

# CITY OF NORTH MANKATO

## *COMPLETE STREETS PLAN & POLICY:*

Adopted July 5, 2016



## Table of Contents

Introduction .....	1
What Are Complete Streets .....	1
Benefits of Complete Streets .....	2
North Mankato Complete Street Policy .....	3
Resolution Adopting Complete Streets Policy .....	5
Engineering Considerations .....	6
Design Guidelines .....	6
Vehicle Speed .....	7
Design Vehicles .....	7
Intersections .....	7
On-Street Parking .....	7
Pedestrian and Bicycle Use .....	8
Land Use .....	9
Functional Classification Guide .....	9
Creating and Designing Complete Streets .....	10
Tool Kit & Design Guidelines .....	11
Walking .....	11
Sidewalk Guidelines .....	11
Crosswalks .....	13
Bicycling .....	15
Types of Bicyclists .....	16
Types of Bicycle Facilities .....	16
Traffic Calming .....	20
Transit .....	23
Proposed On-Street Bicycle Accommodations Chart .....	24
Appendices .....	25
Existing and Proposed On-Street and Trail Facilities Map .....	26
Existing Sidewalk Network Map .....	27
Future Sidewalk System Development Map .....	28

# Introduction

## What Are Complete Streets

Complete Streets are streets and sidewalks that are designed and constructed to serve everyone – pedestrians, bicyclists, and drivers – and they take into account the transportation needs of all people, including children, older adults, and people with disabilities or impaired mobility.



As state and local governments have worked to improve the road network, they have primarily focused on efficiency or making the flow of traffic better for drivers. This has resulted in overbuilt roadways with additional turn or travel lanes that increase the walking distance across intersections and reduce shoulder area to bicyclists. Traffic signals are timed and phased to facilitate vehicles moving through intersections. The curve radius at intersections have increased so traffic can turn at higher speeds which also increases the walking distance across the intersection.

The emphasis on improving the efficiency of vehicle traffic had in many cases created streets that are unfriendly to pedestrians and bicyclists creating an increasing need to drive. Complete Streets policies and projects are aimed at changing streets from places where vehicles dominate to places where all users are accommodated.

Complete Streets may include the following elements:

- Pedestrian and ADA Compliant Elements. Sidewalks, crosswalks, curb ramps, accessible pedestrian signals, detectable tactile cues and warning, and longer intervals;
- Bicycle Elements. Bicycle routes and lanes, signage and pavement marking, and bicycle racks;
- Streetscape Elements. Street trees, landscaping, rain gardens, permeable paving materials, and buffers between vehicles and people;
- Traffic Calming and Access Management Elements. Intersection bump outs, curb extensions, textured material, and center refuge islands. Driveway consolidations, modifications and closures; and
- Transit and Parking Elements. Accessible bus stops, shelters and pull-out integrated with pedestrian enhancements. Delineated on-street parking spaces and curb/sidewalk bump-outs.

## Benefits of Complete Streets

Streets are an integral part of North Mankato and they affect the quality of life and character of our community. They connect neighborhoods, and provide access to businesses, jobs, schools, shopping and services. Complete Streets provide multiple benefits to communities and residents:

- **Downtown Revitalization and Economic Health.** Business districts with Complete Streets that are inviting for pedestrian and bicyclists report higher retail sales, a higher percentage of residents shopping locally, and increased appeal to visitors;
- **Safe Places for Children to Walk, Bike and Play.** Complete Streets can help increase the percentage of children walking and biking to school, which has declined dramatically in the past 50 years;
- **Reduced Transportation Costs.** Complete Streets with improved options for walking and biking helps people save money as U.S. families typically spend between 20% and 40% of their income on transportation;
- **Active Living and Good Health.** Residents in neighborhoods with Complete Streets who have safe places to walk and bike close to home are more likely to be physically active, which is associated with lower rates of obesity and chronic disease;
- **Improved Mobility for Older Adults and People with Disabilities.** Complete Streets (including sidewalk networks) that are accessible and easy to navigate improve transportation options for older adults and people with physical, vision or cognitive disabilities or impairments; and
- **Environmental Health.** Complete Streets with improved options for walking and biking helps reduce vehicle miles driven and associated pollution, particularly pollution and greenhouse gases.



# North Mankato Complete Street Policy

## Background

Complete Streets is a transportation policy and design approach that guides streets to be planned, designed, operated, and maintained to enable safe, convenient and comfortable travel and access for users of all ages and abilities regardless of their mode of transportation.

What constitutes safe, convenient, and comfortable travel and access for users of all ages and abilities regardless of mode of transportation may change from time to time or from project to project to avoid confusion and heightened expectation of this policy. For example, pedestrians and bicycles can be adequately accommodated by allowing them to share the street with vehicles on low-volume residential streets. Based on these factors varying issues, the North Mankato City Council may request staff to further define what conditions, such as traffic volumes/speeds, truck volumes or topographic conditions, will trigger the need to construct designated pedestrian and bicycle facilities.

## Design Standards and Maintenance

- The City Council or their designee will consider bicycle and pedestrian design in all streets construction, reconstruction, rehabilitation and pavement maintenance projects conducted by or behalf of the City, as appropriate, subject to the exceptions contained herein.
- The City shall plan, design, build and maintain all bicycle and pedestrian facilities in accordance with acceptable federal, state and local standards and guidelines, but will consider innovative and/or non-traditional design options as appropriate.

## Design Standard Exceptions

- The incorporation of bicycle and pedestrian facilities shall be considered in street construction, reconstruction and pavement maintenance projects undertaken by or on behalf of the City during the regular design process, except under one or more of the following conditions:
  - a. There is insufficient space within the right of way to safely accommodate such new facilities.
  - b. Inclusion of such new facilities would require an excessive and disproportionate cost.
  - c. Inclusion of such new facilities would create a public safety risk for users of the public right of way.
  - d. Inclusion of such new facilities are not in the public interest.
  - e. The project is limited to routine or seasonal maintenance activities such as mowing, sweeping, or spot pavement repairs, including chip and crack sealing activities.
  - f. Bicyclists and pedestrians are prohibited by law from using the facility.
  - g. There is documentation that there is an absence of current or future need.

- The City Council or their designee shall document the reasoning for their decision to exempt the particular project from the Complete Streets Policy during the engineering feasibility reporting process.

#### **Plan Review Process and Reports**

- Planning studies and/or engineering feasibility reports for street projects prepared by or on behalf of the City will include discussion of whether the Complete Streets Policy was applicable to the project, how Complete Streets was considered during the plan development, and what elements of Complete Streets are recommended for inclusion in the project.

