevard
- Improve the safety, reliability and operations of the corridor for all users
- Maintain reasonable and responsible access to properties adjacent to Highway 10 and the community
- Support economic development and responsible growth in Ramsey

B. Need

Study partners seek to address the following needs for Highway 10 and its supporting roadway network in the City of Ramsey:

Route Importance and Previous Planning

Highway 10 is a principal arterial roadway providing a significant transportation connection from Minneapolis-St. Paul to the northwest suburbs and beyond into northern Minnesota. Highway 10 is a critical multimodal link in the regional transportation network, serving commuters, tourists, trucking traffic, growing transit needs, and parallel rail traffic along the Mississippi River. The 4-lane roadway within the City of Ramsey carries average daily traffic volumes ranging from 35,500 to 56,000 vehicles per day.

Today, Highway 10 is a freeway from Main Street in Anoka to I-35W. West of Main Street, Highway 10 remains an expressway. Projects are funded on both US 169 in Elk River and Highway 10 in Anoka so that by 2025 both will be transitioned to freeway corridors.

MnDOT and Anoka County, in partnership with the cities of Ramsey and Anoka, completed the *Highway 10 Access Planning*, in 2014. This study concluded it will be difficult to achieve the vision of a freeway facility on this portion of Highway 10 within the next 20 years considering current overall state and federal funding levels. The study recommended a range of potential lower-cost, high-benefit improvements that could be implemented incrementally over time that greatly reduced the amount of property impacts. Over the past five years, a new interchange was constructed Armstrong Boulevard in Ramsey, and the cities of Ramsey and Anoka constructed frontage roads towards the ultimate vision. The City and its partners recognize the time is right to continue this momentum by taking the next step to develop one improvement plan to identify future construction and right-of-way needs that will position the city for funding.

Traffic Operations and Mobility

Existing Operations

Highway 10 is a principal arterial with a primary purpose of providing direct, relatively high-speed service for longer trips and large traffic volumes. Today, the segment of Highway 10 in Ramsey carries an average of 35,500 vehicles per day on the west end and 56,000 vehicles per day on the east end. There are two signalized intersections and 73 public and private accesses along Highway 10, 55 of which have direct access to the highway.

Highway 10 serves as a primary route to northern Minnesota and its tourism industry and as a major commuting route into and out of the core Twin Cities metro region for large portions of Anoka, Sherburne and Wright County residents. This is evidenced by 2014 data showing approximately 53% of trips in the morning peak hour and 48% of trips in the evening peak hour pass through the study corridor without stopping. In addition, Highway 10 is one of a few key routes that connects the Twin Cities Metro Area to northern MN. This results in additional trips on Highway 10 from weekend travel during the summer/fall tourism season. For example, on average westbound Highway 10 traffic on Fridays during the summer is 7% higher than a typical weekday.

Highway 10 currently experiences congestion and operational issues. **Table 1** illustrates existing operational issues showing peak hour back-ups occurring at the following intersections with Highway 10: Jarvis Street, Alpine Drive, Ramsey Boulevard and Sunfish Lake Boulevard. Significant peak hour back-ups also are occurring on Sunfish Lake Boulevard at McKinley Street. Railroad operations frequently cause delay on the cross streets and result in queues onto Highway 10.

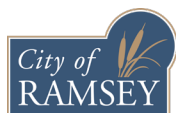


Table 1. Existing (2018) Operational Analysis

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

Future No-Build Conditions

Without improvements to Highway 10 and its supporting network, additional operational problems will occur within the City of Ramsey. In 2025, traffic volumes on Highway 10 are forecasted to range from 39,300 vehicles per day on the west end to 60,600 vehicles per day on the east end. The 2025 no-build traffic modeling analysis assumed the Highway 10 project in Anoka is complete which grade separates Fair oak Avenue and Thurston Avenue. As shown in Table 2, delays will increase throughout the project area and queues lengthen. In the 2025 PM peak hour, the westbound through queue at the Highway 10 and Sunfish Lake Boulevard intersection is anticipated to extend 3,800 feet which is approximately where the Thurston Interchange ramps are anticipated to tie into Highway 10. A summary of the 2025 no-build operations follows Table 2.

Table 2. 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

Summary of 2025 No-Build Operations:

- The Highway 10/Jarvis intersection during AM Peak hour will have a northbound delay of over 24 minutes and southbound delay of over six minutes per vehicle.
- The Highway 10/Jarvis intersection during PM Peak hour will have a northbound delay of over 16 minutes per vehicle.
- The southbound left at the Highway 10/Alpine intersection will have a failing level of service with a delay of over two minutes per vehicle.
- The Highway 10/Ramsey Boulevard intersection will see many failing movements including east and westbound through lane backups beyond the turn lanes.
- The Sunfish Lake Boulevard/McKinley will fail overall during the PM Peak hour with westbound backups extending throughout the business area with a twelve-minute delay per vehicle.
- The Highway 10/Sunfish Lake Boulevard intersection will fail overall during both the AM and PM Peak hour with westbound through backups just under three quarters of a mile long, over halfway to Thurston Avenue.
- The Sunfish Lake Railroad crossing will see southbound backups extending beyond McKinley and northbound backups onto Highway 10.

By 2045, traffic volumes on Highway 10 are forecasted to range from 48,800 vehicles per day on the west end to 74,200 vehicles per day on the east end. Table 3 shows that by 2045 all intersections in the project area experience queuing issues and all intersections along Highway 10 operate with significant delay. In the 2045 PM peak hour, the westbound through queue at the Highway 10 and Sunfish Lake Boulevard intersection is anticipated to extend over 3.8 miles.

A summary of the 2045 no-build operations follows Table 3.

Table 3. 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

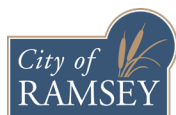
*Delay in seconds per vehicle

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

***Limiting Movement is the highest delay approach

Summary of 2045 No-Build Operations:

- The Highway 10/Jarvis Street intersection will fail overall for both AM and PM Peak hours
 - North and southbound vehicles will see over an hour of delay in the AM Peak hour
 - North and southbound delay will be almost thirty minutes per vehicle in the PM Peak hour
 - West and eastbound vehicles will be unable to find gaps and will back up onto Highway 10, blocking traffic.
- The Highway 10/Alpine Drive intersection will fail overall for both AM and PM Peak hours
 - Southbound delay is over four minutes per vehicle in the AM Peak hour and over three minutes per vehicle in the PM Peak hour
 - Eastbound vehicles will be unable to turn left due to backups on the mainline



- The Highway 10/Armstrong Boulevard Eastbound Ramp fails during the PM Peak hour
 - Approach backups will extend onto the mainline during the AM and PM Peak hours
 - A signal is likely warranted in the future with the higher projected volumes
- The Highway 10/Ramsey Boulevard intersection will fail during the AM Peak hour
 - Eastbound through backups will extend over a mile and see a delay of almost four minutes during the AM Peak hour.
 - The northbound delay will be over ten minutes per vehicle during the AM Peak hour
 - The southbound delay will be over five minutes per vehicle during the AM Peak hour
 - North and westbound through backups will extend beyond the turn lanes during the AM Peak hour
 - East and westbound backups will extend beyond the turn lanes during the PM Peak hour
- The Sunfish Lake Boulevard/McKinley Street intersection will fail overall during the PM Peak hour
 - The westbound backup will extend throughout the business area and all movements will fail with delays of almost twenty minutes per vehicle
 - The eastbound backup will be almost two minutes per vehicle
- The Highway 10/Sunfish Lake Boulevard intersection will fail overall during both the AM and PM Peak hours
 - The westbound backups will extend over 3.5 miles during the PM Peak hour
 - The northbound delay will be over four minutes per vehicle during the AM Peak hour

Key Finding: 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

Highway 10 is experiencing safety issues. There were 277 crashes along Highway 10 within the past three years. Rear end crashes were the most common crash type accounting for 158 of the 277 total crashes. These rear end crashes are likely caused from queueing along Highway 10 at the Ramsey Boulevard and Sunfish Lake Boulevard signals. Significant congestion often results when crashes occur.

The observed crash rate at the Highway 10/Sunfish Lake Boulevard 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 Highway 10 and Sunfish Lake Boulevard 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 preform within the normal range.

In approximately 5 years, when Anoka finishes improving their intersections and removing traffic signals, Sunfish Lake Boulevard will be the first westbound traffic signal on Highway 10. The crash trends observed over the past few years in Anoka, including 192 crashes at Fair Oak Ave, are likely to shift to the Highway 10/Sunfish Lake Boulevard intersection without improvements.

Five fatal crashes occurred within the past ten years (2008-2017) on Highway 10 at the following locations: Alpine Drive, Ramsey Boulevard, Sunfish Lake Boulevard and at a business access between Sunfish Lake Boulevard and Thurston Avenue. Three of the fatal crashes involved a pedestrian.

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

Key Finding: 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.

Multimodal Corridor

Freight, Rail and Transit

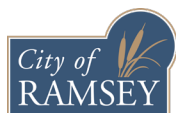
Burlington, Northern and Santa Fe (BNSF) Railway parallels the Highway 10 corridor in Ramsey. In some locations along the west end of the corridor, the railroad and highway are separated by less than 1/8 mile. BNSF runs 57-81 freight trains per day at speeds up to 79 mph through the study corridor. The average freight train is 2.6 miles long. The Northstar also runs 12 commuter trains per day (six in each direction). Additional Northstar trains run during special events such as Minnesota Twins and Vikings games. Two Amtrak trains run per day (one in each direction).

Three out of the four railroad crossings within Ramsey are at-grade. According to the MnDOT Rail Safety and Coordination Office, the Sunfish Lake Boulevard and Ramsey Boulevard at-grade rail crossings are in the top tier of statewide locations currently identified for grade separation but are currently unfunded.

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 Ramsey Blvd and Sunfish Lake Blvd queues onto Highway 10 when trains are present.

Heavy vehicles currently account for approximately 4% of all traffic on Highway 10. The percentage of commercial trucks on north-south intersecting roadways with Highway 10 is higher than average due to freight generators present in this area. Highway 10 is identified as a Tier 2 Truck Corridor which is the second highest freight network tier based on annual average truck volumes, truck percentage of total traffic, proximity to freight clusters, and proximity to regional freight terminals.

Key Finding: 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/Bicycle

Highway 10 corridor lacks sidewalks and trails, yet many pedestrians and bicyclists use the corridor especially near land uses conducive to this type of travel such as parks and convenience, fast food and retail businesses.

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. Existing north-south crossings of Highway 10 and the railroad exist at Ramsey Boulevard and Sunfish Lake Boulevards. However, high traffic volumes and high speeds make Highway 10 difficult for pedestrians and bicyclists to cross. Many pedestrians do not cross Highway 10 or the railroad properly due to delays and/or inconvenience. In addition, there do not appear to be any visual cues for drivers alerting to the presence of pedestrians at Highway 10 intersections except for marked crosswalks.

Key Finding: Pedestrian and bicycle movement is difficult along and across Highway 10 and the railroad due to lack of facilities and designated crossing locations.

Economic Development

The Highway 10 corridor includes a wide range of land uses including general commercial, sales and service, recreational, residential, institutional (i.e., colleges), and agricultural. The east side of the Highway 10 study area is largely developed. The west end of the corridor remains largely undeveloped yet there are plans for substantial growth and development particularly in large master planned development area called The COR and through commercial, business park and mixed-use developments within the study area. Ramsey's population is expected to grow from approximately 26,250 in 2016 to 35,000 by 2040. The City is planning for strategic and responsible growth that can be supported by the transportation network. The City has purchased several properties between Highway 10 and the BNSF Railway using the Metropolitan Council's Right of Way Acquisition Loan Fund (RALF) program in anticipation of Highway 10 expansion. Many businesses along Highway 10 and potential developers are uncertain whether to invest further into these areas until right-of-way needs for future roadway improvements are known. Highway 10 business owners desire a roadway improvement plan with enough detail to give them confidence in their investments and business interests.

Key Finding: 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.

V. Goals, Objectives, and Performance Measures

Table 4 outlines the goals and objectives for the Ramsey Gateway Highway 10 Project. The goals and objectives are intended to align with state and local transportation plans as much as possible. They build off the existing conditions, issues and needs outlined in the Purpose and Need Framework and define desired results or outcomes. Multiple objectives for each goal exist to provide additional details on how the goal can be achieved. The goals and objectives will be used as the framework to guide the identification and evaluation of improvement options within the study area.

Table 4. Goals, Objectives, and Performance Measures

City of Ramsey Strategic Goal	Ramsey Gateway Highway 10 Project	
	Goal	Objective
<i>Smart, Citizen-Focused Government</i>	Safely accommodate all users (motor vehicles, freight, rail, transit, pedestrians, bicyclists)	Eliminate fatal and serious injury crashes
		Reduce all crashes in both frequency and severity
		Provide safe pedestrian and bicycle facilities along roadways and at crossings of roads and rail
		Minimize vehicle delay from railroad operations that results in backups across adjacent intersections and onto Highway 10
<i>A Connected and Active Community</i>	Provide efficient mobility and access for all modes of travel	Provide acceptable mobility and system reliability on Highway 10 for access to Ramsey and beyond including regional and statewide tourism destinations
		Ensure acceptable vehicle delay and travel times for arterial highways (e.g., Highway 10, Sunfish Lake Blvd, Ramsey Blvd, and Armstrong Blvd)
		Serve the projected regional and local growth demands
		Provide reasonable and responsible access to optimize mobility and reduce the need for vehicles to enter onto Highway 10 for short trips
		Provide convenient access for pedestrians and bicyclists to serve demand
<i>Financial Stability</i>	Develop a financially responsible infrastructure implementation plan	Develop projects and phasing that meet schedule and funding constraints
		Minimize right-of-way costs
		Minimize lifecycle costs
		Maximize benefit-cost of improvements
		Maximize potential to secure multiple funding scenarios
<i>A Balance of Rural Character and Urban Growth</i>	Support plans to build a connected and recognizable Highway 10 corridor	Attract visitors and residents to the Highway 10 corridor by car, train/transit, bike or foot
		Create a cohesive and inviting aesthetic including appropriate signage, lighting and landscape
		Define right-of-way needs for clarity to affected businesses and property owners
		Accommodate existing and future land uses
		Promote business expansion
		Support connections to Ramsey assets and destinations (parks, trails, The COR, etc.) from either side of Highway 10
		Seek consistency with state, regional and local plans
	Provide infrastructure improvements compatible with the natural and built environment	Avoid impacts to environmental resources
		Minimize impacts to the built environment

VI. Tier 1 Concept Screening

A two-part concepts evaluation process was undertaken to identify and evaluate Highway 10 improvement concepts. The initial evaluation, called the Tier 1 Screening, was focused on dismissing concepts that did not meet the project's purpose and need framework and goals and objectives. Remaining concepts were then moved forward into a Tier 2 evaluation that compared the benefits and trade-offs of each in detail.

