

# DMC TRANSPORTATION & INFRASTRUCTURE PROGRAM INTEGRATED TRANSIT STUDIES

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## Street Use & Complete Streets Study Report

Prepared for:

**Destination Medical Center Corporation**

**City of Rochester, Minnesota**

**DMC Transportation & Infrastructure Program**



**DMC** TRANSPORTATION  
INFRASTRUCTURE  
PROGRAM MANAGEMENT

Prepared by:



**June 20, 2018**

City Project No. J8623

This report is one of five Integrated Transit Studies (ITS) Reports and an Executive Summary that were prepared for the Destination Medical Center Corporation (DMCC) and the City of Rochester, Minnesota. The ITS reports were accepted by the DMCC on June 28, 2018 ([Resolution No. 69-2018](#)) and by the City of Rochester on July 2, 2018 ([Resolution 237-18](#)).

The Integrated Transit Studies are comprised of the following reports:

- Executive Summary
- Transit Circulator Study Report
- Parking & Transportation Management Authority (TMA) Study Report
- City Loop Study Report
- Street Use & Complete Streets Study Report
- Street Operations Study Report

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## 1.0 Introduction

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This technical memo details the work that was done during the Street Use Study, one of five concurrent studies during 2017 that investigated proposed multimodal elements of the transportation system in downtown Rochester. Other studies investigated topics such as transit systems and routes, traffic and street operations and the proposed City Loop facility.

### The Vision for Downtown Streets

Historically, the Mayo Clinic has been the primary economic driver of downtown Rochester. While the Mayo Clinic will continue to be the main economic driver, downtown Rochester is quickly becoming a hub for additional medical support services, education, research and innovation as a result of the recent Destination Medical Center (DMC) initiative. The DMC initiative plans to enhance Rochester's standing as a global medical destination that supports healthy lifestyles, active living and enhanced mobility choices for its citizens and visitors alike.

Per the DMC Development Plan completed in 2014, the DMC is envisioned as a major economic development initiative that will drive significant new job



**A vision for significant commercial development and signature streets and public spaces in the Heart of the City area of downtown Rochester. Source: DMC Development Plan**

growth and tax base to downtown Rochester. The Plan also states that the DMC will significantly increase and accelerate the demand for private development and public infrastructure in this market. The DMC targets the addition of tens of thousands of jobs to Rochester, increasing the population by approximately 25 percent by 2030 and more than doubling visitation to the Mayo Clinic from patients/companions, business travelers, and convention and event visitors.

By adding new residents, businesses, visitors and employees, this growth will place more demand on downtown streets which are the most significant public space in downtown. Streets should move workers, visitors, residents, goods and shoppers around downtown comfortably via a variety of transport modes including by foot or bicycle. World class streets are often noted for their superior pedestrian and bicycle-oriented design features rather than their efficiency of moving automobiles. Indeed, high quality pedestrian and bicycle amenities are increasingly sought after in urban downtown environments and the future streets of downtown Rochester will need to be highly walkable and bicycle friendly. As such, we have identified pedestrian and bicycle enhancements to downtown streets as part of this study.



**World class streets and public spaces create economically successful, vibrant and sustainable downtowns. Source: DMC Development Plan**

We have incorporated urban placemaking and Complete Streets principles into our planning and design process with the goal of enhancing streets and



creating a healthy, walkable and sustainable downtown Rochester. Over the years, there have been a number of community planning efforts that support this philosophy including the **Downtown Rochester Master Plan (2010)**, the **DMC Development Plan (2014)**, the **DMC District Design Guidelines (2017)** as well as the City’s most recent draft of the **Comprehensive Plan Update (2017)**.

This planning effort seeks to update previous street use strategies while considering concurrent findings from the Transit Circulator and City Loop studies. Our approach stitches together multimodal planning and design aspects with urban design principles while emphasizing the concept of community utility – aligning the proposed street characteristics and design features with the planned user groups (e.g., pedestrians, bicyclists, transit vehicles and motorists.)

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*This study focused on enhancing downtown streets for pedestrians and bicyclists while accommodating needed transit improvements and maintaining vehicular access. It supports and embraces the vision statements and goals presented in the Downtown Rochester Master Plan and the DMC Development Plan, especially those related to making downtown Rochester more walkable and bikeable.*

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**The vision for downtown Rochester streets to be multimodal and support pedestrians, bicyclists, transit, automobiles and emerging technologies (e.g. autonomous vehicles.) Source: DMC Development Plan**

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## 2.0 Street Use Analysis

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The Street Use Analysis worked within the following planning framework to provide recommendations to retrofit downtown Rochester as Complete Streets for all users with enhanced bicycle and pedestrian facilities.

- Use *previous studies and design standards as a baseline*, modify if necessary
- Develop an understanding of existing land use, infrastructure, street use, community priorities and design limitations
- Take into consideration currently planned or imminent public sector bicycle, pedestrian and roadway projects as well as significant planned or imminent private sector development
- Consider transit and City Loop proposals as well as emerging Heart of the City and Discovery Walk concepts
- Identify *specific projects able to be implemented* in the following 12-18 months
- Identify *near-term* (5-7 year) and *long-term* (7-15 year) projects
- Retrofits could range in scale from a “bucket of paint” to overall street redesign and/or right-of-way acquisition



**Vision for a vibrant and active 1<sup>st</sup> Avenue with high quality pedestrian-oriented features. Source: Rochester Downtown Master Plan**



## Public Engagement

### Public Workshop Overview and Results

On January 24, 2017, the Project Team hosted an Open House for the public and key stakeholders to gain a better understanding of the study objectives and provide feedback on mobility issues within the context of the study planning area. Several stations were set up to either provide information to attendees of the workshop or to garner feedback. Stations that provided information included presentation boards detailing an initial review of downtown Rochester's streets' existing levels of service. Three stations were set up to gather feedback from the public regarding preferred pedestrian, bicycle and transit facilities. Attendees were shown images depicting a range of facility types and asked to place a green dot with the image of their most preferred type and a red dot with their least preferred type. This information was then used in subsequent work sessions to create specific multimodal improvements along key corridors.



(Above) The January 2017 public workshop was well attended despite inclement weather. (Right) Attendees selected preferred street types and design elements on the presentation boards.

### Summary of Feedback

- **PEDESTRIAN FACILITIES:** Most preferred – wide sidewalks with outdoor café seating and high-quality pedestrian amenities; Least preferred – pedestrians crossing wide and multilane roads.
- **BICYCLE FACILITIES:** Most preferred – separated and/or protected facilities and bike/pedestrian bridge; Least preferred – unprotected and shared lanes
- **TRANSIT FACILITIES:** This station yielded some conflicting results. The image of a modern streetcar with a high-quality transit stop garnered the

most green dots and the most red dots, potentially illustrating controversial views on this facility type.



**Figure 1.** Results from a public engagement exercise used at the workshop. Participants were asked to place green dots with images of bicycle facilities that they most preferred to see in downtown Rochester. They placed red dots with images of facilities that they least preferred.

## Block-by-block Assessment Tool

As a part of the planning and design process, a new tool was developed for creating an inventory of streets and assessing the impacts related to vehicular, pedestrian, bike and transit improvements along a given street. This new tool is called the Block-by-block Assessment Tool. It evaluates Complete Streets design elements and was created specifically for collecting community-wide inventory (from building face to building face) along specific streets and corridors.

This inventory includes: shared use paths; bikeways; pedestrian paths; transit accommodations (such as shelters); signs; and transit infrastructure. In addition to noting the existence of facilities, the width and condition of all facilities was recorded. The inventory was used to better understand the resources that are currently available, as well as to assess the needs that have been previously identified in planning efforts.

This data inventory (Figure 2) was collected using high resolution aerial imagery, Google Street View and on-site field work. It was then converted to ARC GIS shape files and provided to all of the Rochester DMC Integrated Transit Studies Project Teams for their use. The Block-by-block Assessment Tool allows for the appraisal of current conditions for bicycle, pedestrian, transit and parking facilities. It can be used to analyze proposed Complete Streets improvements and to measure the trade-offs associated with different modes. This tool was used to perform a Complete Streets analysis for existing conditions on downtown Rochester streets as well as for the various transit network scenarios developed over the course of the study by the Transit team.

Representative results of an application of the tool are displayed in Figure 3 which analyzes Street Lighting (quality) and ADA Ramp compliance for select streets within the downtown study area. Together, this data inventory coupled with the transportation scenarios can be used to evaluate existing infrastructure impacts, such as parking displacement and expected demolition and reconstruction of curb & gutter and sidewalks.



**BLOCK ASSESSMENT**

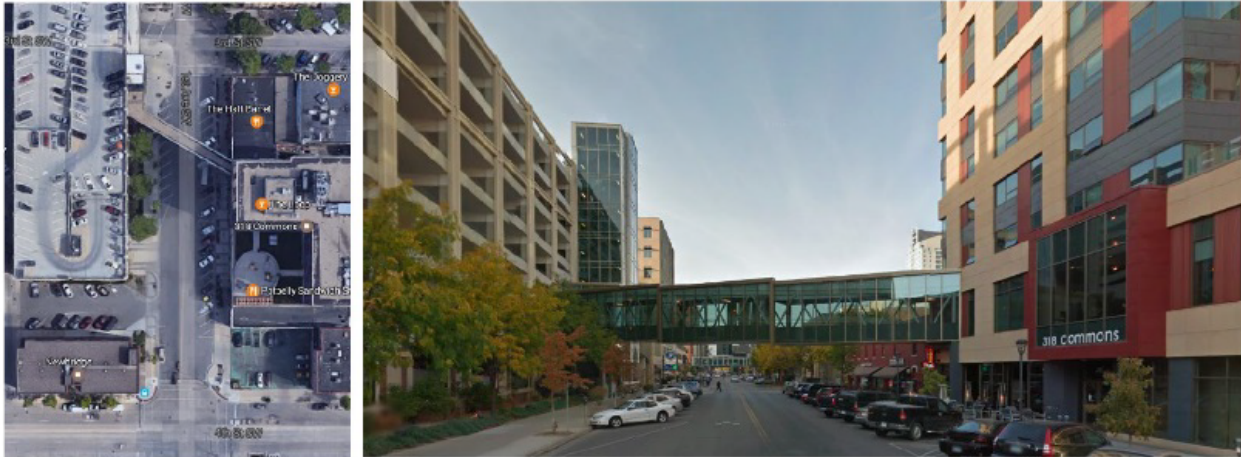
Date: 1.04.2017

Evaluator (initials): mmr

Street Name: 1<sup>st</sup> Avenue SW

Cross-Street 1: 3<sup>rd</sup> Street SW

Cross Street 2: 4<sup>th</sup> Street SW



Block Assessment South to North	Street Characteristics							Pedestrian Zone Characteristics					Land Use Characteristics					
	Right-of-Way Width (feet)*	Width of Outside Lane (feet)	On-Street Parking (Type/Rest.)	Speed Limit (mph)	Number of Lanes (through lanes)	Transit Stop (amenities)	Transit Frequency (No. per Hour)	Bike Facility (Type)*	Street Trees (incl. quality)	Lighting (Type)*	Sidewalk Width (feet)	Buffer Width (feet)	Outdoor Seating (Yes/No)	Ground Floor Retail (%)	Public Destination (low-moderate-high)	Maintenance or Litter / Graffiti (low-moderate-high)	Building Height to Corridor Width (ratio)*	Blank Wall to Void or Windows (%)
<b>Corridor Treatments</b>																		
Value of Assessment	40	15	Angle/Meter	25?	1	0	0	0	2	2	16	0	No	20	Low	Low	.90	25%
<b>Intersection Treatments</b>																		
Intersection Assessment	Crosswalks (number)	Pedestrian Buttons (number)	Slip Lanes (number)	ADA Compliant Ramps (Yes/No)	Max. Curb Radius (feet)	Maximum Crossing Width (feet)	Permitted Right Turn on Red (Yes/No)	Additional Comments										
3 <sup>rd</sup> St SW	4	0	0	Yes	10	42	Yes	Route 55 runs only on Tuesdays and Fridays with hours from 9:00am to 2:30pm Land Uses include parking deck, apartment building (Newbridge) Crosswalks are parallel lines Two parallel parking spaces in front of apartment building Overhead walkway										
4 <sup>th</sup> St SW	4	4	0	Yes	20	53	Yes											
Block Assessment North to South	Street Characteristics							Pedestrian Zone Characteristics					Land Use Characteristics					
Right-of-Way Width (feet)*	Width of Outside Lane (feet)	On-Street Parking (Type/Rest.)	Speed Limit (mph)	Number of Lanes (through lanes)	Transit Stop (amenities)	Transit Frequency (No. per Hour)	Bike Facility (Type)*	Street Trees (incl. quality)*	Lighting (Type)*	Sidewalk Width (feet)	Buffer Width (feet)	Outdoor Seating (Yes/No)	Ground Floor Retail (%)	Public Destination (low-moderate-high)	Maintenance or Litter / Graffiti (low-moderate-high)	Building Height to Corridor Width (ratio)*	Blank Wall to Void or Windows (%)	
<b>Corridor Treatments</b>																		
Value of Assessment	40	17	Angle/Meter	25?	1	0	0	0	2	2	16	0	Yes	80	Moderate	Low	.90	20

**\*DEFINITIONS**  
 Right-of-Way Width (feet): approximate, measured from centerline to edge of public right-of-way / parcel line  
 Bike Facility (Type): 0=none; 1=striped; 2=marking; 3=marking+stripe; 4=separated  
 Street Trees (incl. quality): 0=none; 1=poor/not healthy; 2=good/healthy  
 Lighting (Type): 0=none; 1=high-level; 2=pedestrian-level/decorative  
 Public Destination (low-moderate-high): Low=no public spaces; Moderate=busy private space; High=public destination (park, school, library, recreation, learning)

Figure 2. Sample Block Assessment Results.

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Figure 3. Typical results from evaluation of pedestrian amenities using the Block-by-Block Assessment Tool.

## Multimodal Level of Service Analysis

### Level of Service Analysis

Level of Service (LOS) describes measures of effectiveness for various modes of transportation operations. This tool is used to evaluate modal problems and potential solutions in the planning process. LOS was used in this analysis to present a report card on how area roadways perform for pedestrians and bicyclists. LOS for this study is graded from good to poor. The LOS analysis indicates if pedestrians and bicyclists experience safety issues, discomfort, and delays as they maneuver area roadways. A lower score reflects the low quality or lack of walking and biking facilities and infrastructure.

General factors considered in the pedestrian LOS analysis were: existing sidewalks and widths, traffic volumes, the presence of on-street parking, street trees and other protective barriers. Elements considered in the bicycle LOS analysis were: traffic volumes, number of lanes, existing bicycle facilities and/or shared use paths.

Performance reviews for pedestrian and bicycle modes were completed for the existing conditions as well as the proposed recommendations for streets

in the downtown area. Significant improvements in scores are seen from the existing to build out scenario for bicycle and pedestrian modes. Proposed pedestrian lighting and enhanced crossings, street trees to buffer traffic and provide shade, in combination with high quality dedicated bicycle facilities were all elements that drove LOS scores up. A brief summary of network improvements considered in the LOS analysis includes, but is not limited to:

- Interim buffered bicycle lanes along 4<sup>th</sup> Avenue SW, 3<sup>rd</sup> Avenue SW and Center Street will provide dedicated facilities for skilled and confident bicyclists.
- Decorative pedestrian level lighting, wide sidewalks, street trees and high visibility crosswalks are proposed for all street types in the DMC district, *which positively impacted the pedestrian LOS significantly.*
- Several bicycle boulevards, bike lanes, signage and other bicycle amenities are proposed for select streets.
- Roadway improvements along 1<sup>st</sup> Avenue NW from 3<sup>rd</sup> Street NW to Center Street include a road channelization to enhance travel safety and mobility.
- New shared street enhancements as part of concurrent planning efforts with Heart of the City and Discovery Walk.