## Resolution Adopting Complete Streets Policy

WHEREAS, the City of North Mankato recognizes that its transportation network (e.g., streets, sidewalks, trails and pathways) is intended to balance the needs and interests of all users of all ages and abilities; and

WHEREAS, streets are a key factor in the experience of the public realm and play a crucial role in economic development, public safety and health and overall quality of life; and

WHEREAS, the design and function of our streets has often favored the motorist over other users, notably bicyclists, pedestrians, transit users and persons with disabilities; and

WHEREAS, Active Transportation integrates physical activity into daily lives through increased emphasis on walking, bicycling, and public transportation; and

WHEREAS, Active Transportation improves public health, reduces traffic congestion, enhances air quality and supports local economic development; and

WHEREAS, the City of North Mankato has recently completed a Complete Streets Plan and Policy which serves as a guide for public investment and incorporating multimodal transportation; and

WHEREAS, the City of North Mankato seeks to create an interconnected network of transportation facilities which accommodates all modes of travel in a manner that is consistent with neighborhood context and supportive of community goals; and

WHEREAS, Complete Streets are defined as streets that are planned, designed, operated and maintained to enable safe access for all users and upon which pedestrians, bicyclists, transit users, persons with disabilities, and motorists of all ages and abilities are able to safely move along and across streets; and

WHEREAS, the City of North Mankato seeks to establish a Complete Streets policy to incorporate Active Transportation into the planning, design and operation of all future City street projects whether new construction, reconstruction, rehabilitation, or pavement maintenance; and

WHEREAS, it is recognized that certain streets may not be feasible, whether physically or financially, for Complete Streets accommodation.

NOW THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF NORTH MANKATO, MINNESOTA:

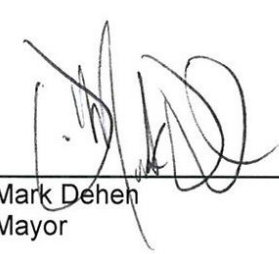
1. The City Council of the City of North Mankato approves and adopts the Complete Streets Policy attached to this Resolution.

This resolution shall become effective upon its adoption.

Passed this 4th day of January, 2016

ATTEST:

  
April Van Genderen  
City Clerk

  
Mark Dehen  
Mayor



## Engineering Considerations

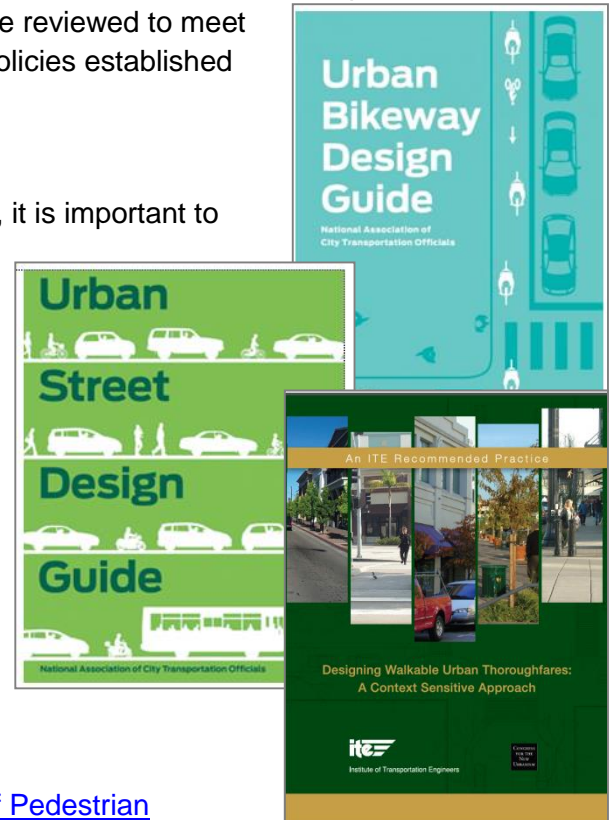
The Complete Streets plan is part of a City's Vision to meet the needs for various modes of transportation and providing a safe network of facilities to accommodate access and travel for all users. For Complete Streets to be successful, every road project should be evaluated for compliance with the Complete Streets Policy and guiding principles. Road projects vary across a spectrum from the new development of roadways in subdivision development to the reconstruction of existing streets. Other roadway projects can include surface improvements such as milling and overlay, seal coating, chip sealing and resurfacing projects.

Modifications to streets within North Mankato shall be reviewed in accordance with proven and accepted design criteria. Transportation projects shall be reviewed to meet the criteria of safety, feasibility, proper application and policies established by the engineering department.

## Design Guidelines

When designing roadway projects within North Mankato, it is important to consider nationally and regionally recognized guidelines. This will provide the best approach for creating standards for new features or transportation facilities within the right of way. This will provide consistency and reduce the potential for conflict. The following is a list of commonly accepted guidelines for street design the City of North Mankato will utilize as resources:

- [A Policy on Geometric Design of Highways and Streets, 6th Edition](#), AASHTO
- [Guide for the Development of Bicycle Facilities, 4th Edition](#), AASHTO
- [Guide for the Planning, Design, and Operation of Pedestrian Facilities, 1st Edition](#), AASHTO
- [Manual on Uniform Traffic Control Devices](#), Federal Highway Administration
  - [Bicycle Facilities and the Manual on Uniform Traffic Control Devices](#), Federal Highway Administration
- [Public Rights of Way Accessibility Guidelines](#), U.S. Access Board
- [Memorandum: Bicycle and Pedestrian Facility Design Flexibility](#), Federal Highway Administration
- [Designing Walkable Urban Thoroughfares: A Context Sensitive Approach: An ITE Recommended Practice](#), Institute of Transportation Engineers and the Congress for the New Urbanism
- [Urban Bikeway Design Guide](#), National Association of City Transportation Officials





- [Urban Street Design Guide](#), National Association of City Transportation Officials
- [Highway Capacity Manual 2010](#), Transportation Research Board
- [Complete Streets Complete Networks](#), Active Transportation Alliance

## Vehicle Speed

Vehicle target speed is the 85th percentile speed that is desired for a given street. Lowering vehicle speeds is a primary goal for Complete Streets because it directly impacts the severity as well as number of crash-related injuries and fatalities.



Target speed can be achieved through a combination of engineering treatments, driver education, and police enforcement. Streets should be designed with target speeds and speed limits that are appropriate for both their current and future context, including roadway classification and street type, as well as adjacent land uses and user demand.



Specific design treatments are capable of achieving predictable speed and volume reductions, though their benefits must balance with the potential impacts on parking and emergency vehicles. On local roads and in school zones, target speeds should be set at or below 30 MPH in order for pedestrian safety to be maximized.

## Design Vehicles

A design vehicle is a vehicle type that needs to be accommodated in the design of the roadway or intersection. Street functional classification will help determine the intended vehicle type as well as the land use in the area. In order to design safe and efficient intersections along its route, it is extremely important to select the design vehicle which will be using them. All roadway designs shall meet the minimum standards for the needs of the fire department as well as other emergency vehicles.