A. Concepts Previously Considered

The 2014 Highway 10 Access Planning Study identified multiple Highway 10 improvement options within the Cities of Ramsey and Anoka that could be achieved with lower costs than a full freeway vision, yet still achieve most of the benefits. Bolton & Menk developed a toolbox of both traditional and non-traditional improvements for agency and stakeholder consideration. The toolbox was vetted with the agencies/stakeholders before applying to locations on the corridor. The result was identification and prioritization of 13 right-sized, fundable-scale projects for the Highway 10 corridor in Ramsey.

The 2014 Highway 10 Access Planning Study recommendations for individual projects were broken into immediate priority, short-term priority projects, mid-term priority projects, and opportunity/development/safety-driven projects. The recommended projects specific to the City of Ramsey include the following (see Appendix C):

Immediate Priority Projects

- Construct North Frontage Road from Sunfish Lake Boulevard to Anoka Technical College
- Construct North Frontage Road from Ramsey Boulevard to Sunfish Lake Boulevard
- Construct South Frontage Road from Traprock Street to Ramsey Boulevard¹.

Short-Term Priority Projects

- Extend Riverdale Rive east of Tungsten Street².

Mid-Term Priority Projects

- Grade separation at Sunfish Lake Boulevard – Highway 10 flyover with access or overpass with right-turn access
- Grade separation at Ramsey Boulevard – Highway 10 flyover with access or overpass with right-turn access

Opportunity/Development/Safety Driven Priority Projects

- Purchase ROW north of Highway 10 and west of Ramsey Boulevard
- Extend Civic Center Drive to Ramsey Boulevard
- Railroad grade separation at Sunfish Lake Boulevard
- Railroad grade separation at Ramsey Boulevard
- Extend 156th Street from Jarvis Street to Alpine Drive
- Construct a Reduced Conflict U-Turn (RCUT) intersection at Highway 10/Alpine Drive
- Construct a Reduced Conflict U-Turn (RCUT) intersection at Highway 10/Bowers Drive
- Extend Riverdale Drive from Bowers Drive to Llama Street
- Frontage road connections supporting these

¹ This project was completed in 2016.

² This project was completed in 2016.

Public and agency participation was critical to the success and results of the 2014 Access Planning Study. Input from affected local agencies and the public lent credibility to key decisions made during the project. The following summarizes the public outreach during this study:

Project Management Team (PMT):

The study was led by a PMT comprised of planning and engineering staff from MnDOT, Anoka County, and the Metropolitan Council. The PMT met monthly to manage and deliver the project to consider all public, stakeholder, and elected official input.

Study Advisory Committee:

A Study Advisory Committee was formed, and met seven times during the study, to provide an opportunity for local community input and feedback to the PMT. Members of this committee included planning and engineering staff from the Cities of Ramsey, Anoka, and Elk River, MnDOT, Anoka County and the Metropolitan Council.

Design Charette:

A Design Charette was conducted to provide a brainstorming working session between planning and engineering staff from MnDOT, the Federal Highway Administration (FHWA), Anoka County and the Cities of Ramsey and Anoka. The goal of the design charrette was to collaborate with innovative experts from a wide range of backgrounds to understand key issues and identify creative solutions.

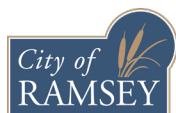
Public Open Houses:

Three public open house meetings were conducted to; 1) gather input on the problem statement and existing conditions analysis, 2) review the range of concepts under consideration, and 3) to solicit input and feedback on the study recommendations and implementation plan. In addition, several coordination meetings were held at key project milestones to solicit input and provide updates to other impacted individuals and agencies. This included coordination with property and business owners, the National Park Service, Ramsey and Anoka City Councils, the Anoka County Board of Commissioners, and the Metropolitan Council Transportation Committee.

B. Ramsey Gateway Highway 10 Project Concepts

The Ramsey Gateway Highway 10 Project refreshed the existing conditions analysis from the *2014 Highway 10 Access Planning Study* and completed a 2025 and 2045 traffic forecast to understand how conditions may change over time without any roadway improvements (i.e., the no-build condition). This effort recognized that both the Anoka Highway 10 Solution and the Elk River 169 Redesign Projects will be completed by 2025. The 2014 Highway 10 Access Planning Study recommendations were used as the starting point for concept development. In addition, the following new information influenced the initial range of improvement concepts to be studied through the Ramsey Gateway Highway 10 Project:

- At-grade full movement intersections at Ramsey Blvd and Sunfish Lake Blvd will not operate acceptably in 2025 or 2045
 - The one exception is that an at-grade six-lane section would operate acceptably in 2025, but not 2045.
- It is no longer practical to consider phased construction of grade separation at Ramsey Blvd or Sunfish Lake Blvd due to the forecasted traffic volumes
- At-grade solutions on the west end of the corridor are limited due to operational issues and safety concerns



The sections below outline the full range of improvement concepts considered in the Ramsey Gateway Highway 10 Project. The study corridor was divided into an east end and a west end. The Highway 10 interchange with Armstrong Boulevard serves as the distinction between these two subareas. *The west end, defined as west of Armstrong Boulevard to Jarvis Street in Elk River*, is less developed with few destinations that generate vehicle and pedestrian traffic. *The east end, defined as east of Armstrong Boulevard to the Ramsey Anoka boarder*, is mostly developed and as result has the highest traffic volumes, crash rates, and pedestrian demands. The Purpose and Need Framework technical memo includes full documentation of needs in the corridor. A brief summary of needs is included in the section below.

West End

Currently, the failing side street movements on the west end show that vehicles are not finding adequate gaps in traffic on Highway 10 and are waiting over a minute during peak traffic hours to turn onto or cross the highway. This has resulted in driver's willingness to take less gaps than what is recommended by AASHTO. A five-year crash analysis (2013-2017) showed a total of 59 crashes along Highway 10 on the west end with rear end crashes being the most common.

MnDOT's Highway 10 Weigh Station and the Dayton Port Rest Area are located between Alpine Drive and Beatty Street. The existing acceleration and deceleration lanes that serve the weigh station are shorter than MnDOT's standard, limiting the ability for the weigh station to stay open during peak traffic hours due to the difficulty for large vehicles to reenter the traffic stream. The rest area also does not currently have acceleration and deceleration lanes that meet MnDOT standards.

Concepts considered on the west end included both full movement and partial movement intersections and at-grade and grade separated options. Concepts were analyzed with CAP-X, which is a planning level tool used to determine how the different intersection types would serve the forecasted traffic. The options below were analyzed are summarized in Table 5:

- No-Build
- Non-Signalized At-Grade Full Movement Intersections at Jarvis/Adams/Alpine
- Non-Signalized At-Grade Partial Movement Intersections at Jarvis/Adams/Alpine
 - Reduced Conflict U-Turn Intersection
 - Right-in/Right-out
- Signalized Reduced Conflict U-Turn Intersection at Jarvis/Adams/Alpine
- Partial R-Cut at Bowers Drive
- Overpass with Right-in/Right-out

East End

The east end has the highest number of crashes, including fatal crashes, and delays within the study area. Rear end crashes are most common and often occur at the Ramsey Blvd and Sunfish Lake Blvd signals. This area of the city currently has the highest demand for community and regional connectivity to the Ramsey COR and other surrounding businesses, residential areas, and natural recreational areas. Three of the four fatal crashes in the last ten years (2008-2017) were pedestrian crashes. Operationally, during peak hours all approaches to the intersections of Highway 10 with Ramsey Boulevard and Sunfish Lake Boulevard have failing movements with hours of east and westbound congestion daily. South and northbound vehicles entering or exiting the highway often see over two minutes of delay per vehicle during peak hours. In addition, due to the proximity of the BNSF Railroad (1/8 mile in some areas), northbound queues at Ramsey Boulevard and Sunfish Lake Boulevard regularly back up onto Highway 10 during peak traffic times.

Concepts considered on the east end included both full movement and partial movement intersections and at-grade and grade separated options. These options were also analyzed using CAP-X are summarized in Table 5.

- Highway 10 Expansion to 6-lane
- Ramsey Boulevard
 - Railroad Options: At-Grade or Grade Separated (Ramsey Blvd Underpass, Ramsey Blvd Overpass)
 - At-grade Full Movement Intersection
 - Partial Movement Grade Separation
 - Full Grade Separation
- Sunfish Lake Boulevard
 - Railroad Options: At-Grade or Grade Separated (Sunfish Lake Blvd Underpass, Sunfish Lake Blvd Overpass)
 - At-Grade Full Movement Intersection
 - Partial Movement Grade Separation
 - Full Grade Separation

C. Tier 1 Concepts Evaluation and Dismissed Concepts

Based on technical analysis and input from the TAC, elected officials and the public, a Tier 1 screening was completed to identify fatal flaws and discuss concepts that do not meet the purpose and need framework. The Tier 1 screening generally dismissed concepts that did not meet safety and operations, mobility and access, and financial responsibility goals. The table below identifies concepts from the Tier 1 Screening that are not recommended to be carried forward into the detailed Tier 2 evaluation.

Table 5. Tier 1 Screening

Dismissed Concepts	Conflicting Goals	Reason Dismissed*
West End		
1. At-Grade Full Access Intersections (non-signalized)	<i>1 and 2</i>	<p>a) Long delays for side streets are a safety concern.</p> <p>b) 2018 hourly volumes (3500+) at Jarvis and Alpine confirm that a full movement intersection would not operate safely as gaps are infrequent.</p>
2. At-Grade Reduced Conflict Intersections (non-signalized)	<i>1 and 2</i>	<p>a) Long delays for side streets are a safety concern.</p>
East End		
1. Highway 10 Expansion to 6-lane (At-grade)	<i>1, 2, 3, and 4</i>	<p>a) Does not provide adequate traffic operations for the long-term.</p> <p>b) High cost.</p> <p>c) High likelihood of property acquisitions.</p> <p>d) Not consistent with Anoka and Elk River Hwy 10/169 improvement plans.</p>
2. Split Diamond between Ramsey Blvd & Sunfish Lake Blvd	<i>1</i>	<p>a) Does not provide adequate traffic operations.</p>
3. At-grade full movement intersections at Ramsey and Sunfish Lake Blvd	<i>1 and 2</i>	<p>a) Does not provide adequate traffic operations.</p> <p>b) Safety concern with signalized intersection control.</p>
4. At-Grade Rail Crossing at Ramsey Boulevard	<i>1</i>	<p>a) City of Ramsey and Anoka County desire grade-separated crossing at Ramsey Boulevard for safe and efficient access into the community and on this important minor arterial county highway.</p>
5. Partial movement grade separation at Ramsey Blvd	<i>2 and 4</i>	<p>b) Full movement at Ramsey Blvd desired by City of Ramsey to serve businesses from Highway 10.</p> <p>c) Full movement at Ramsey Blvd desired by City of Ramsey for community connectivity to, from and across Highway 10.</p>
6. Railroad Underpass at Sunfish Lake Blvd	<i>3, 4, and 5</i>	<p>a) Shoofly railroad track construction needed which would require acquisition of 4 businesses, relocation of powerlines relocation, and mitigation of significant ground water issues. These impacts result in substantial cost.</p> <p>b) Underpass could be considered a future opportunity but due to impacts and cost it was not determined feasible within this study's planning horizon.</p>

* Details supporting the traffic and safety analyses are documented in the Existing and No-Build Traffic Conditions Tech Memo.

VII. Range of Concepts for Tier 2 Evaluation

This section documents the Tier 2 evaluation process, technical analysis, recommendations, and stakeholder/public involvement leading to the ultimate selection of a locally preferred vision for the Highway 10 corridor within the City of Ramsey.

Following the Tier 1 Screening described in the section above, the remaining concepts were refined to further develop roadway profile and cross-sectional grades, as well as frontage roads, traffic patterns, and traffic control needs at intersections. The technical Tier 2 Evaluation was based on how each address the Goals and Measures previously discussed and how the impacts of each concept compared. The following section summarizes the comparison across the Ramsey Boulevard Concepts and the Sunfish Lake Boulevard Concepts.

Table 6 lists the comprehensive list of all Tier 2 concepts evaluated for the Ramsey Gateway Highway 10 Project.