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*Traditionally in most cities including Rochester, automobile Level of Service has been prioritized over all other modes. This mantra has delivered streets designed primarily to move automobiles efficiently. Moving forward, consistent with the visions set forth in the Downtown Rochester Master Plan and the Destination Medical Center Development Plan, downtown Rochester street regulation and design should prioritize pedestrian and bicycle Level of Service over that of the automobile.*

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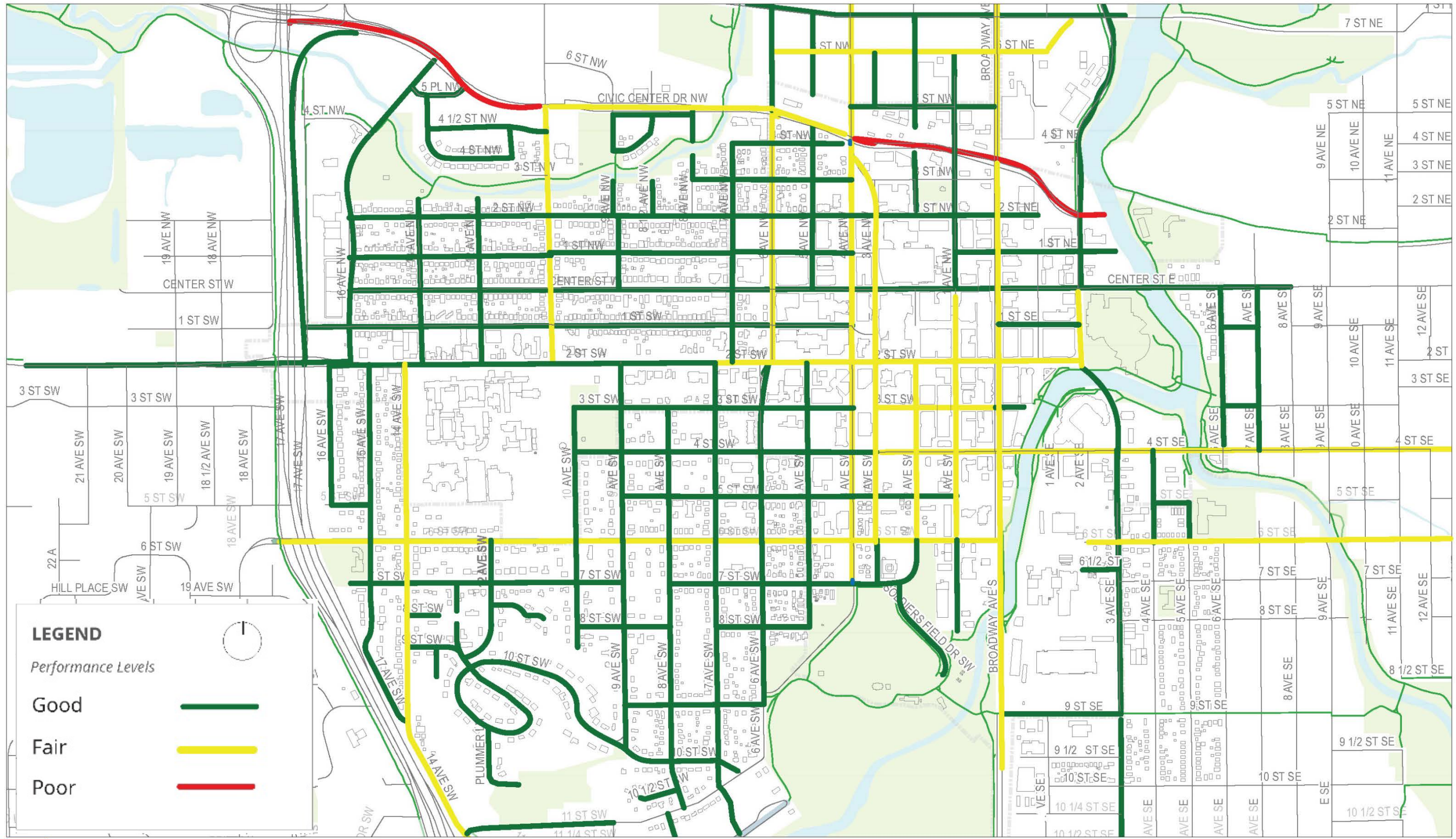


Figure 4. Existing Pedestrian LOS



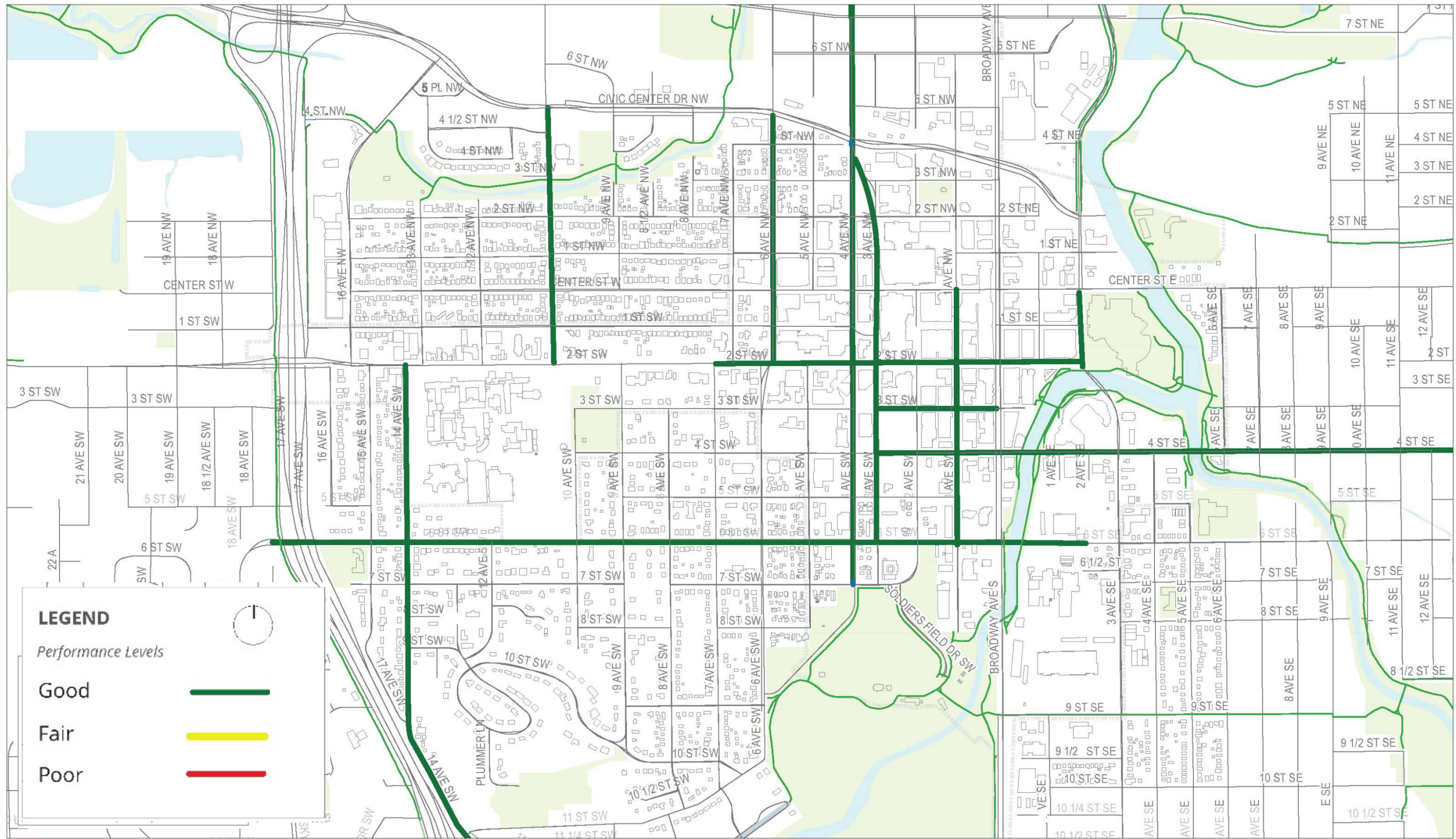


Figure 5. Proposed Pedestrian LOS (Showing ONLY streets that have changed in LOS)



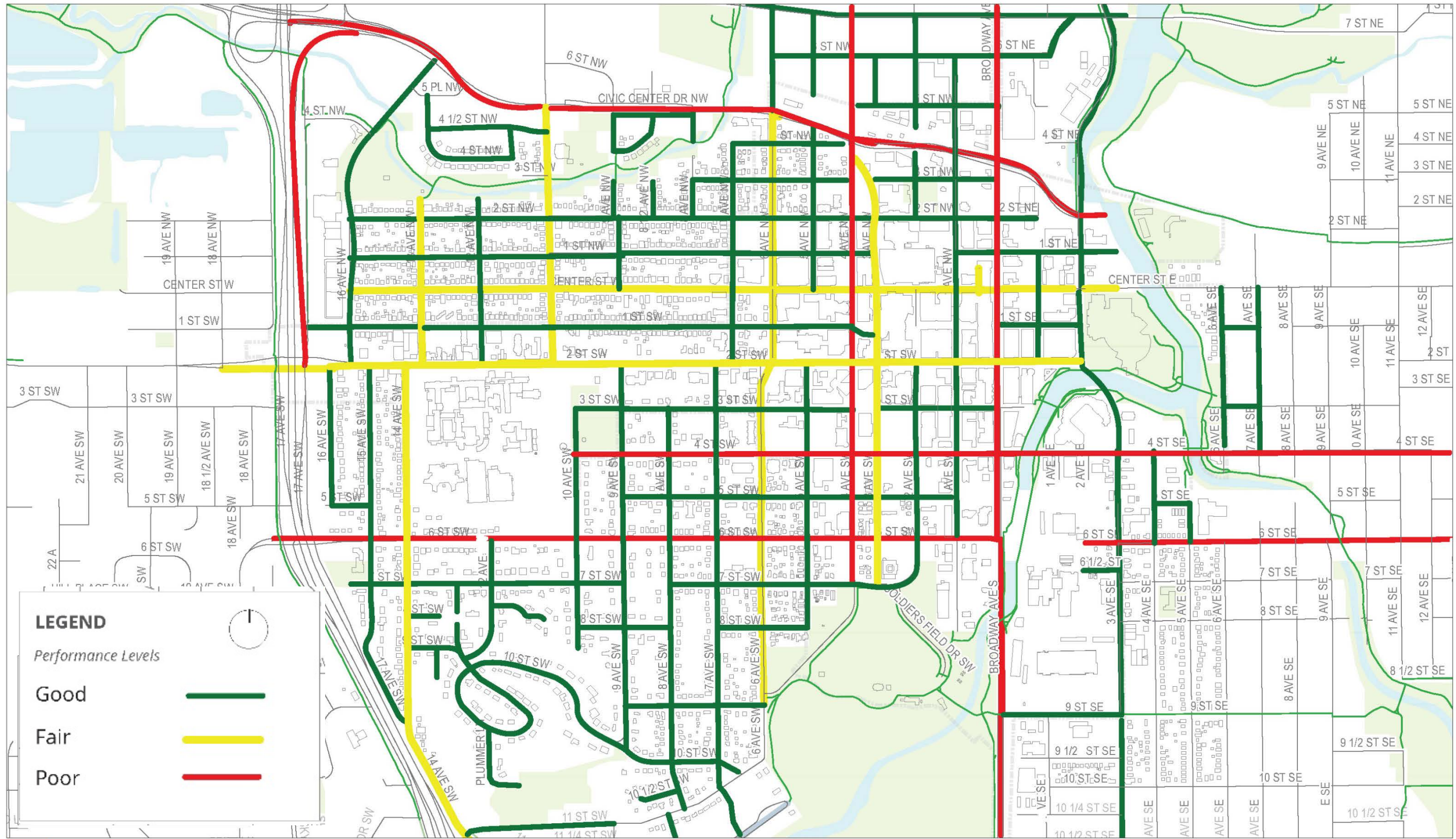


Figure 6. Existing Bicycle LOS



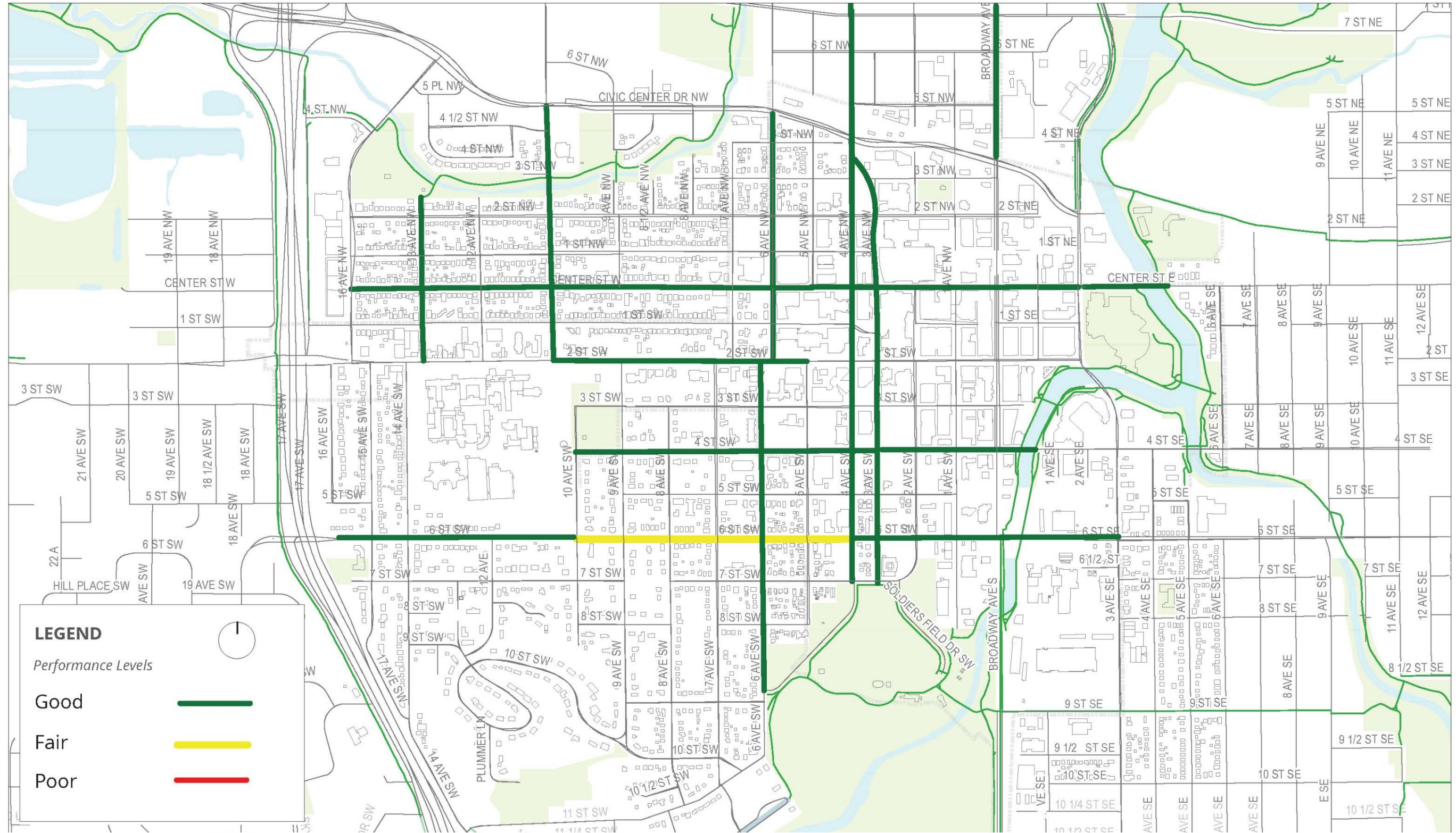


Figure 7. Proposed Bicycle LOS (Showing ONLY streets that have changed LOS)