## Intersections

Intersections are significant points of conflict within the street system. Their impact on safety, capacity, speed, and user costs is considerable. For this reason, intersections deserve special attention in their design. Design considerations should include the type of traffic control, capacity analysis, degree of access control for the functional classification of the street, pedestrian traffic, bicycle traffic and lighting. The use of small turning radii, raised intersections, crosswalks, lighting, textured pavement, roundabouts and other speed mitigating design elements should be prioritized whenever possible to improve that safety for all users.

## On-Street Parking

On-street parking is beneficial in the many areas of North Mankato that have limited off-street parking. On-street parking can also provide a traffic calming benefit providing increased safety

as drivers tend to travel at slower speeds. These slower speeds provide pedestrians, bicyclists and drivers more time to react; and when a crash does occur, the severity is greatly reduced. On-street parking designs can include parallel parking, 45 and 60 degree parking as well as reverse angle parking. The benefits of on-street parking should only be implemented with the use of appropriate design elements to avoid negative consequences.

## **Pedestrian and Bicycle Use**

All roadway designs shall take into consideration pedestrian and bicycle use of all ages and abilities. Factors that contribute to a quality environment for both bicyclists and pedestrians can include the following:

- Pleasant visual environment
- Network of existing infrastructure separated from traffic. Boulevards created along the street provide a more appealing sidewalk to walk along vs. a sidewalk that is built curbside
- Short street crossing distances
- American with Disabilities (ADA) Requirements

Safety of the pedestrian and separation from high speed traffic is of the utmost importance in planning for pedestrian facilities. Complete streets need to provide for a range of passive and active uses including, but not limited to walking, waiting for transit, and crossing the street. While specific treatments or dimensions may vary by context, the goal in any environment is to have a continuous pedestrian network that provides dedicated space for pedestrians and separation from vehicles.

Factors that contribute to successful bicycle routes include the following:

- a well-connected network of bicycling facilities
- well marked bicycle routes
- safe travel routes
- direct travel routes, particularly when bicycling for purposes other than strictly exercise or recreation

When determining bicycle routes, factors such as surrounding land use, the speed of vehicles on the street and the directness of the route connecting destination, should all be considered. An additional consideration includes the different types of bicyclists with varying levels of expertise and comfort riding in mixed traffic. Creating viable transportation options means that a variety of facility types should be provided to create a bicycling network.

## **Land Use**

Street designs should take into consideration the various land uses throughout North Mankato. Areas zoned as residential will have different design requirements than areas that are zoned as Central Business District or Commercial. Street designs will need to accommodate the adjacent land uses and the users of the street. Commercial and industrial areas will likely need larger turning radii and larger travel lanes to accommodate commercial trucks. Residential areas may have speed and traffic volume issues which may require other engineering treatments to provide necessary safety for all users.

## **Functional Classification Guide**

Like most jurisdictions in the United States, North Mankato's streets have been categorized in order to better understand how they serve motor vehicle traffic. Each road's classification has been determined by the state using guidelines developed by the American Association of State Highway and Transportation Officials (AASHTO). Complete Streets projects must take into consideration this roadway classification as it helps determine how the road and network needs to be treated to handle the traffic volumes and other conflicts that may arise as a result of design changes. It is also often used in determining Federal or State funding criteria when improvements are needed. The road classifications for the urban environment of North Mankato are as follows:

### **Principal Arterial**

- Serve major activity centers, highest traffic volume corridors and longest trip demands
- Carry high proportion of total urban travel on minimum mileage
- Interconnect and provide continuity for major rural corridors to accommodate trips entering and leaving urban area and movements through the urban area
- Serve demand for intra-area travel between the central business district and outlying residential areas

### **Minor Arterial**

- Interconnect and augment the higher-level Arterials
- Serve trips of moderate length at a somewhat lower level of travel mobility than Principal Arterials
- Distribute traffic to smaller geographic areas than those served by higher-level Arterials
- Provide more land access than Principal Arterials without penetrating identifiable neighborhoods
- Provide urban connections for Rural Collectors

### **Major Collector**

- Serve both land access and traffic circulation in higher density residential and commercial/industrial areas
- Penetrate residential neighborhoods, often for significant distances
- Distribute and channel trips between Local Roads and Arterials, usually over a distance of greater than three-quarters of a mile
- Operating characteristics include higher speeds and more signalized intersections

#### Minor Collector

- Serve both land access and traffic circulation in lower density residential and commercial/industrial areas
- Penetrate residential neighborhoods, often only for a short distance
- Distribute and channel trips between Local Roads and Arterials, usually over a distance of less than three-quarters of a mile
- Operating characteristics include lower speeds and fewer signalized intersections

#### Local Road

- Provide direct access to adjacent land
- Provide access to higher systems
- Carry no through traffic movement
- Constitute the mileage not classified as part of the Arterial or Collector systems

### **Creating and Designing Complete Streets**

A variety of design treatments and engineering solutions can be created in any street design. It is important to involve the community, provide engineering, and education necessary for successful implementation. The City of North Mankato has created a tool box which shows many possible treatments. This tool box, as documented below, will be utilized as a starting point. This toolbox will provide guidance in determining which elements are most appropriate and feasible to the street in design.

# Tool Kit & Design Guidelines

## Walking

We start and end nearly every trip as a pedestrian. Despite this, walking is often the least considered mode of travel when it comes to providing convenient, safe and adequate facilities. Well-designed pedestrian facilities can create a more walkable environment, where pedestrians feel safe and secure because they are not intimidated by adjacent traffic.

### Sidewalk Guidelines

While the design of a sidewalk depends on its location and function, the following general guidelines should be considered:

**Sidewalks should be at least 5 feet wide.** If sidewalks are too narrow, fewer people can use them, people have to walk single file, and people may be uncomfortably close to buildings and/or automobile traffic. Narrow sidewalks may not provide enough clear space for people who use walking aids or wheelchairs. Even wider sidewalks should be installed in areas near schools, on commercial streets, or in other areas where there will be many people walking. The minimum width for an Americans with Disabilities Act (ADA)-compliant sidewalk is 3 feet, but sidewalks this narrow should be limited to short distances and wider passing spaces may need be provided at set intervals if the sidewalk is less than 5' across. Wheel chair ramps with detectable warning domes should be installed where sidewalks cross a curb, and existing ramps should be upgraded to meet current ADA guidelines.

**Obstructions** – such as utility poles, untrimmed trees or shrubs, or illegally parked vehicles – can create even narrower spaces with little room to maneuver around them. Narrow sidewalks are also more likely to have driveway crossings with steep cross slopes and curb ramps with insufficient landings and/or steep ramp grades.