Table 6. Tier 2 Evaluation Concepts

Sunfish Lake Boulevard	Ramsey Boulevard	Jarvis/Alpine
<ul style="list-style-type: none"> No Build <p><i>With Grade Separated Railroad Crossing:</i></p> <ul style="list-style-type: none"> Overpass with Right-in/Right-out (RI/RO) (A & B) Standard Diamond Tight Diamond Single Point Urban Interchange (SPUI) Grade Separated Roundabout Split Diamond with Ramsey Boulevard <p><i>At Grade Railroad Crossing:</i></p> <ul style="list-style-type: none"> Single Point Urban Interchange (SPUI) Grade Separated Roundabout Center Turn Overpass High-T (Ped Overpass) High-T (Ped Underpass) Flyover Highway 10 Overpass with RI/RO & WB Exit Ramp Highway 10 Overpass with RI/RO 	<ul style="list-style-type: none"> No Build <p><i>Over Railroad Crossing:</i></p> <ul style="list-style-type: none"> Standard Diamond Tight Diamond Folded EB On Tight Diamond Folded WB Off Tight Diamond Folded EB on & WB Off Tight Diamond Folded EB on & Semi-Folded WB Off Tight Diamond Overpass with RI/RO Overpass with RI/RO (West) Single Point Urban Interchange (SPUI) Tight Diamond with West Frontage Road Split Diamond with Sunfish Lake Boulevard <p><i>Under Railroad Crossing:</i></p> <ul style="list-style-type: none"> Standard Diamond Tight Diamond Folded EB On Tight Diamond Folded WB Off Tight Diamond Folded EB on & WB Off Tight Diamond Folded EB on & Semi-Folded WB Off Tight Diamond Overpass with RI/RO Single Point Urban Interchange (SPUI) Tight Diamond with West Frontage Road 	<ul style="list-style-type: none"> No Build <ul style="list-style-type: none"> Signalized RCUT Overpass with RIRO RIRO at Bowers Dr Lengthen Accel/Decel Lanes to Weigh Station Rest Area remains in current location Rest Area expands to north side of Highway 10 for WB access Rest Area no longer exists in study area

VIII. Guiding Framework for Concepts

Several considerations are summarized below that influenced the range of concepts developed. These topics emerged through early discussion with the TAC, Ramsey City Council, and Anoka County Transportation Committee and include:

Full Access at Both Ramsey Blvd and Sunfish Lake Blvd

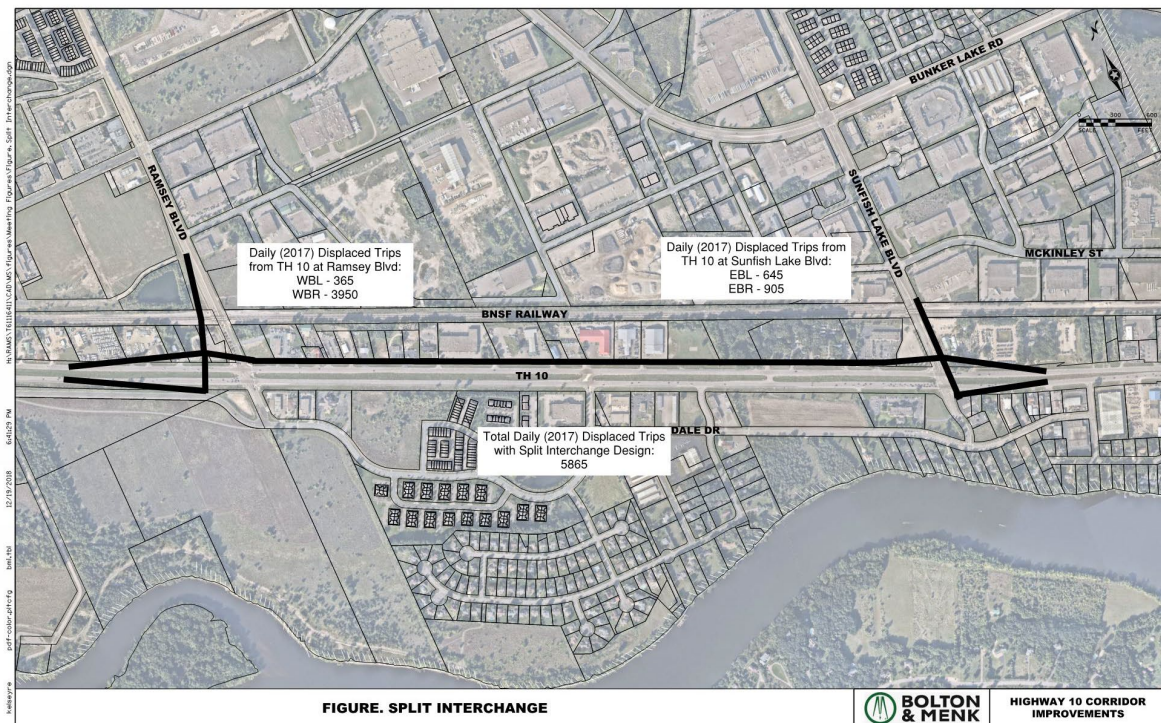
The Ramsey City Council expressed a preference for full movement access and railroad grade separation at Ramsey Boulevard citing this location as their primary gateway to the community. As documented in the Tier 1 Screening, this meant no reduced access movements to the highway or at-grade rail crossings were considered at Ramsey Boulevard. The Ramsey City Council and Anoka County Transportation Committee were willing to consider both full access and reduced access movements and both at-grade and grade separated rail options at Sunfish Lake Boulevard.

In addition, the project team also chose to analyze a few additional improvement concepts at Ramsey Blvd and Sunfish Lake Blvd that were consistent with the intention of the 2014 Highway 10 Access Planning Study - to achieve as many operational and safety benefits as possible yet minimize costs. This led to consideration of the following:

Split Diamond Interchange

Figure 3 illustrates the split diamond design between Ramsey Blvd and Sunfish Lake Blvd. This concept would most likely be a low-cost option; however, it was dismissed by the TAC early in the process as it did not provide adequate traffic operations due to several key movements being displaced as shown in the figure below.

Figure 3 – Split Diamond Interchange Design



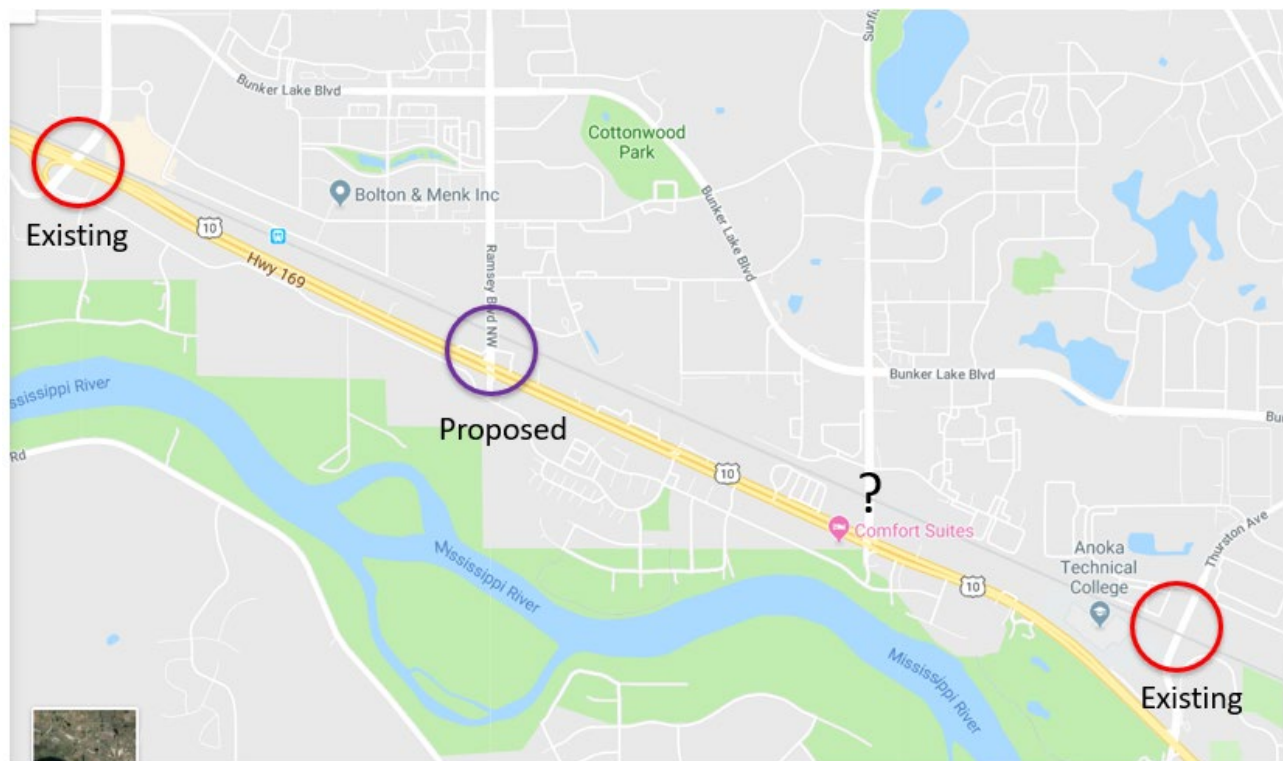
Sunfish Lake Blvd Flyover (No Highway 10 Access)

A flyover option was analyzed that grade separated Highway 10 from Sunfish Lake Blvd, but eliminated access between Highway 10 and Sunfish Lake Blvd. Traffic would be re-routed to Thurston Ave and Ramsey Blvd. The 2045 PM peak hour analysis showed that delay and queuing is a major issue along the frontage road with this concept. The average vehicle queue is 1450 feet and the maximum queue is 4000 ft. This maximum queue extends nearly the entire length of the frontage road between Thurston Ave and Sunfish Lake Blvd. Additionally, vehicles would wait on average over five minutes to turn right onto Thurston Ave from the frontage road. This concluded that the flyover option would not be able to handle the increase in traffic along the frontage road without direct access between Highway 10 and Sunfish Lake Blvd. For these reasons, the flyover option was dismissed from consideration early in the study process.

BNSF Railroad Grade Separation

A major discussion point in the evaluation of improvement concepts was whether to consider grade separation of the BNSF Railroad at both Ramsey Boulevard and Sunfish Lake Boulevard. Figure 4 illustrates that today, grade separation of the railroad exists at Armstrong Boulevard and Thurston Avenue (in Anoka). The Tier 1 Concept Screening documented the TAC's recommendation to evaluate grade-separated rail crossing concepts only at Ramsey Boulevard. The TAC continued with evaluation of both at-grade and grade separated crossings at Sunfish Lake Boulevard.

Figure 4 – Existing and Proposed Rail Grade Separations



This direction was supported by the following input from BNSF and the MnDOT Freight Office early in the study process:

- **BNSF** – the railroad supports grade-separation at both Ramsey Boulevard and Sunfish Lake Boulevard. The railroad is opposed to changing the railroad profile with project. An overpass is the preferred design. An underpass would require a shoofly temporary railroad track so that rail operations would not be impacted by construction. The temporary track would need to accommodate a train going the current operation speed (79 mph). An underpass of the railroad at either intersection would require mitigation of significant groundwater issues. See BNSF meeting notes in Appendix G.
- **MnDOT Rail Office** - MnDOT has authority to determine safe installations at these crossings and require changes if necessary. As such, the MnDOT has listed both the at-grade rail crossings at Ramsey Boulevard and Sunfish Lake Boulevard, within the City of Ramsey, in their top tier priorities across the State of Minnesota to replace with grade-separated solutions.

Another consideration in the development and evaluation of rail grade separation options was whether the grade separation could be phased and built separate from the highway grade separation improvement. The technical analysis concluded that due to the proximity of Highway 10 to the BNSF railroad, both the highway and railroad grade separation should be built together. For example, if Sunfish Lake Boulevard goes over the rail, it also needs to go over Highway 10. The same is true for Ramsey Boulevard. In addition, it is not possible to phase improvements meaning both the highway and rail grade separations would need to be built at the same time. This is due to the site grading changes that need to occur at the approaches of each intersection. The figures in Appendix E illustrate why staging the construction of grade separations at either Sunfish Lake Boulevard or Ramsey Boulevard is not possible.

Property Acquisition

The City of Ramsey has purchased several properties over the past decade in preparation for Highway 10 corridor improvements using the Metropolitan Council's Right-of-Way Acquisition Loan Fund. Where possible, improvement concepts developed with this study utilized previously acquired properties.

For purposes of this study, all RALF properties were considered a right-of-way cost to the project since these loans will need to be repaid to the RALF account once a project is constructed. Appendix D includes a graphic and a table showing the RALF properties and the values assumed for each in determining right-of-way costs.

Ramsey Boulevard Alignment

Early in the concept development phase the project team identified an opportunity to shift the alignment of Ramsey Boulevard to the west of its existing alignment. This shift reduced impacts to existing businesses and allowed for a perpendicular crossing of Highway 10 thereby reducing the bridge length and overall bridge costs. The TAC supported this alignment shift which was carried through on all Ramsey Boulevard improvement concepts.

Frontage Roads

Frontage road connections on the north side of Highway 10 between Ramsey Boulevard and Sunfish Lake Boulevard and east of Sunfish Lake Boulevard both north and south of Highway 10 were identified in the 2014 Highway 10 Access Planning Study. The TAC recommended carrying this forward with all improvement concepts on the east end as shown below in Figure 5-7.