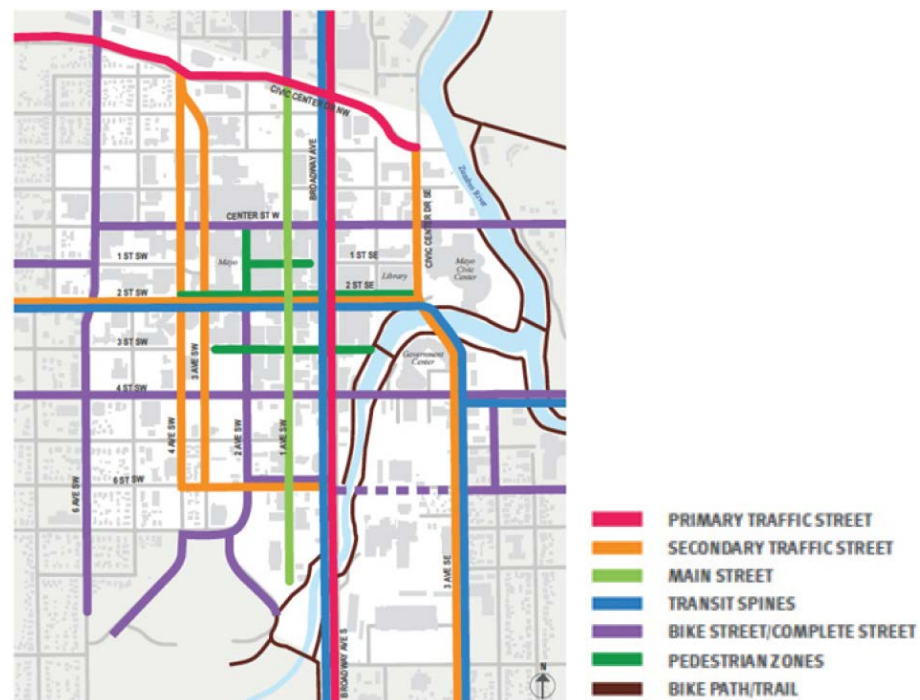
## Street Typologies

### Overview: Street Typologies from Previous Studies

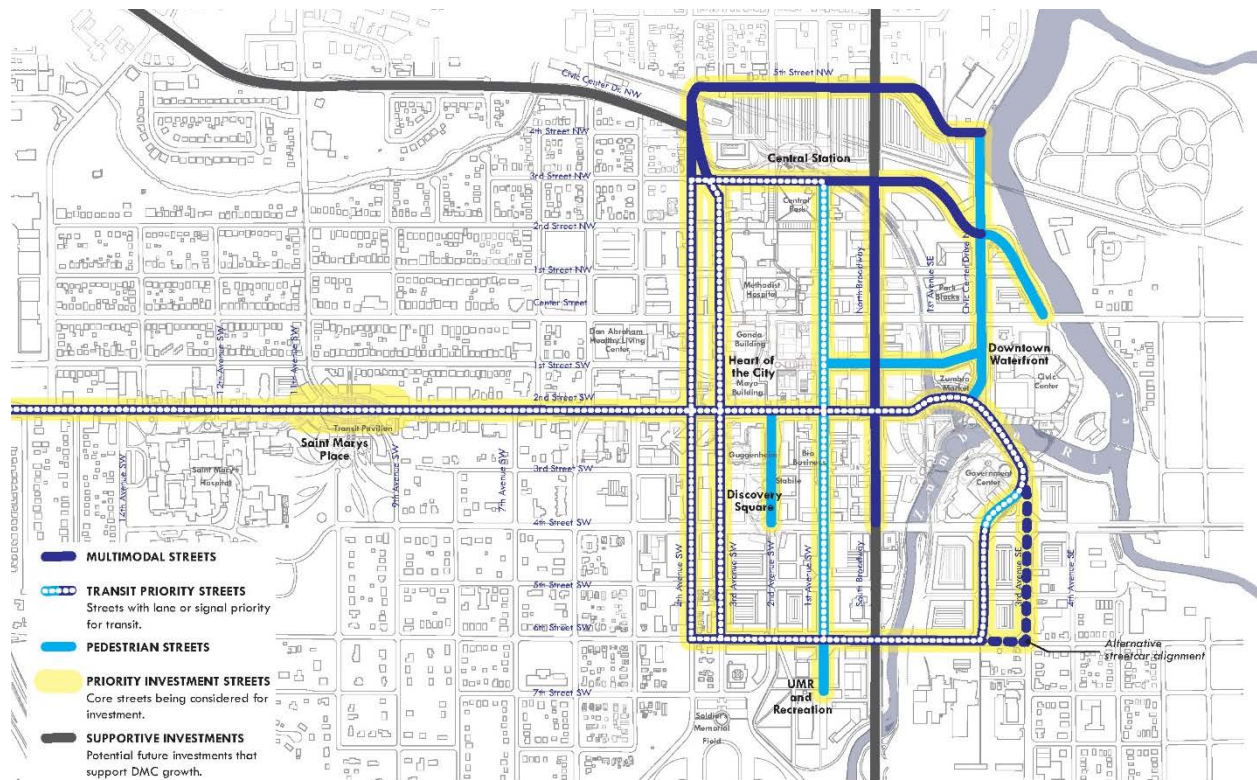
Recent planning efforts in Downtown Rochester have sought to classify the streets by primary current or planned function and design features. For example, there may be streets that function more as roadways that move cars efficiently in and out of downtown and other streets may function more as destination streets with a mix of land uses including restaurant, office and retail typically with less vehicular movement and more pedestrian activity.

The first city adopted document addressing street typologies was the Downtown Rochester Master Plan in 2010, which states the following regarding the purpose and character of downtown Rochester's streets:

*“To promote planned growth and travel, Rochester will need to make more efficient use of current street space. In short, this means carrying more people in high-occupancy vehicles, such as transit and shuttles, and encouraging travel by foot and bicycle where possible. Like most cities, Rochester has largely designed and managed streets for private vehicle circulation and access to parking. Proposed Master Plan street types (which are not intended to replace the City’s functional classifications) set priorities for movement of people, not just vehicles, and ensures that transit, cyclists and pedestrians are all provided safe and convenient access to and circulation through downtown.”*



**Figure 8. Street Typologies: Downtown Rochester Master Plan (2010)**



**Figure 9. Streets Framework: DMC Development Plan**

Following the 2010 Master Plan, the 2014 DMC Development Plan, provided a slightly different set of street typologies as illustrated in Figure 9. Finally, in 2017 downtown street typologies were also included in the Rochester Destination Medical Center District Design Guidelines (DMC District Design Guidelines). The DMC District Design Guidelines lists seven street types, four of which were adopted from the 2010 city adopted master plan. For this study, we reviewed and incorporated the 3 studies referenced above into a single unified set of typologies for consideration.

In general, the new typologies are intended to simplify and clarify those in previous studies. Additionally, these typologies have been applied to all streets in Downtown Rochester, thereby expanding the applications of previous studies. Finally, these typologies have been developed in unison with the latest parking, traffic and transit studies and take into consideration the latest transportation planning concepts for downtown Rochester.

While terminology and recommendations vary slightly from current and past studies, the overall premise has been consistent throughout – to change the tide and enhance streets by re-prioritizing pedestrian and bicyclist needs to create a vibrant, safe, memorable place for all people using all modes and

fulfilling the city’s consistent vision for an attractive and successful, world class downtown.

**Table 1: Comparison of Existing Street Typology Frameworks for downtown Rochester**

Typologies Recommended in this Study	Downtown Master Plan	DMC Design Guidelines	Comprehensive Plan (Downtown)	DMC Development Plan
Mobility Corridor	Primary Traffic Street Secondary Traffic Street	Primary Traffic Street		
Transit Priority Street	Transit Spine	Transit Mobility Street	Transit Commercial	Transit Priority Street
Main Street	Main Street	Main Street / Destination Street	Downtown Commercial	Pedestrian Street
Multi Modal Street	Bike Street / Complete Street	Secondary Traffic Street		Multimodal Street
Neighborhood Street				
Pedestrian/Shared Street	Pedestrian Zone	Dedicated Bike & Ped Corridor	Active Downtown	
	Bike Path / Trail Corridor	Alley and Lane		
		Special Corridor - City Loop - The Crescent		

## Classifications & Design Guidelines

The following describes characteristics and design guidelines for each of the proposed Street Typologies for the Rochester downtown street system. These typologies represent a blend of the DMC District Design Guidelines as well as the preliminary street classifications identified in the DMC Development Plan and Rochester Downtown Master Plan. This effort was in response to the proposed modal composition of the Integrated Transit Study effort. The classifications represent six typologies that highlight the predominant design characteristics or mobility modes depending on the Function (target users - who it provides service to) and Design Amenities (street features) needed to support each classification (Figure 10).





Street Trees



Curb Extensions



Hanging Baskets



Parklets



Banner Signs



Wayfinding Signs



Public Art



Bike Racks



Wide Sidewalks



Outdoor Seating



Pedestrian Lighting



Benches



High Visibility Crosswalks



Decorative Crosswalks



Mid-Block Crosswalks



Pedestrian Countdown Signals

Figure 10. Common street enhancement elements proposed.

Brief Design Guidelines have been outlined for each typology. In general, streets located inside the DMC District area should have a higher degree of pedestrian and bicycle amenities than streets outside that area due to the fact that they are typically more mixed in land uses and more intensely developed, whereas streets outside the district are more residential and neighborhood oriented.

While much deliberation has been involved in developing these typologies, further discussion could be warranted. Additionally, the city may consider refining these typologies and supporting the final draft typologies by codifying the downtown streets with an adopted Street Regulating Plan or similar document.

## Transit Priority Streets



**Representative Transit Priority Street. Design elements and modal priorities are transit-oriented, while also being pedestrian-friendly.**

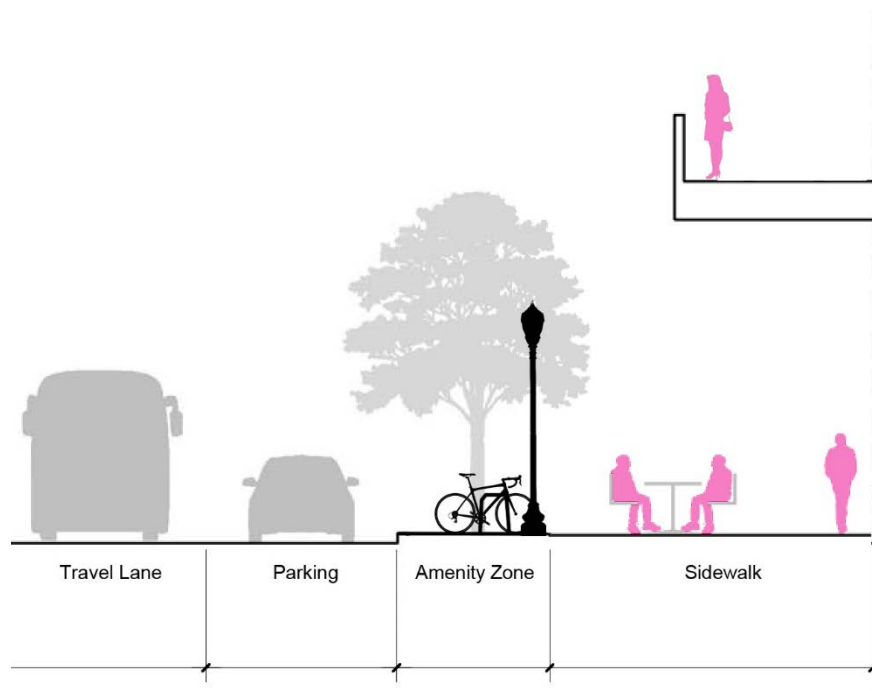
These streets are primarily transit serving in their function and design amenities. They may include light rail, tram and/or bus rapid transit as well as emerging transit technologies like shared autonomous vehicles. They predominantly provide high-quality transit service with a concentration of transit vehicles, stops and riders and connect community destination points. They have the potential to promote significant economic development, especially within  $\frac{1}{4}$  mile of transit stops. They also provide a high-quality pedestrian and bicyclist experience (first-mile, last-mile) in which walking and biking actively complement public transit. Enhanced design features and amenities are common, like decorative pedestrian level lighting, high-quality transit stops, landscaping and paving materials. High volumes of

pedestrian and bicyclist traffic are typical and safety for these modes is a high priority at crossings as well as along the corridors.

### Example: 2<sup>nd</sup> Street SW/SE

#### General Design Guidelines

- Maximum 11' travel lanes
- 8 - 10' minimum sidewalk width
- 5' minimum amenity zone (see Figure 11), 8' minimum at transit stops
- Street trees approximately every 35'
- Landscaping
- Decorative pedestrian level lighting
- On-street parking (if possible, but prioritize space for pedestrian and bicycle facilities before allocating space for on-street parking)
- Protected refuge islands, pedestrian countdown signals,
- Curb extensions at intersections and wide high-visibility crosswalks that may also incorporate decorative features.



**Figure 11.** The amenity zone is generally located between the sidewalk and the curb. It typically contains elements like street trees, bicycle racks, pedestrian level lighting and wayfinding signage.





**Representative Mobility Street. Design features accommodate high volumes of vehicles while still providing facilities for other modes.**

## Mobility Streets

These are “workhorse” streets, urban thoroughfares that connect outlying areas into downtown and move car, freight, and commuter traffic through downtown via major portals. They typically have more travel lanes, wider rights-of-way and can accommodate more mobility options and higher volumes of traffic at peak hours. However, they must provide safe and comfortable intersection crossings and amenities for pedestrians and bicyclists. This is critical on Mobility streets as they are typically wide and more difficult to cross for pedestrians and bicyclists.

### Example: Civic Center Drive NW

#### General Design Guidelines

- Maximum 11’ travel lanes
- 6 - 8’ minimum sidewalk width
- 5’ minimum amenity zone
- Street trees approximately every 35’
- Landscaping
- Decorative pedestrian level lighting
- On-street parking (as appropriate for adjacent land use)

- Protected refuge islands and pedestrian countdown signals at intersections
- Curb extensions at intersections and wide or high-visibility crosswalks.



**Typical Main street condition. Streets cater to pedestrian movement and amenities while also accommodating automobiles.**

## Main Streets

These streets are concentrated in the downtown core. They are designed to calm vehicular traffic and accommodate the highest density of residential and commercial use and the greatest concentration of pedestrians and bicyclists. The sidewalk zone and amenity zone together are the widest of all street typologies. These areas have a higher level of paving to accommodate higher volumes of pedestrian traffic, outdoor seating/dining areas and other high-quality pedestrian and bicycle amenities. Vegetation is an important component of Main Streets to enhance community aesthetics and pedestrian comfort. Plantings, such as street trees and ornamental flowers and grasses should be located in select areas and protected to avoid damage by pedestrians and bicyclists. Intersections should have wide high-visibility crosswalks that may also incorporate decorative features.

### Example: Historic 3<sup>rd</sup> Street SW, 1<sup>st</sup> Avenue SW

#### General Design Guidelines

- Maximum 11' travel lanes
- 8 - 10' minimum sidewalk width (ideally 12+ feet)



- 5' minimum amenity zone
- Street trees approximately every 35'
- Landscaping
- Decorative pedestrian level lighting
- On-street parking (if possible, but prioritize space for pedestrian and bicycle facilities before allocating space for on-street parking)
- Pedestrian countdown signals
- Curb extensions at intersections and wide high-visibility crosswalks or highly visible decorative crosswalks

### Shared, Festival & Pedestrian-only Streets



**Representative Shared Street. The curbless design and cohesive paving materials allow for flexible usage ultimately catering to pedestrians and bicyclists.**

Shared streets are often curbless and designed as a flexible public space for primarily pedestrian use, but accommodating of other modes. They have superior quality design features, amenities and materials that cater primarily to patrons on foot, but also accommodate very slow-moving bicyclists and motor vehicles (moving at walking speed) that need to pass through the space, typically for parcel access purposes. Bollards, planters, pavement colors and materials, and similar elements define where motor vehicle and bicycle movement are allowed while pedestrians can move freely throughout the entire space. Festival streets may be designed to allow for full vehicular closure to accommodate events and festivals, which may include enhanced utility access. They can either take the form of a shared street or a traditional street with raised curbs with designated pedestrian, bicycle and

vehicle zones. Pedestrian-only streets have similar characteristics to shared streets, except they do not allow for motor vehicle movement.

**Examples: Peace Plaza** (Pedestrian-only); **Planned Discovery Walk** (Shared Street)

### **General Design Guidelines**

- Curbless and utilizes a cohesive pallet of decorative paving materials throughout the right-of-way
- Shared: Maximum 10' travel lanes
- Festival: Maximum 11' travel lanes
- 8' minimum sidewalk width (ideally 12+ feet)
- 5' minimum amenity zone (ideally 8+ feet)
- Street trees and landscaping
- Public art
- Decorative pedestrian level lighting
- Pedestrian countdown signals. Festival Streets with curbs: Curb extensions at intersections, as appropriate
- Crosswalks as appropriate
- Fire Department vehicle access corridors as appropriate

## Multimodal Streets



**Representative Multimodal Street. Design features do not prioritize one mode over another, but strive to accommodate a variety of modes.**

Multimodal streets have no modal priority, but strive to accommodate a variety of modes, such as bicycles, local buses, pedestrians and motor vehicles. Multimodal street design will vary in relation to its context as they can be located in either neighborhood residential or commercial districts.

### General Design Guidelines

- Maximum 11' travel lanes
- 6-8' minimum sidewalk width
- 5' minimum amenity zone
- Street trees approximately every 35' (in tree wells if possible)
- Landscaping
- Decorative pedestrian level lighting
- On-street parking as appropriate
- Pedestrian countdown signals
- Curb extensions at intersections and high-visibility crosswalks or highly visible decorative crosswalks

## Neighborhood Streets

These streets serve downtown residential neighborhoods and provide access to neighborhood residences, parks, shops and schools. They can be utilized for play and leisure and should be safe, comfortable and inviting places for people to walk or bike. They are designed for low traffic volumes and to encourage safe vehicle speeds. Bicyclists should be able to comfortably share the street with motor vehicles. Sidewalks and street trees should be provided where possible.



**Representative Neighborhood street type. Streets are designed for low volumes of slow moving traffic and are comfortable and inviting for play and leisure uses.**

## General Design Guidelines

- Maximum 10' travel lanes
- 6' minimum sidewalk width
- 6 - 8' amenity zone or boulevard desired in order to support street trees
- Street trees approximately every 35'
- Pedestrian level lighting (in DMC District)
- On-street parking (if possible)
- Crosswalks generally not required. High-visibility crosswalks recommended near schools and commercial nodes and at intersections with transit, main, multimodal or mobility streets.

