DEPARTMENT OF TRANSPORTATION

RESURFACING HWY 5 / WEST 7TH STREET IN SAINT PAUL

SCOPING ALTERNATVIES ANALYSIS

MUNSTER AVE TO OLIVE ST | CITY OF ST PAUL, MN

June 13, 2023

Prepared for:
Minnesota Department of Transportation
1500 W. County Road B2
Roseville, MN 55113

PROJECT ID # T9X276
S.P. 6201-91 | S.P. 6201-95
WSB PROJECT NO. 019993-000

Table of Contents

Section 1 Introduction

The Minnesota Department of Transportation (MnDOT) is planning to resurface Hwy 5/West 7th St. The project area is located in St. Paul, between Munster Ave. and Olive St. Project construction is planned as two separate projects, Munster Ave. to St. Clair Ave. in fiscal year (FY) 2027 and St. Clair Ave. to Olive St. in FY 2028. As MnDOT prepares to resurface the pavement, the department also looks for areas of improvement compatible with a resurfacing project. This report documents the analysis of different scoping alternative concepts considered for the project corridor.

Section 1 of this scoping report introduces the project and describes the overall objectives of the scoping study. Section 2 presents background information for the project. Section 3 describes the scoping alternatives, evaluations, costs, and recommendations for which scoping alternatives should be considered more closely for inclusion with the project in the next phase of this project, the Alternatives Evaluation.

Project Overview

Hwy 5/West Seventh St. is an important transportation corridor connecting downtown St. Paul to Bloomington and Fort Snelling as shown in **Figure 1 Project Location Map**. This road is used by pedestrians, bicyclists, transit riders, freight carriers and motorists as a key route to visit many restaurants, shops, manufacturing centers, office buildings, multi-family and senior residences, event centers, and an arena. This makes this corridor important for transportation, economic, social, and recreational uses in the community.

MnDOT is conducting pavement resurfacing projects to improve mobility and safety on West Seventh St. between Munster Ave. and Olive St. in St. Paul. In addition to addressing pavement deficiencies, extensive improvements will be made to the sidewalks and curb ramps within the project limits. MnDOT must follow a Complete Streets approach in all phases of planning, scoping, project development, construction, operations, permitting, and maintenance activities.

The anticipated project scope includes a medium mill and overlay, curb ramp replacement, sidewalk replacement, pedestrian crossing upgrades, driveway adjustments, drainage preservation and treatment,

traffic signal replacement/revisions including accessible pedestrian signal upgrades, lighting installation, guardrail replacement, bridge preservation and upgrades, and right-of-way work.

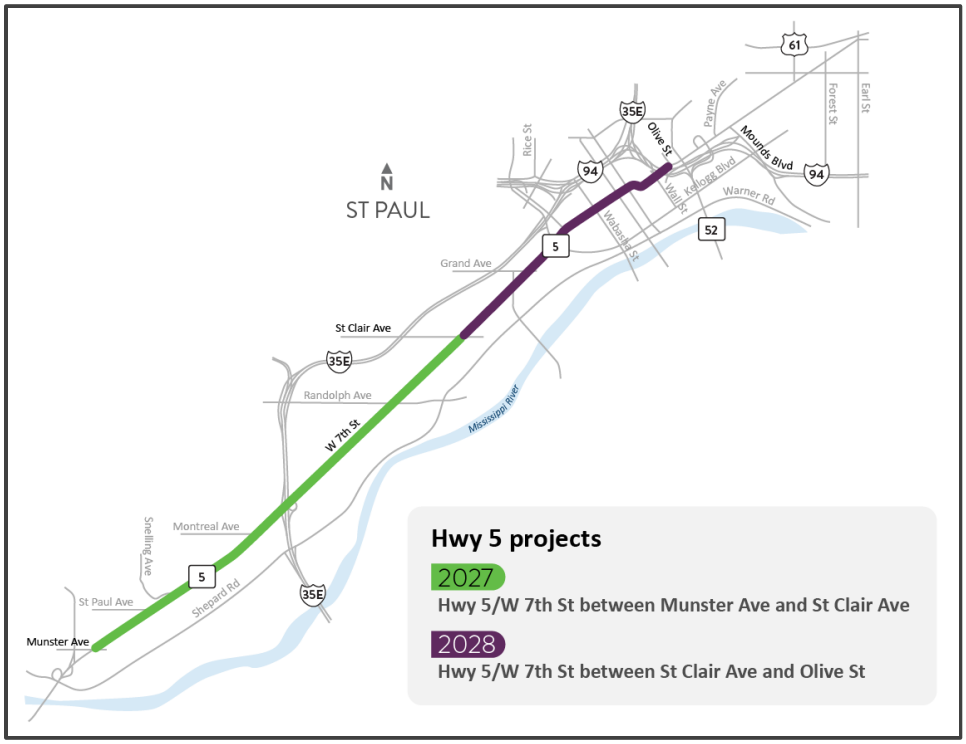


Figure 1. Project Location Map

Scoping Study Objectives

Hwy 5/West Seventh St. is an important piece to the City's transportation, economic, social, and recreational network and identifying the project scoping alternative concepts and process in a clear format is a fundamental component of this project.

The objective of this Scoping Alternatives Analysis is to evaluate additional improvements that can be made cost-effectively within the anticipated pavement rehabilitation project scope. This report will summarize the design concepts considered, examine how the alternatives would fit within the context of meeting the Purpose and Needs of the project, and identify conceptual construction costs. The preferred scoping concepts will progress to the next phase of this project for further vetting in an Alternatives Analysis, after coordination within MnDOT and with project partners.

Riverview Corridor Project and Transit

The Riverview Corridor Project is tasked to evaluate and implement an enhanced regional transit connection between anchor locations such as Downtown St. Paul, the Minneapolis-St. Paul International Airport, and the Mall of America. Improvements are anticipated to follow the Hwy 5/West Seventh St. corridor through St. Paul.

Construction of the resurfacing project on Hwy 5 is planned for completion prior to Riverview Corridor improvements. Ongoing coordination is being performed between the two projects to identify opportunities for Riverview Corridor transit improvements that could be implemented with the resurfacing project, as well as ensure the improvements made on the resurfacing project are complementary to the Riverview Corridor transit alternatives.

With the Hwy 5 resurfacing project, proposed replacement of sidewalks and curb ramps will improve the accessibility of existing bus stops throughout the project area on Hwy 5. Any other infrastructure related modifications to transit including bus stop locations or amenities will be driven by coordination with the Riverview Corridor Project and Metro Transit.

Section 2 Background Information

This section describes important project background information including project progress in scoping and analyzing the corridor, as well as high level description of the different corridor segments.

Project Progress

A Project Scoping Report for the west portion of the project has been issued (S.P. 6201-91, Munster Ave. to St. Clair Ave.), although the east portion of the project is currently in the scoping process and a Project Scoping Report is yet to be issued (S.P. 6201-95, St. Clair Ave. to Olive St.). MnDOT has issued a memorandum regarding "West 7th Resurfacing Project Issues and Challenges", which identifies key issues throughout the project area by agency staff, as well as partners from Ramsey County, the City of St. Paul, Metro Transit, and more. A Public Engagement Plan has been developed and Phase 1 has already been completed as of December 2022, in which the project team worked with the public to identify existing issues within the corridor. Phase 2 of the Public Engagement Plan informed, engaged, and solicited feedback from the public on the Draft Scoping Alternatives Analysis in the spring of 2023. Also, a study was completed analyzing the Existing Multimodal Mobility and Safety Conditions within the project area. Each of these documents can be found in the project appendix.

MnDOT's ADA Unit has completed a scoping field walk of the project area, issued a scoping recommendations report, and committed funds to this project for recommended improvements. Their recommendations are highly detailed and specific for almost every curb ramp, pedestrian crossing, and block of sidewalk. Since the Scoping Alternatives Analysis is intended to be a high-level evaluation of scoping alternatives, the recommendations they provided will be incorporated at the Preliminary Layout design phase. Refer to the ADA Scoping Recommendations report for more information.

MnDOT Metro District has also developed a draft purpose and need for the project, in preparation for development of the project environmental document, which is currently assumed to be a Programmatic Categorical Exclusion.

Segments

In line with MnDOT's policy to create Context Sensitive Solutions for state projects, the corridor was divided into the five segments as shown in **Figure 2 - Highway 5 Segments**. These segments were selected based on the existing Highway 5 cross section, the number of lanes, safety issues, and surrounding land use. Breaking the corridor into segments allows for the analysis of each concept to consider the unique characteristics of the segment.