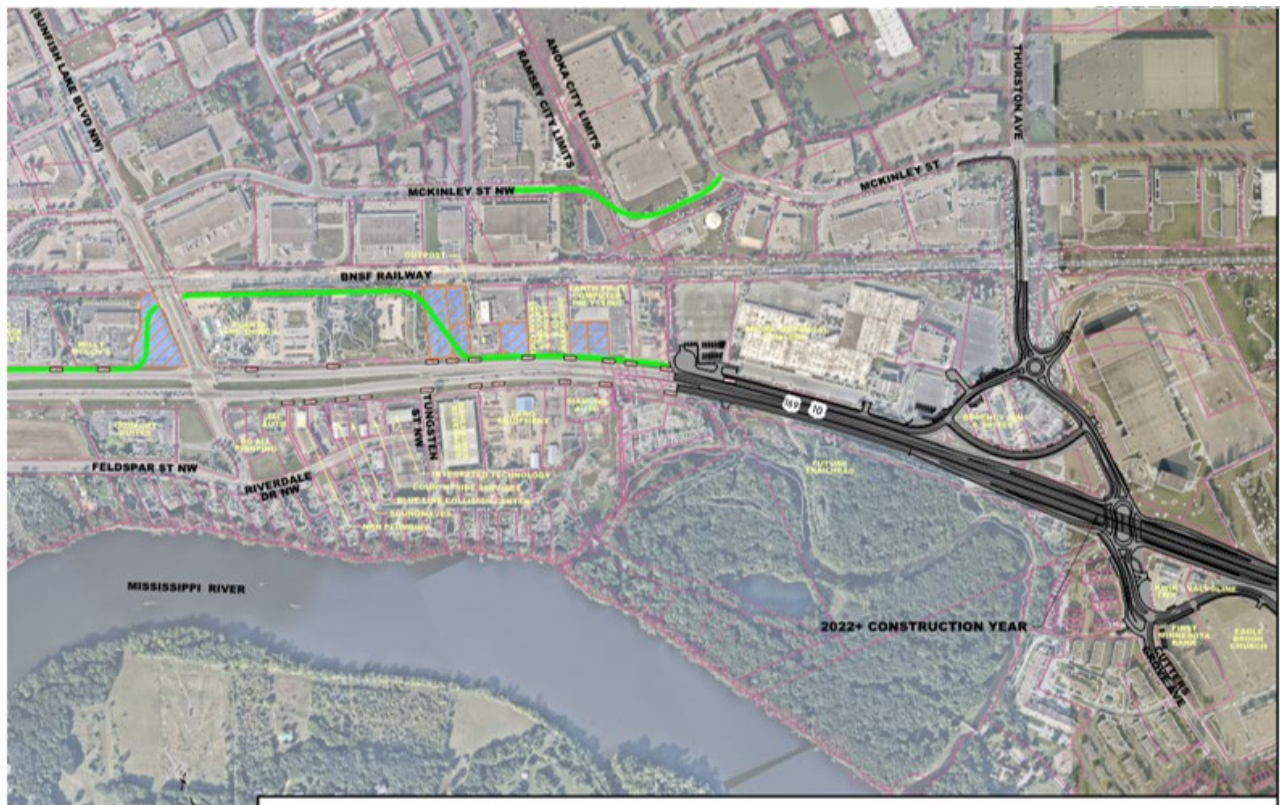
Figure 5 – Frontage Road Between Ramsey and Sunfish Lake Boulevard



Figure 6 – Frontage Road Southeast of Sunfish Lake Boulevard



Figure 7 – Frontage Road Northeast of Sunfish Lake Boulevard (including Anoka Solution Project)



McKinley Street

The 2014 Highway 10 Access Planning Study identified a potential extension of McKinley Street between Ramsey and Anoka; however, at the time this improvement was not supported by the City of Anoka. The

City of Ramsey is interested in revisiting the topic with the City of Anoka and has therefore included it in all improvement concepts developed as part of the Ramsey Gateway Highway 10 improvements. Anoka County is also interested in this connection due to the benefits it would provide during the construction of the Highway 10 Anoka Project in 2023-24.

IX. Concept Evaluation

A. Tier 2 Detailed Evaluation Results

East End

The evaluation was presented in a matrix format to facilitate the comparison across concepts and to identify agency supported concepts to further develop and present for public input. Table 7 below shows a summarized list of evaluation criteria found to differentiate among improvement concepts. Other measures from Table 4 (Goals/Objectives) were considered but found to show no differences in comparing improvement concepts.

Table 7. Differentiating Criteria

Project Goals	Measures
Safely accommodates all users	Pedestrian-Vehicle Conflict Points
	Perceived Pedestrian Comfort
Provide efficient mobility and access for all modes of travel	Design Year Traffic Operations
	Requires a Separate Pedestrian Bridge
	Community Connectivity – Provides all movements
	Provides Railroad Grade Separation
	Ease of Business Access – Retail
	Ease of Business Access – Industrial
Compatible with the natural and built environment	Access to Business Park
	Potential Property Impacts*
	Impact to Regional Park
Develop a financially responsible infrastructure implementation plan	Impact to Public Works Campus
	Relative Cost Comparison
Support plans to build a connected and recognizable Highway 10 corridor	Constructability/Long Term Maintenance
	Likelihood of Railroad Approval
	Agency Support to Carry Concept Forward

*Assessment based on planning-level concepts and will require further review to verify actual impacts.

Figures 8 and 9 illustrate the summarized evaluation results at Ramsey Blvd and Sunfish Lake Blvd respectively.

Figure 8 – Ramsey Boulevard Evaluation

Measures	No Build	RAMSEY BLVD OVER RAILROAD CONCEPTS										RAMSEY BLVD UNDER RAILROAD CONCEPTS								Notes
		1	2	3	4	5	6	7A	7B	8	9	1	2	3	4	5	6	7	8	
		Standard Diamond	Tight Diamond	Folded EB On Tight Diamond	Folded WB Off Tight Diamond	Folded EB On & WB Off Tight Diamond	Folded EB On & Semi-Folded WB Off Tight Diamond	Overpass with Right-In/Right-Out	Overpass with Right-In/Right-Out (West)	Single Point Urban Interchange (SPUI)	Tight Diamond with West Frontage Road	Standard Diamond	Tight Diamond	Folded EB On Tight Diamond	Folded WB Off Tight Diamond	Folded EB On & WB Off Tight Diamond	Folded EB On & Semi-Folded WB Off Tight Diamond	Overpass with Right-In/Right-Out	Single Point Urban Interchange (SPUI)	
Pedestrian-Vehicle Conflict Points	13	23	23	43	25	47	47	17	23	23	24	23	23	43	27	47	47	27	23	Conflict points were counted where crosswalks and sidewalk connections will be provided.
Perceived Pedestrian Comfort																				
Total Interchange Delay (seconds/vehicle)	2045 AM	164										Dismissed prior to operational analysis								
	2045 PM	36																		
Ease of Business Access - Retail	From EB TH 10	Baseline										Option eliminates Holiday Gas Station								Assume traveling to Holiday Gas Station. Green - adds <60 seconds Yellow - adds 60-120 seconds Red - adds 120+ seconds
	From WB TH 10	Baseline																		
Ease of Business Access - Industrial	From EB TH 10	Baseline																		Assume traveling to 143rd Ave at Ebony St Green - adds <60 seconds Yellow - adds 60-120 seconds Red - adds 120+ seconds
	From WB TH 10	Baseline																		
Potential Property Impacts*	0	12 full 8 partial	9 full 4 partial	9 full 6 partial	9 full 3 partial	9 full 4 partial	9 full 4 partial	11 full 2 partial	9 full 4 partial	9 full 5 partial	6 full 4 partial	12 full 8 partial	9 full 5 partial	9 full 6 partial	9 full 3 partial	9 full 4 partial	9 full 4 partial	9 full 4 partial	9 full 5 partial	
Impact to Regional Park	0 Acres	21 Acres	4 Acres	21 Acres	4 Acres	21 Acres	21 Acres	7 Acres	7 Acres	4 Acres	4 Acres	21 Acres	4 Acres	21 Acres	4 Acres	21 Acres	21 Acres	4 Acres	4 Acres	Any impact is a concern because the park is already smaller than the average regional park.
Impact to Public Works Campus																				Underpass options require a shoofly which impacts the existing Public Works Campus.
Cost	\$0 M	Dismissed prior to cost estimation	\$58 - 64 M	Dismissed prior to cost estimation	\$52 - 58 M	Dismissed prior to cost estimation	Dismissed prior to cost estimation	\$46 - 51 M	\$49 - 54 M	Dismissed prior to cost estimation	\$61 - 67 M	Dismissed prior to cost estimation								
Constructability/Long Term Maintenance																				Underpass options require a shoofly which influences the construction schedule and requires extra measures for drainage. Additionally TH 10 grade change is more impactful to traffic than Ramsey grade change.
Likelihood of Railroad Approval																				Discussions with BNSF Railroad indicate strong preference for an overpass.
Agency Support to Carry Concept Forward	No Support	No Support	Supported Concept	No Support	Supported Concept	No Support	No Support	Supported Concept	Supported Concept	No Support	Supported Concept	No Support	No Support	No Support	No Support	No Support	No Support	No Support	No Support	

*Assessment based on planning-level concepts and will require further review to verify actual impacts.

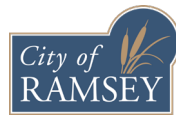
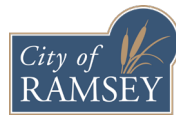


Figure 9 – Sunfish Lake Boulevard Evaluation

Measures		No Build	SUNFISH LAKE BLVD CONCEPTS															Notes
			GRADE SEPARATED RAILROAD CROSSING							AT GRADE RAILROAD CROSSING								
			1A	1B	2	3	4A	5A	6A	4B	5B	6B	7A	7B	8	9A	9B	
			Sunfish Overpass with RI/RO	Sunfish Overpass with RI/RO	Standard Diamond	Tight Diamond	Single Point Urban Interchange (SPUI)	Grade Separated Roundabout	Center Turn Overpass	Single Point Urban Interchange (SPUI)	Grade Separated Roundabout	Center Turn Overpass	High-T (Ped Overpass)	High-T (Ped Underpass)	Flyover	TH 10 Overpass with RI/RO & WB Exit Ramp	TH 10 Overpass with RI/RO	
Pedestrian-Vehicle Conflict Points		7	26	17	30	30	30	30	30	30	30	30	20	20	16	17	16	Conflict points were counted where crosswalks and sidewalk connections will be provided.
Perceived Pedestrian Comfort													Assumes separate pedestrian bridge	Assumes separate pedestrian underpass				
Total Interchange Delay (seconds/vehicle)	2045 AM	86	3	3	Dismissed prior to operational analysis	Dismissed prior to operational analysis	14	9	16	14	9	16	6	6	**	5	5	
	2045 PM	130	4	4			15	10	11	15	10	11	8	8	**	6	6	
Requires a Separate Pedestrian Bridge		NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES	NO	NO	NO	
Community Connectivity - Accommodates All Movements																		
Ease of Business Access - Retail	From EB TH 10	Baseline																Assume traveling to Do It All Printing Green - adds <60 seconds Yellow - adds 60-120 seconds Red - adds 120+ seconds
	From WB TH 10	Baseline																
Ease of Business Access - Industrial	From EB TH 10	Baseline																Assume traveling to McKinley St at Unity St Green - adds <60 seconds Yellow - adds 60-120 seconds Red - adds 120+ seconds
	From WB TH 10	Baseline																
Access to Business Park																		
Potential Property Impacts*		0	5 full 15 partial	5 full 14 partial	9 full 16 partial	9 full 13 partial	5 full 17 partial	5 full 17 partial	5 full 14 partial	5 full 15 partial	5 full 12 partial	5 full 12 partial	5 full 12 partial	4 full 12 partial	4 full 10 partial	5 full 11 partial	5 full 11 partial	
Provides Railroad Grade Separation																		
Cost		\$0 M	\$61 - 68 M	\$54 - 60 M	Dismissed prior to cost estimation	Dismissed prior to cost estimation	\$133 - 147 M	\$89 - 99 M	\$90- 100 M	\$65 - 72 M	\$51 - 56 M	\$59 - 65 M	\$52 - 57 M	\$42 - 47 M	\$32 - 36 M	\$34 - 38 M	\$34 - 38 M	
Constructability/Long Term Maintenance																		TH 10 grade change is more impactful to traffic than Sunfish Lake Blvd grade change.
Agency Support to Carry Concept Forward		No Support	Supported Concept	Supported Concept	No Support	No Support	No Support	No Support	No Support	No Support	Supported Concept	Supported Concept	No Support	No Support	No Support	Supported Concept	Supported Concept	

*Assessment based on planning-level concepts and will require further review to verify actual impacts.

**Frontage Road Queue Extends from Thurston Ave to Sunfish Lake Blvd with 2045 traffic volumes.









Tables 8 and 9 provide a snapshot of each concept evaluated and a brief summary of its operational characteristics and its pros/cons. It also notes those improvement concepts dismissed through the process by collective agreement with the TAC, Ramsey City Council, and Anoka County Transportation Committee. Videos summarizing the Ramsey Boulevard and Sunfish Lake Boulevard options not dismissed are available in the links below and Appendix H.