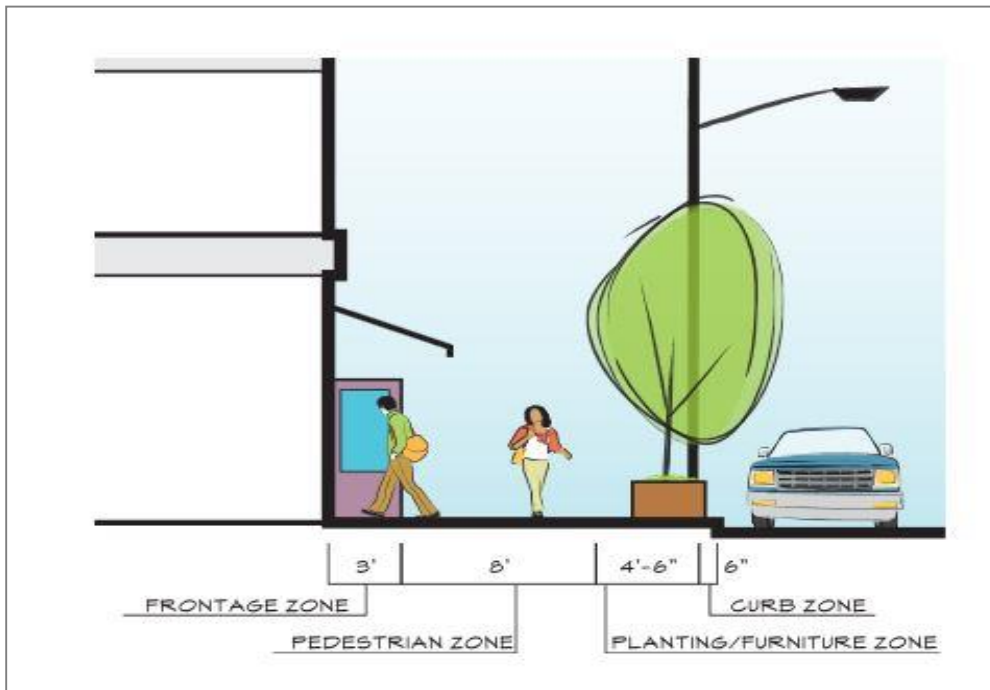
**There should be at least a 4-foot buffer between the sidewalk and the vehicle travel lane.** As pedestrians, we feel more secure when there is a buffer between ourselves and moving vehicles. The buffer may include an on-street parking lane, an on-street bike lane, greenspace or planting strips, raised curbs, space for street trees, street furniture, street lights or utility poles, or a combination of those elements.

**Sidewalks should be at least 8 feet wide where buildings abut the sidewalk.** The three additional feet of sidewalk is needed so that doors can be opened and people can enter and exit buildings without blocking the sidewalk for other pedestrians.

**Sidewalks should continue across driveways.** Sidewalks should not be paved over in order to maintain a continuous, level surface with minimal cross-slope.

**Sidewalks should be constructed of concrete or a material with a similar lifespan and performance.**

**Sidewalk Zones.** The sidewalk corridor can include several zones depending on the setting:



**Curb Zone.** For curbed streets, the curb zone is typically the first 6 inches of the sidewalk corridor immediately adjacent to the roadway. The curbs function both to prevent street run-off from flowing onto sidewalks and adjacent properties, and to discourage people from driving or parking off the roadway. People with vision impairments also use curbs to identify the border between the sidewalk corridor and the roadway.

**Planting/Furniture Zone.** The planting/furniture zone lies between the curb and pedestrian zones. Items such as signs, utility poles, fire hydrants, parking meters, benches, mailboxes and newspaper boxes should be located in this zone rather than within the pedestrian zone where they become obstacles. The planting/furniture zone is commonly an unpaved planting strip, particularly on residential or side streets. If the planting/furniture zone is paved, which is more typical in a downtown setting or on a commercial street, it is frequently distinguished from the pedestrian zone by a different surface color, texture and/or pattern.

**The planting/furniture zone also serves as a buffer between the pedestrian zone and the roadway.** To provide a sufficient buffer, this zone should be at least 2 feet wide. When adjacent to an on-street parking lane, the width should be at least 3 feet and have enough clear space to allow people to get in and out of the parked vehicles. If it will be serving as a planting strip, this zone should be at least 4' wide to provide enough space for street trees. A wider planting/furniture zone also provides a place to store snow cleared from the roadway and pedestrian zone.



**Pedestrian Zone.** The portion of the sidewalk corridor specifically reserved for people to walk on is the pedestrian zone. It should be completely free of obstacles, protruding objects, and vertical obstructions, which are particularly hazardous to pedestrians with vision impairments who may not be able to detect or avoid them. The appropriate width of this portion of the sidewalk corridor is discussed above.

**Frontage Zone.** The frontage zone is the area between the pedestrian zone and the property line. A frontage zone is needed when buildings are located right at the edge of the sidewalk, most common in a downtown setting or on a commercial street. This zone should not be less than 1 foot wide and may need to be wider to accommodate building doors that open out into the sidewalk corridor and other activities at the edge of the sidewalk. Sidewalk cafes, protruding display windows, street vendors, sandwich board signs, and sidewalk sales may all occur or be located within the frontage zone if there is adequate width. Like the planting/furniture zone, the frontage zone is frequently distinguished from the pedestrian zone by a different surface color, texture and/or pattern. If the sidewalk corridor is adjacent to lawns or landscaped areas, as is common on residential streets, a frontage zone will not be needed.

## Crosswalks

**Crosswalk Guidelines.** As pedestrians, we are at risk whenever we have to cross the roadway. For this reason, sidewalk networks should be designed to minimize the number of times people need to cross the road when walking between destinations. Marked crosswalks are an effective method for improving safety and reducing accidents.