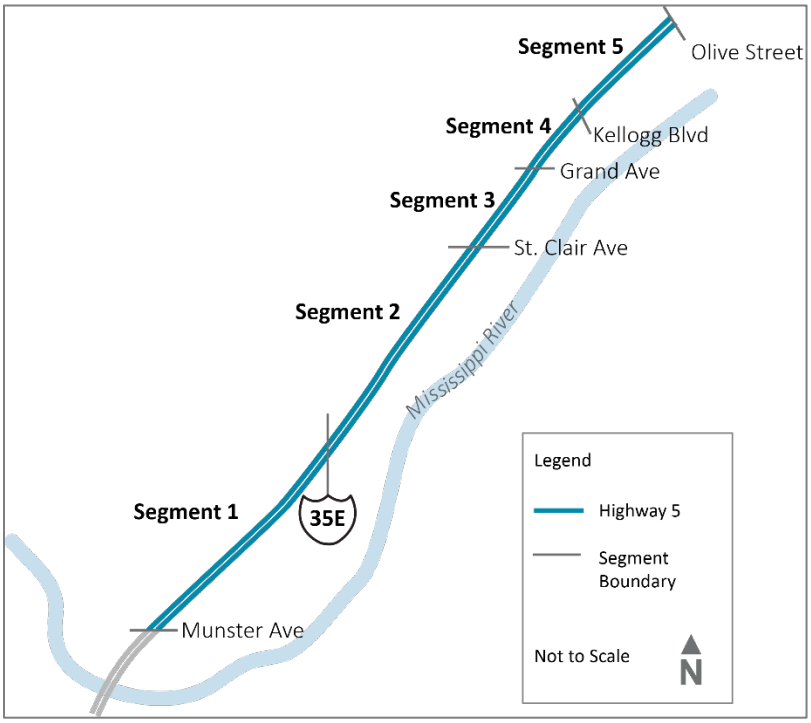


Figure 2 - Highway 5 Segments

- Segment 1 – Munster Ave to I-35E – carries a higher volume of through traffic between the Mississippi River bridge and I-35E. The existing section is five lanes; the land use is a mix of residential, commercial, and industrial; and the density of access points is lower than on the rest of the corridor.
- Segment 2 – I-35E to St Clair Ave – is a three-lane section through an area that has more residential and neighborhood-level commercial land uses. Volume is lower east of I-35E and there are more accesses to Highway 5. The MnDOT pavement projects split at St Clair Ave.

- Segment 3 – St Clair Ave to Grand Ave – is similar to Segment 2, except it is a four-lane undivided section from Goodhue St to Grand Ave.
- Segment 4 – Grand Ave to Kellogg Blvd – is a four-lane undivided section through a commercial area. It has higher vehicle volume than Segments 2 and 3, higher pedestrian activity, and a higher crash frequency.
- Segment 5 – W. Kellogg Blvd to Olive St – is a four-lane section with turn lanes through Downtown St Paul. There are many crossings and signalized intersections, and right-of-way constraints limit the ability to make traffic improvements on this segment.

Environmental Justice

Environmental Justice is an important lens in which the State of Minnesota is analyzing through their processes. The Minnesota Pollution Control Agency (MPCA) has released a tool by census tract to identify areas considered to be an Environmental Justice area of concern, based on reported income levels, People of Color (POC), and federally recognized Indian Tribes. The MPCA considers tribal areas and census tracts with higher concentrations of low-income residents and people of color as areas of increased concern for environmental justice. The project area contains Environmental Justice areas of concern. It does not contain any federally recognized Indian Tribes. **Table 1** demonstrates Environmental Justice statistics broken down by project segment that should be taken into consideration when evaluating scoping alternatives.

Table 1. Environmental Justice Statistics by Segment.

Project Segment Number	Census tract numbers in the project area	Reported income level less than 185% of the federal poverty level	People of Color (POC)
1	376.03	59% (+/- 24%) *	72% (+/- 14%) **
1	367	24% (+/- 17%) *	30% (+/- 11%)
1	375	12% (+/- 17%)	31% (+/- 12%)
1	366	8% (+/- 22%)	8% (+/- 4%)
2	367	24% (+/- 17%) *	30% (+/- 11%)
2	368	31% (+/- 16%) *	28% (+/- 13%)
2	369	35% (+/- 21%) *	19% (+/- 6%)
3	369	35% (+/- 21%) *	19% (+/- 6%)
3	360	23% (+/- 22%) *	22% (+/- 10%)
3	359	42% (+/- 22%) *	25% (+/- 11%)
4	360	23% (+/- 22%) *	22% (+/- 10%)
4	359	42% (+/- 22%) *	25% (+/- 11%)
5	342.01	30% (+/- 20%) *	35% (+/- 16%) **
5	342.03	17% (+/- 19%)	29% (+/- 9%)
5	342.04	35% (+/- 21%) *	30% (+/- 10%)
5	330	56% (+/- 18%) *	71% (+/- 5%) **

***** At least 40% of people reported income less than 185% of the federal poverty level.
****** 50% or more people of color.

In Segment 1 of the project area, the population surrounding Hwy 5 corridor includes people with reported incomes less than 185% of the federal poverty level, particularly south of Hwy 5. The western half of the project area also includes higher proportions of POC and is an Environmental Justice area of concern because of both low-income and POC residents. Environmental Justice should be thoughtfully incorporated in the decision-making process for Segment 1.

Segments 2, 3, and 4 of the project area contain residents with income levels less than 185% of the federal poverty level. While Segments 2, 3, and 4 are not considered Environment Justice areas of concern per the MPCA's guidelines, consider negative impacts to low-income residents in the area during the decision-making process.

In Segment 5 of the project area, the area to the southeast, northeast, and southwest are Environmental Justice areas of concern because of higher proportions of low-income and POC residents. Environmental Justice should be thoughtfully incorporated in the decision-making process for Segment 5.

Section 3 Concept Evaluation

This section discusses scoping alternatives identified, as well as the existing conditions behind each of the concepts. Impacts are identified for each scoping alternative, including estimated construction costs for scoping purposes. Implementing one alternative does not necessarily preclude another, most of the scoping alternatives are not in competition with each other and may be complimentary.

Public feedback regarding each of the Scoping Alternatives outlined in Section 3 is highlighted in the Phase 2 Engagement Summary which can be found in the Appendix. Public engagement was completed using online surveys, emails, social media advertising, and an in-person public meeting hosted near the project at the Palace Community Center.

Key takeaways summarized in the Phase 2 Engagement Summary:

- Online Survey/Email
    - Ongoing confusion between the Riverview Corridor and the Hwy 5/West 7th Street projects
    - Request for more greenspace
    - If bike lanes are implemented, there is a strong preference for protected bike lanes among participants
    - Request for more traffic calming measures
    - Request for more pedestrian safety measures – noting the area along Hwy 5 is highly residential, as well as a place for businesses
- Public Meeting
    - Ongoing confusion between the Riverview Corridor and the Hwy 5/West 7th Street projects
    - Support for protected bike lanes
    - Request for more greenspace along the entire corridor
    - Request for better lighting for pedestrians

Scoping Alternatives

Project Corridor Wide Scoping Alternatives

Alternative 0.A: No Build Alternative

The No Build Alternative maintains the existing Hwy 5 corridor configuration. It does not address any of the pavement deficiencies and ride quality issues, pedestrian accessibility deficiencies and risk. A No Build alternative requires

continuous maintenance to preserve the existing Hwy 5 corridor conditions.

Alternative 0.B: Add curb extensions at curb ramps[1]

The City of St. Paul and public engagement responses have expressed interest in curb extensions throughout the entire project area for pedestrian crossings. Curb extensions, also referred to as bump outs, physically shift the curb and sidewalk into the roadway shoulder or parking lane, reducing the roadway width. Curb extensions on intersection corners may extend into one or both of the intersecting roadways. Each curb extension can be designed to maximize their size without restricting turning movements of the design vehicle for each intersection, such as a bus or a semitruck with trailer depending on the location. Improvement Notes / Cost:

- Reduce pedestrian crossing distance
- Improve pedestrian visibility
- Improve walkability
- May provide traffic calming effect
- Often requires modifications to the drainage system in order to move and add catch basins where needed, adding cost
- Maintenance impacts for snow removal
- May impact parking near pedestrian crossings
- Create opportunity for green infrastructure
- Create opportunity for aesthetic improvements
- Create opportunity to reduce intersection skew by modifying corner geometry
- Net Cost: $15k to $50k per intersection pending impacts to drainage

Curb extensions are a great tool for enhancing walkability. Since curb ramps are already scoped for replacement, this project is an opportune project to implement them. Feasibility may be limited by the location of transit stops, absence of shoulders or parking lanes, and vehicle turning-movements individual locations. Where pedestrian crossing volumes are low and modifications to drainage systems are needed, the value may not be sufficient and will need to be analyzed for each curb ramp individually.

Alternative 0.C: Pedestrian crossing beacon systems

In addition to geometric enhancements like curb extensions, pedestrian beacon systems can improve pedestrian crossing safety at uncontrolled

[1] All curb extensions identified in the ADA Scoping Recommendations will be incorporated in the Preliminary Design phase of this project

crosswalks. Options include rectangular rapid flashing beacons (RRFBs) and pedestrian hybrid beacons (PHBs).

RRFBs are a pedestrian actuated flasher system that accompany pedestrian crossing warning signs at marked crosswalks. RRFBs flash with an alternating high frequency when activated to enhance conspicuity of pedestrians at the crossing to drivers. The effectiveness of RRFBs is still under research, they are currently allowed for use by the Federal Highway Administration through an Interim Approval. RRFBs are a warning system and not a form of traffic control.

PHBs are a special type of hybrid beacon used to warn and control traffic at unsignalized, marked crosswalks. This is another pedestrian actuated system, when activated it directs vehicles to slow and come to a stop to allow pedestrians to safely cross the roadway. PHBs have substantially higher costs than RRFB systems but provide positive stop control to vehicles making it a safer option, particularly on multilane roads and where vehicular volumes and speeds are higher.