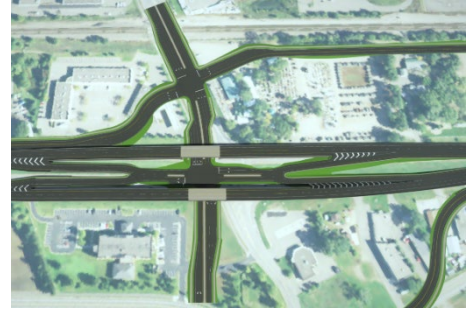
[Sunfish Lake Boulevard Options](https://www.youtube.com/watch?time_continue=4&v=usqeWYj8n-E) - https://www.youtube.com/watch?time_continue=4&v=usqeWYj8n-E




[Ramsey Boulevard Options](https://www.youtube.com/watch?v=gMcyINiDGUU) - <https://www.youtube.com/watch?v=gMcyINiDGUU>

Table 8. Sunfish Lake Boulevard Evaluation Summary

Concept	Characteristics	Summary of Evaluation Differences – Pros/Cons
Sunfish Lake Boulevard (Grade Separated Railroad Crossing) <ul style="list-style-type: none"> Sunfish Lake Blvd is grade separated from Highway 10 and the railroad Requires reconstruction of McKinley St, driveway access at Command Tooling Systems (McKinley St), driveway access to Sunfish Commons (N Frontage Rd) and residential driveways along Riverdale Dr Minimal traffic delay 		
Overpass with RI/RO A 	<ul style="list-style-type: none"> RI/RO access along TH 10 with full acceleration and deceleration lanes Direct connection between N Frontage Rd and Sunfish Lake Blvd 	<p><i>Pros:</i></p> <ul style="list-style-type: none"> Lower cost of railroad cost grade separated options Accommodates all movements Operates with the lowest delay of all options <p><i>Cons:</i></p> <ul style="list-style-type: none"> Results in an additional 5,000-6,000 daily trips on Riverdale Drive Grades in northwest quadrant are a challenge for business access
Overpass with RI/RO B 	<ul style="list-style-type: none"> RI/RO access along TH 10 with full acceleration and deceleration lanes Not a direct connection between N Frontage Rd and Sunfish Lake Blvd 	<p><i>Pros:</i></p> <ul style="list-style-type: none"> Lower cost of railroad cost grade separated options Accommodates all movements <p><i>Cons:</i></p> <ul style="list-style-type: none"> Redundant frontage road system

<p>Standard Diamond</p> 	<ul style="list-style-type: none"> • Standard Diamond Interchange would impact businesses on all surrounding parcels • Ramp terminals are within 100 feet of N Frontage Rd to the north and Riverdale Dr to the south • Direct connection between N Frontage Rd and Sunfish Lake Blvd 	<p><i>Pros:</i></p> <ul style="list-style-type: none"> • Traditional interchange design is familiar to users <p><i>Cons:</i></p> <ul style="list-style-type: none"> • Major impacts to surrounding properties • High cost <p>TAC/Ramsey City Council/Anoka County Transportation Committee Recommended Dismissal due to major impacts and high cost.</p>
<p>Tight Diamond</p> 	<ul style="list-style-type: none"> • Tight Diamond Interchange would impact businesses on all surrounding parcels • Direct connection between N Frontage Rd and Sunfish Lake Blvd 	<p><i>Pros:</i></p> <ul style="list-style-type: none"> • Traditional interchange design is familiar to users <p><i>Cons:</i></p> <ul style="list-style-type: none"> • Major impacts to surrounding properties • High cost <p>TAC/Ramsey City Council/Anoka County Transportation Committee Recommended Dismissal due to major impacts and high cost.</p>
<p>Single Point Urban Interchange (SPUI)</p> 	<ul style="list-style-type: none"> • Large bridge structure • Requires traffic signal • Direct connection between N Frontage Rd and Sunfish Lake Blvd • TH 10 traffic enter/exit from ramps to the right of traffic similar to a typical interchange 	<p><i>Pros:</i></p> <ul style="list-style-type: none"> • Ease of access for motorists • No re-routing of trips onto Riverdale Drive <p><i>Cons:</i></p> <ul style="list-style-type: none"> • High cost • Perceived pedestrian comfort is low
<p>Grade Separated Roundabout</p> 	<ul style="list-style-type: none"> • Large bridge structure • Direct connection between N Frontage Rd and Sunfish Lake Blvd • TH 10 traffic enter/exit from ramps to the right of traffic similar to a typical interchange 	<p><i>Pros:</i></p> <ul style="list-style-type: none"> • Ease of access for motorists • No re-routing of trips onto Riverdale Drive <p><i>Cons:</i></p> <ul style="list-style-type: none"> • High cost • Perceived pedestrian comfort is low

<p>Center Turn Overpass</p> 	<ul style="list-style-type: none"> • Requires traffic signal • Direct connection between N Frontage Rd and Sunfish Lake Blvd • TH 10 traffic enters/exits highway to the left of traffic 	<p><i>Pros:</i></p> <ul style="list-style-type: none"> • Compact design yet accommodates all movements <p><i>Cons:</i></p> <ul style="list-style-type: none"> • High cost • Driver comfort with left entrance/exit Ramps
<p>Sunfish Lake Boulevard (At Grade Railroad Crossing)</p> <ul style="list-style-type: none"> • Highway 10 is grade separated from Sunfish Lake Blvd • Direct connection between N Frontage Rd and Sunfish Lake Blvd 		
<p>Single Point Urban Interchange (SPUI)</p> 	<ul style="list-style-type: none"> • Largest/most expensive bridge structure as no center support is possible with intersection design. • Requires traffic signal • TH 10 traffic enter/exit from ramps to the right of traffic similar to a typical interchange 	<p><i>Pros:</i></p> <ul style="list-style-type: none"> • Minimal traffic delay <p><i>Cons:</i></p> <ul style="list-style-type: none"> • High cost of bridge • Perceived pedestrian comfort is low
<p>Grade Separated Roundabout</p> 	<ul style="list-style-type: none"> • Large bridge structure (not as expensive as with SPUI option because center support is possible with roundabout design) • TH 10 traffic enter/exit from ramps to the right of traffic similar to a typical interchange 	<p><i>Pros:</i></p> <ul style="list-style-type: none"> • Minimal traffic delay <p><i>Cons:</i></p> <ul style="list-style-type: none"> • Perceived pedestrian comfort is low
<p>Center Turn Overpass</p> 	<ul style="list-style-type: none"> • Requires traffic signal • TH 10 traffic enters/exits highway to the left of traffic • Requires significant retaining walls along TH 10 	<p><i>Pros:</i></p> <ul style="list-style-type: none"> • Minimal traffic delay <p><i>Cons:</i></p> <ul style="list-style-type: none"> • Driver comfort with left entrance/exit Ramps

<p>High-T (Pedestrian Overpass)</p> 	<ul style="list-style-type: none"> • Requires traffic signal • Highway 10 traffic is free flowing, eastbound left and southbound left movements are signalized • Westbound left, northbound left, northbound thru and southbound thru need to be re-routed • Requires additional structure for pedestrian accommodation 	<p><i>Pros:</i></p> <ul style="list-style-type: none"> • Minimal traffic delay <p><i>Cons:</i></p> <ul style="list-style-type: none"> • Major structure for pedestrian bridge (crossing over a half mile in total length with double spiral needed) • Not all movements are accommodated <p>TAC/Ramsey City Council/Anoka County Transportation Committee Recommended Dismissal due to high cost and not all movements are accommodated.</p>
<p>High-T (Pedestrian Underpass)</p> 	<ul style="list-style-type: none"> • Requires traffic signal • Highway 10 traffic is free flowing, eastbound left and southbound left movements are signalized • Westbound left, northbound left, northbound thru and southbound thru need to be re-routed • Requires additional structure for pedestrian accommodation 	<p><i>Pros:</i></p> <ul style="list-style-type: none"> • Minimal traffic delay <p><i>Cons:</i></p> <ul style="list-style-type: none"> • Perceived pedestrian comfort is low for tunnel • Not all movements are accommodated <p>TAC/Ramsey City Council/Anoka County Transportation Committee Recommended Dismissal since not all movements are accommodated.</p>
<p>Flyover</p> 	<ul style="list-style-type: none"> • No TH 10 access. All movements re-routed to Thurston Ave and Ramsey Blvd 	<p><i>Pros:</i></p> <ul style="list-style-type: none"> • Lower cost • Minimal property impacts <p><i>Cons:</i></p> <ul style="list-style-type: none"> • High traffic volume on Frontage Rd between Sunfish Lake Blvd and Thurston Ave cannot be accommodated. Traffic queuing would be excessive. • Not all movements are accommodated <p>TAC/Ramsey City Council/Anoka County Transportation Committee Recommended Dismissal due to unacceptable operations.</p>













<p>Highway 10 Overpass with RI/RO & WB Exit Ramp</p> 	<ul style="list-style-type: none"> • RI/RO access along eastbound TH 10 with full acceleration and deceleration lanes • Direct access from WB TH 10 to Sunfish Lake Blvd • No access from Sunfish Lake Blvd onto WB TH 10. Traffic would be rerouted to Ramsey Blvd via a proposed frontage road. • Roundabout shown, but traffic control has not been determined. • Small bridge structure 	<p><i>Pros:</i></p> <ul style="list-style-type: none"> • Lower cost • Minimal traffic delay <p><i>Cons:</i></p> <ul style="list-style-type: none"> • Not all movements are accommodated <p>TAC/Ramsey City Council/Anoka County Transportation Committee Recommended Dismissal since not all movements are accommodated.</p>
<p>Highway 10 Overpass with RI/RO</p> 	<ul style="list-style-type: none"> • RI/RO access along TH 10 with full acceleration and deceleration lanes • Roundabout shown, but traffic control has not been determined. • Small bridge structure 	<p><i>Pros:</i></p> <ul style="list-style-type: none"> • Lower cost • Minimal traffic delay <p><i>Cons:</i></p> <ul style="list-style-type: none"> • Adds 5,090-6,000 daily trips onto Riverdale Drive which is a concern expressed by residents.

Table 9. Ramsey Boulevard Evaluation Summary

Concept	Characteristics	Reason Supported/Not Supported
Ramsey Boulevard (Ramsey Over Railroad Crossing) <ul style="list-style-type: none"> Ramsey Blvd is grade separated from Highway 10 and the railroad Ramsey Blvd is realigned to cross TH 10 at a 90-degree angle to minimize cost by reducing the length of the bridge needed to span TH 10 and minimize impacts to the businesses on the southwest corner of the intersection. 		
Standard Diamond 	<ul style="list-style-type: none"> N Frontage Rd is required to be a one-way near TH 10 WB Exit Ramp Large footprint Requires full acquisition of properties north of TH 10 between Armstrong Blvd and Ramsey Blvd 	<p><i>Pros:</i></p> <ul style="list-style-type: none"> Traditional interchange design is familiar to users. <p><i>Cons:</i></p> <ul style="list-style-type: none"> Major impacts to regional park Major impacts to businesses <p>TAC/Ramsey City Council/Anoka County Transportation Committee Recommended Dismissal due to major impacts to businesses and regional park.</p>
Tight Diamond 	<ul style="list-style-type: none"> Typical interchange design Intersections of Ramsey Blvd with the frontage road and TH 10 WB ramps are spaced closely to fit between railroad and TH 10 Requires full acquisition of properties north of TH 10 between Armstrong Blvd and Ramsey Blvd 	<p><i>Pros:</i></p> <ul style="list-style-type: none"> Minimal impacts to regional park Traditional design familiar to users <p><i>Cons:</i></p> <ul style="list-style-type: none"> Closely spaced ramp and frontage road intersections.
Folded EB On Tight Diamond 	<ul style="list-style-type: none"> Standard Tight Diamond design for westbound TH 10 ramps. Loop ramp in southwest quadrant requires Riverdale Dr reconstruction Requires full acquisition of properties north of TH 10 between Armstrong Blvd and Ramsey Blvd 	<p><i>Pros:</i></p> <ul style="list-style-type: none"> Traditional design familiar to users. <p><i>Cons:</i></p> <ul style="list-style-type: none"> Major impacts to regional park <p>TAC/Ramsey City Council/Anoka County Transportation Committee Recommended Dismissal due to regional park impacts.</p>

<p>Folded WB Off Tight Diamond</p> 	<ul style="list-style-type: none"> • Standard Tight Diamond design for eastbound TH 10 ramps. • Requires traffic signal • The frontage road and WB TH 10 ramps form a single intersection along Ramsey Blvd • Tight radius (150') needed to fit without impacting RR right of way • Requires full acquisition of properties north of TH 10 between Armstrong Blvd and Ramsey Blvd 	<p><i>Pros:</i></p> <ul style="list-style-type: none"> • Minimal impacts to regional park • Least impactful option to businesses on northeast corner • One ramp/frontage road intersection north of the interchange bridge. <p><i>Cons:</i></p> <ul style="list-style-type: none"> • Minimal radius for loop ramp.
<p>Folded EB on & WB Off Tight Diamond</p> 	<ul style="list-style-type: none"> • Requires traffic signal • Tight radius (150') needed to fit without impacting RR right of way • Requires full acquisition of properties north of TH 10 between Armstrong Blvd and Ramsey Blvd 	<p><i>Cons:</i></p> <ul style="list-style-type: none"> • Major impacts to regional park <p>TAC/Ramsey City Council/Anoka County Transportation Committee Recommended Dismissal due to regional park impacts.</p>
<p>Folded EB on & Semi-Folded WB Off Tight Diamond</p> 	<ul style="list-style-type: none"> • Requires traffic signal • Larger radius for the WB Exit Ramp T's into WB Entrance ramp • Requires full acquisition of properties north of TH 10 between Armstrong Blvd and Ramsey Blvd 	<p><i>Cons:</i></p> <ul style="list-style-type: none"> • Major impacts to regional park <p>TAC/Ramsey City Council/Anoka County Transportation Committee Recommended Dismissal due to regional park impacts.</p>
<p>Overpass with RI/RO</p> 	<ul style="list-style-type: none"> • RI/RO access along TH 10 with full acceleration and deceleration lanes • Both directions of TH 10 traffic exit prior to Ramsey Blvd (similar to standard interchange ramps) • Requires full acquisition of properties north of TH 10 between Armstrong Blvd and Ramsey Blvd • Most impactful option to businesses on northeast corner 	<p><i>Pros:</i></p> <ul style="list-style-type: none"> • Lower cost • Minimal impacts to regional park • Design mimics traditional interchange design with highway exit points prior to interchange bridge <p><i>Cons:</i></p> <ul style="list-style-type: none"> • Additional turns required

<p>Overpass with RI/RI (West)</p> 	<ul style="list-style-type: none"> • RI/RO access along TH 10 with full acceleration and deceleration lanes • Requires traffic signal • Eastbound TH 10 traffic exits prior to Ramsey Blvd (like standard interchange ramps) • Westbound TH 10 traffic passes Ramsey Blvd before exiting • Higher cost than other Overpass with RI/RO due to more retaining wall and intersection lanes at Ramsey Blvd and N Frontage Road/WB TH 10 Access • Requires full acquisition of properties north of TH 10 between Armstrong Blvd and Ramsey Blvd 	<p><i>Pros:</i></p> <ul style="list-style-type: none"> • Lower cost • Minimal impacts to regional park • Utilizes acquired property in northwest quadrant for infrastructure purposes <p><i>Cons:</i></p> <ul style="list-style-type: none"> • Highway 10 exit for westbound traffic is past the interchange bridge
<p>Single Point Urban Interchange (SPUI)</p> 	<ul style="list-style-type: none"> • Requires traffic signal • Large bridge structure • Requires full acquisition of properties north of TH 10 between Armstrong Blvd and Ramsey Blvd 	<p><i>Pros:</i></p> <ul style="list-style-type: none"> • Minimal impacts to regional park <p><i>Cons:</i></p> <ul style="list-style-type: none"> • High cost • Perceived pedestrian comfort is low <p>TAC/Ramsey City Council/Anoka County Transportation Committee Recommended Dismissal due to high cost.</p>
<p>Tight Diamond with West Frontage Road</p> 	<ul style="list-style-type: none"> • Standard tight diamond design, however, access to frontage road is via the westbound ramps • Frontage Rd extends west of Ramsey Blvd to provide access to businesses ending in a cul-de-sac near Armstrong Blvd. • Requires an off road and indirect pedestrian route 	<p><i>Pros:</i></p> <ul style="list-style-type: none"> • Minimal impacts to regional park <p><i>Cons:</i></p> <ul style="list-style-type: none"> • High cost • Would require significant reconstruction of WB TH 10 <p>TAC/Ramsey City Council/Anoka County Transportation Committee Recommended Dismissal due to high cost and impacts.</p>

Ramsey Boulevard (Ramsey Under Railroad Crossing)

All Ramsey Boulevard railroad underpass concepts were dismissed early in the Tier 2 Evaluation. Discussions with BNSF Railroad indicate strong preference for an overpass. The underpass options were also not supported as they would require a temporary shoofly which influences the construction schedule, has property impacts, and requires extra measures for drainage. Appendix E includes a graphic showing shoofly impacts. Additionally, a Highway 10 grade change (Highway 10 over Ramsey) would be more impactful to traffic than a Ramsey Blvd grade change.