Crosswalks indicate the preferred locations for pedestrians to cross a street and provide warning to motorists that people may be crossing. The following are guidelines for crosswalks which should be considered:

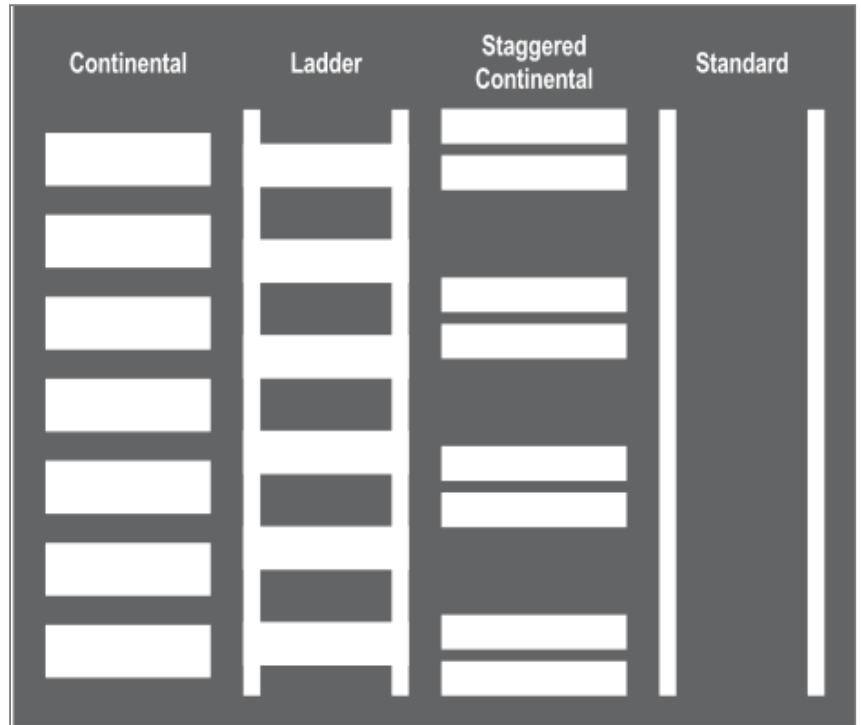
**The length of crosswalks should be minimized and signals appropriately timed to allow all pedestrians to cross safely.** A shorter crossing distance improves safety by minimizing pedestrians' exposure to moving traffic. Long crossing distances also make it more difficult for seniors, children and people with impaired mobility to safely cross a street. Median refuge islands should be considered for crossings that are more than 60 feet long.

**Crosswalks located at intersections are preferred to those located at mid-block.** Typically, crosswalks should be installed at intersections controlled by either stop signs or a traffic control signal. Mid-block locations are acceptable when warranted by heavy pedestrian traffic or to provide access to a major pedestrian destination. When the distance to the nearest crosswalk is more than 500 feet, people are more likely to jaywalk rather than walking a long distance to the crosswalk and a mid-block crosswalk may be justified. Crosswalks are implied at all intersections whether or not they are marked, while mid-block crossings can only be created by a marked crosswalk.

**Marked crosswalks should be at least 6 feet wide.**

Marked crosswalks should be delineated by white lines and should be designed in accordance with the Manual of Uniform Traffic Control Devices (MUTCD). The MUTCD includes a number of options for crosswalk markings. Research indicates that the continental design is the most visible to drivers, and is recommended at high-traffic roadways. The painted lines should be 12 to 24 inches wide and separated by gaps of 12 to 60 inches. The gap between the lines should not be more than 2.5 times the width of the lines. The lines in the continental design can

be aligned so that vehicle wheels pass between, rather than over, them to extend their lifespan.



The standard design is typically the lowest cost to install and maintain, and is suitable for lower-traffic intersections. The width of the lines may be reduced to 6 inches at low-traffic intersections.

**Marked crosswalks can be an attractive streetscape element.** The travel portion of the crosswalk may be painted or have a tactile surface (ex. pavers or stamped concrete) to further distinguish it from the travel way. Decorative crosswalks are often installed as part of an overall streetscape design intended to create an attractive downtown or similar pedestrian-oriented destination. The surface material should be visible, non-slippery and not cause a tripping hazard.

**There are techniques for stamping patterns into concrete or asphalt to create the appearance and texture of brick or pavers.** A crosswalk painted brick red with white outlines closely mimics a crosswalk built of brick pavers and is much less expensive to build and maintain.



**Marked crosswalks require regular maintenance.** Crosswalk markings will require regular repainting or replacement, particularly on heavily traveled streets. The standard or solid designs are frequently used on low-volume residential or side streets, and their simple design reduces installation and maintenance costs.

**Street lighting should be installed at all street intersections.** Mid-block street lighting should typically be installed on residential and collector streets in areas of high pedestrian or bicycle activity (such as schools, parks, transit stops and centers, access to transit, and commercial and recreational facilities that draw large numbers of pedestrians) and along all arterial streets. There are many different types of lighting sources and fixtures available to the designer. Regardless of the lighting equipment used, the level and consistency of lighting provided, the design should normally conform to RP-8, “American National Standard Practice for Roadway Lighting,” and guidance provided by the Illuminating Engineering Society of North America.

Complete street lighting designs should:

- Ensure pedestrian walkways and crossways are sufficiently lit;
- Consider adding pedestrian-level lighting in areas of higher pedestrian volumes, downtown, and at key intersections;
- Install lighting on both sides of streets in commercial districts; and use uniform lighting levels.

## Bicycling

Bicycling as a mode of transportation involves sharing the road with vehicles. Even in communities with separated bike paths, it will not be possible to travel between most destinations entirely off-road. Because of this, most streets should incorporate design elements that facilitate bicycling. It is not necessary to specifically designate streets as bicycle routes or provide bicycle lanes. Rather, all roadways should be maintained and upgraded to accommodate safe and convenient bicycle travel.



The type of accommodation depends on the type of road and characteristics of traffic. On low volume, residential streets, bicyclists can easily become integrated vehicles and may not require any separation. The street is a shared-space used by vehicles, bicyclists and pedestrians. However, special treatments are necessary and greater separation is required to accommodate bicyclists on higher-volume and/or higher-speed roadways.

## Types of Bicyclists

Three categories of bicyclists should be considered: young children, the average rider, and the advanced bicyclist. North Mankato allows young children to bicycle on the sidewalk, but older children and adults are encouraged to bike on the road. Advanced bicyclists are generally comfortable riding with vehicles even in high-traffic situations, but the average rider will probably not be comfortable where there is not a designated space for bicycling such as a bike lane or shoulder. Because the majority of bicyclists are young children or average riders, bicycle facilities should be designed to serve their needs.

Young children and average riders prefer low volume, low-speed roads or designated bicycle facilities with well-defined separation from motorized vehicles. These riders are best served by a well-marked network of neighborhood streets and designated bicycle facilities. However, on higher-volume and/or higher-speed roadways, special treatments are necessary and greater separation is required to accommodate bicyclists that are at least 4 feet wide to feel comfortable riding on shared roadways.

## Types of Bicycle Facilities

**Bicycle Advisory Lane**—An advisory bike lane is similar to a regular bike lane, but is used on low volume streets that are narrow. An advisory bike lane is marked with a dotted line to the left side of the lane. These markings give bicyclists a space to ride, but are also available to motorists if space is needed to pass oncoming traffic.



**Bicycle (Bike) Box**—A defined and/or colored area at a signalized intersection provided for bicyclists to pull in front of waiting traffic. The box is intended to reduce car-bike conflicts, particularly involving right-turning movements across the path of a bicyclist, and to increase bicyclist visibility.







**Bicycle (Bike) Lane**—A portion of a roadway that has been designated by striping, pavement markings, and signs for the preferential or exclusive use of bicyclists.