Improvement Notes / Cost:

- Improve pedestrian safety
- Introduce long-term maintenance needs
- Locations under consideration for beacon systems
    - Mickey's Diner between Homer St. and Dealton Ave.
    - Rankin St. intersection
    - Armstrong Ave./Bay St. intersection
    - Ann St./Goodhue St intersection
- Net cost: $30k to $200k

RRFBs can be effective but should be reserved for locations with substantial safety issues as not to diminish their effectiveness. PHBs are effective but have a substantially higher cost than RRFBs.

Alternative 0.D: Stormwater Treatment & Environmental Sustainability

Stormwater treatment must be provided for areas of impervious surface that are new or reconstructed. Stormwater runoff volume must be at least equivalent to 1.1 inches of runoff over new and reconstructed impervious surfaces. Areas that are only milled and overlaid do not count as being "reconstructed." Treatment must be accomplished through either infiltration or filtration. This is a requirement from the Capitol Region Watershed District

(CRWD). Solutions may be varied and implemented with other alternatives throughout the corridor. Tactics may include:

- Reduce impervious surface areas
    - Introduce permeable surfaces including rain gardens in boulevards, curb extensions, and medians with low maintenance vegetation
    - Utilize low water needed native pollinator habitat where possible
    - Introduce native plantings and street trees (or tree trenches), in unpaved areas
    - Introduce structural stormwater treatment devices to pretreat stormwater prior to discharge to storm sewer
- Iron-enhanced sand filters, SAFL baffles, etc.

Alternative 0.E: Owner driven driveway consolidation/removal

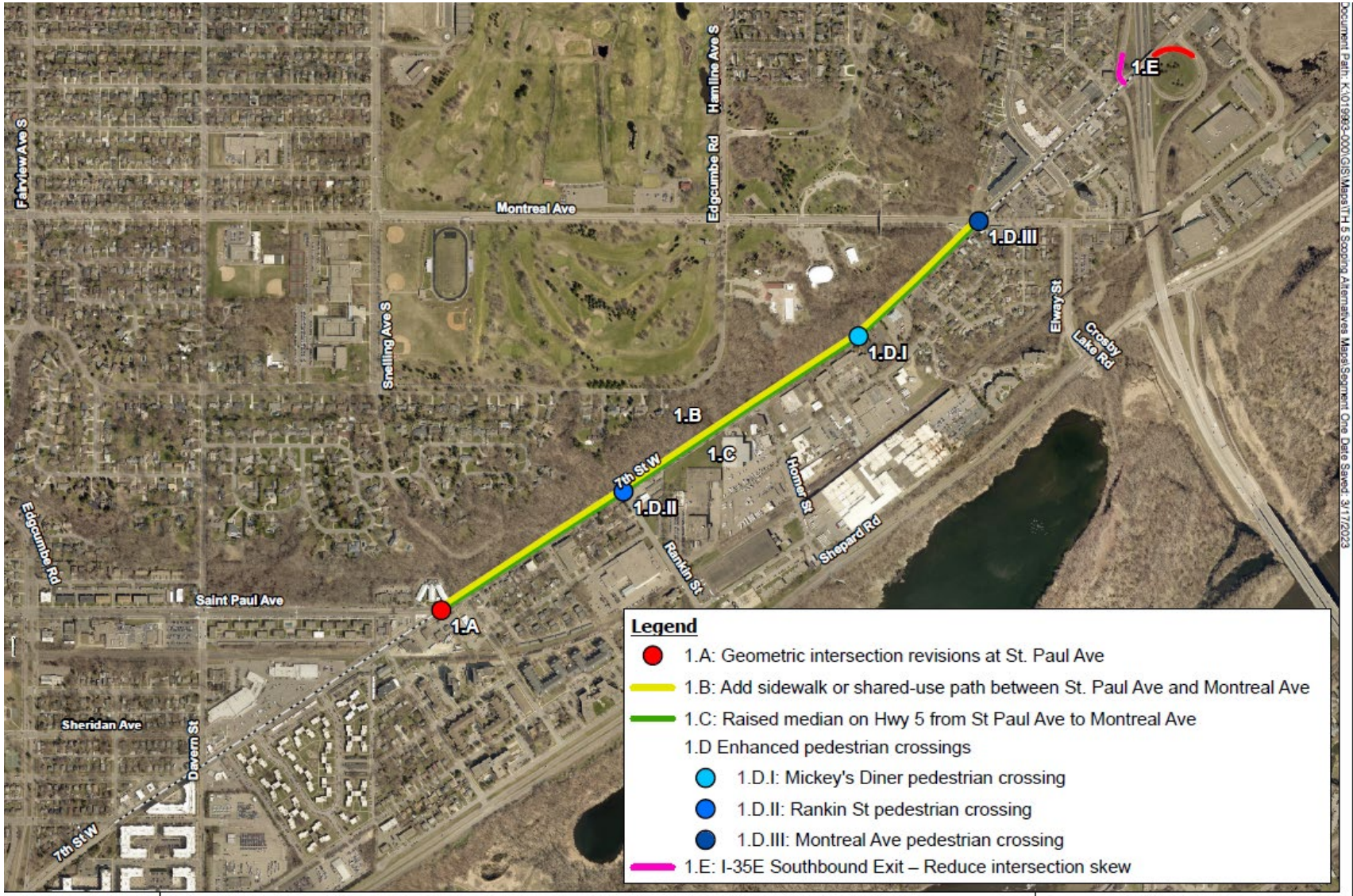
Driveways on a roadway introduce conflict points for traffic and pedestrians. MnDOT will work with willing property owners to consolidate or remove driveways serving their property at their request. The City of St. Paul commissioned the "West 7th Street Parking Study" in 2019, one of the conceptual strategies presented for improving on street parking was to identify driveways no longer in use to provide additional legal on-street parking. Improvement Notes / Cost:

- Reduce conflict points
- Improve traffic safety
- Improve walkability
- Increase available on-street parking
- Net cost: Neutral

Anticipating most driveways will be replaced to bring the pedestrian access route crossing them to ADA compliance, the cost is neutral since the sidewalk, curb, and aprons would have been replaced. Alternative 0.E fits well within the anticipated scope of the resurfacing project.

Segment 1 Scoping Alternatives - Munster Avenue to I-35E

Locations of scoping alternatives in Segment 1 are shown in **Figure 3 - Segment One**


Fairview Ave S
Montreal Ave
Edgcumbe Rd
Hamline Ave S
Snelling Ave S
1.E
1.D.III
Elway St
Crosby Lake Rd
1.D.I
1.B
1.C
7th St W
1.D.II
Homer St
Rankin St
Shepard Rd
Edgcumbe Rd
Saint Paul Ave
1.A
Sheridan Ave
Davern St
7th St W
Document Path: K:\019993-000\GIS\Maps\TH 5 Scoping Alternatives Maps\Segment One Date Saved: 3/17/2023
Legend
1.A: Geometric intersection revisions at St. Paul Ave
1.B: Add sidewalk or shared-use path between St. Paul Ave and Montreal Ave
1.C: Raised median on Hwy 5 from St Paul Ave to Montreal Ave
1.D Enhanced pedestrian crossings
1.D.I: Mickey's Diner pedestrian crossing
1.D.II: Rankin St pedestrian crossing
1.D.III: Montreal Ave pedestrian crossing
1.E: I-35E Southbound Exit – Reduce intersection skew
DEPARTMENT OF TRANSPORTATION
Figure 3 - Segment One
TH 5 Scoping Alternatives
Minnesota Department of Transportation
N
0
1,000
Feet
1 inch = 1,000 feet

Alternative 1.A: Geometric intersection revisions at St. Paul Ave.

St. Paul Ave is a two-lane road with parking and bike lanes that ends at Hwy 5, where the two roads intersect at a 33-degree angle, one of the highest skews in the entire project area. The fourth leg of the signalized intersection, across Hwy 5 from St. Paul Ave. is an entrance to McDonald's and Caribou Coffee parking lots which intersects Hwy 5 at 90 degrees, not in continuous alignment with St. Paul Ave. There is also a two-way connection between St. Paul Ave. and Hwy 5 located 100 feet west of the signalized intersection where eastbound traffic on St. Paul Ave. make right turns on to Hwy 5 and northeast bound traffic on Hwy 5 make left turns onto St Paul Ave. The intersection skew facilitates higher speed right-turn movements from southwest-bound Hwy 5 and left-turn movements from eastbound St. Paul Ave. The skew also results in pedestrian crossing distance to 120 feet to cross four 12-foot-wide lanes on St. Paul Ave.

From 2017-2021, three crashes at this intersection involved a pedestrian or bicyclist, the second highest volume of pedestrian related crashes in the project limits.

Potential impacts to the existing bus stops will be closely coordinated with Metro Transit.

Several alternatives were considered to address issues with this intersection:

- Alternative 1.A.I. – Modify the existing two-way connection between St. Paul Ave. to a more typical one-way channelized right-turn lane. Improvement Notes / Cost:
    - Improved driver expectations by moving Hwy 5 left-turn movements to the signalized intersection
    - Adds left-turn vehicle volumes from northeast-bound Hwy 5 to westbound St. Paul Ave., which could add signal delay
    - Northeast-bound left-turn movements may be given protected-permissive signal phasing which improves safety
    - Three transit stops may be impacted, two on the two-way segment and one on St. Paul Ave
    - Moving curb alignments will require drainage system revisions
    - Net Cost: $45k to $55k

Northeast-bound left-turn volumes are low relative to other movements at this intersection. Alternative 1.A.I does not substantially improve safety or operations.