Scoring criteria was then associated with each evaluation measure to compare the project benefits (i.e., how well it addressed the project goals) compared to the costs of each improvement concept. All goals were considered to have equal weight. Figures 10-15 illustrate the project benefits and costs for Ramsey Boulevard and Sunfish Lake Boulevard.

Figure 10 – Ramsey Boulevard Preliminary Cost Estimates

Ramsey Blvd Preliminary Costs				
Ramsey Over Cost Estimates	Construction	Right-of-Way	Engineering	TOTAL
Option 2. Tight Diamond	\$34 - \$38 M	\$16 - \$18 M	\$6.8 - \$7.6 M	\$58 - \$64 M
Option 4. Folded WB TH 10 Off	\$30 - \$34 M	\$16 - \$18 M	\$6.1 - \$6.7 M	\$52 - \$58 M
Option 7A. Overpass with RIRO	\$23 - \$25 M	\$18 - \$20 M	\$4.6 - \$5.0 M	\$46 - \$51 M
Option 7B. Overpass with RIRO	\$27 - \$30 M	\$16 - \$18 M	\$5.5 - \$6.0 M	\$49 - \$54 M
Option 9. Tight Diamond with Frontage Rd	\$41 - \$45 M	\$12 - \$13 M	\$8.2 - \$9.0 M	\$61 - \$67 M

Figure 11 – Ramsey Boulevard Scoring Results

Criteria	Ramsey Blvd				
	2	4	7A	7B	9
	Tight Diamond	Folded WB Off Tight Diamond	Overpass with Right-In/Right-Out	Overpass with Right-In/Right-Out (WEST)	Tight Diamond with West Frontage Rd
Pedestrian-Vehicle Conflict Points	2	2	2	2	2
Perceived Pedestrian Comfort	3	3	3	3	2
Total Interchange Delay (seconds/vehicle)	3	3	3	3	3
	3	3	3	3	3
Ease of Business Access - Retail	3	3	3	3	3
	3	3	2	3	3
Ease of Business Access - Industrial	3	3	3	3	3
	3	3	3	3	3
Potential Property Impacts*	2	2	2	2	2
Impact to Regional Park	2	2	2	2	2
Impact to Public Works Campus	3	3	3	3	3
Constructability/Long Term Maintenance	3	3	3	3	3
Likelihood of Railroad Approval	3	3	3	3	3
Score	82	82	80	82	79

Figure 12 – Ramsey Boulevard Project Benefits and Costs

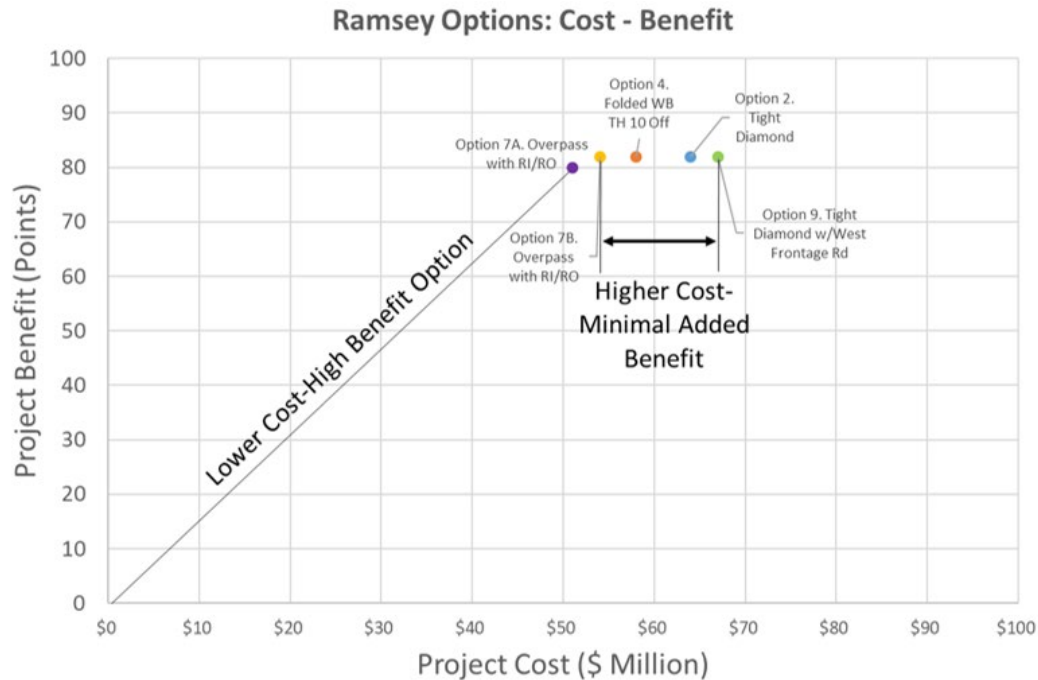


Figure 13 – Sunfish Lake Boulevard Preliminary Cost Estimates

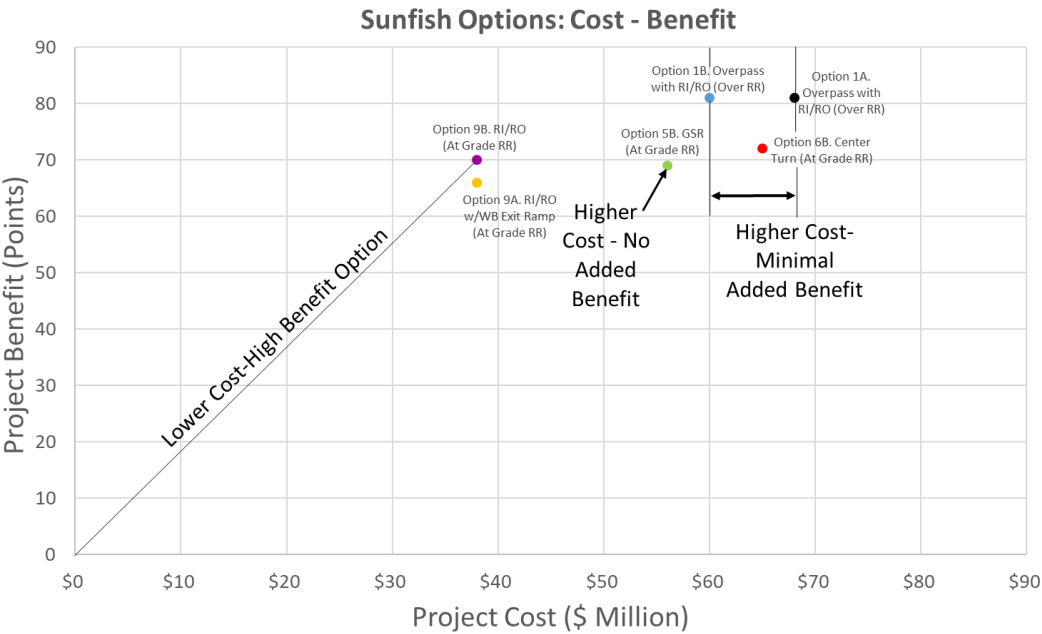
Sunfish Lake Blvd Preliminary Costs

Sunfish Cost Estimates	Construction	Right-of-Way	Engineering	TOTAL
Option 1A. Overpass with RIRO (Over RR)	\$41 - \$46 M	\$12 - \$13 M	\$8.3 - \$9.1 M	\$61 - \$68 M
Option 1B. Overpass with RIRO (Over RR)	\$35 - \$39M	\$12 - \$13 M	\$7.1 - \$7.8 M	\$54 - \$60 M
Option 5B. Grade Separated RAB (At Grade RR)	\$33 - \$36 M	\$12 - \$13 M	\$6.5 - \$7.2 M	\$51 - \$56 M
Option 6B. Center Turn Overpass (At Grade RR)	\$40 - \$44 M	\$11 - \$12 M	\$7.9 - \$8.8 M	\$59 - \$65 M
Option 9A. Overpass w/RIRO, Reduced Access (At Grade RR)	\$19 - \$21 M	\$11 - \$12 M	\$3.8 - \$4.2 M	\$34 - \$38 M
Option 9B. Overpass w/RIRO, Full Access (At Grade RR)	\$19 - \$21 M	\$11 - \$12 M	\$3.9 - \$4.3 M	\$34 - \$38 M

Figure 14 – Sunfish Lake Blvd Scoring Results

Criteria	Sunfish Lake Blvd													
	1A Overpass with Right-In/ Right-Out	1B Overpass with Right-In/ Right-Out	4A Single Point Urban Interchange (SPUI)	5A Grade Separated Roundabout	6A Center Turn Overpass	4B Single Point Urban Interchange (SPUI)	5B Grade Separated Roundabout	6B Center Turn Overpass	7A High-T (Ped Overpass)	7B High-T (Ped Underpass)	8 Flyover	9A EB RIRO w/Roundabout	9B RIRO w/Roundabout	10 RIRO w/Signal
Pedestrian-Vehicle Conflict Points	2	2	1	1	1	1	1	1	2	2	2	2	2	2
Perceived Pedestrian Comfort	3	3	1	1	2	1	2	2	3	3	3	2	2	3
Total Interchange Delay (seconds/vehicle)	3	3	3	3	3	3	3	3	3	3	1	3	3	3
	3	3	3	3	3	3	3	3	3	3	1	3	3	3
Requires a Separate Pedestrian Bridge	3	3	3	3	3	3	3	3	1	1	3	3	3	3
Community Connectivity - Provides all movements	3	3	3	3	3	3	3	3	1	1	1	1	3	3
Ease of Business Access - Retail	3	3	3	3	3	3	3	3	1	1	1	3	3	3
	2	2	3	3	3	3	3	3	3	3	1	3	2	2
Ease of Business Access - Industrial	3	3	3	3	3	3	3	3	1	1	1	3	3	3
	3	3	3	3	3	3	3	3	3	3	1	3	3	3
Access to Business Park	2	2	3	3	2	3	3	3	2	2	1	2	2	2
Potential Property Impacts*	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Provides Railroad Grade Separation	3	3	3	3	3	1	1	1	1	1	1	1	1	1
Constructability/Long Term Maintenance	3	3	2	2	2	2	2	2	2	2	2	2	2	2
Score	81	81	74	74	74	69	72	72	58	58	50	66	70	73

Figure 15 – Sunfish Lake Blvd Project Benefits and Costs



West End

The west end of the study included Highway 10 from the western limits of the City of Ramsey to Armstrong Boulevard. Highway 10 carries approximately 35,500 vehicles per day (2018 volumes) in this section. Volumes are expected to grow to 48,800 by 2045. Land uses include rural residential, agricultural, business/industrial, and Dayton Port Rest Area and Weigh Station.

Due to the traffic volumes, at-grade intersections in this area are a safety concern. Full movement intersections at Jarvis Street and Alpine Drive are in the highest risk category per MnDOT Access Management Manual (based on conflicting hourly volumes). This analysis confirms that left turns are high risk as gaps on the highway are infrequent. It is anticipated the gaps on Highway 10 will lessen as signals are removed in Anoka and in the future at Ramsey Boulevard and Sunfish Lake Boulevard.

Coordination with MnDOT weigh station staff confirmed the acceleration and deceleration lanes are substandard length (too short). Weigh station staff noted they often close the station during peak traffic hours due to safety concerns with heavy commercial vehicles accelerating into heavy traffic. MnDOT rest area staff noted the rest area entrance and exit points are confusing for travelers. The rest area site is unique for MnDOT as it is smaller than a typical rest area footprint, is located on only one side of the highway, is surrounded by residential development, and lacks truck parking. MnDOT staff has looked at relocating this rest area in the past but said there is no current plan or funding in place to do that.

West End Improvement Concepts Considered

The traffic analysis showed the need to consider improvement options that:

- Reduce direct access to Highway 10 by adding/connecting frontage roads
- Consider a signalized reduced conflict U-turn or a low-cost grade separation near Jarvis Street/Alpine Drive (see Figure 16 and 17)
- Add acceleration/deceleration lanes to any remaining access points (see Appendix F)
- Consider the following rest area scenarios: rest area remains as is, rest area is expanded to provide a westbound location, and rest area is moved out of the study area completely (see Appendix F).