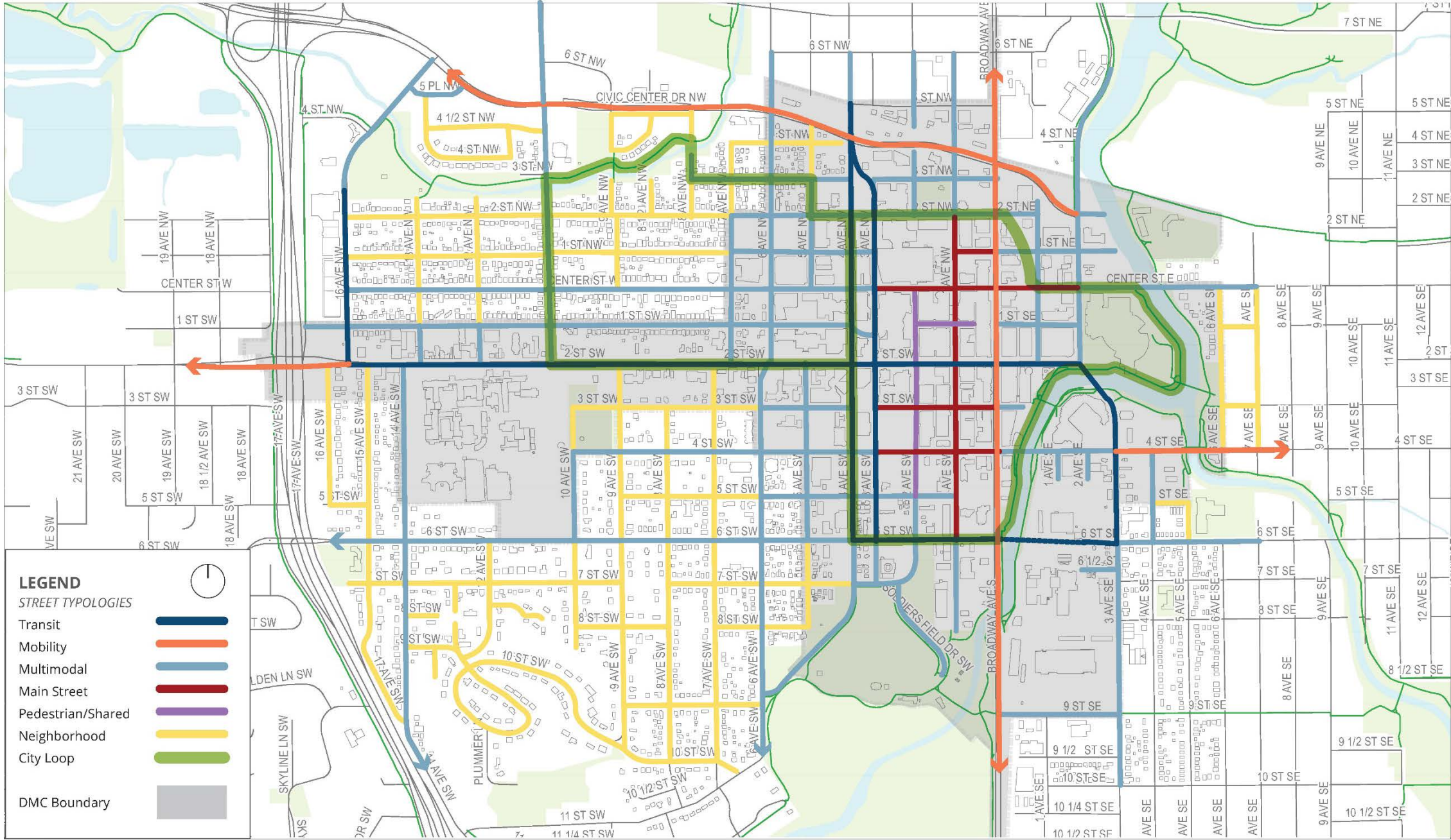


**Typologies for Each Transit Scenario**

Draft street typologies were applied to each of the multimodal scenarios evaluated during the study. The scenarios depicted various transit network solutions including tram, elevated autonomous vehicles and bus rapid transit along several alignments throughout the district.

**Typology consistencies between the transit scenarios include:**

- Civic Center Drive and Broadway Avenue are Mobility streets
- Streets in the downtown core are mostly Main Streets or Pedestrian/Shared streets
- 6<sup>th</sup> Street SW, 6<sup>th</sup> Avenue NW/SW, Center Street W and 14<sup>th</sup> Avenue SW are predominately Multimodal streets
- 2<sup>nd</sup> Street SW is an east-west Transit Street in all scenarios
- 3<sup>rd</sup> Avenue SE is a Transit street in all scenarios
- Neighborhood streets are consistent among all scenarios



**Major variations between scenarios are mostly seen in the Transit streets, which include:**

- 3<sup>rd</sup> & 4<sup>th</sup> Avenues NW/SW
- 16<sup>th</sup> Avenue NW
- 11<sup>th</sup> Avenue NW
- Segments of 6<sup>th</sup> Street SW/SE

**Figure 12. Street Typology: Transit Scenario DMC Modified**







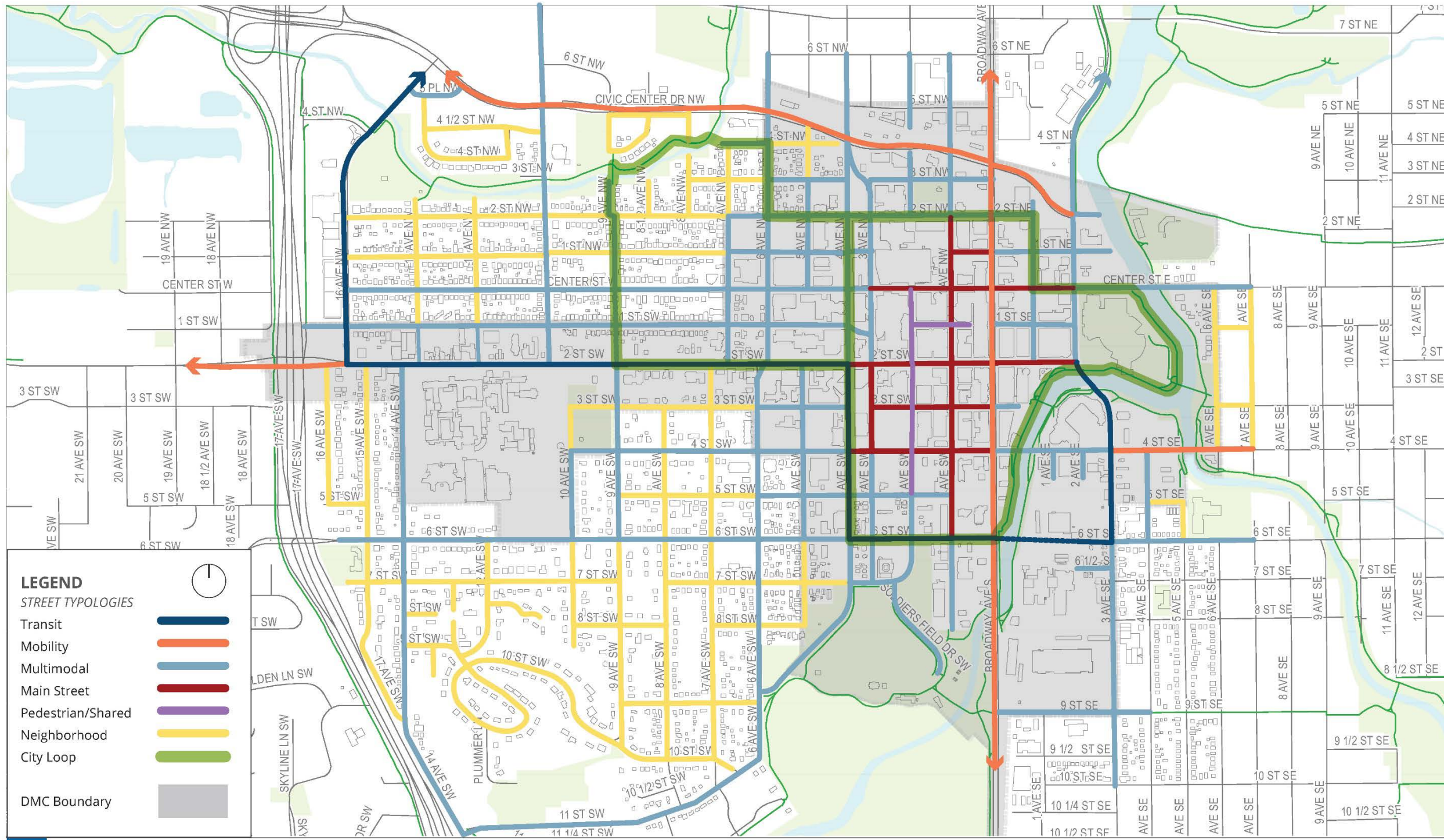
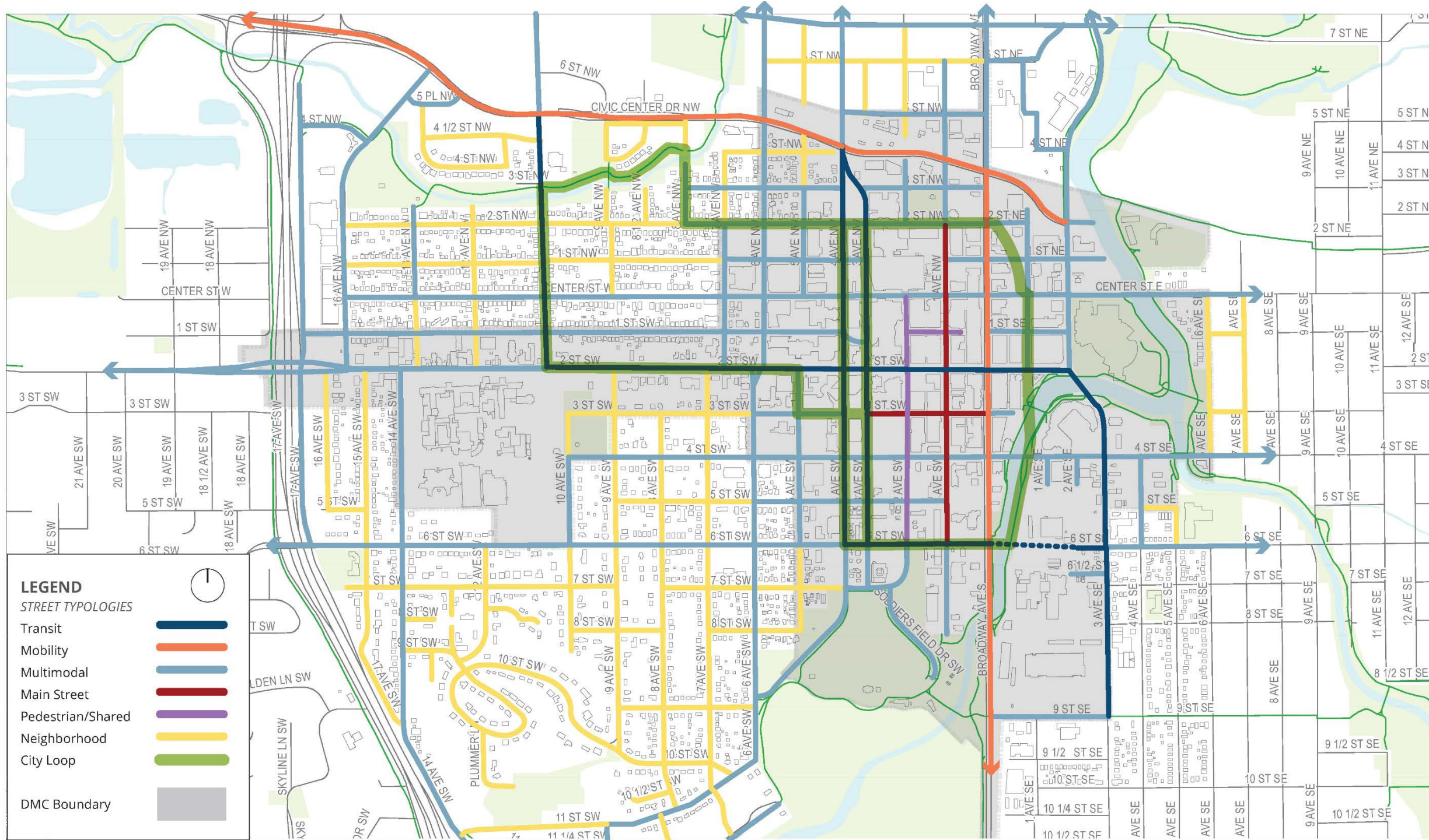


Figure 14. Street Typology: Transit Scenario D





The Hybrid Scenario utilizes 11<sup>th</sup> Avenue as a major portal into downtown from the northwest via Civic Center Drive NW and 3<sup>rd</sup> Avenue SE as the east/southeast gateway into downtown.

Several Transit streets in this scenario align directly with the proposed City Loop including 11<sup>th</sup> Avenue NW, 3<sup>rd</sup> & 4<sup>th</sup> Avenues NW/SW, 2<sup>nd</sup> Street SW and 6<sup>th</sup> Street SW. These streets in particular have great potential for vibrancy and activity as major transit, bicycle and pedestrian facilities and amenities will be present.

Figure 15. Street Typology: Hybrid Transit Scenario



## 3.0 Bicycle Access and Facilities

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### Overview/Background

It is widely recognized that great downtowns are highly walkable with streets that are designed for safe and comfortable travel by all pedestrians. In the last 10-20 years, a growing number of cities are recognizing that there is increasing interest in also providing safe and comfortable travel opportunities for bicyclists within their downtown areas as more people find cycling to be a viable option for commuting or other daily trip needs in addition to recreation. Many cities are acknowledging that creating such an environment is key to attracting and keeping the best talent, which supports and sustains economic growth. Downtown Rochester and adjacent neighborhoods are well-suited to be a high-quality bicycling community. There is an established grid of streets providing a network of connectivity, the terrain is relatively flat and many of the streets have fairly low vehicular volumes. Additionally, Rochester has a well-established network of shared use paths that provide connectivity from outlying areas to the edges of downtown providing access for those on foot or two wheels. But direct, high-quality bikeway access into and across downtown in both north-south and east-west orientations is not currently available.



**Downtown Rochester's streets should accommodate bicyclists with all levels of interest and experience.**

Several previous planning efforts have stated goals of making downtown Rochester's streets more comfortable and safe for bicyclists. The 2012 Rochester Area Bicycle Master Plan sought to advance three major principles, which are also relevant to this planning process:

- Create a sufficiently dense network of bicycle facilities so that all residents are within reasonable proximity to the network and all key destinations are served;
- Promote the use of bicycles as a viable and attractive alternative to the automobile;
- Provide for safe and convenient bicycle travel for people over a wide range of ages and abilities.

### **Typical Bicycle User Types** This section is an excerpt from the DMC City Loop Protected Bikeway Design Guide

The current American Association of State Highway and Transportation Officials (AASHTO) Guide to the Development of Bicycle Facilities encourages designers to identify their rider type based on the trip purpose (Recreational vs Transportation) and on the level of comfort and skill of the rider (Causal vs Experienced). An alternate framework for understanding the range of users for transportation focused bicycling is described below. Developed by planners in Portland, OR\* and supported by research\*\*, this classification groups users into four categories to address varying attitudes towards bicycling in the US.

#### **Strong and Fearless (approximately 1% of population)**

Characterized by bicyclists that will typically ride anywhere regardless of roadway conditions or weather. These bicyclists can ride faster than other user types, prefer direct routes and will typically choose roadway connections -- even if shared with vehicles -- over separate bicycle facilities such as shared-use paths.

#### **Enthusied and Confident (5-10% of population)**

This user group encompasses bicyclists who are fairly comfortable riding on all types of bikeways but usually choose low traffic streets or shared-use paths when available. These bicyclists may deviate from a more direct route in favor of a preferred facility type. This group includes all kinds of bicyclists such as commuters, recreationalists, racers and utilitarian bicyclists.

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\* Roger Geller, City of Portland Bureau of Transportation. Four Types of Cyclists. <http://www.portlandonline.com/transportation/index.cfm?&a=237507>. 2009.

\*\* Dill, J., McNeil, N. Four Types of Cyclists? Testing a Typology to Better Understand Bicycling Behavior and Potential. 2012.

**Interested but Concerned (approximately 60% of population)**

This user type comprises the bulk of the cycling population and represents bicyclists who typically only ride a bicycle on low traffic streets or shared-use paths under favorable weather conditions. These bicyclists perceive significant barriers to their increased use of cycling, specifically traffic and other safety issues. These people may become “Enthusied & Confident” with encouragement, education and experience.

**No Way, No How (approximately 30% of population)**

Persons in this category are not bicyclists, and perceive severe safety issues with riding in traffic. Some people in this group may eventually become more regular cyclists with time and education. A significant portion of these people will not ride a bicycle under any circumstances and may not be physically able to do so.

**Selecting Appropriate Bicycle Facilities**

This section is an excerpt from the DMC City Loop Protected Bikeway Design Guide

Selecting the best bikeway facility type for a given roadway should be based on the range of factors that influence bicycle users’ comfort and safety. There is a significant impact on cycling comfort when the speed differential between bicyclists and motor vehicle traffic is high and motor vehicle traffic volumes are high.