- Alternative 1.A.II – Add a pedestrian median refuge island on St. Paul Ave. Improvement Notes / Cost:
    - Reduces total pedestrian crossing distance
    - Improves walkability
    - Eliminate inside westbound lane
    - No effect on traffic operations anticipated
    - Net Cost: $50k to $60k

The relatively low cost makes this improvement a good value due to the existing crash history involving pedestrians at this intersection.

- Alternative 1.A.III – Reduce intersection skew by reconstructing and realigning the St. Paul Ave. approach. Improvement Notes / Cost:
    - Eliminates unsignalized two-way connection
    - May result in right-of-way acquisition, up to a full property
    - McDonald's/Caribou Coffee driveway may be removed from signal control
    - Reduces pedestrian crossing distance on St. Paul Ave. approach improving walkability
    - Reduces vehicle turning speeds for eastbound left-turns and southwest-bound right-turns
    - Reducing the intersection footprint by reducing skew improves pedestrian visibility, reduces vehicle speeds through the crosswalk area, and improves walkability
    - Moving curb alignments will require drainage system revisions
    - Three transit stops located would be impacted, two on this segment and one on St. Paul Ave.
    - Net cost without property acquisition: $530k to $550k
    - Net cost with property acquisition: $680k to $700k

Since the traffic signal is already intended to be replaced, this would be an opportunity to revise the intersection geometry without adding costs for signal revisions. While there are benefits to reducing the intersection skew, the cost and impacts are substantial. Feasibility may be limited by the topography of area.

Alternative 1.B: Add sidewalk or shared-use path between St. Paul Ave. and Montreal Ave.

Sidewalk is continuous along the north side of the project area, except for the segment between St. Paul Ave. and Montreal Ave. The only pedestrian destinations along the north side of Hwy 5 in this stretch are two transit stops. Snelling Ave. intersects Hwy 5 in this segment but there is inadequate access for pedestrians in absence of sidewalks and shoulders on Snelling Ave. The topography in this area is steep as the terrain rises to the north.

Most of the land abutting Hwy 5 on the north side of this segment is City of Saint Paul parkland, either as McDonough Park or Highland Park and is therefore a Section 4(f) resource. Any permanent acquisition of portions of this parkland would be considered a Section 4(f) use and would likely be processed under the de minimis Section 4(f) rules. If only temporary easement would be required for construction here, then it would not be a Section 4(f) use and could be processed with a temporary occupancy letter. Improvement Notes / Cost:

- Reduces pedestrian crossing conflicts for pedestrians traveling along the north side of Hwy 5
- Increases safety for transit users by providing better access to bus stops adjacent to southwest-bound lanes
- Improves walkability
- Potential for right-of-way acquisition
- Impacts to Section 4(f) protected land
- Increases impervious surface area
- Significant grading and excavation due to the existing topography
- Clearing and grubbing will provide space for maintenance vehicles to pull off the north side of the road, which is currently an issue for local maintenance
- Creates a potential need for retaining walls for much of this segment
- Impacts to the adjacent Section 4(f) property could be limited if Alternative 1.C is implemented with a 6'-8' wide median in conjunction with a curb realignment to create additional space for sidewalk or shared-use path.
- Net Cost: $1.1M to $1.2M

The only pedestrian destinations along this side of the road are the two transit stops and a poor multimodal connection at Snelling Ave., substantial impacts

to a Section 4(f) property and high costs may outweigh the benefit.

Alternative 1.C: Raised median on Hwy 5 from St Paul Ave. to Montreal Ave.

This roadway section is currently five lanes including two lanes in each direction, left-turn lanes at driveways and intersections, and painted gore areas where there are no left-turn movements. As indicated in the Existing Mobility and Safety Conditions study, this segment has a notably high fatal and serious injury crash rate index. A raised median could be introduced in the center lane of the road, with gaps for turning movements at intersections and driveways as appropriate. Improvement Notes / Cost:

- Creates physical buffer between head-to-head traffic
- Creates an opportunity to reduce the impervious surface area by using green spaces in the median
- Creates an opportunity for aesthetic improvements
- Creates an opportunity for access control by introducing right-in/right-out access to residences and businesses along the south side of Hwy 5, which also limits mobility
- May provide traffic calming effect
- Improves traffic safety
- Net cost: $650k to $780k

Fatal and serious injury crashes are an issue in this segment, with the presence of a center turn lane through this section. While there is space available to construct raised medians, impacts to property access will need to be closely evaluated to avoid undue impacts to residents and businesses.

Alternative 1.D: Enhanced pedestrian crossings

Feedback received through Phase 1 of Public Engagement indicated one of the key findings to be public concerns for pedestrian safety. Specific comments were made about the pedestrian crossings at the Montreal Ave. intersection and the transit stop adjacent to Mickey's Diner.

Alternative 1.D.I: Mickey's Diner pedestrian crossing. Improvement Notes / Cost:

- Add permanent raised median pedestrian refuge island in place of existing temporary island
- Increased pedestrian crossing safety
- Net Cost: $15k to $25k
- See Alternative 0.C for pedestrian beacon improvement

Alternative 1.D.II: Rankin St. pedestrian crossing. Improvement Notes / Cost:

- Relocate westbound bus stop and pedestrian crossing to west side of intersection where there is no left-turn lane
- Add permanent raised median pedestrian refuge island
- Increased pedestrian crossing safety
- Net Cost: $15k to $25k
- See Alternative 0.C for pedestrian beacon improvement

Alternative 1.D.III: Montreal Ave. pedestrian crossing. Improvement Notes / Cost:

- Add pedestrian refuge on west leg of Montreal Ave.
    - Eliminate the inside westbound lane on the west leg of Montreal Ave.
- Opportunity to reconfigure eastbound lane configuration
    - The existing shared through/left-turn lane would become a dedicated through lane separating the traffic movements completely
    - Extend left-turn lane to maintain storage capacity
    - Restripe lanes on west leg of Montreal Ave.
- No significant operational impacts are anticipated since there is only one westbound through lane on the east leg and single right- and left-turn lanes on Hwy 5
- Reduces pedestrian crossing distance
- Improves walkability
- Net Cost: $35k to $50k

The benefits of sub-alternatives 1.D are all cost-effective solutions with walkability benefits that are fitting within scope of a resurfacing project.

Alternative 1.E: I-35E Southbound Exit – Reduce intersection skew

The southbound I-35E exit approach intersects Hwy 5 at a 65-degree angle and has three lanes including a left turn-lane, a shared through/right-turn lane, and a right-turn lane. Skewed intersection geometrics facilitate higher speed turning movements and can make it challenging for drivers to turn their heads to watch traffic when making right turns on red. Intersection skew also increases pedestrian crossing distances.

From 2017-2021, the existing crash rate is 0.42 per million vehicles entering,

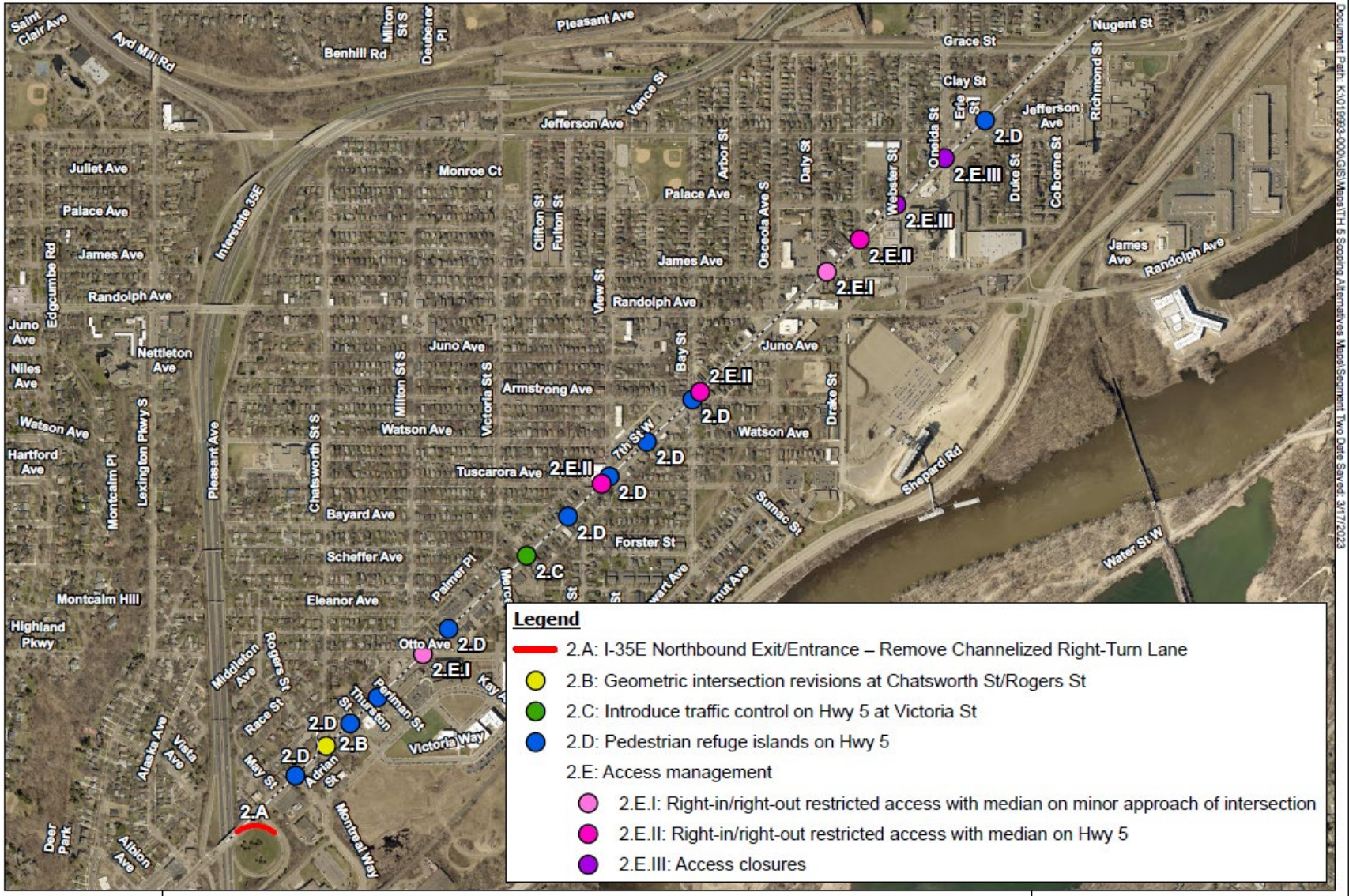
which is well below the critical crash rate for this intersection of 0.85 giving the intersection a crash index value of 0.49. While the intersection crash rate is approximately half of the critical crash rate, it did have the highest volume of crashes of any intersection in the project area over that 5-year span at 26 crashes. Two crashes at this intersection involved a pedestrian or bicyclist. Improvement Notes / Cost:

- Reduces or eliminates intersection skew
- Facilitates speed reduction for southbound right-turn movements
- Decreases pedestrian crossing distance for improved walkability
- Improves traffic safety
- Significant grading impacts adjacent to I-35E
- Net Cost: $130k to $160k

The high volume of crashes introduces costs and delays not associated with construction costs that should be considered more closely.

Segment 2 Scoping Alternatives - I-35E to St. Clair Avenue

Locations of scoping alternatives in Segment 2 are shown in **Figure 4 - Segment Two**



DEPARTMENT OF TRANSPORTATION

Figure 4 - Segment Two

TH 5 Scoping Alternatives
Minnesota Department of Transportation

N

0 1,000 Feet

1 inch = 1,000 feet

Alternative 2.A: I-35E Northbound Exit/Entrance – Remove Channelized Right-Turn Lane

There is an existing channelized right-turn lane for northeast-bound vehicles on Hwy 5 to the I-35E Northbound Entrance Ramp. This alternative would remove the channelized right turn lane and move right turns to the intersection, creating space for dedicated right-turn lane.

The northeast-bound right turn is the highest volume movement for the intersection. The pedestrian crosswalk on the right-turn lane is parallel to Hwy 5, crossing the lane at a skew which results in a longer crossing distance.

Channelized right-turn lanes provide operational benefits for vehicular traffic but facilitate higher vehicle speeds through the crosswalk area posing increased safety risks for pedestrians. There is no deceleration lane for right-turning vehicles, which can make it challenging for pedestrian to judge crossing gaps since right-turning vehicles are mixed in the same lane as vehicles continuing through the intersection.

Channelized right-turn lanes are particularly difficult to cross for pedestrians with visual impairments, since right-turning vehicles flow more continuously making it difficult to distinguish between the through moving vehicles and the conflicting right turns when attempting to cross. Even when the coinciding through movement is red, right-turning vehicles continue to flow. Improvement Notes / Cost:

- Facilitates speed reduction for northeast-bound right-turn movements
- Adversely affects traffic operations
- Improves walkability and accessibility
- Net Cost: $65k to $75k

The northeast-bound right turn lane is the highest volume vehicle movement through the intersection so potential impacts to traffic operations need to be weighted accordingly, but there are existing deficiencies for pedestrians crossing these high volumes of turning vehicles that should be addressed.

Alternative 2.B: Geometric intersection revisions at Chatsworth St./Rogers St.

Chatsworth St. and Rogers St. intersect immediately adjacent to the northwest side of Hwy 5. Realigning the Chatsworth St. approach to intersect Rogers St. north of Hwy 5 at a right angle would concentrate vehicle movements to Hwy 5 from Rogers St. This would also reduce the Rogers St. approach width on Hwy 5.

From 2017-2021, the existing crash rate is 0.08 per million vehicles entering, which is well below the critical crash rate for this intersection of 0.33 giving the intersection a crash index value of 0.24. Improvement Notes / Cost:

- Reduce pedestrian crossing distances across both Rogers St. and Chatsworth Ave. for improved walkability
- Potential right-of-way impacts
- Net Cost: $100k to $150k

While the intersection geometry is atypical and there is potential for improved walkability, the crash rates are low limiting the value of this improvement.

Alternative 2.C: Introduce traffic control on Hwy 5 at Victoria St.

The intersection at Victoria St. has the highest intersection crash rate in the corridor and is the only intersection with a crash rate higher than its critical rate. Victoria St. had 13 total crashes, including 3 serious injury crashes, resulting in a crash rate 65 percent higher than the critical rate. During public engagement efforts, multiple comments were received about the safety concerns for vehicles, pedestrians, and bicyclists at this intersection. Improvement Notes / Cost:

- Improved traffic safety
- Improved walkability
- Increased traffic delay
- Net Cost: $275,000 to $325,000

A traffic signal is a likely solution, although the appropriate form of traffic control should be determined through an Intersection Control Evaluation.

Alternative 2.D: Pedestrian refuge islands on Hwy 5

Pedestrian safety concerns were a key issue identified through public engagement. Pedestrian refuge islands allow pedestrians to cross a two-way road and stage their crossing one direction of traffic at a time. Ideal locations for refuge islands would be any T-intersection where there is an existing or proposed center two-way left-turn lane since there are no left-turn movements on one approach and no turning lane would be sacrificed. Segment 2 has two existing temporary pedestrian refuge island installations with striping, signing, and surface mounted delineators and Perlman St. and Armstrong Ave.
Intersections evaluated for permanent pedestrian refuge islands:

- Montreal Way southwest leg
- Thurston St southwest leg
- Perlman St. southwest leg (existing temporary refuge island)
- Eleanor Ave. northeast leg
- Canton St. southwest leg
- View St. northeast leg
- Watson Ave. southwest leg
- Armstrong Ave. northeast leg (existing temporary refuge island)
- Erie St. northeast leg

Improvement Notes / Cost:

- Improves walkability
- No impacts to vehicle movements at intersections
- No impacts to property access
- No impacts to existing drainage
- Maintenance impacts such as snow removal
- May provide traffic calming effect
- Net cost: $15k to $25k each

Constructing pedestrian refuge islands fit well within the scope of a resurfacing project. The cost of each island is relatively low although added maintenance could be an issue so all eight locations may not be desirable. Each location should be evaluated more closely for adjacent pedestrian generators/destinations, as well as the existing pedestrian crossing behaviors for selection of preferred locations.

Alternative 2.E: Access management

The evaluation of access management targeted intersections with more than four approaches and intersections where two roadways met at or immediately adjacent to Hwy 5. All intersections considered have skewed approaches to Hwy 5. These unusual intersection configurations may cause driver confusion regarding right-of-way.

Alternative 2.E.I: Right-in/right-out restricted access with median on minor approach of intersection. Locations considered:

- Otto Ave./Milton St.
    - Introduce median on west leg of Otto Ave. for right-in/right-out access from Milton St.
- James Ave./Day St.
    - Introduce median on west leg of James Ave. for right-in/right-out access from Day St.

Improvement Notes / Cost:

- Due to narrow roadway widths on the minor approaches, introducing a median would impact on-street parking adjacent to the proposed medians
- Reduces conflict points
- Improve driver expectations
- Improve traffic safety
- Net Cost: $15k to $25k each

Each of these minor approaches intersect immediately adjacent to Hwy 5, while this is poor intersection geometry, the crash rates for both intersections are well below the critical crash rates with crash rate indexes of 0.13 and 0.28, respectively. Since there is no apparent safety issue based on crash data, there is limited value in implementing this type of access control for these locations.

Alternative 2.E.II: Right-in/right-out restricted access with median on Hwy 5. Locations considered:

- Tuscarora Ave. and View St.
    - Five-legged intersection and two nearby driveways on Hwy 5
    - Minor approaches on northwest side of Hwy 5 are only 85-feet apart but both align with Tuscarora Ave. on the southeast side.
    - Visibility between minor approaches on northwest side of Hwy 5 is limited by building at back of sidewalk
    - Net Cost: $45k to $55k

- Armstrong Ave. and Bay St.
    - Six-legged intersection
    - Crash rate index of 0.97 (crash rate approaching critical)
    - Visibility between minor approaches on each side of Hwy 5 is limited by buildings at back of sidewalk
    - Net Cost: $110k to $130k
- Toronto St.
    - Four-legged intersection
    - A demonstration project in 2019 tested right-in/right-out access using a temporary median created by surface mounted delineators through Toronto St.
    - Net Cost: $25k to $35k

Restricting access to right-in/right-out movements by using medians on Hwy 5 reduces conflict points as well as provides space for pedestrian refuge at crosswalks. The density of access points and gridded local roads provide nearby alternatives for traffic to make left turns. The intersections at Tuscarora Ave./View St. and Armstrong Ave./Bay St. are immediately adjacent, so impacts should be considered concurrently.