Figure 16 - Unsignalized/Signalized RCUT at Jarvis Street and Alpine Drive

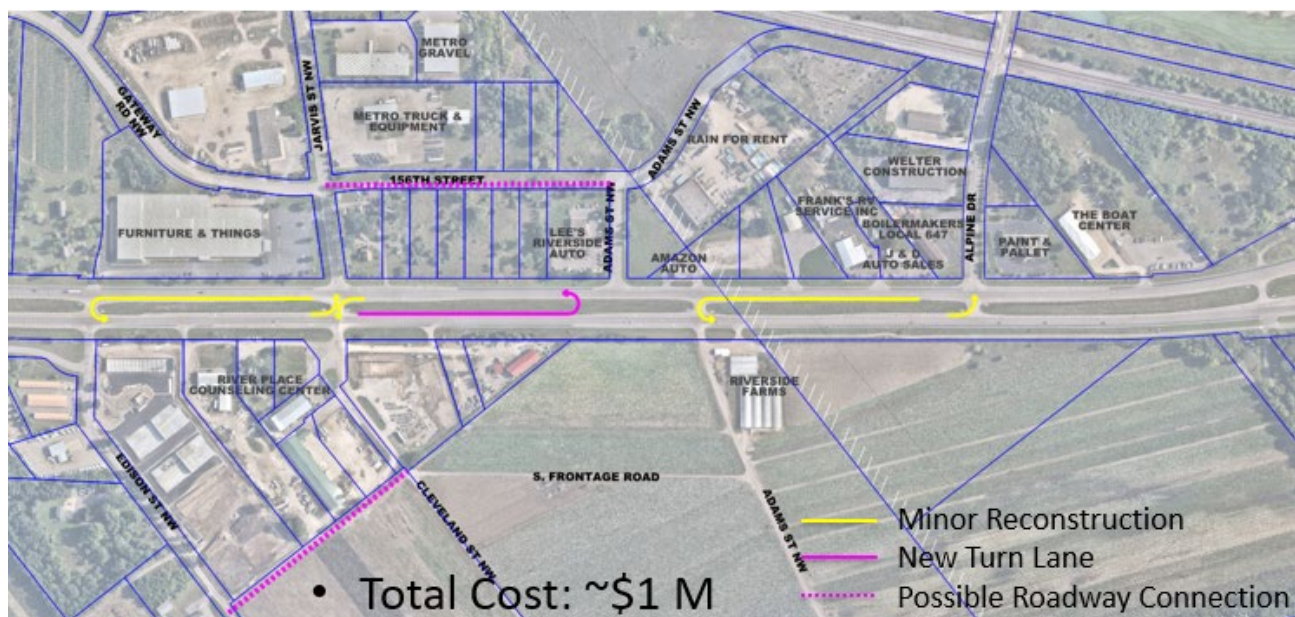


Figure 17 - Overpass at Jarvis Street



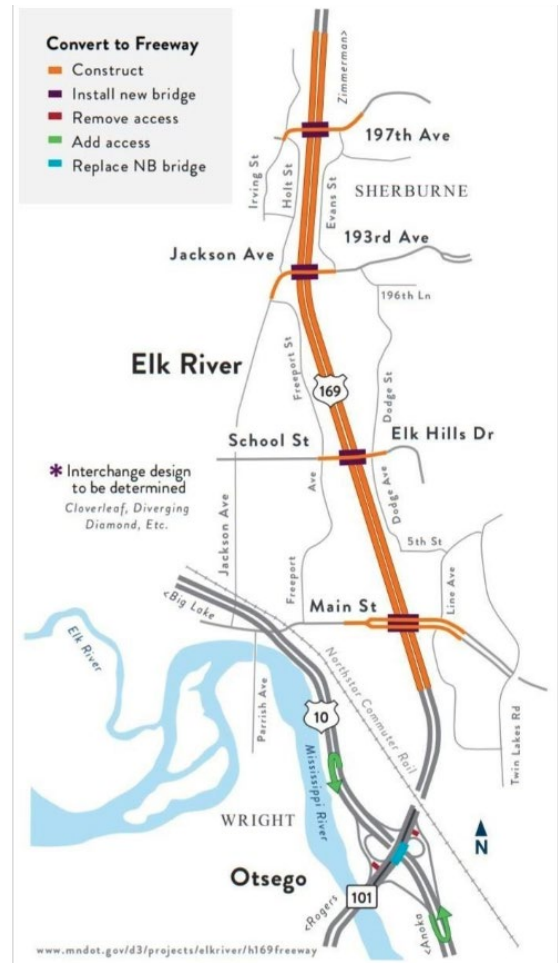
West End Recommendation

A recommended vision for the west end was not identified in this study. Instead, a recommendation was made to add this area into a future study with the City of Elk River to define the vision for access and intersection control on Highway 10 between Armstrong Boulevard and the Highway 101/10/169 interchange in Elk River. The primary reason for this recommendation was the uncertainty surrounding signalized RCUT improvement options and whether adding signals to Highway 10 was consistent with the long-term function of this highway between Ramsey and Elk River. Elk River's 169 Redefine Project is considering adding signalized U-turns on Highway 10 with Highway 101/10/169 interchange improvements as shown in Figure 18.

The Ramsey City Council was reluctant to consider options that included a signal, recognizing the challenges occurring today at signalized intersections to the east. The TAC and Ramsey City Council agreed additional study is needed to factor in Elk River's growth plans before recommending that a signalized Highway 10 corridor would or would not be best between Ramsey and Elk River.

At the writing of this report, Elk River was actively coordinating with MnDOT District 3 and MnDOT Metro to initiate a study of Highway 10 between Ramsey and Elk River. Ramsey is interested in collaborating on the study with Elk River in order to finalize a vision for their west end.

Figure 18 – Elk River 169 Redefine Project



X. Public and Agency Input

Public and agency input was collected throughout the study as described in the sections below.

B. Agency Input

In addition to the TAC, project staff sought input from key agencies at study milestones and during the identification and evaluation of improvement concepts. Below is a brief summary of the outreach conducted.

FHWA

The project team met with FHWA staff in the early phases of the study to gather input on the study process, schedule and purpose and need framework. A meeting summary is included in Appendix G. Additionally, the project team shared all public open house materials and messages with FHWA prior to the open house.

MnDOT

The project team met with MnDOT staff at various points in the study. The first meeting was with MnDOT Rest Area and Weigh Station staff to discuss issues and needs near the Dayton Port Rest Area and Weigh Station on Highway 10 on the west end of the corridor. A meeting summary is included in Appendix G.

Two additional meetings were held with MnDOT Metro Area staff and the District Engineer to review key study milestones including purpose and need framework and the improvement concept evaluation results. MnDOT expressed support for the city/county initiatives to further the vision for Highway 10 yet noted no funding beyond regular maintenance is planned or programmed for Highway 10 improvements at this time. MnDOT advised the best opportunity to put together funding for projects such as these are to keep the costs as low as possible.

Design Workshop

On March 8, 2019 staff from the City of Ramsey, Anoka County and MnDOT gathered to further explore Sunfish Lake Boulevard/Highway 10 improvement concepts. A meeting summary is included in Appendix G. Findings from this exercise included:

- If Sunfish Lake Blvd is grade-separated at the BNSF railroad, it must also go over Highway 10.
- If Sunfish Lake Blvd remain at-grade at the BNSF railroad, additional flexibility in options is provided when Highway 10 goes over Sunfish Lake Blvd.
- New variations of the overpass with RIRO emerged including:
 - Additional full movement access configurations with right-in/right-out locations and frontage road access
 - Limited movement option – no southbound Sunfish Lake Blvd to westbound Highway 10 access
- Collector-distributor road idea was explored between Ramsey Blvd and Sunfish Lake Blvd but found to not be feasible due to right-of-way constraints.

Elected Official Updates

The project team provided updates to the Ramsey City Council and Anoka County Transportation Committee at key points throughout the study's duration. Appendix G includes copies of presentations from each of these meetings.

C. Public Input

Public input was collected in the spring of 2019 to gather input on the full range of concepts identified, screened, and evaluated. Appendix H contains copies of the information shared at these meetings.

Figures 19-20 provides a summary of input collected at the property owner meetings and public open house.

Figure 19 – Business and Property Owner Input (May 2019)



Figure 20 – Open House Input (June 2019)



D. Additional Concepts Based on Public Input

A concern was raised by residents along Riverdale Drive near Sunfish Lake Boulevard regarding the right-in/right-out improvement options. Their concern was the additional traffic that would be routed onto Riverdale Drive from the southbound Sunfish Lake Blvd to eastbound Highway 10 movement with these options. The project team reviewed the traffic analysis and found an additional 5,300-6,000 vehicles per day could be expected on Riverdale Drive with these options in 2045. The total daily volumes on Riverdale Drive with these options is projected to be 8,000 vehicles per day in 2045 which is within the range that a two-lane roadway can adequately carry. In comparison, the projected total volumes for improvement concepts such as the Center Turn Overpass and Grade-Separated Roundabout are in the range of 2,300 daily vehicles on Riverdale Drive in 2045.

Based on the concerns expressed by Riverdale Drive residents, the project team considered an additional concept that would provide a more traditional loop ramp for the southbound Sunfish Lake Blvd to eastbound Hwy 10 movement, rather than the right-in/right-out. These options would result in a total of 3,400 vehicles per day on Riverdale Drive in 2045 but would also come at a cost of approximately \$4-6 million more than the same options without the loop ramp. The TAC determined to revisit this issue during preliminary design. These concepts are included in Appendix I.

XI. Locally Preferred Vision Recommendations

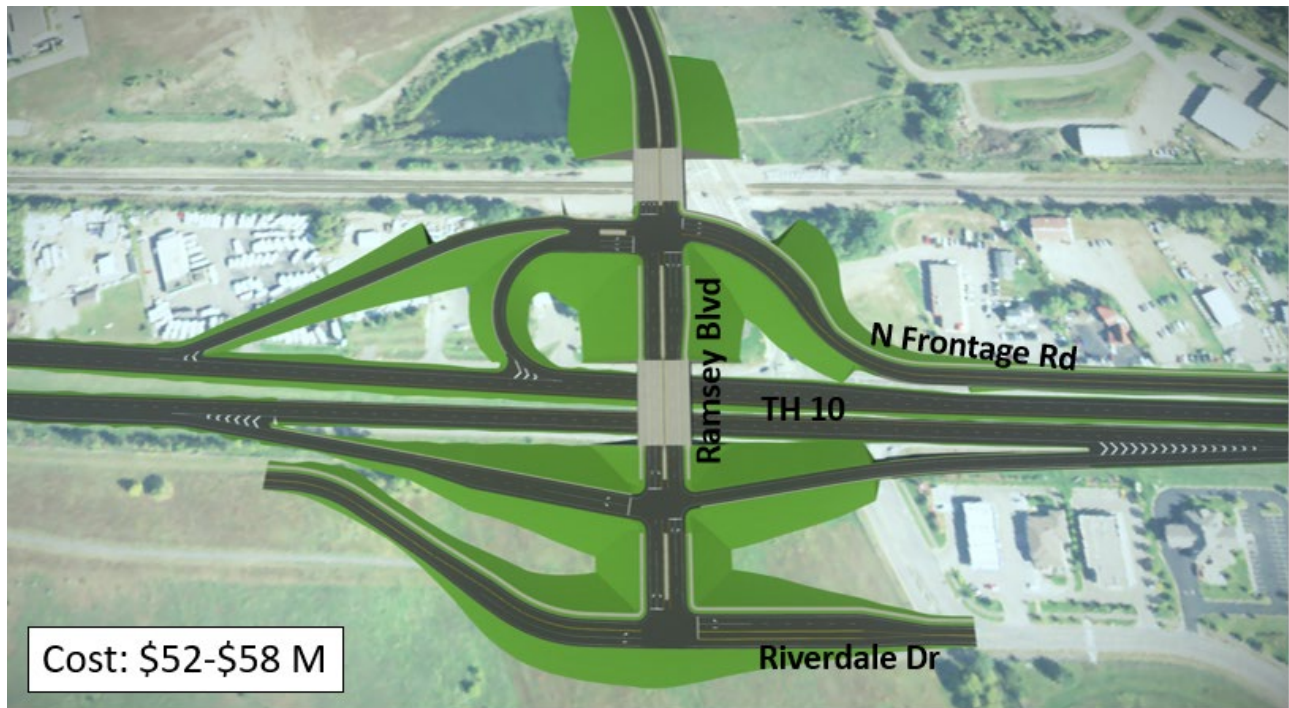
In September of 2019, the study portion of the Ramsey Gateway Highway 10 Project closed with a locally preferred vision for Highway 10 in Ramsey supported by both the Ramsey City Council and the Anoka County Transportation Committee. The following summarizes the TAC recommendations and the Ramsey City Council and Anoka County positions leading to locally preferred vision.

E. TAC Recommendation

Ramsey Boulevard at Highway 10

The TAC recommended the Folded Tight Diamond Concept at Ramsey Boulevard (see Figure 21). This concept was recommended due to its ability to effectively accommodate future traffic operations and all users, to minimize right-of-way impacts where possible, to effectively use property that must be acquired in the northwest quadrant of the intersection, and to meet the needs of a community gateway through familiar interchange design and railroad grade separation. The cost estimate for this improvement concept is \$52-58 million (in 2025 dollars) which includes construction, right-of-way acquisition and Right-of-Way Acquisition Loan Fund (RALF) payback, and engineering.

Figure 21 – Ramsey Boulevard Folded Tight Diamond Concept



Frontage Road Between Ramsey Boulevard and Sunfish Lake Boulevard

The TAC recommended to continue planning for the frontage road connection on the north side of Highway 10 between Ramsey Boulevard and Sunfish Lake Boulevard (see Figure 22). This frontage road was identified in the 2014 Highway 10 Access Planning Study. The cost estimate for this improvement concept is \$12-14 million (in 2025 dollars) which includes construction, right-of-way acquisition and Right-of-Way Acquisition Loan Fund (RALF) payback, and engineering.