**Bikeway Facility Continuum**

The diagram below illustrates the spectrum of on street bikeway facilities from the least to greatest amount of separation between bicyclists and motor vehicle traffic. Typically, the higher degree of user separation results in a more comfortable facility accessible to a broader category of people interested in bicycling.

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# BIKEWAY FACILITY CONTINUUM

least protected

most protected

**SHARED LANE MARKING**  
Bike Boulevard

**BIKE LANE**  
Standard

**BUFFERED BIKE LANE**

**PROTECTED BIKE LANE:**  
At-grade, protected with parking

**PROTECTED BIKE LANE:**  
At-grade, protected with barrier

**TWO WAY PROTECTED BIKE LANE:**  
At grade, protected with barrier

**TWO WAY OR ONE WAY PROTECTED BIKE LANE**  
Raised and Separated.

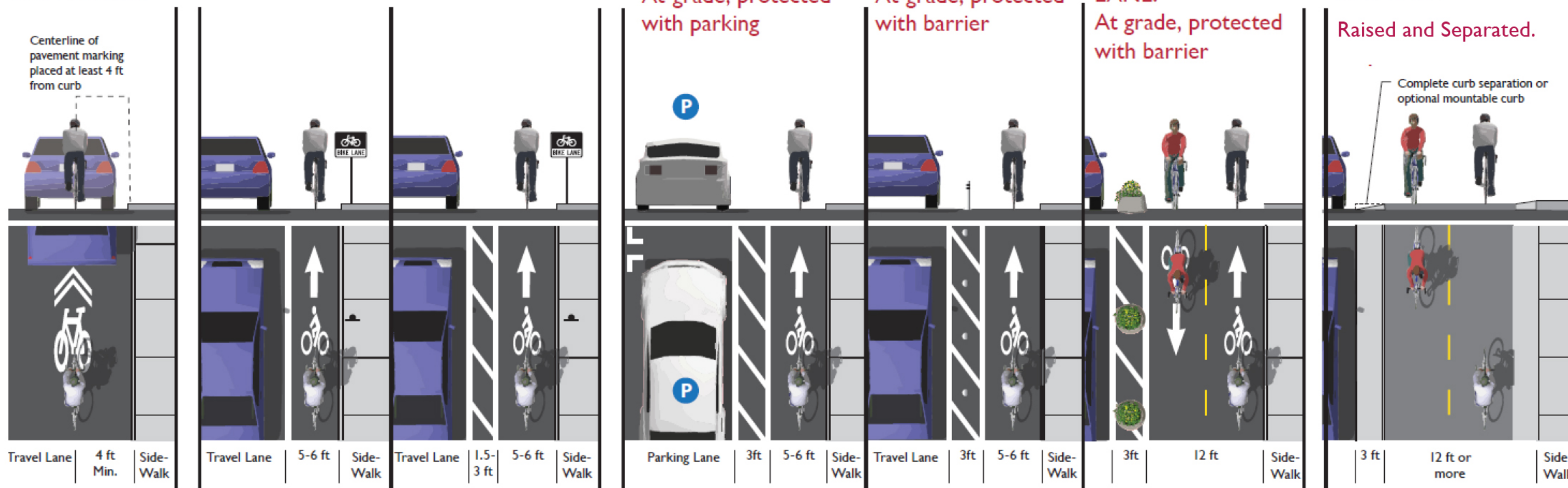


Figure 16. Bikeway Facility Continuum

Source: DMC City Loop Protected Bikeway Design Guide

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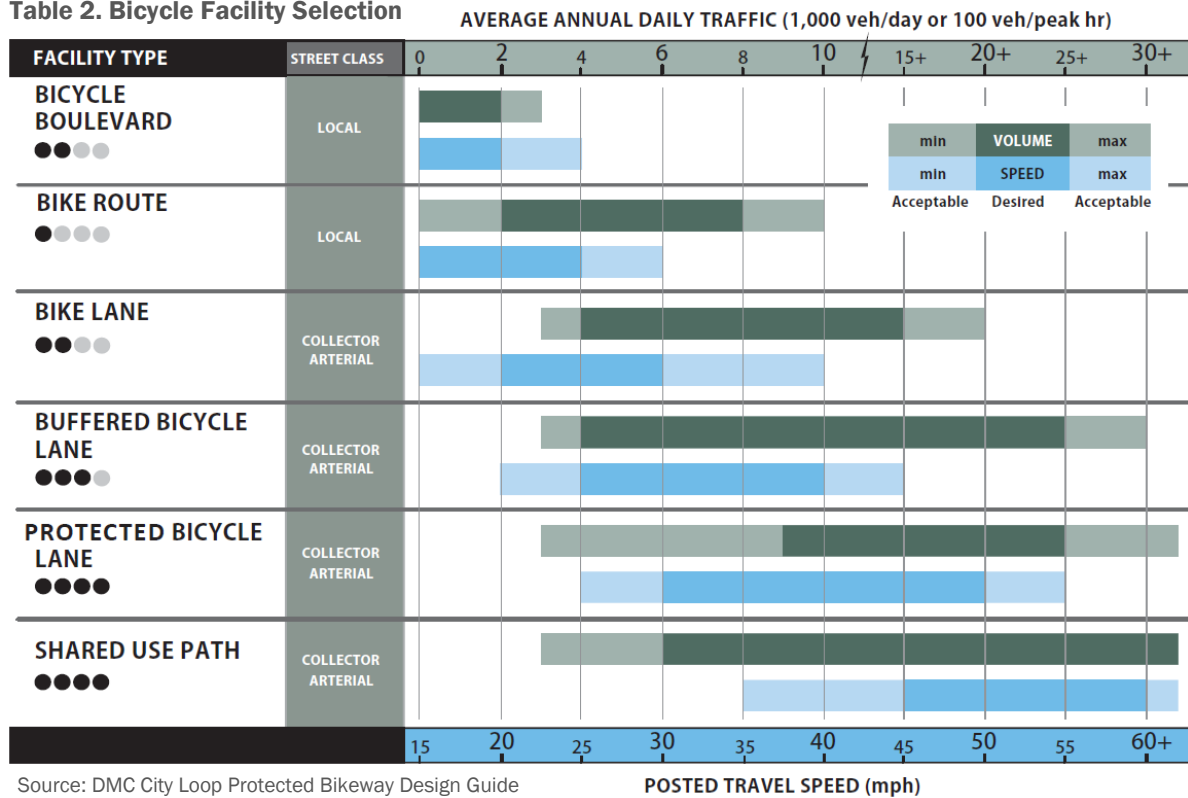


## Facility Selection Table

As a starting point to identify a preferred facility, the chart below can be used to determine the recommended type of bikeway to provide under a given set of roadway speed and volume conditions. To use this chart, identify the daily traffic volume along the top and travel speed along the bottom of the existing or proposed roadway, and then identify appropriate facility types by moving vertically to find the facilities where both speeds and volumes fall within the desired range of operation.

Other factors beyond speed and volume which affect facility selection include traffic mix of automobiles and heavy vehicles, the presence of on-street parking, intersection density, surrounding land use, and roadway sight distance. These factors are not included in the facility selection chart below, but should always be considered in the facility selection and design process.

**Table 2. Bicycle Facility Selection**



Source: DMC City Loop Protected Bikeway Design Guide

## Facility Maintenance Considerations

Bicycle facilities are intended to be used throughout the year. Therefore, facility maintenance operations and equipment may need to factor into the selection of facility type.



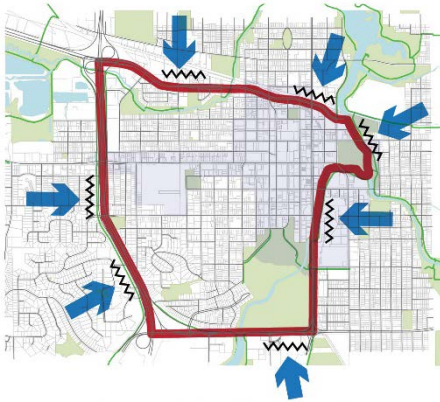
**Representative winter conditions for two Minneapolis protected bike lanes. Source: Mike Kennedy, Roads and Bridges Magazine, August 29, 2016 (left image); Robin Garwood (right image).**

## Downtown Bicycle Connectivity

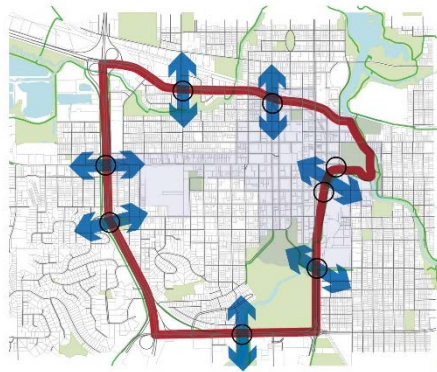
Downtown Rochester is ringed by significant barriers that inhibit bicycle (and pedestrian) connectivity into and through downtown from surrounding areas. The barrier ring is generally composed of Civic Center Drive NW to the north, Highway 52 to the west, 12<sup>th</sup> Street SW to the south, S Broadway and the Zumbro River to the east.

- Improving bicycle connectivity across these barriers is essential to promote cycling as a mobility option.
- Existing shared use paths along the Zumbro River, Cascade Creek, and in Soldiers Field provide some connectivity, but do not provide direct and convenient bikeways to downtown destinations or across the downtown that are vital to enhancing mobility choices.

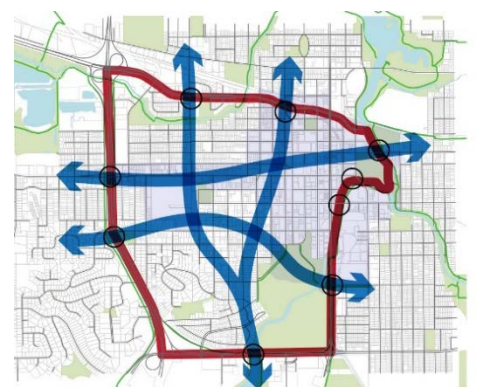
The following figures illustrate graphically the barriers to connectivity that exist and how a network planning approach that considers both connectivity into and through the downtown can provide enhanced options for pedestrian and bicycle travel.



Highways, thoroughfares and rivers or streams are barriers that impede safe, comfortable bicycle connectivity into downtown from adjacent neighborhoods.



Portals along these barriers present opportunities to provide pedestrian and bicycle connectivity into downtown, but most are not currently safe or comfortable for those users.



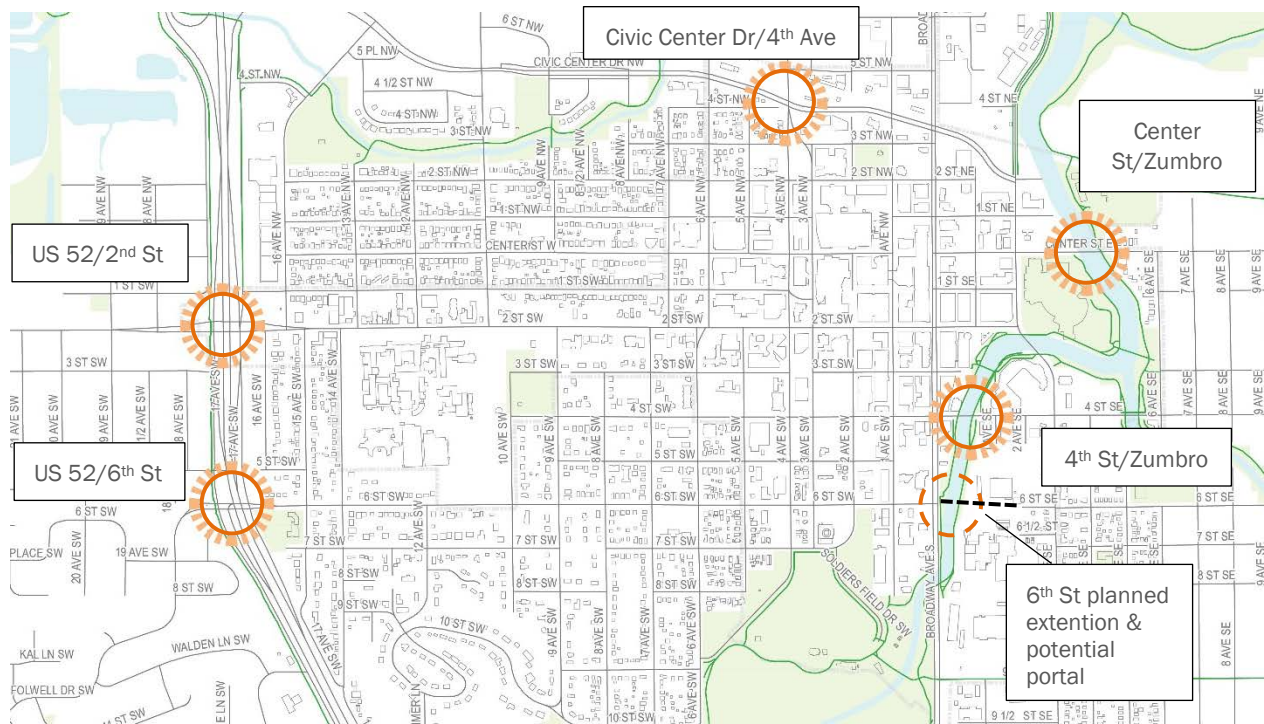
While safe, comfortable portals give bicyclists and pedestrians access across barriers, high quality bicycle and pedestrian corridors are necessary to provide access to downtown destinations and beyond.

### Bicycle and Pedestrian Portals: Connectivity Opportunities

Several portals along the “ring of barriers” already exist and could become key access points or gateways into downtown for bicyclists. The following portals have been identified as potential key entrance portals as they provide key north-south and east-west access into downtown and they align directly with existing or planned on-street bikeways or shared use paths outside the district. Initial evaluations of special conditions at these portals indicate it may be feasible to retrofit them to provide bicycle facilities. These locations include:

- US 52/ 2<sup>nd</sup> Street SW interchange
- US 52/6<sup>th</sup> Street SW interchange
- Civic Center Drive NW/4<sup>th</sup> Avenue NW intersection
- E Center Street/Zumbro River bridge
- 4<sup>th</sup> Street SE/Zumbro River bridge
- A planned connection of 6th St SE between 3rd Ave SE and South Broadway Avenue could provide an additional connection or alternative to the 4th St SE location





**Figure 17. Five key portals (dashed circles), if enhanced with high quality bicycle and pedestrian facilities, would provide safe, comfortable access into downtown for those on foot and two wheels from adjacent neighborhoods and the robust network of shared use paths (green lines).**

## Bicycle Network

The following near term (within 5-7 years) and long term (7-15 years) opportunities to implement a bikeway network in downtown Rochester were identified. This bikeway network was developed based on the following primary goals and objectives:

- The plan should build on and further develop the 2012 Rochester Area Bicycle Master Plan recommendations;
- Connect bicyclists to downtown Rochester safely and comfortably from the established network of shared use paths and greenways as well as existing on-street bike facilities outside of downtown;
- Provide for east-west and north-south connections through downtown that provide connections to major downtown destinations;

- Provide cost effective bicycle facilities by recommending the highest quality facility type within the existing roadway dimensions that impact the existing curb and gutter to the least degree possible;
- Provide bicycle facilities that accommodate a wide range of user groups.

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The first phase of bicycle improvements build off the existing facilities on 6<sup>th</sup> St SW and planned improvements to segments of 4<sup>th</sup> Street SW and a proposed interim buffered bike lane pilot project on Center St and 3rd/4th Avenues west. In order to provide consistent connectivity from east to west and north to south across downtown, on-street bicycle facilities should connect to the key portals and to existing multi-use paths at Soldier's Memorial Field Park, along the Zumbro River and along Cascade Creek. The proposed improvements are planned to provide the highest quality facility possible while avoiding significant impacts to curb and gutter, largely using the existing roadway widths. With this, however, on-street parking zones are impacted in several locations. Impacts to parking areas are detailed later in this document. The recommended development goal is to deploy this network in 5-7 years.