Alternative 2.E.III: Access closures. Locations considered:

- Palace Ave.
    - Need to maintain access to properties on Palace Ave.
    - No crashes reported from 2017-2021
    - Net Cost: $45k to $55k
- Oneida St.
    - Need to maintain access to driveway on Oneida St. from Jefferson Ave.
    - Redirects most traffic to adjacent signalized intersection at Jefferson Ave.
    - Crash rate index of 0.14, well below critical crash rate
    - Net Cost: $35k to $45k

Intersection density is high in this area of Hwy 5. Closing these intersections to Hwy 5 can reduce conflict points, improve walkability, and create space for additional on-street parking on Hwy 5. There does not appear to be an existing traffic safety issue for either intersection based on crash data. There may be more value in revising the intersection geometries to reduce intersection skew and/or limiting access to right-in/right-out with medians on Hwy 5.

Segment 3 Scoping Alternatives – St. Clair Avenue to Grand Avenue

Locations of scoping alternatives in Segment 3 are shown in **Figure 5-SegmentThree**

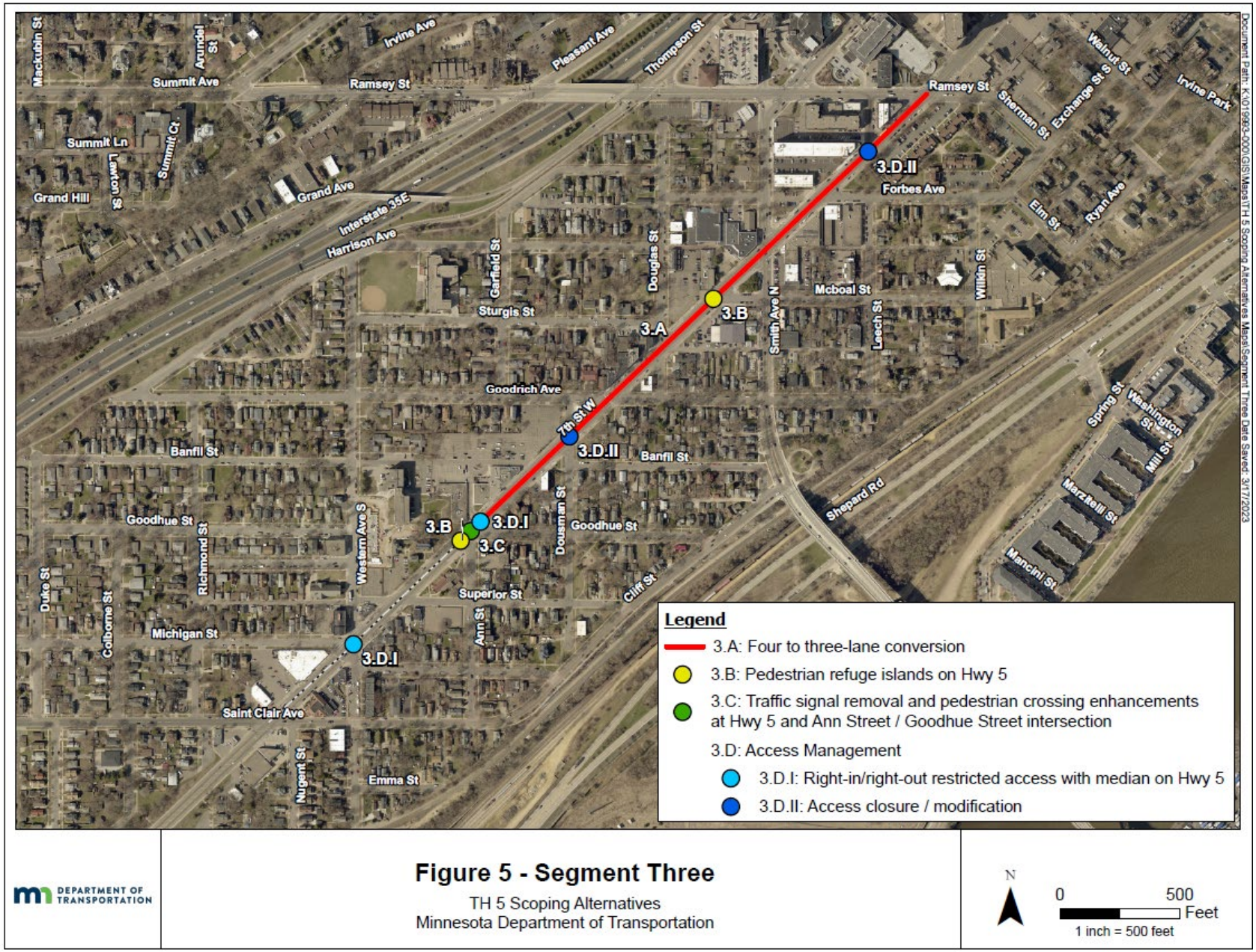
Alternative 3.A: Four to three-lane conversion

Hwy 5 transitions from a three-lane section southwest of Goodhue St. to an undivided four-lane section to the northeast. Average annual daily traffic (AADT) volume from St. Clair Ave. to Smith Ave. is 10,800 vehicles per day (vpd). From Smith Ave. to Grand Ave. the AADT is 15,400 vpd. FHWA advises that roadways with ADT of 20,000 vpd or less may be good candidates for a four to three-lane conversion and should be evaluated for feasibility. According to the Hwy 5 Existing Multimodal and Safety Conditions study, the crash data indicates that there is a significant crash history in the corridor and there would likely be a safety benefit in changing the 4-lane undivided segments on Highway 5 to another design type with a lower expected crash rate. Improvement Notes / Cost:

- Crash reduction
- Reduce rear-end and left-turn crashes
- Fewer lanes for people walking to cross
- Provides space for bicycle lanes
- Improves left turns from side streets
- Improves traffic flow
- Less lane weaving[2]
- Net Cost: $5k to $25k

A four to three-lane conversion can be a low-cost safety solution when only pavement marking changes are needed. Adding bicycle lanes in the space created by vacating a traffic lane would help balance the transportation needs in this segment. Traffic modeling is necessary to validate this alternative.

[2] MnDOT Traffic Engineering: Four to Three-Lane Conversion/Three-Lane Roadway/Road Diet


Mackubin St
Arundel St
Irvine Ave
Pleasant Ave
Thompson St
Summit Ave
Ramsey St
Ramsey St
Walnut St
Sherman St
Exchange St S
Irvine Park
Summit Ln
Lawton St
Summit Ct
Grand Hill
Grand Ave
Interstate 35E
Harrison Ave
3.D.II
Forbes Ave
Elm St
Ryan Ave
Garfield St
Douglas St
Wilkin St
Mcboal St
Sturgis St
3.A
3.B
Smith Ave N
Leech St
Goodrich Ave
7th St W
Spring St
Washington St
Mill St
Banfil St
3.D.II
Banfil St
Shepard Rd
Goodhue St
Western Ave S
3.B
3.D.I
3.C
Dousman St
Goodhue St
Merzkelli St
Duke St
Richmond St
Superior St
Cliff St
Mancini St
Colborne St
Michigan St
Ann St
3.D.I
Saint Clair Ave
Nugent St
Emma St
Legend
3.A: Four to three-lane conversion
3.B: Pedestrian refuge islands on Hwy 5
3.C: Traffic signal removal and pedestrian crossing enhancements at Hwy 5 and Ann Street / Goodhue Street intersection
3.D: Access Management
3.D.I: Right-in/right-out restricted access with median on Hwy 5
3.D.II: Access closure / modification
Document Path: K:\019983-000\GIS\Maps\TH 5 Scoping Alternatives Maps\Segment Three Date Saved: 3/17/2023
DEPARTMENT OF TRANSPORTATION
Figure 5 - Segment Three
TH 5 Scoping Alternatives
Minnesota Department of Transportation
N
0
500
Feet
1 inch = 500 feet

Alternative 3.B: Pedestrian refuge islands on Hwy 5

Pedestrian refuge islands can be implemented by shifting driving lanes and introducing parking restrictions on the existing four-lane roadway cross section. If a three-lane section is introduced (see Alternative 3.A), space would be readily available to introduce pedestrian refuge islands. Refer to Alternative 2.D for more discussion on pedestrian refuge islands. Locations considered:

- Goodhue St./Ann St. southwest leg
- Goodhue St./Ann St. northeast leg (see Alt. 3.C)
- McBoal St. southwest leg

Improvement Notes / Cost:

- Improves walkability
- No impacts to vehicle movements at intersections
- No impacts to property access
- No impacts to existing drainage
- Maintenance impacts such as snow removal
- May provide traffic calming effect
- Net cost: $15k to $25k each

Constructing pedestrian refuge islands fit well within the scope of a resurfacing project. The cost of each island is relatively low although added maintenance could be an issue so all eight locations may not be desirable. Each location should be evaluated more closely for adjacent pedestrian generators/destinations, as well as the existing pedestrian crossing behaviors for selection of preferred locations.