**Bicycle (Bike) Path**—A pathway that is intended for the exclusive use by bicyclists, where a separate, parallel path is provided for pedestrians and other wheeled users. Most pathways are shared between bicyclists and other uses.



**Bikeway**—A generic term for any road, street, path, or traveled way that is in some manner specifically or legally designated for bicycle travel, regardless of whether such facilities are designated for the exclusive use of bicycles or are to be shared with other transportation modes.



**Bus/Bikeway**—A marked lane for exclusive use by buses and cyclists. May also be referred to as a bus/bicycle lane.

**Contraflow Bicycle Lane**—A bicycle lane that allows bicyclists to travel the opposite direction of motor vehicle traffic on a one-way street.



**Cycle Track**—A bicycle facility, typically unidirectional, that is separated from motor vehicle travel lanes, as well as sidewalks and pedestrians, by a physical barrier such as on-street parking or a curb, or is grade-separated.

**On-road Accommodation**—A facility that is part of the roadway or traveled way that is typically used by bicyclists and/or motor vehicles such as a shared lane, wide curb lane, bicycle lane, or bikeable shoulder.



**Off-road Accommodation**—A path that is separate from the roadway used by motor vehicles. This may be parallel to a roadway or separate, as it may pass through parks within the public right-of-way or on private right-of-way. This can be separated from pedestrian traffic (bicycle path) or shared with pedestrian traffic (shared use path).

**Paved Shoulder**—The portion of the roadway contiguous with the traveled way for accommodation of stopped vehicles, for emergency use, and for lateral support of sub-base, base, and surface courses. Use by cyclists may be allowed or prohibited based upon specific State laws.



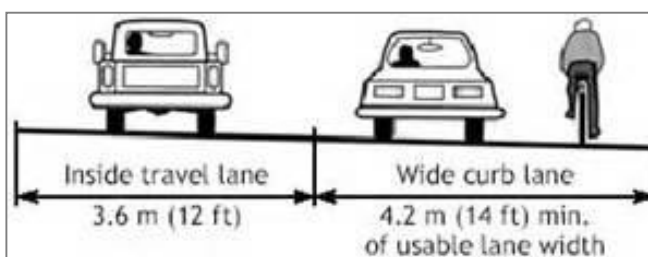
**Separated Bicycle Facility**—A bikeway within or adjacent to the roadway and separated from moving traffic by barriers or curbs, parking lanes, striped buffers, and other means. Separated bicycle facilities may be unidirectional or bidirectional.





**Shared Lane**—A lane of a traveled way that is open to bicycle travel and motor vehicle use.

**Narrow Lane**—A travel lane less than 14' in width, which does not allow bicyclists and motorists to travel side-by-side within the same traffic lane and maintain a safe separation distance.



**Wide Curb Lane**—A travel lane at least 14' wide, adjacent to a curb, which allows bicyclists and motorists to travel side-by-side within the same traffic lane.



#### **Shared Lane Marking (SLM or “Sharrow”)**

A pavement marking symbol that assists bicyclists with lateral positioning in lanes that are too narrow for a motor vehicle and a bicycle to travel side-by-side within the same traffic lane.

**Shared Roadway**—A roadway that is open to and legally permits both bicycle and motor vehicle travel; any existing street where bicycles are not prohibited.

**Shared Use Path**—A bikeway physically separated from motorized vehicular traffic by an open space or barrier and either within the highway right-of-way or within an independent right-of-way. Shared use paths may also be used by pedestrians, skaters, wheelchair users, joggers, and other non-motorized users. Such facilities are often referred to as “trails.”



**Signed Shared Roadway (Signed Bike Route)**—A shared roadway that has been designated by signing as a preferred route for bicycle use.

**Trail**—Non-descriptive general term typically referring to off-roadway facilities but with no standardized definition. Use should generally be avoided as it may refer to a range of facilities, including a coarse, unpaved hiking/biking route or a paved urbanized facility.



## Traffic Calming

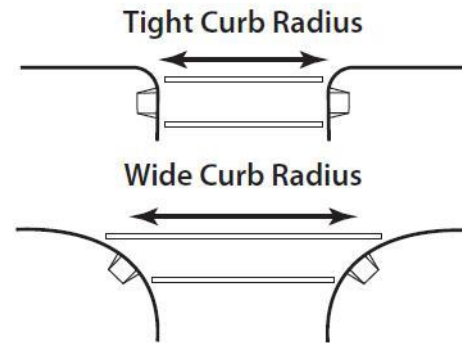
Pedestrian and bicyclist safety can also be addressed by altering how vehicles occupy and use the street. There are a variety of techniques, commonly referred to as traffic calming measures, that involve making physical changes to the roadway in order to alter driver behavior, reduce travel speeds and provide a safer environment for pedestrians and bicyclists.

The aim of traffic calming is to balance the needs of motorists with other users, including pedestrians and bicyclists. Instead of treating the street only as a conduit for vehicles passing through at the greatest possible speed, it becomes shared space that creates a sense of place. Traffic calming techniques are designed to reduce the impact of motor vehicle traffic by slowing traffic, or literally “calming” it. This makes streets friendlier to pedestrians and bicyclists. Traffic calming measures are frequently combined with streetscape improvements such as landscaping, decorative pavement, street lights, benches, bike racks, or similar amenities to make the street a pleasant place to be. Low-impact development approaches to managing storm water may also be integrated into traffic calming projects.

Traffic calming can be applied inexpensively and flexibly. Many of the strategies employ painting lines, colors and patterns on existing pavement; using planters, installing bollards, planters or other removable barriers; eliminating or adding parking; or installing sidewalk extensions or similar structures at intersections and crosswalks. Many traffic calming measures can be tested through temporary installations that once fine-tuned can be rebuilt with more permanent materials.

Common traffic calming measures include:

**Tighter Curb Radius.** The longer the radius of a curb, the faster a motorist can drive around that curve. Reducing the radius to less than 20 feet also narrows intersections and increases sidewalk space, which reduces the crossing distance. This gives pedestrians a better chance to see and be seen by approaching traffic.



**Curb Extensions.** Curb extensions, bump-outs, bulb-outs, chokers, or neck-downs extend the sidewalk or curb line out into the parking lane or road shoulder. This reduces the effective width of the street and has multiple pedestrian safety benefits. Curb extensions reduce the crossing distance, and therefore the time it takes a pedestrian to cross the street. They visually and physically narrow the roadway, which causes motorists to slow down. Curb extensions also improve the ability of pedestrians and drivers to see each other. Curb extensions can help define a gateway or entry point to a downtown or neighborhood. They can provide space for landscaping, signs, kiosks, street lamps or other amenities.