### **General Enhancements**

- Dedicated and/or protected bikeways where possible
- Green intersection (conflict) markings
- Loop detectors at traffic signals
- Bike boxes and signals at strategic intersections
- Bike signage and wayfinding
- Minimum standard “inverted U” bike racks (decorative/artistic bike racks where appropriate) at selected locations along bike facilities near major destinations
- Sheltered bike parking in strategic locations



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### Phase 2 Long Term Bicycle Network

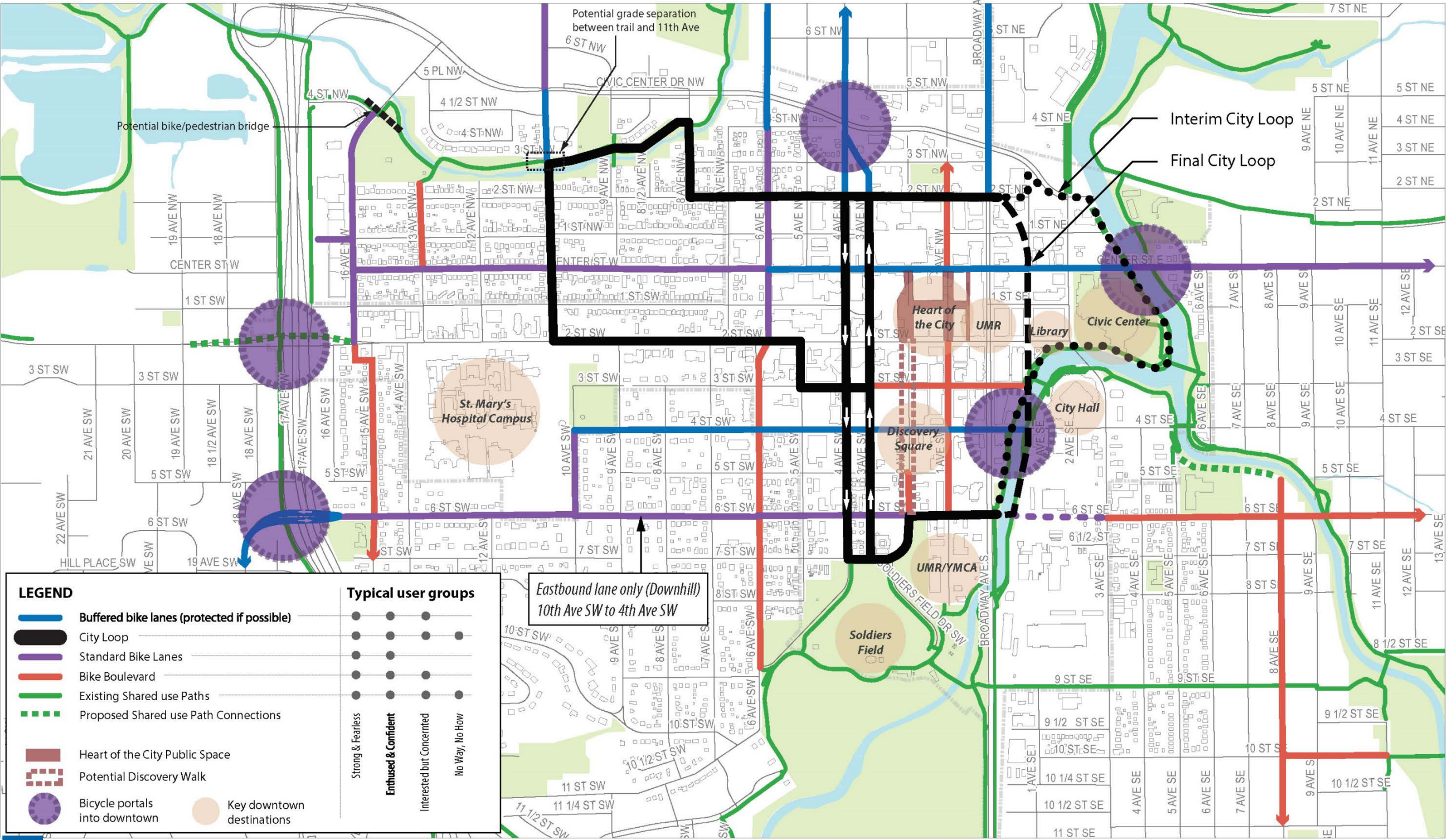


Figure 19. Bikeway network improvements proposed to be implemented after 7-15 years into the future.

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Looking out to a phase 2 expansion of the downtown Rochester bicycle network to be implemented 7-15 years into the future, key developments include connections to the proposed City Loop facility. In addition, bicycle facilities are proposed to connect neighborhoods adjacent to or just outside of downtown to the downtown core and key destinations.

## Priority Bike Improvements

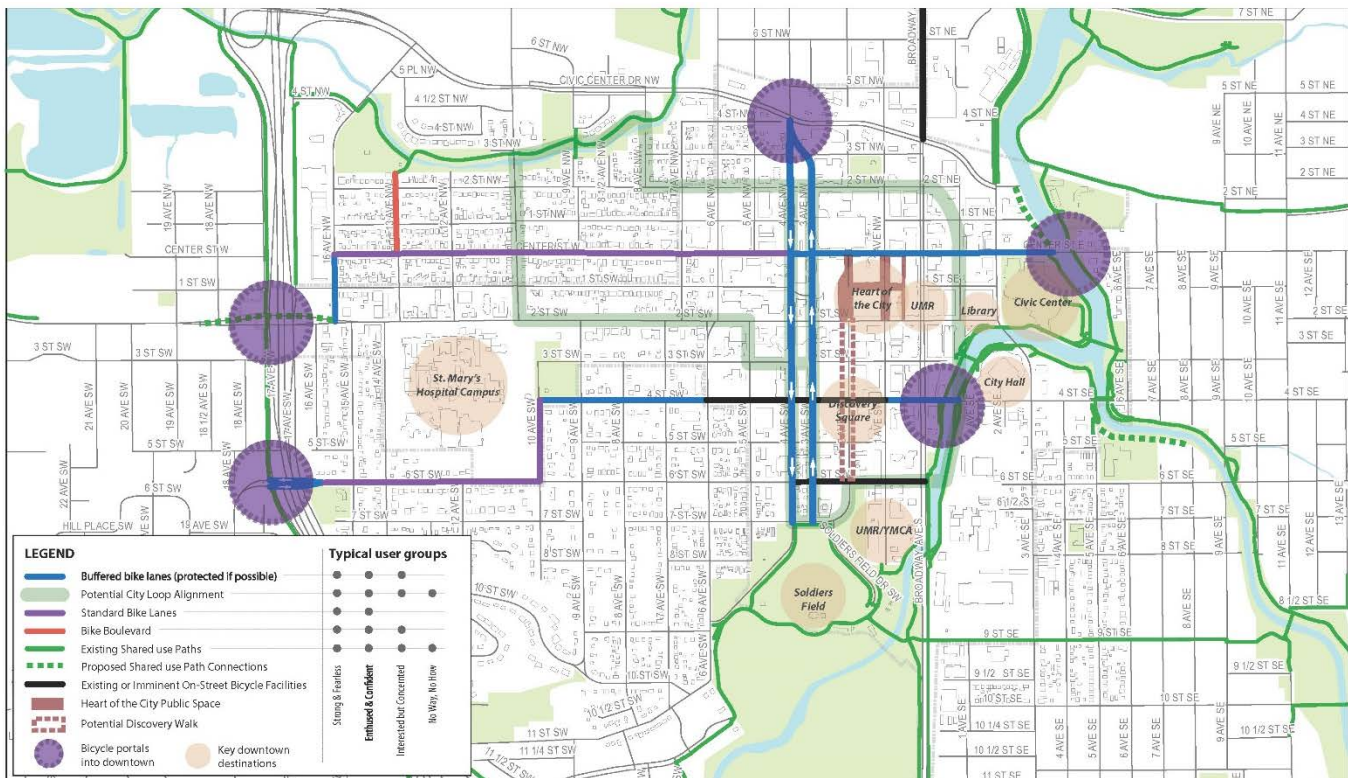


Figure 20. Priority Bikeway Network Improvements

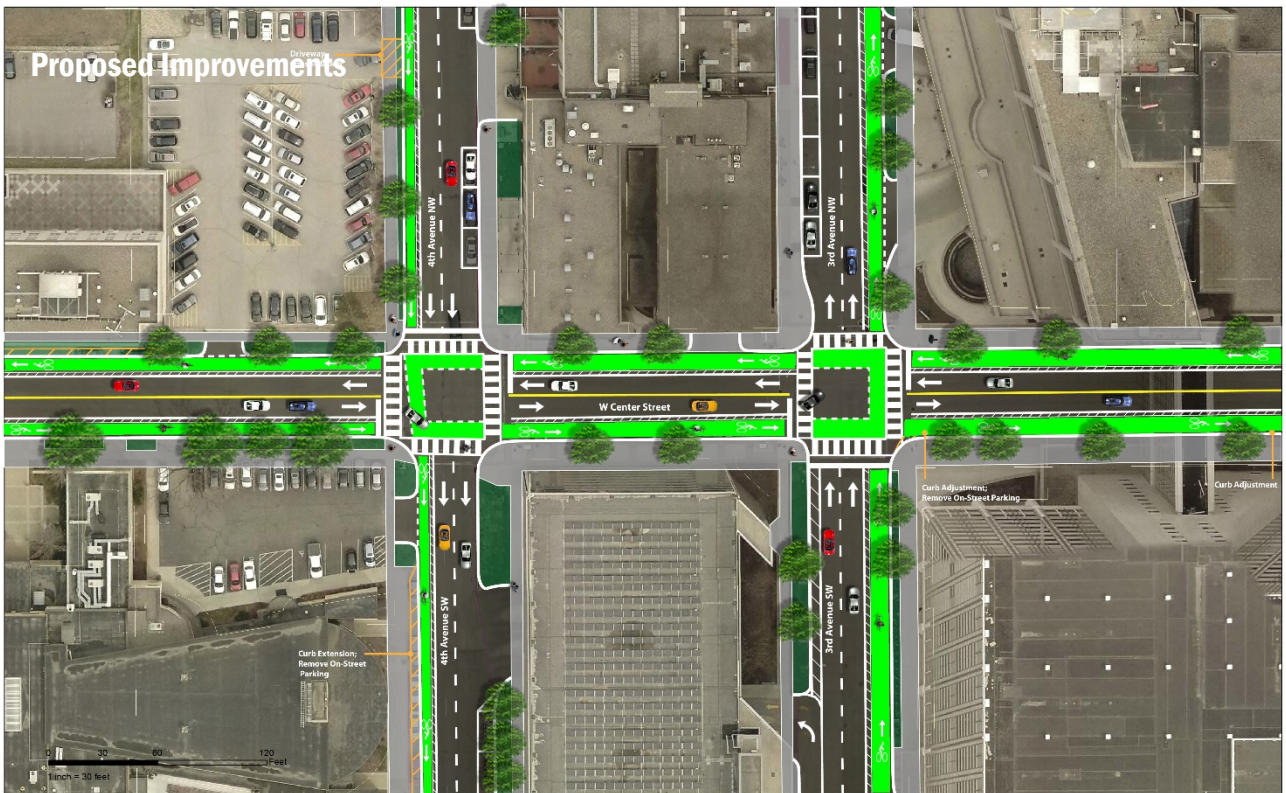
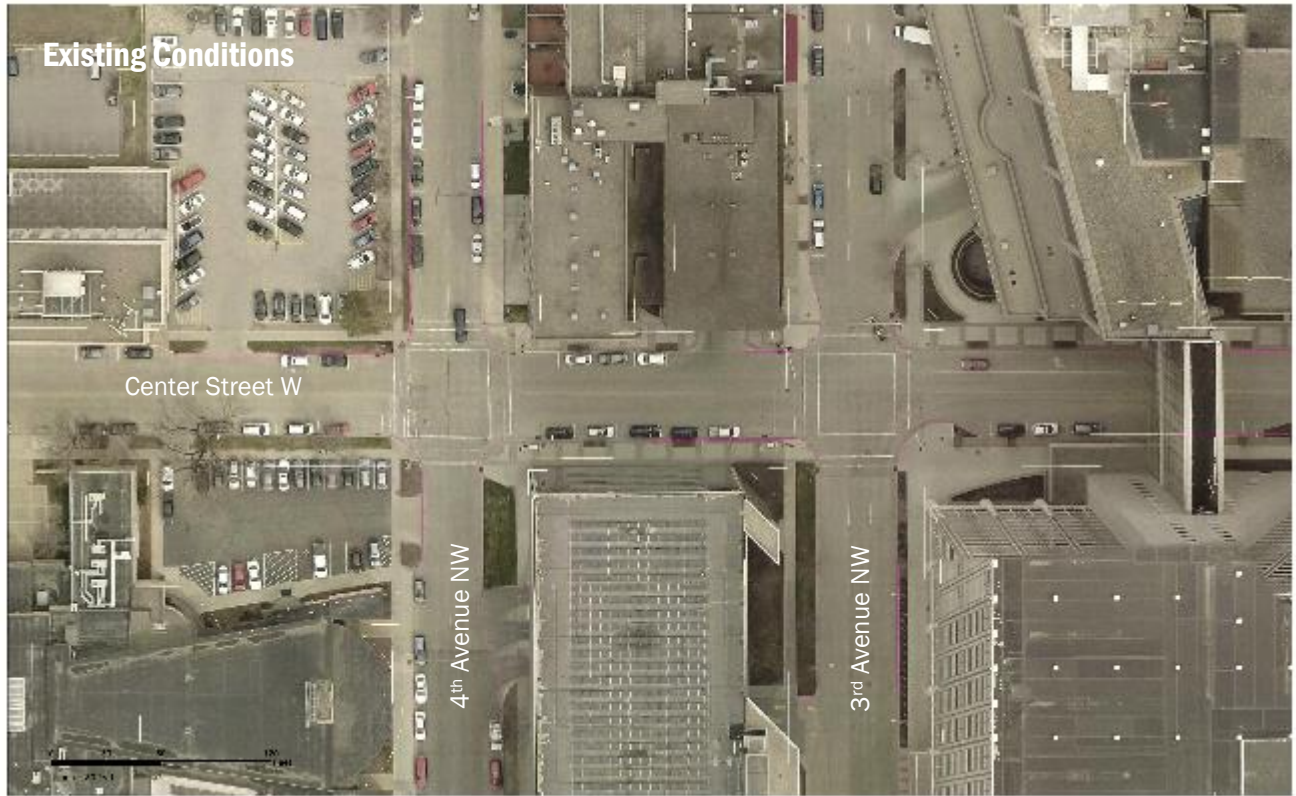
After developing the near-term and long-term bikeway network and determining an ideal facility type for each planned bicycle corridor, a select few corridors emerged as candidates for priority implementation. 3<sup>rd</sup> and 4<sup>th</sup> Avenues and Center Street were selected as ideal corridors to implement protected or buffered bicycle facilities in the next 1-2 years. These facilities are intended to provide direct east-west and north-south connectivity from identified portals into and through downtown where none exist today. They connect to existing or imminent bikeways in downtown (e.g., existing 6<sup>th</sup> St SW bike lanes, planned 4<sup>th</sup> St SW buffered bike lanes) and give bicyclists options to access key downtown destinations (e.g., St. Mary's Hospital,

planned Discovery Square, planned City Loop, Heart of the City, UMR, Civic Center, City Hall and Soldier's Field Park).

*Conceptual designs for these facilities were completed and are shown on the following page. These are representative layouts showing how these streets could accommodate buffered bikeways, but more study is needed to determine final concepts and to refine designs. Note that paired one way facilities are proposed on 3<sup>rd</sup> and 4<sup>th</sup> Avenues to match the one way operation of existing vehicle traffic.*



## Concept Designs for 3rd & 4th Avenues & Center Street Priority Bikeways





## Bicycle and Pedestrian Portal Concepts

Portals are critical elements in providing high quality pedestrian and bicycle connectivity into downtown. They should be enhanced with high quality pedestrian improvements and bicycle facilities that cater to all bicycle user groups from advanced to casual riders. Signage and wayfinding should be included to direct bicyclists to and through portals as well as to key downtown destinations. Street trees, landscaping and high-visibility crosswalks should be implemented to create an attractive, comfortable environment for those on foot or bike.

Conceptual designs for each portal were completed to illustrate one potential option for making high quality pedestrian and bicycle enhancements. *These are draft concepts that need further analysis and study. They were designed for maximum safety, comfort and connectivity for bicyclists and pedestrians.* Some negative impact to automobile LOS is expected with these concepts, but a significant increase in pedestrian and bicycle LOS was a higher priority in the design decisions made during development of these concepts.