Alternative 3.C: Traffic signal removal and pedestrian crossing enhancements at Hwy 5 and Ann Street / Goodhue Street intersection

The existing traffic signal at this 5-legged intersection (includes a private driveway entrance) is mixed between a signal on Hwy 5 and stop control on the minor approaches. The traffic signal remains in the green phase on Hwy 5 unless actuated by a pedestrian.

This alternative includes both the removal of the traffic signal on Hwy 5 and introduction of curb extensions and pedestrian refuge island on the northeast leg of Hwy 5. Improvement Notes / Cost:

- Eliminates confusing combination of traffic controls (stop and signal)
- Removes signalized pedestrian crossing protection
- Removes southwest-bound left turn lane on Hwy 5

- Reduces pedestrian crossing distance
- May impact left-turn movements from vehicles exiting the driveway on the north side of Hwy 5
- Reduced operational and maintenance costs compared to a traffic signal
- May provide traffic calming effect
- Relocate two catch basins
- Maintenance impacts for snow removal
- Creates opportunity for green infrastructure
- Creates opportunity for aesthetic improvements
- Net Cost: $45k to $55k

A traffic control revision is recommended to better meet driver expectations, whether fully signalized, through-stop controlled, or other. An Intersection Control Evaluation should be performed for this intersection to determine the appropriate traffic control. Pedestrian crossing enhancements on this approach may be modified to balance traffic and pedestrian needs.

Alternative 3.D: Access management

The evaluation of access management targeted intersections with multiple roadways more than four approaches that may cause driver confusion regarding right-of-way, all of which are skewed intersections.

Alternative 3.D.I: Right-in/right-out restricted access with median on Hwy 5. Locations considered:

- Michigan St./Western Ave.
  - Five-legged intersection
  - Visibility between minor approaches on northwest side of Hwy 5 is limited by building at back of sidewalk
  - Introduce median from funeral home driveway through the intersection
  - Net Cost: $75k to $90k
- Ann St. / Goodhue St. (compare to Alternative 3.C)
  - Five-legged intersection
  - Net Cost: $75k to $90k

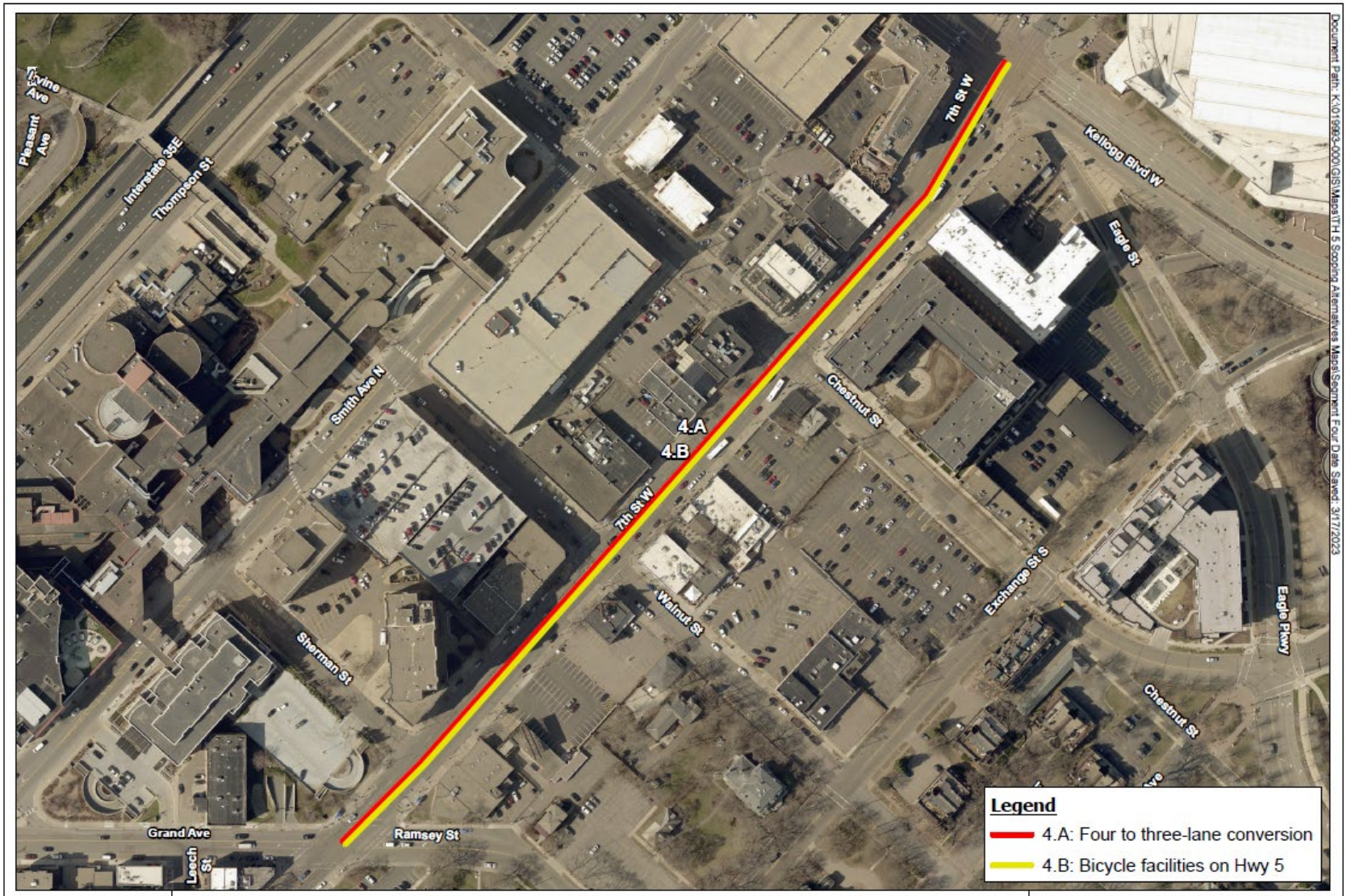
Restricting access to right-in/right-out movements by using medians on Hwy 5 reduces conflict points and provides space for pedestrian refuge at crosswalks. The density of access points and gridded local roads provide nearby alternatives for traffic to make left turns.

Alternative 3.D II: Access closure / modification

- Dousman St. north leg between Hwy 5 and Goodrich Ave
  - Reduce impervious area
  - Revise the south leg geometry of Dousman St. to intersect Hwy 5 at right angle
  - Reduces conflict points
  - Permanently closes driveway access to restaurant parking lot (currently gated closed with parking striped in front of it)
  - Access modification may also include turning this segment into a one-way southbound road with right-out only access to preserve parking on Dousman St.
  - Net Cost: $75k to $90k
- Leech St. north leg
  - Seasonally closed for pedestrian use and café seating since 2020
  - Maintain one-way access to hotel parking lot
  - Reduce intersection footprint
  - Net Cost: $90k to $110k

Segment 4 Scoping Alternatives –Grand Avenue to Kellogg Boulevard

Locations of scoping alternatives in Segment 4 are shown in **Figure 6 - Segment Four**



DEPARTMENT OF TRANSPORTATION

Figure 6 - Segment Four

TH 5 Scoping Alternatives
Minnesota Department of Transportation

N

0 200 Feet

1 inch = 200 feet

Alternative 4.A: Four to three-lane conversion

Hwy 5 is an undivided four-lane section through Segment 4. The AADT from Grand Ave. to Kellogg Blvd. is 15,400 vpd. FHWA advises that roadways with ADT of 20,000 vpd or less may be good candidates for a four to three-lane conversion and should be evaluated for feasibility. According to the Hwy 5 Existing Multimodal and Safety Conditions study, Segment 4 has the highest non-intersection crash rate in the project corridor and there would likely be a safety benefit in changing the 4-lane undivided segments on Highway 5 to another design type with a lower expected crash rate. Improvement Notes / Cost:

- Crash reduction
- Reduce rear-end and left-turn crashes
- Fewer lanes for people walking to cross
- Provides space for bicycle lanes
- Improves left turns from side streets
- Improves traffic flow
- Less lane weaving
- Net Cost: $5k to $25k

A four to three-lane conversion can be a low-cost safety solution when only pavement marking changes are needed. Shifting roadway crown and surface drainage will need to be considered. Adding bicycle lanes in the space created by vacating a traffic lane is consistent with Complete Streets practices. Traffic modeling is necessary to validate this alternative. Event traffic should also be considered