**Narrowing Travel Lanes.** Conventional traffic engineering has recommended travel lanes that are 12' wide (or greater) to meet safety standards, but newer evidence shows that lanes as narrow as 9' can still be safe for driving. Narrowing lanes also allows space for addition of bicycle lanes and improves crossing for pedestrians and gives them more space to walk.

**Raised Islands.** Raised islands are typically used on heavily traveled streets and/or multi-lane streets. They are placed in the center of the street at intersections or mid-block. Pedestrians do not have to cross the entire street at once, but can cross partway to the island and wait for another gap in traffic or turn of the lights to get across the remaining lane(s).







**Raised Crossing.** A raised pedestrian crossing is essentially a speed table or a speed hump with a flat portion the width of a crosswalk (typically 10' to 15' wide). Gently sloping ramps about 6' wide are placed on either side of the raised crossing. The raised crossing is generally at the same height as the sidewalk, while speed tables or bumps are typically between 3 to 6 inches.

**Raised Intersection.** A raised intersection is similar in concept to the raised crossing, except that the entire center of the intersection is raised to the height of the sidewalk. Raised intersections often incorporate a decorative or tactile surface treatment and serve as an aesthetic streetscape element.



**Roundabouts.** A raised, circular island in the center of an intersection around which all vehicles must travel until reaching their destination street. Roundabouts create a slower moving, steady flow of traffic and reduce conflict points, resulting in fewer accidents. Although roundabouts are not usually signalized, approaching vehicles naturally slow down as the streets narrow in their approach. Slower vehicles along with the installation of crosswalks provide pedestrians a safer, more obvious opportunity to cross. The center island can serve as a gateway to a downtown or neighborhood. A sloping ramp around the perimeter of the raised island allows buses, trucks and other large vehicles to maneuver the continuous curve while still maintaining a lowered speed.

## Transit

Well-planned and designed transit facilities provide safe, comfortable and intentional locations for riders to access transit. They send a message to all street users that transit is a legitimate and viable form of transportation. Generally speaking, there are three levels of transit facilities on complete streets:

- Stops – dedicated waiting areas with appropriate signage for passengers waiting to board a transit vehicle
- Benches – dedicated seating for transit passengers; and
- Shelters – covered locations, usually with seating and other amenities, for transit passengers

Ideally, passenger shelters should be located at occasional intervals along all transit routes and especially at stops with substantial passenger activity. However, factors such as cost and limited right-of-way may limit the placement of shelters. At stop locations with passenger activity throughout the day, a bench is recommended at minimum, while a shelter is preferred. Larger developments – shopping centers, office buildings, etc. – should be encouraged to build transit shelters concurrently with construction.

Regardless of the facility type chosen, the transit stop should be located on a level surface, such as a concrete pad, that provides a safe distance from moving vehicles in the traveled way. The stop should be located to provide passengers convenient access to and from their likely destinations, particularly passengers with disabilities. Transit stops also should maintain a clear area for disabled access from the bus shelter to a waiting transit vehicle. This depends on a number of factors, including sidewalks and ramps, building placement and street crossing opportunities (both mid-block and at intersections).

Transit Facility Guidelines:

**Transit Stop.** Minimum for all transit routes. Should include appropriate signage and be located on a flat, dry surface with safe clearance from moving vehicles.

**Bench.** Minimum at locations serving multiple passengers throughout the day.

**Shelter.** Preferred at locations serving multiple passengers throughout the day.



## Proposed On-Street Bicycle Accommodations Chart

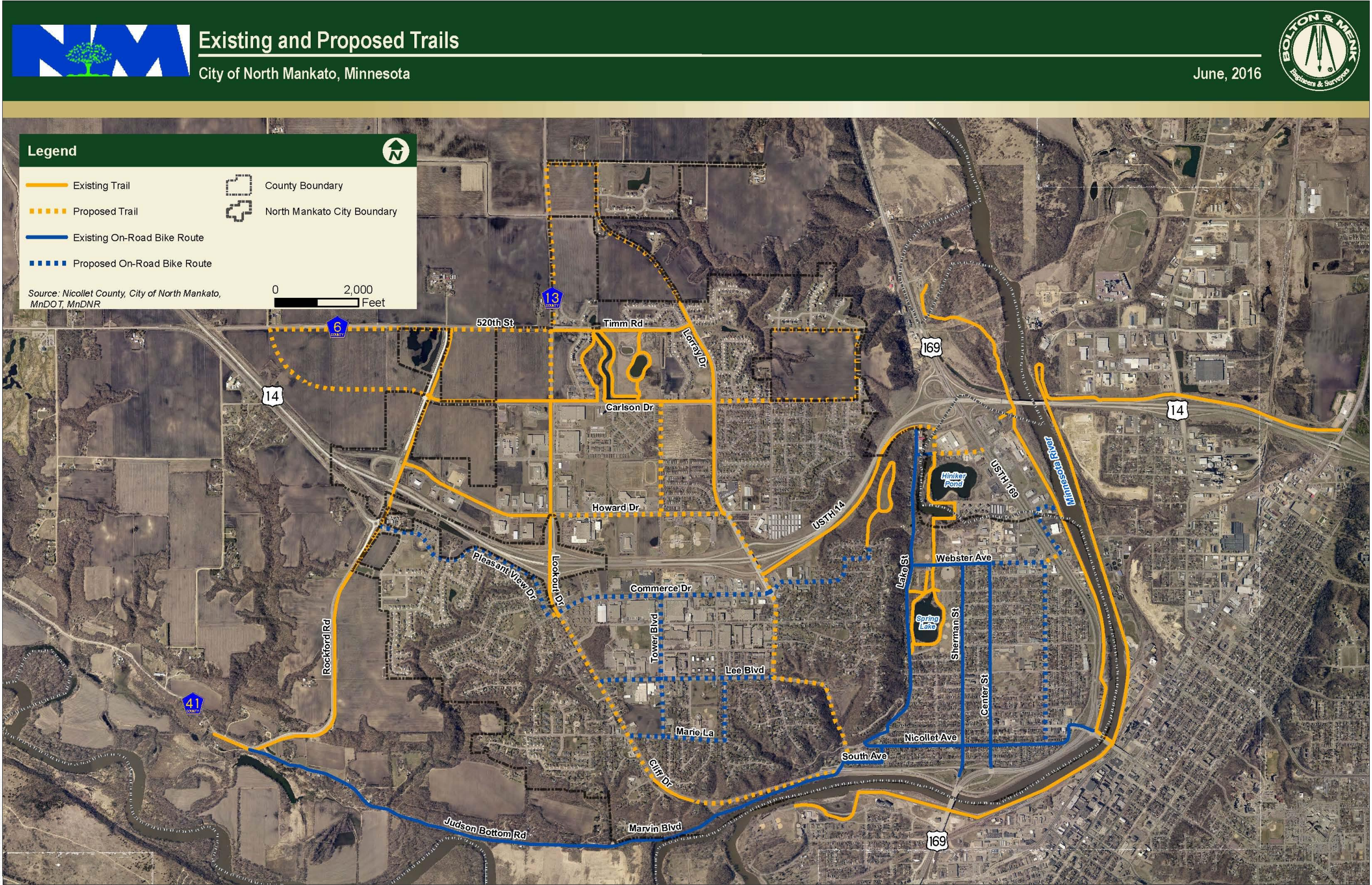
Street Name	Speed Limit	ADT	Curb & Gutter Opening	Thru Traffic Lanes	Parking	Proposed Bicycle Accommodations		Notes
						Bike Lanes	Shared Lane	
Roe Crest (Lee to Marie)	30	1,200	41'	2 lanes	Both Sides		X	No Marking
Marie Lane (Roe Crest to Lookout)	30	1,650	44'	2 lanes	Both Sides		X	Center stripe
Tower (Marie to Lee)	30	810	44'	2 lanes	Both Sides		X	Center Stripe
Tower (Lee to Commerce)	30	2,500	44'	2 lanes	None		X	Center Stripe
Commerce (LorRay to Lookout)	30	4,100 to 11,000	52'	3 lanes	None		X	Center Turn Lane
Lee Boulevard (Lookout to Hoover)	30	3,250	44'	2 lanes	None		X	Center stripe
Lee Boulevard (Hoover to LorRay)	30	3,600 to 5,600	44'	2 lanes	One Side	South Side Only	X	Center stripe
Pleasantview (Northridge to Peregrine)	30	3,000	36'	2 lanes	One Side	East Side Only	X	No Marking
Pleasantview (Peregrine to Rockford Road)	30	3,000	40'	2 lanes	Both Sides		X	No Marking
Range Street (Nicollet to McKinley)	30	3,300 to 3,800	40'	2 lanes	West Side		X	Center stripe
Range Street McKinley to Webster)	30	3,300	44'	2 lanes	Both Sides		X	Center stripe
Webster Avenue (Range to TH 169)	30	4,150		2 lanes				Off-Street Bike Path
North River Road/Pauley Way	30		36'	2 lanes	Both Sides		X	No Marking
Commerce Drive (Lor Ray to Colette Drive)	30	2,000 (est.)	44'	2 lanes	One Side	South Side Only from Lor Ray Drive to 550' west of Collette	X	Center stripe
Commerce Drive (Collete Drive to Mary Circle)	30	1,000 (est.)	36'	2 lanes	Both Sides		X	No Marking
Mary Circle/Candi Lane/Mary Lane (Commerce to Bluff Park Entrance)	30	500 to 800 (est.)	36'	2 lanes	Both Sides		X	No Marking