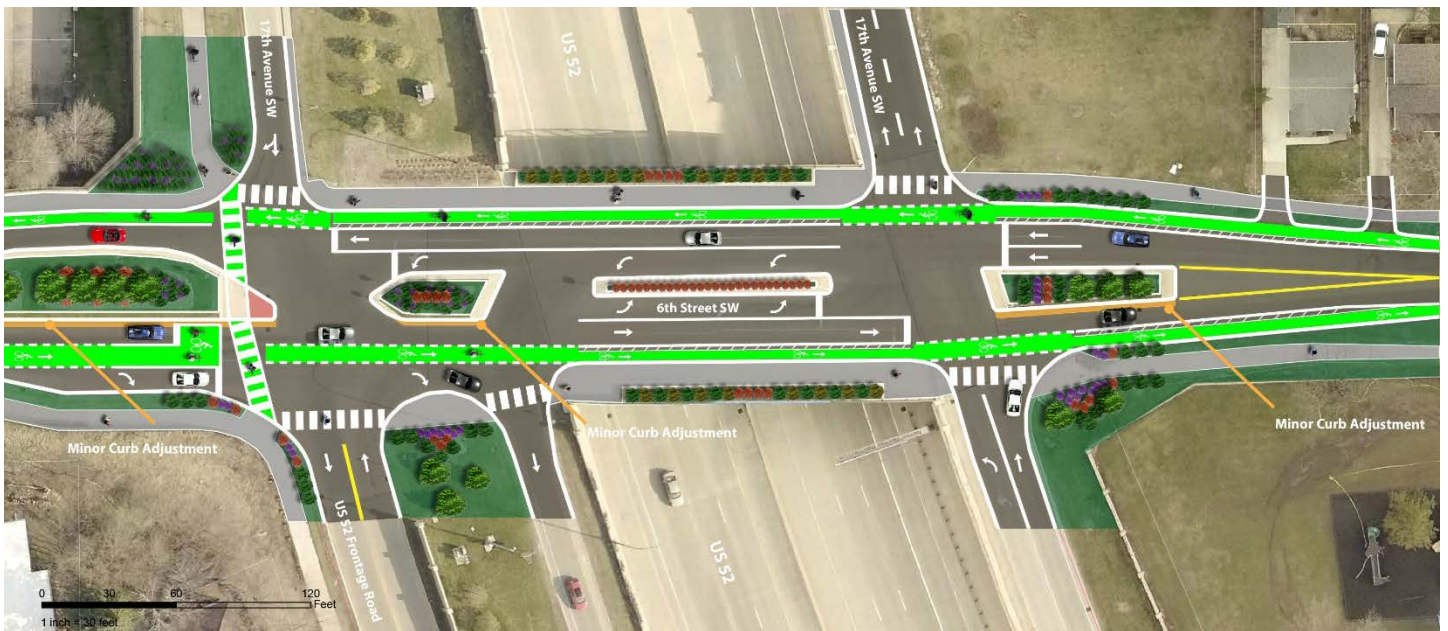
Trade-offs will need to be evaluated with these concepts and future refined concepts and decision makers must determine to what extent automobile LOS can be diminished in favor of increased pedestrian and bicycle LOS. *These concepts were developed to be consistent with the visions in recent adopted plans, to make downtown Rochester's streets more pedestrian and bicycle friendly.*

## US 52/6th Street SW Interchange

### Existing Conditions



### Proposed Improvements



## General Assumptions

- Modification to existing median islands (3) including minor adjustments to drainage inlets (west island only)
- Restriping travel lanes, striped bike lanes and green bike lanes through intersections
- Green Bike Box on Folwell Drive SW western approach
- Enhanced bikeway signage and pedestrian level lighting.
- Recommend buffered bike lanes continue on 6<sup>th</sup> Street SW to Folwell Drive SW (existing width of roadway is 42 feet) to the west of this intersection (no curb & gutter adjustments required). The 2012 Bicycle Master Plan recommends a local area bike route using shared lanes (sharrows) here. But, given the width of the roadway, buffered bike lanes should be investigated as an alternative to shared lanes, as they would provide a higher quality, safer facility that would be more likely utilized by all types of bicyclists.
- Enhanced “gateway” landscaping treatment
- This concept was not modeled by the ITS Traffic team, but does not impact traffic capacity. There are no anticipated traffic flow impacts and additional modeling is not needed at this location.

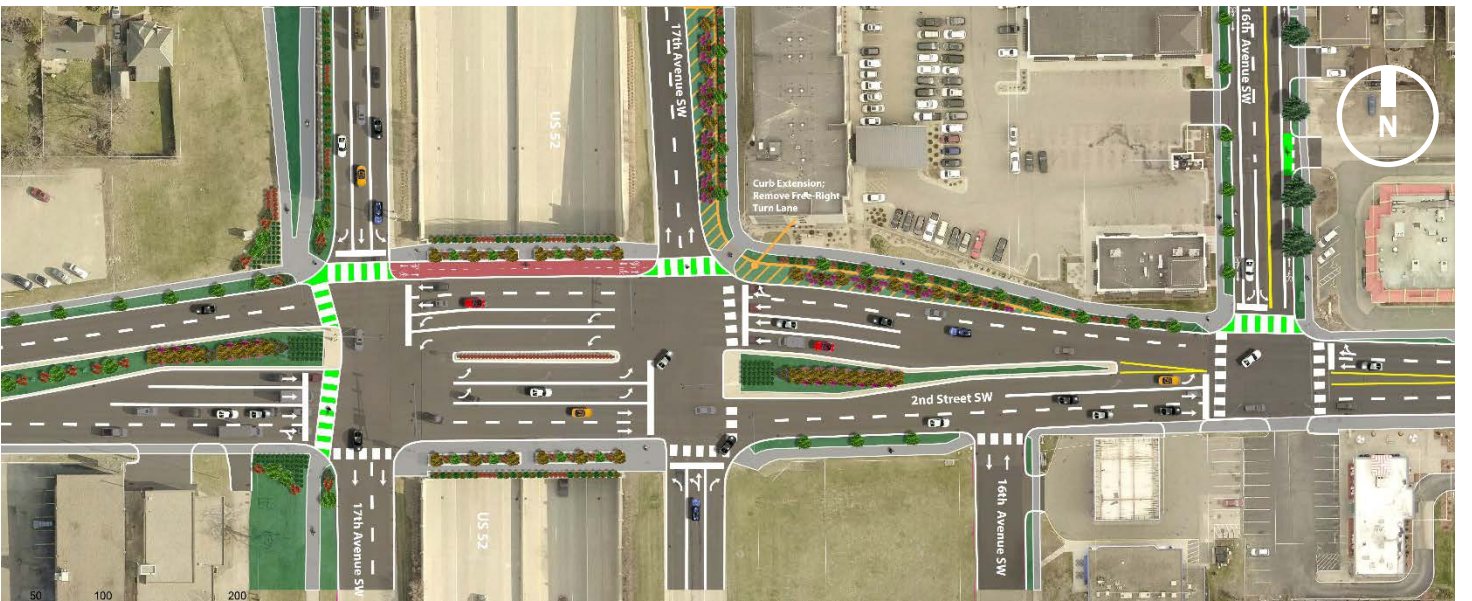


## US 52/2<sup>nd</sup> Street SW Interchange

### Existing Conditions



### Proposed Improvements



### **General Assumptions**

- Remove one-way connection to 17<sup>th</sup> Avenue SW (no drainage modifications needed)
- Install shared use path along the north side of 2<sup>nd</sup> Street from 16<sup>th</sup> Avenue SW to existing greenway on west side of US 52
- Striped high visibility crosswalks (10' wide) through intersections
- Install stop bar at US 52 SB ramp/2<sup>nd</sup> Street SW
- Enhanced bikeway signage and pedestrian level lighting
- Note: Recommended bike lanes on 16<sup>th</sup> Avenue SW (no curb & gutter adjustments required)
- This concept was not modeled by the ITS Traffic team. Traffic flow could be impacted with this concept and additional analysis is needed.

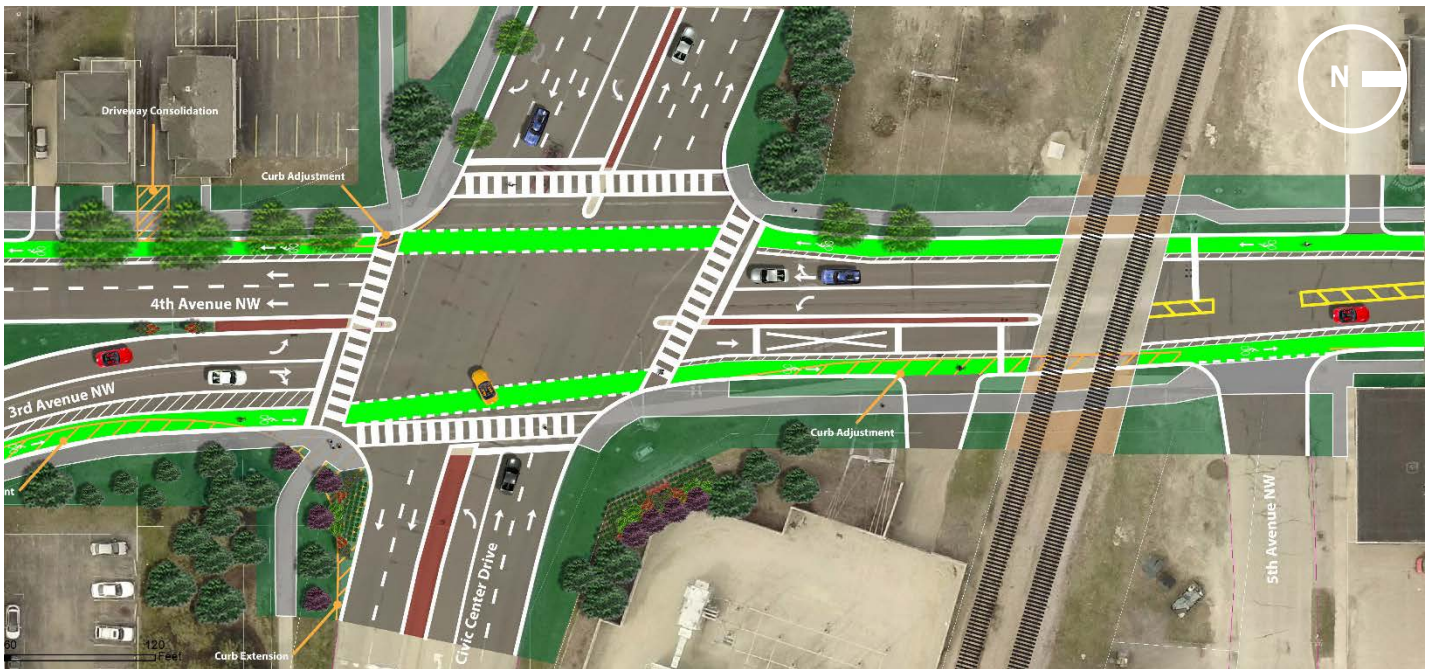


## Civic Center Drive NW & 4th Avenue NW Intersection

### Existing Conditions



### Proposed Improvements



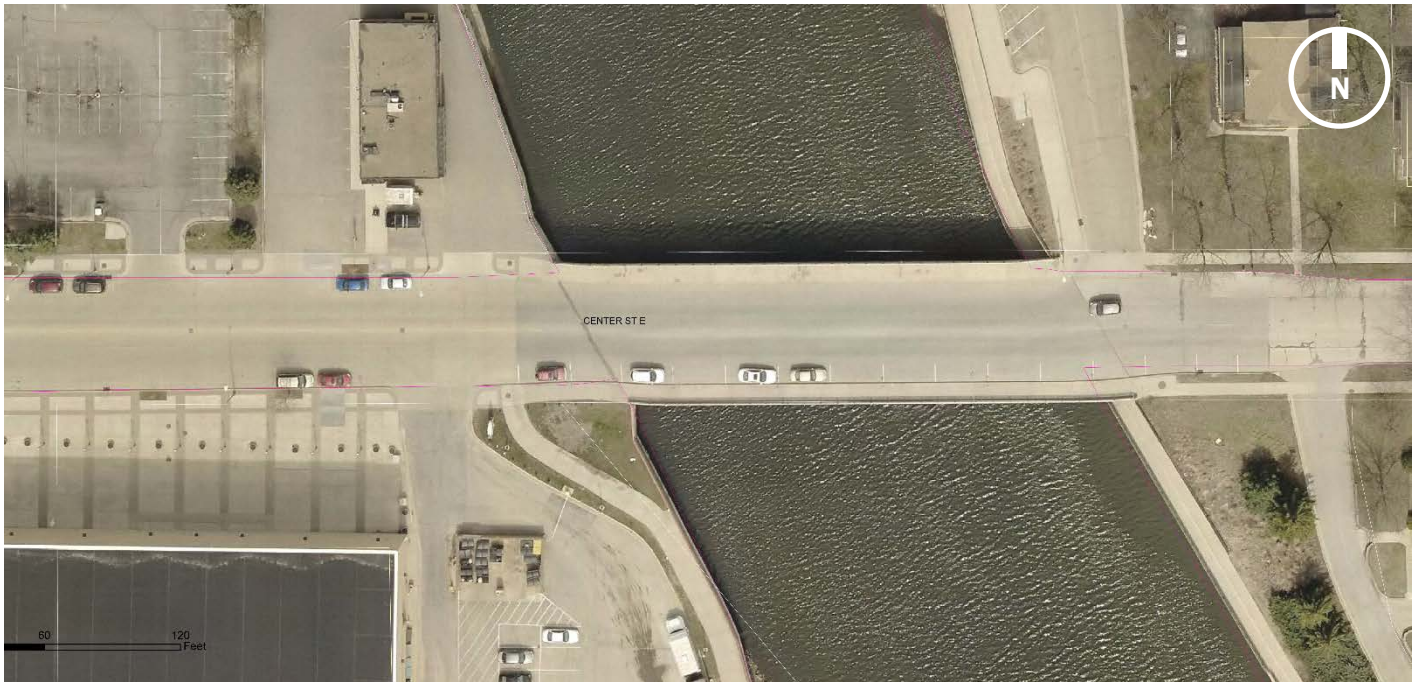


## General Assumptions

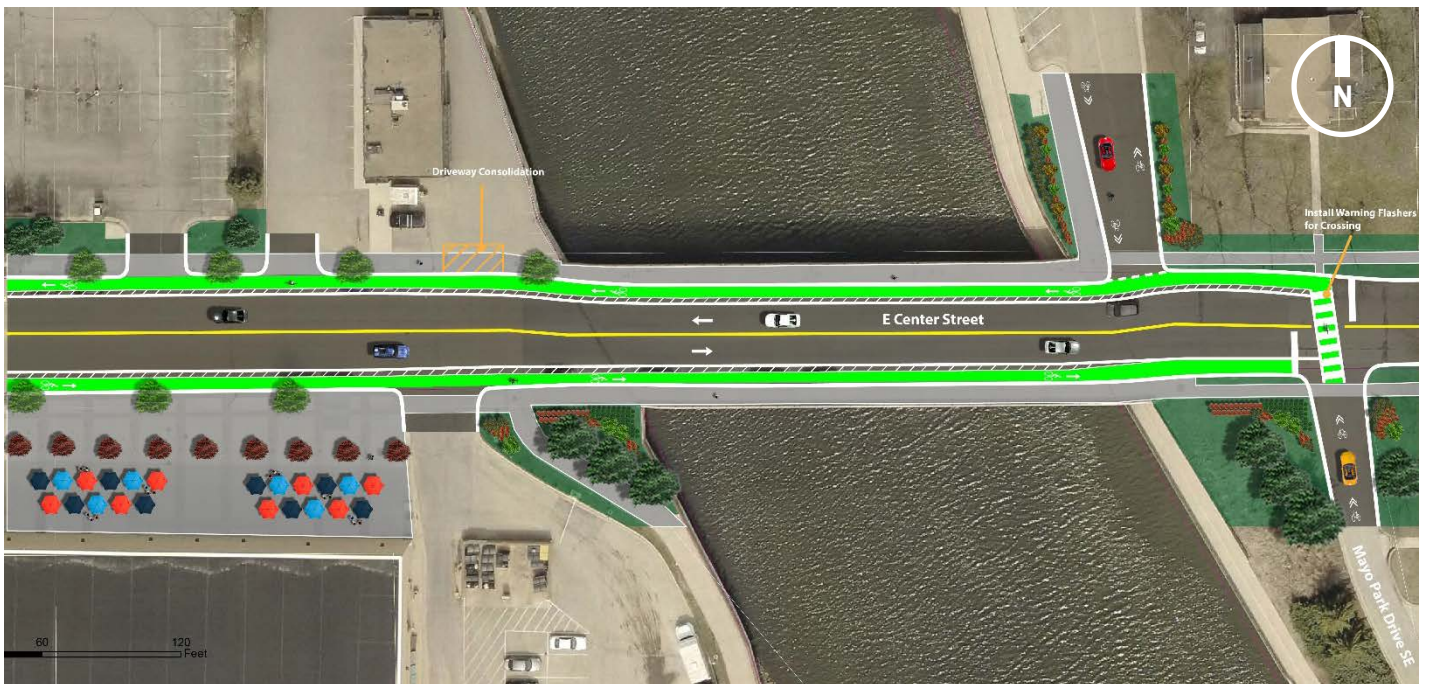
- Interim improvement, as potential BRT transit way is proposed through this area by the ITS Transit team and additional intersection/roadway modifications would be necessary to implement that concept
- Minor modifications to existing curb and gutter in southwest corner on 4<sup>th</sup> Avenue NW and southeast corner 3<sup>rd</sup> Avenue NW
- Remove free flow right turn from 3<sup>rd</sup> Avenue NW to Civic Center Drive NW and replace with new curb at intersection
- Restripe travel lanes on 4<sup>th</sup> Avenue NW and 3<sup>rd</sup> Avenue NW (11' width)
- Install buffered bike lanes (6' width) and green bike lanes through intersection along 4<sup>th</sup> Avenue NW and 3<sup>rd</sup> Avenue NW. (Note: Buffered bike lanes are also planned for 4<sup>th</sup> Avenue NW north of Civic Center Drive NW.)
- Reconfigure median on 4<sup>th</sup> Avenue NW between Civic Center Drive NW and railroad tracks and install buffered bike lanes between Civic Center Drive NW and 5<sup>th</sup> Street NW. (Note: This may require lengthening the gate arms, but no curb and gutter modifications are necessary.)
- Install high visibility crosswalks on all legs of intersections and pedestrian refuge areas on three legs.
- Close driveway (nearest to intersection) on south leg of 4<sup>th</sup> Avenue NW.
- Install enhanced bikeway signage, pedestrian level lighting and street trees.
- This concept was not modeled by the ITS Traffic team. Traffic flow could be impacted with this concept and additional analysis is needed.