Alternative 4.B: Bicycle facilities on Hwy 5

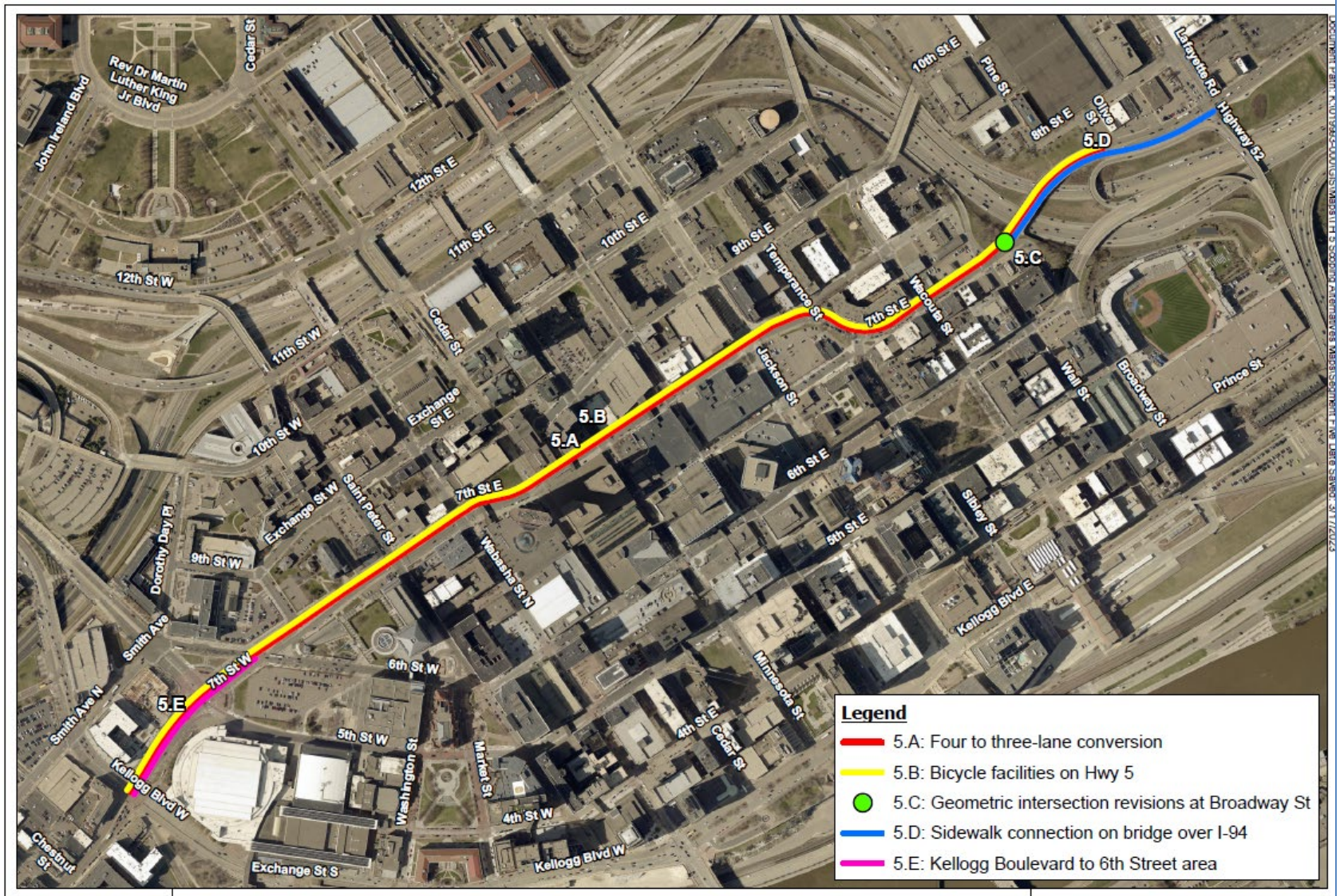
This area was identified by local partners at the City of St. Paul as a high priority area for bicycle facilities. If a three-lane configuration is selected (see Alternative 4.A), then space would be readily available for bicycle lanes. Otherwise on-street parking lane(s) may need to be removed if the current four-lane configuration is carried forward. Options may include one-way bicycle lanes on each side of Hwy 5 or a two-way bike facility protected by a barrier curb with bollards, similar to an installation on 10th St. in Downtown St. Paul. Improvement Notes / Costs:

- Improves bicycle network and connectivity between downtown and more residential and commercial areas to the west

- Potential impacts to on-street parking for the existing four-lane configuration
- Net Costs:
    - One-way bicycle lanes on both sides of the road – $5k to $10k
    - Two-way bicycle lanes on one side of road with barrier curb and bollards – $200k to $250k

Segment 5 Scoping Alternatives – Kellogg Boulevard to Olive Street

Locations of scoping alternatives in Segment 5 are shown in **Figure 7 - Segment Five**



DEPARTMENT OF TRANSPORTATION

Figure 7 - Segment Five

TH 5 Scoping Alternatives
Minnesota Department of Transportation

Alternative 5.A: Four to three-lane conversion

Hwy 5 is a four-lane section through Segment 5. Opposing traffic is divided by a median from Kellogg Blvd. through Wabasha St. The AADT in Segment 5 ranges from 11,500 to 15,400 vpd. FHWA advises that roadways with ADT of 20,000 vpd or less may be good candidates for a four to three-lane conversion and should be evaluated for feasibility. According to the Hwy 5 Existing Multimodal and Safety Conditions study, the crash data indicates that there is a significant crash history in the corridor and there would likely be a safety benefit in changing the 4-lane undivided segments on Highway 5 to some other design type with a lower expected crash rate. Improvement Notes / Cost:

- Crash reduction
- Reduced rear-end and left-turn crashes
- Fewer lanes for people walking to cross
- Creates space for bicycle lanes
- Improves left turns from side streets
- Improves traffic flow
- Less lane weaving
- Net Cost: $5k to $25k

A four to three-lane conversion can be a low-cost safety solution when only pavement marking changes are needed. Shifting roadway crown and surface drainage will need to be considered. See Alternative 5.B for more analysis on the impacts of bicycle lanes.

Traffic modeling is necessary to validate this alternative, in which close attention should be paid to the area between Kellogg Blvd and W. 6th St. where additional lanes may be critical during peak hour and event congestion. If the existing lane configurations were left in place through these two blocks, it would limit the ability to add bicycle lanes between segments 4 and 5.

Alternative 5.B: Bicycle facilities on Hwy 5

Segment 5 was identified by local partners at the City of St. Paul as the highest priority area for bicycle facilities. Options may include one-way bicycle lanes on each side of Hwy 5 or a two-way bike facility protected by a barrier curb with bollards, similar to an installation on 10th St. in Downtown St. Paul. Improvement Notes / Costs:

- Improves bicycle network and connectivity downtown

- Since there is limited right of way and no on-street parking for most of segment 5:
    - One-way bicycle lanes on both sides of the road would likely require two traffic lanes to be eliminated
    - Two-way bicycle lanes on one side of the road would require at least one traffic lane to be eliminated in either direction
- Net Costs:
    - One-way bicycle lanes on both sides of the road – $15k to $25k
    - Two-way bicycle lanes on one side of road with barrier curb and bollards – $700k to $850k

Alternative 5.C: Geometric intersection revisions at Broadway St.

Broadway St. is a southeast-bound one-way street that intersects Hwy 5 at the end of a horizontal curve. The existing curb alignment on the southeast side of Hwy 5 does not follow the curve in Hwy 5, resulting in a widened roadway section. The widened area does provide shoulder space for right-turning vehicles to slow down outside of the through lane but may result in higher speeds. There were no crashes at this intersection from 2017-2021. This alternative would include curb realignment between Wall St. and Broadway St. parallel to centerline. Improvement Notes / Cost:

- Opportunity to introduce green infrastructure
- May provide traffic calming effect
- Could result in drainage impacts and catch basin relocation
- Net cost: $40k to $45k

If sidewalk is added on Hwy 5 along the southeast side of the bridge over I-94 (see Alternative 5.C), then this geometric revision would create a more direct sidewalk alignment for pedestrians on the southeast side of Hwy 5.

Alternative 5.D: Sidewalk connection on bridge over I-94

St. Paul's Pedestrian Plan identifies a sidewalk gap in a high priority area for walking on the southeast side of Bridge 62703 over I-94 and its approaches. This is the only gap in sidewalk on the south side of Hwy 5 throughout the project corridor. The gap in sidewalk is approximately 1200 feet long and it extends over 500 feet beyond the project limit at Olive St. to the east side of Lafayette Rd. Improvement Notes / Cost:

- Improve walkability
- Would need to eliminate a driving lane to accommodate
- Project limits not sufficient to completely eliminate gap in sidewalk
- Would need a dead load extra capacity analysis completed by the MnDOT Bridge Office
- Net Cost: $200k to $250k

If a three-lane section were introduced (see Alternative 5.A), then there would be space available to introduce sidewalk over this bridge, although terminating sidewalk at Olive St. would still result in a gap in pedestrian facilities on the southeast side of Hwy 5.

Alternative 5.E: Kellogg Boulevard to 6th Street area

- Eliminate channelized right-turn lanes at both intersections
- Evaluate alternative pavement options to replace deteriorating red concrete
- Development of "sense of place" alternatives in-progress such as green infrastructure, vegetation, and landscaping. Consider vegetation consistent with MnDOT and City requirements, particularly maintenance needs.
    - Placement of vegetation or other aesthetic improvements should allow unimpeded for sight lines for all modes of transportation, particularly at the intersections.
- Net cost: $320k to $390k

Appendices

A. Project Scoping Report (S.P. 6201-91, Munster Ave. to St. Clair Ave.)
B. Project Issues and Challenges Summary
C. Draft Executive Summary of Purpose and Need
D. Phase 1 Engagement Summary
E. Phase 2 Engagement Summary
F. Hwy 5 Existing Multimodal Mobility and Safety Conditions