## Appendices



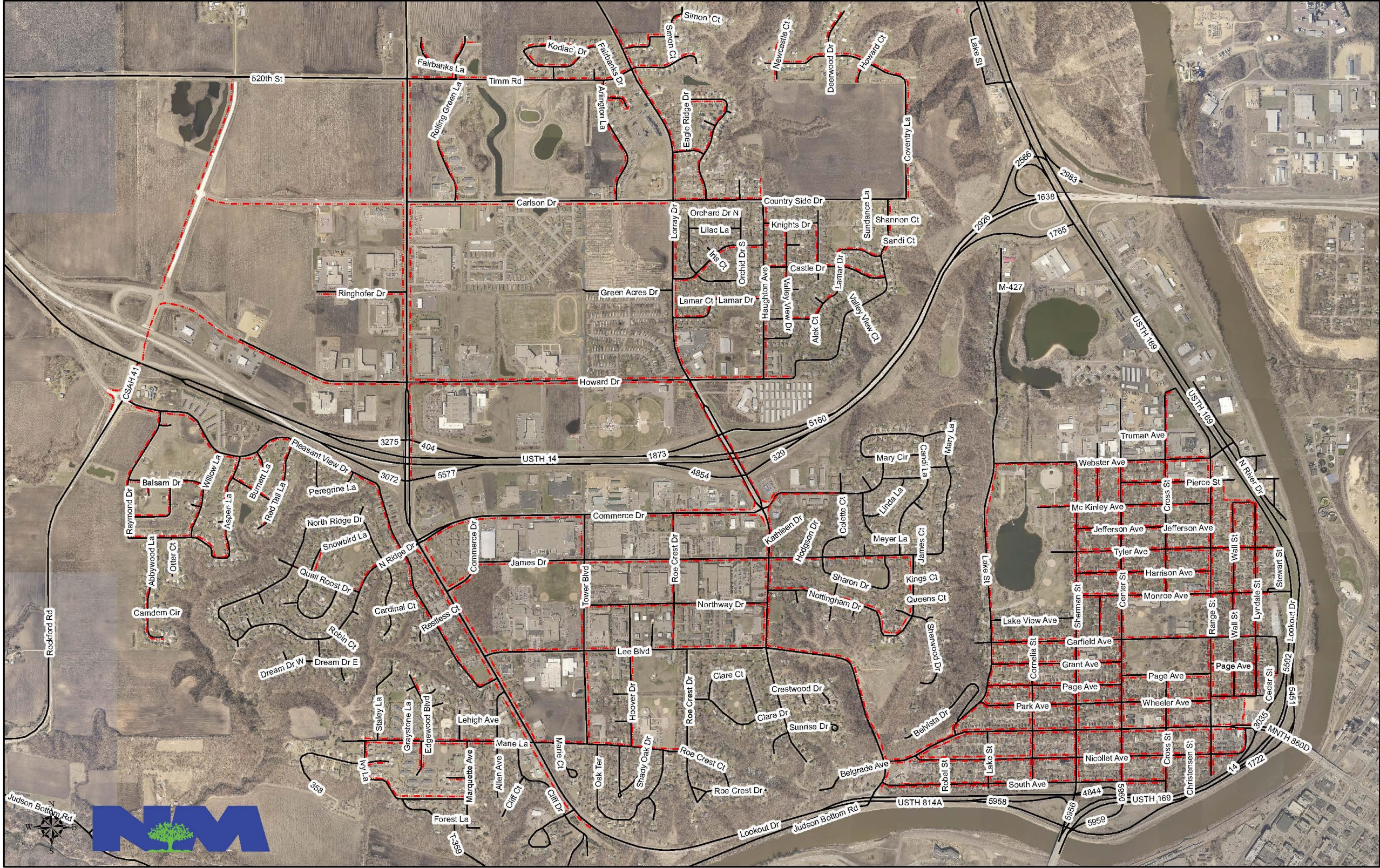
Existing and Proposed On-Street and Trail Facilities Map



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Existing Sidewalk Network Map





Future Sidewalk System Development Map