Figure 22 – Frontage Road Between Ramsey and Sunfish Lake Boulevard



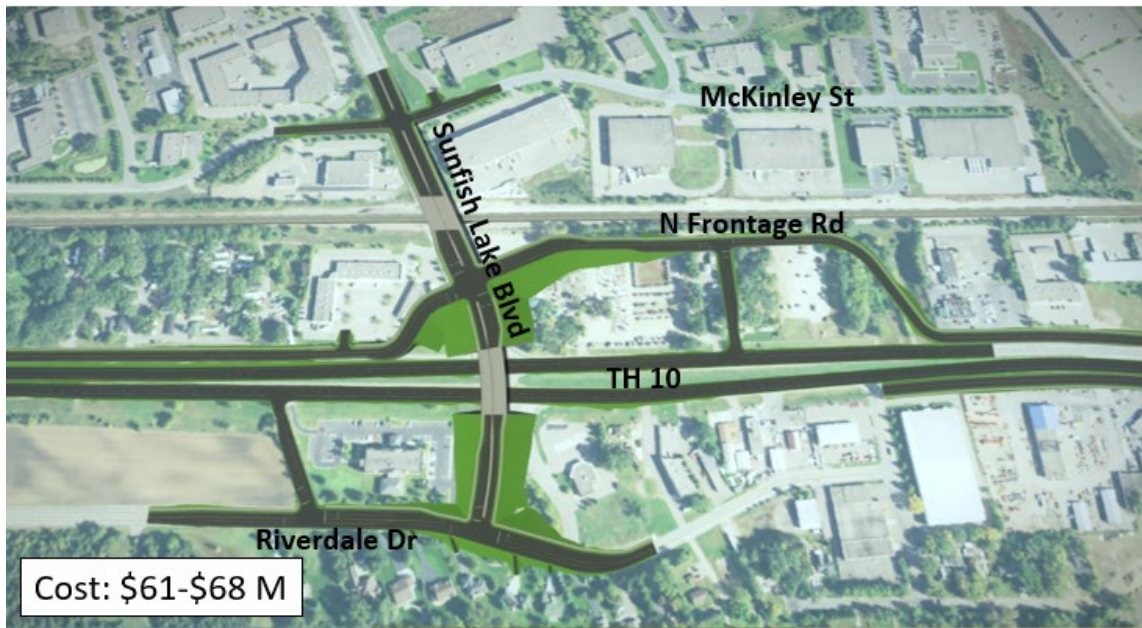
Sunfish Lake Boulevard at Highway 10

The TAC recommended two improvement options for the City Council and County Transportation Committee consideration. Both options are more non-traditional interchange designs that include at-grade right-in/right-out movements for access to/from Highway 10. This type of at-grade configuration was considered as means to keep costs down, consistent the intention of the 2014 Highway 10 Access Planning Study. The primary difference between the two improvement concepts is railroad grade separation or not.

The TAC felt whether railroad grade separation was needed at Sunfish Lake Boulevard was a policy decision to be determined by the City Council and County Board.

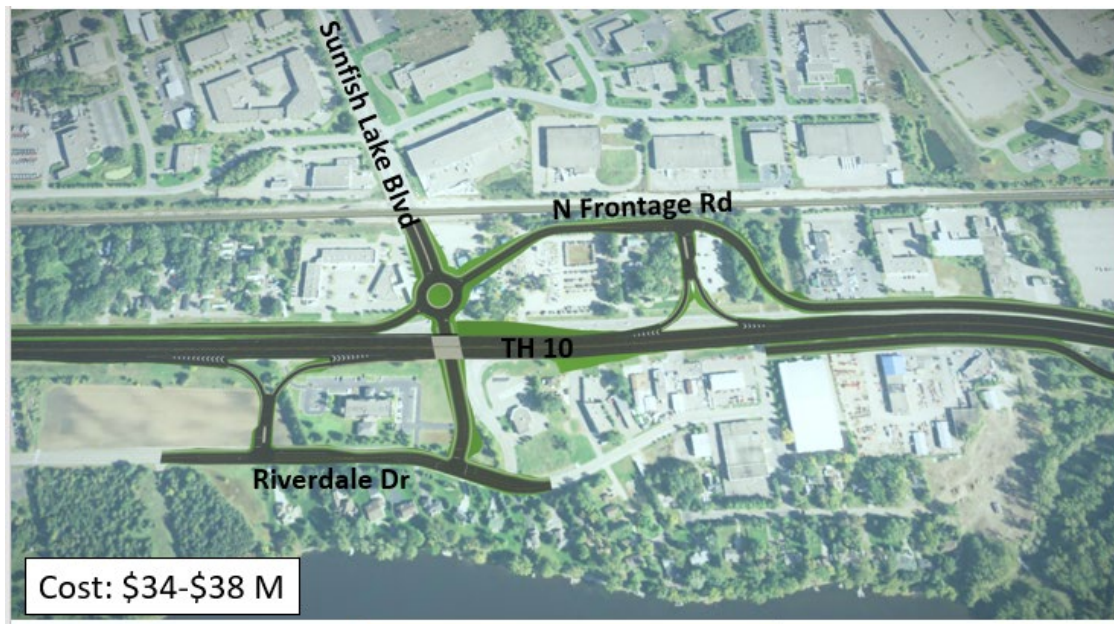
Figure 23 illustrates the first option – a Sunfish Lake Blvd overpass of Highway 10 and the BNSF railroad with right-in/right-out access to Highway 10. The cost estimate for this improvement concept is \$61-68 million (in 2025 dollars) which includes construction, right-of-way acquisition and Right-of-Way Acquisition Loan Fund (RALF) payback, and engineering.

Figure 23 – Sunfish Lake Boulevard Overpass with RIRO and Rail Grade Separation



The second option is illustrated in Figure 24 and is a Highway 10 overpass of Sunfish Lake Boulevard with at-grade railroad crossing and right-in/right-out access to Highway 10. The concept illustrates a roundabout on Sunfish Lake Boulevard, but it is assumed a traffic signal could also work. The cost estimate for this improvement concept is \$34-38 million (in 2025 dollars) which includes construction, right-of-way acquisition and Right-of-Way Acquisition Loan Fund (RALF) payback, and engineering.

Figure 24 – Sunfish Lake Boulevard – Highway 10 Overpass with RIRO and At-Grade Rail



It should be noted that all Sunfish Lake Boulevard options include the costs for a frontage road south of Highway 10, east of Sunfish Lake Boulevard as shown in Figure 25. The ultimate alignment of this frontage road and endpoint is to be determined in the preliminary design phase of this project. MnDOT has expressed that it is unlikely that a right-in/right-out connection to Highway 10 from this frontage road would be allowed.

Figure 25 – Frontage Road East of Sunfish Lake Blvd



West End Recommendation

A recommended vision for the west end was not identified in this study. Instead, a recommendation was made to add this area into a future study with the City of Elk River to define the future vision for access and intersection control on Highway 10 between Armstrong Boulevard and the Highway 101/10/169 interchange in Elk River. The TAC did recommend the City of Ramsey and MnDOT consider an interim improvement as shown in Figure 16 as a proactive safety improvement in this area.

F. Ramsey City Council

The Ramsey City Council at their July 16, 2019 work session and September 10, 2019 council meeting expressed support for the TAC's recommendation for a Folded Tight Diamond Interchange concept at Ramsey Boulevard and the Sunfish Lake Boulevard Overpass of Highway 10 and the BNSF Railroad. The Council's position on the need for rail grade separation at Sunfish Lake Boulevard is to provide efficient and safe access to the community and the large industrial park located off Sunfish Lake Boulevard.

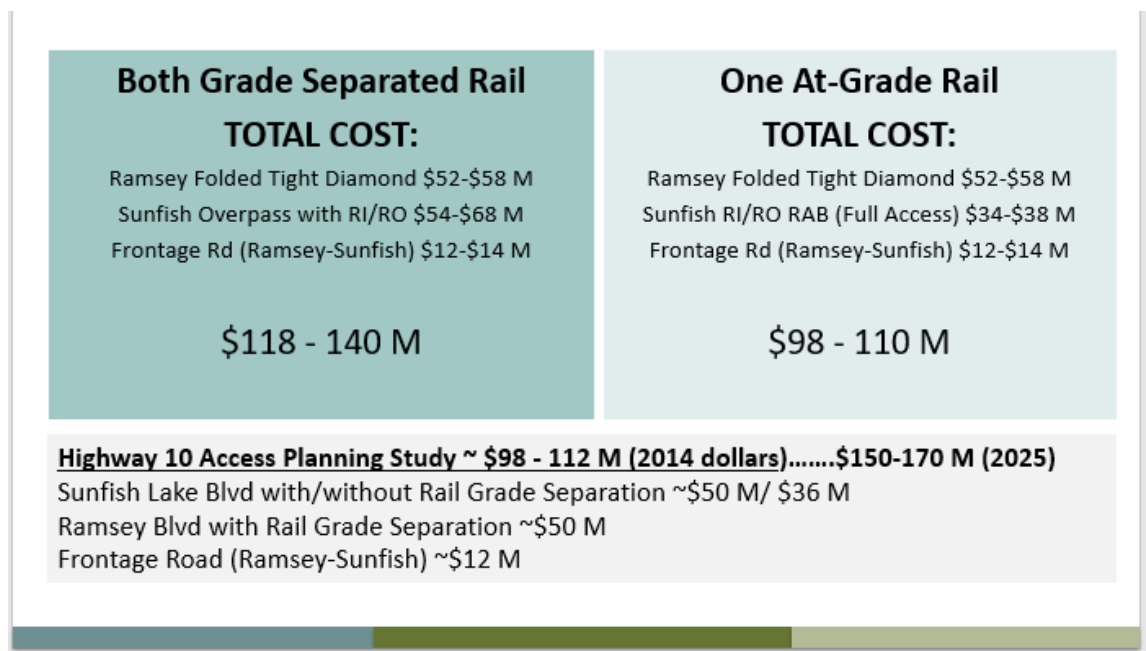
The Council also expressed support towards a future McKinley Street extension into the City of Anoka to better facilitate connections between industrial users and to support construction staging during the Anoka Highway 10 project in 2023-24.

On the west end of the corridor, the Council supported the TAC's recommendation for a future joint study with Elk River and to revisit the interim proactive safety improvement with MnDOT if conditions dictate an improvement.

G. Anoka County Transportation Committee

The Anoka County Transportation Committee considered the TAC and City Council recommendations at their September 3, 2019 meeting. The Anoka County Transportation Committee expressed support for trying to secure funding for the City's recommendation – Folded Tight Diamond at Ramsey Blvd and Sunfish Lake Blvd Overpass of Highway and Railroad – for a period of two years. However, several County Commissioners expressed concern with the overall cost of the project and the potential inability to find enough funding to make the project a reality. Therefore, the County Transportation Committee qualified their recommendation to revisit the need for rail grade separation at Sunfish Lake Boulevard if funding does not develop in the next two years or by approximately 2022. Figure 26 illustrates the cost estimate differences between one rail grade separation at Ramsey Blvd or both locations grade separated. It also compares these to estimates from the conclusion of the 2014 Highway 10 Access Planning Study.

Figure 26 – Cost Comparison for Ramsey and Sunfish Lake Boulevard Recommendations



XII. Next Steps

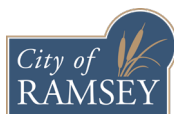
The next phases of the Ramsey Gateway Highway 10 Project prior to construction include:

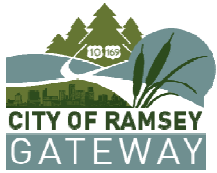
- Preliminary Interchange Approval
- Develop an implementation to determine project pieces and phases
- Secure Funding
- Complete Design and Environmental Documentation
- Interchange Access Request

The following issues will need further vetting during preliminary design:

- Frontage/backage road access to the Tungsten District on the south side of Highway 10
- Exact frontage road alignments for all improvement options
- Right-in/right-out access configurations at Sunfish Lake Boulevard interchange
- McKinley Street extension options with the City of Anoka
- Traffic control at ramp and frontage road intersections

Appendix A:





Highway 10 Corridor Improvements

City of Ramsey

Public Involvement Plan - Phase I

Meeting Groups / Activities			Attended By		Roles & Goals		★ Date mail/email invite sent (draft sent one week in advance for city review) ■ Date of meeting/activity																							
							February				March				April				May				June							
							4	11	18	25	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24			
Highway 10 Steering Committee	Business Representatives Property Owner Representatives General Public Representatives Ramsey City Staff Consultant Staff	<ul style="list-style-type: none">• Educate with information and insight• Build respect and understanding• Identify issues and concerns• Provide feedback to PMT			★		■						★		■															
Stakeholder Meetings (2-4 Small Group Meetings)	Businesses Property Owners Business Advocacy Groups PMT/TAC Representation Consultant Staff	<ul style="list-style-type: none">• Educate with information and insight• Build respect and understanding• Identify issues and concerns• Understand upcoming projects / visions / opportunities• Work with the project team to resolve issues• Provide feedback to PMT			★		■	■																						
Public Open House	Public Stakeholders PMT/TAC Representation Consultant Staff	<ul style="list-style-type: none">• Share project purpose with the public and stakeholders• Gather input on issues, needs and opportunities• Solicit input on alternatives and address trade-offs							★		■	■																		
Input ID™ Comment Map	Available on project website and monitored by Bolton & Menk	<ul style="list-style-type: none">• Solicit input on alternatives online• Track trends and provide feedback from the project team• Provide summary of input to public and PMT									■	■																		
Video #2: Recommendations	Available on project website	<ul style="list-style-type: none">• Share project purpose and alternative concepts with the public and stakeholders• Educate with information and insight• Provide consistent clear messaging																		■										