## Center Street E & Zumbro River Bridge

### Existing Conditions



### Proposed Improvements



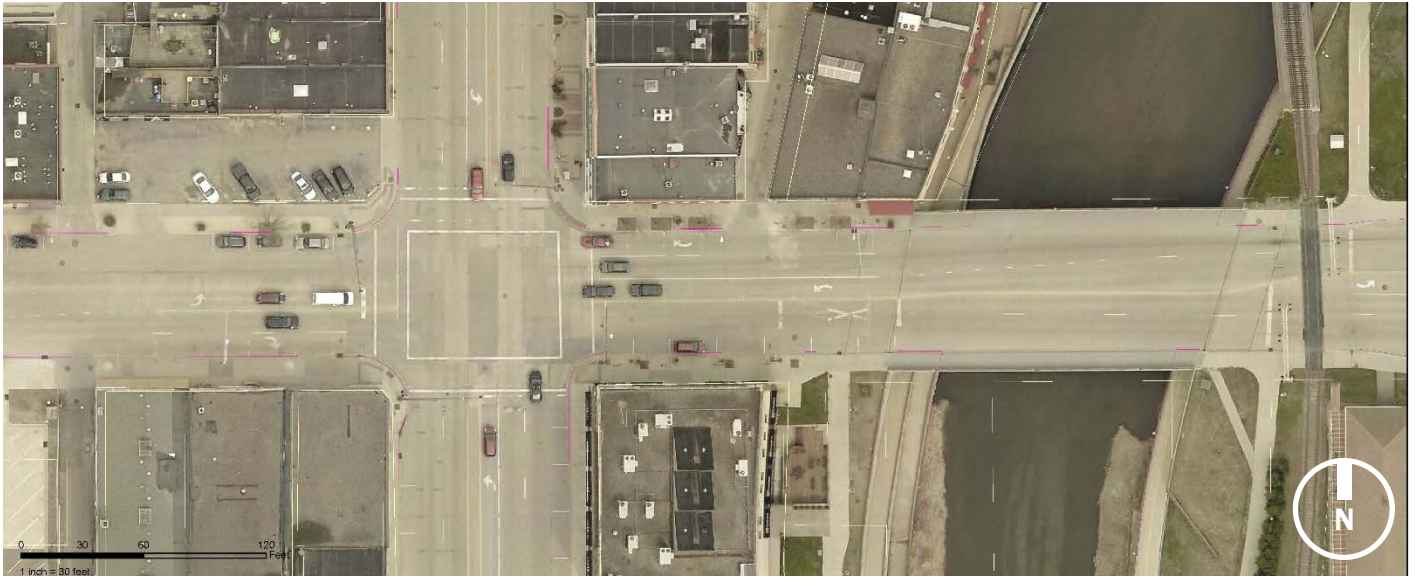
## General Assumptions

- No modifications to existing curb and gutter.
- Remove parking on bridge, restripe travel lanes (11' width).
- Add Sharrows to Mayo Park Drive SE and Mayo Field access to existing river trail
- Install buffered or protected bike lanes (6' width) and green bike lanes through intersections
- Install raised crossing on east end of bridge to access river trail. Install stop bars and actuated flashers at raised crossing.
- Close driveway (nearest to west end of bridge) on north side of Center Street E and encourage cross-access to adjacent Civic Center North Municipal parking lot.
- Enhanced bikeway signage, pedestrian level lighting and street trees in tree wells
- This concept was not modeled by the ITS Traffic team, but does not impact traffic capacity. There are no anticipated traffic flow impacts and additional modeling is not needed at this location.

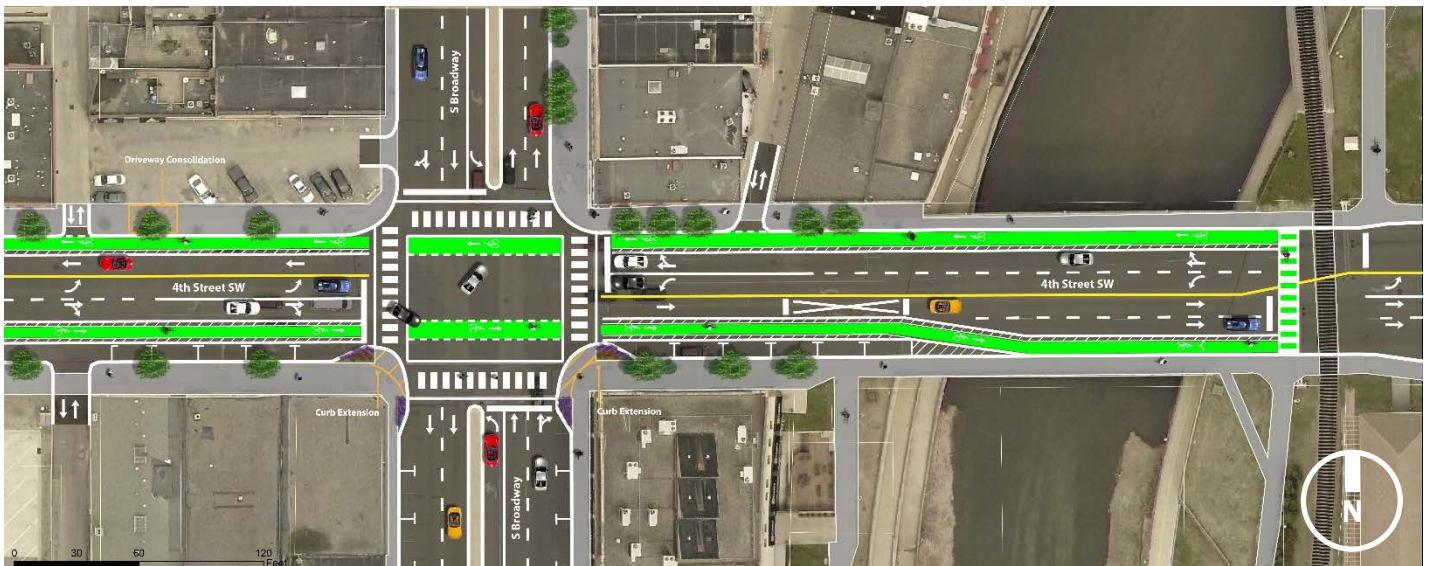


### 4th Street SE & Zumbro River Bridge

#### Existing Conditions



#### Proposed Improvements



## General Assumptions

- Install curb extensions at southwest and southeast corners of Broadway Avenue S/4<sup>th</sup> Street SE/SW intersection
- Remove parking on north side of 4<sup>th</sup> Street SE restripe travel lanes (11' width).
- Install buffered or protected bike lanes (6' width) and green bike lanes through intersections
- Install raised crossing on 4<sup>th</sup> Street SE at east end of bridge to access river trail. Install stop bars and actuated flashers at raised crossing.
- Close driveway (nearest to intersection) on north side of 4<sup>th</sup> Street SW west of Broadway Avenue S
- Enhanced bikeway signage, pedestrian level lighting and street trees in tree wells
- The geometrics in the concept were not modeled by the ITS Traffic team. Additional analysis is needed.
- This concept was not modeled by the ITS Traffic team. Traffic flow could be impacted with this concept and additional analysis is needed.

# 4.0 Planning Level Construction Costs

This section provides a synopsis of the improvements and related costs for the aforementioned street enhancements and bicycle and pedestrian improvements. Construction costs were developed based on available unit costs provided by the City and/or MnDOT. For the interim recommendations, it is assumed that right of way takings will not be necessary to accommodate the improvements.

## Street Enhancements

Table 3. Planning Level Cost Estimates for Street Enhancements

Street Type	Planning Level Overall Cost	General Assumptions
Transit	*	These planning level cost estimates are costs for upgrading features of downtown streets to meet general standards defined in the Street Typologies section of this report.
Main Streets	\$1,000,000	
Multimodal	\$2,800,000	
Mobility	\$1,300,000	
Neighborhood	\$430,000	
Pedestrian-only & Shared Streets	\$39,720,000**	

\*Estimate provided by others

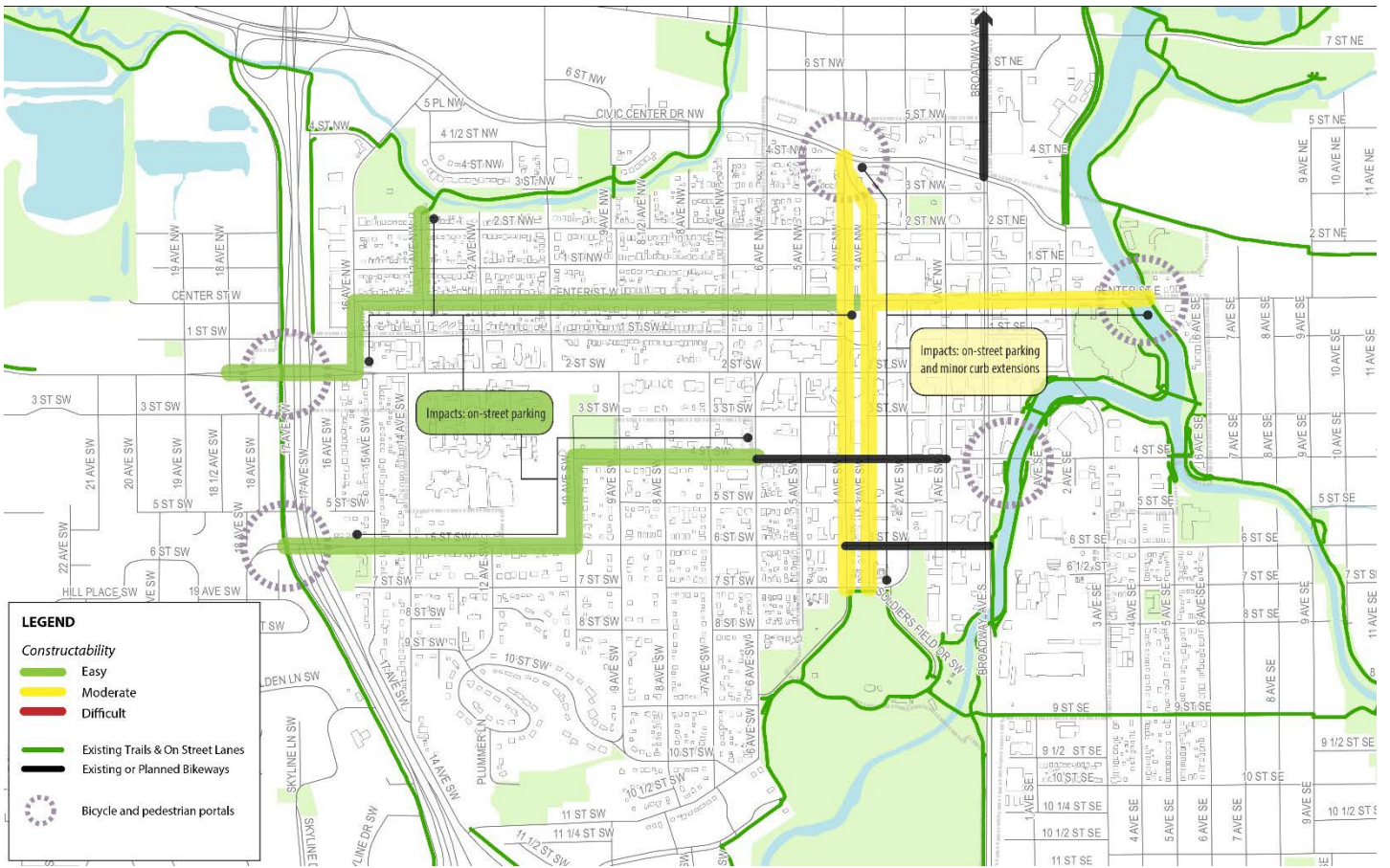
\*\*Estimate provided by Heart of the City Design Team includes improvements to 2<sup>nd</sup> Avenue SW and 1<sup>st</sup> Avenue SW from W Center Street to 2<sup>nd</sup> Street SW. Estimates provided by the Discovery Walk Design Team include enhancements along 2<sup>nd</sup> Avenue SW from 2<sup>nd</sup> Street SW to 6<sup>th</sup> Street SW.

## Priority Bicycle Improvements Costs & Constructability

### Constructability & Impacts

The following are planning level impacts and an assessment of constructability for priority bicycle improvements identified. In general, these facilities were planned to be implemented using the existing roadway with very minor curb modification where absolutely necessary. As such, the primary impact associated with these proposed facilities is to on-street parking areas. An attempt was made to tabulate the number of parking spaces impacted using Google Street View imagery. Constructability of these facilities was assigned as “easy,” “moderate” or “difficult.”





**Figure 21. Estimated Constructability of Priority Bicycle Improvements**

**Table 4. Priority Bicycle Improvements, Costs and Impacts**

Corridor	Facility Proposed	Planning Level Cost	Impacts
6 <sup>th</sup> Street SW	Bike lanes	\$55,000	60 on-street parking spaces
10 <sup>th</sup> Avenue SW	Bike lanes	\$20,000	20 on-street parking spaces
4 <sup>th</sup> Street SW	Buffered bike lanes	\$75,000	60 on-street parking spaces
3 <sup>rd</sup> Avenue SW	Buffered or protected bike lanes	\$275,000*	60 on-street parking spaces; minor curb and gutter impacts
4 <sup>th</sup> Avenue SW	Buffered or protected bike lanes	\$275,000*	85 on-street parking spaces; minor curb and gutter impacts
Center Street (Zumbro River to 6 <sup>th</sup> Avenue SW)	Buffered or protected bike lanes	\$275,000*	100 on-street parking spaces; minor curb and gutter impacts
Center Street (6 <sup>th</sup> Avenue to 16 <sup>th</sup> Avenue)	Bike lanes or bicycle boulevard	\$85,000	150 on-street parking spaces. No impacts with bicycle boulevard option.
16 <sup>th</sup> Avenue NW	Bike lanes	\$35,000	None
13 <sup>th</sup> Avenue NW	Bicycle boulevard	\$20,000	None

*\*Estimate provided by others (AECOM)*

## Pedestrian Improvements

Much of the DMC and downtown area is well served by existing alleys, enhancing the opportunity to minimize curb cuts (Adapted from the DMC District Design Guidelines)

- Curb cuts negatively impact walkability and bikeability as they increase potential conflicts between cars, pedestrians and bicycles
- Access to private property should be via an alley as opposed to a private curb cut. As properties are being redeveloped, curb cuts should be eliminated and alleys should be re-established where feasible.

## PEDESTRIAN PROJECTS [ADAPTED FROM THE ROCHESTER DOWNTOWN MOBILITY PLAN]

### PHASE 1

- Improve the pedestrian environment within the Downtown Core, especially on streets that connect key destinations (like the Mayo Civic Center and Heart of the City) by:
  - Installing high-visibility crosswalks (as a minimum standard) at all intersections;
  - Installing street trees where none are present and installation is feasible;
  - Modify existing traffic signal and intersection at Broadway and 3<sup>rd</sup> Street SW/SE with pedestrian refuge, high-visibility crosswalks and signage;
  - Ensure all north-south and east-west pedestrian crossing signals along Broadway Avenue S from 2<sup>nd</sup> Street NE to 6<sup>th</sup> Street SW have Leading Pedestrian Intervals (LPIs) where not already present.
- Reinforce 1<sup>st</sup> Avenue NW/SW as a Main Street pedestrian-oriented zone by:
  - Implementing a channelization project from 3<sup>rd</sup> Street NW to Center Street W would provide an opportunity to add bike lanes and the potential for better utilization of the existing 60 feet of roadway;
  - Installing clearly defined crosswalks and signage at all intersections;
  - Improving the pedestrian realm by adding high quality pedestrian amenities, including street trees, public seating, and landscaped buffers;
  - Reducing driveways and curb-cuts as feasible over time
- Improve pedestrian visibility and comfort on 2nd Street SW/SE between 1st Avenue SW and Civic Center Drive SE by expanding pedestrian facilities
  - Consistent with recommendations in the Downtown Master Plan, investigate a new street design for this segment that



would facilitate a Riverfront Arts space for events and/or potentially a festival street style concept design

## PHASE 2

- Extend 6th Street SE pedestrian facilities across the Zumbro River between S Broadway and 3<sup>rd</sup> Avenue SE by:
  - Providing high-quality pedestrian and bicycle facilities along a new 6th Street SE bridge between S Broadway and 3rd Avenue SE
  - As a future mitigation for neighborhood cut through traffic, consider automobile diversion at 3rd Avenue SE using a mountable median to restrict eastbound and westbound through vehicle movement (except pedestrian and bicycle traffic)