SIOUX CITY BIKE FACILITY STUDY

JANUARY 2022, PREPARED BY:

RDG PLANNING ● DESIGN

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INTRODUCTION

The purpose of bike facilities

As people, we move by many different means. Obviously, by foot is the oldest form of transportation. Foot travel led to development of trails and paths to direct people and provide a generally unobstructed route. The invention of the automobile led to the creations of millions of miles of roads from gravel to paved concrete. Railroad and subways led to specific rail paths in the street and separate from the street. However, far fewer facilities are specifically for bicycle travel. While today's trails are wide enough for bike travel, they are typically shared with pedestrians. Not until relatively recently have bicycle specific facilities started to proliferate in some cities.

Bike facilities provide many benefits:

Increases the number of people who may use biking for transportation as well as recreation. Sioux City is improving is existing trails and close to a citywide trail loop. The existing trails are well use and have a significant transportation function. However, the overwhelming majority of users are recreational cyclists and pedestrians. A measurement of the success of this study will be significantly increasing the percentage of trips for a variety of purposes.

Improves bicycle access to key community destinations. An active transportation network should get people comfortably and safely to where they want to go. Therefore, Sioux City's system should be destination based, providing clear and direct connections to key community features.

Removes or improves barriers that discourage people from biking for transportation and recreation. Sioux City has a hilly topography which will discourage many people from commuting by bike. But other important barriers can be much more discouraging. These include railroad lines, major regional highways like Gordon Drive, and busy urban streets. Creating more comfortable routes is an important objective of this study.

Improves access to the city's trail system by providing connecting links from neighborhoods to trails. Sioux City's trails are the main lines of its bikeway system, and will continue to serve many of its bicycle trips. Good connections to these trails, and implementing cost effective extensions that improve service to major destinations and employment centers can create major benefits and help direct new development.

Use bicycling as part of an effort to make the Sioux City area healthier for the community, and for the individual. Trips made by bicycle promote health at two levels:

- Community health. On a social level, bicycling builds community by enhancing the quality of civic life, helping us interact with each other as people. Places that lead in bicycle transportation also tend to attract people because of their community quality.
- Individual health. This is a very important objective which promotes community health through better individual health. Incorporating physical activity into the normal routine of daily life for everyone from kids to seniors makes all of us healthier, reduces overweight and obesity rates, improves wellness, and lowers overall health care costs.

Capitalizes on the development benefits of a destination-based bicycle transportation system. Better active transportation facilities can have a significant and desirable effect on urban design and development patterns. Walkable and bikeable neighborhoods and projects are highly valued by a new generation of homeowners and investors.

Increases safety on the road for motorists, bicyclists, and pedestrians. Improved safety is a critical goal for any transportation improvement, and is fundamental to efforts to increase the number of people who bike in the region. Bicycle lanes have been shown to decrease the number of cars to bicycle crashes and this increase in safety for road users is due to several reasons. (https://ajph.aphapublications.org/doi/abs/10.2105/AJPH.2011.300319).

- First, bicycle lanes help reduce unsafe interactions between bicyclist and car drivers since both have a better understanding of where they should be moving on the roadway.
- Second, bicycle lanes increase the passing distance of cars from bicycles compared to roads without bicycle lanes. In one study, painted bicycle lanes increased "the distances of very close passes from 93 cm to 101 cm" and "Protected bicycle lanes are 10 time more effective than painted bicycle lanes" (Nolan, Sinclair, Savage https://www.sciencedirect.com/science/article/abs/pii/S0001457521002153).
- Third, bicycle lanes act as traffic calmer by helping narrow car lanes. Also, bicycle lanes visually narrow the road which help lower car speeds. Protected bicycle lanes further enhance the safety features mentioned above by providing a stronger differentiation of space, a harder narrowing of the lane then a painted line, and finally enhanced visually narrowing.

Physical safety improvements must also be supported by education, enforcement, and encouragement programs, and its effectiveness measured by evaluation.

Sioux City's on-going bicycle efforts

The community has shown support for several bicycle related efforts in the past and the City and SIMPCO lead active transportation planning on many levels. These actions include:

- Creating the Active Transportation Advisory Committee in 2017.
- Holding regular round tables.
- The initial effort to complete an Active Transportation Plan in 2015.
- The first on-street bike lanes installed on Leech Avenue in 2020.
- Significant increase in the miles of off-street trails in the last 10 years.

The purpose of a bike facility study

For Sioux City, a bike facility study is important to show the benefits of providing safe and comfortable bike routes across the city. A study helps leaders place priorities on different bike projects in the face of limited resources. The purpose follows the outline of each chapter:

1. Biking in Sioux City - How safe is biking in Sioux City and where are the conditions that would limit the usage of future bike facilities.
2. Priority Facilities for Sioux City - Which possible routes which are most conducive and feasible for bicycle travel the highest priority? Priority that is measured by destinations served, connections to existing facilities, topography, and affect on vehicular traffic.
3. Funding the System - What are the appropriate facilities on the priority routes and how much do they costs?
4. Implementing the System - How do we strategically phase in the new bicycle system over time giving the level of funding needed and ability to create connectivity between implementation phases.

The study provides the blueprint for Capital Improvement Plans and grant pursuits, but is not static in time. The study can, and should, change as local conditions change such as a new road reconstruction project or windfalls in funding sources.

CHAPTER 1:
BIKING IN SIOUX CITY TODAY

This chapter outlines the existing conditions in Sioux City pertinent to bicycling. These conditions include determinants of a future bikeway system such as destinations, existing facilities, and opportunities as well as a broader understanding as to how the region has developed and grown from land use and motor vehicle transportation aspects.

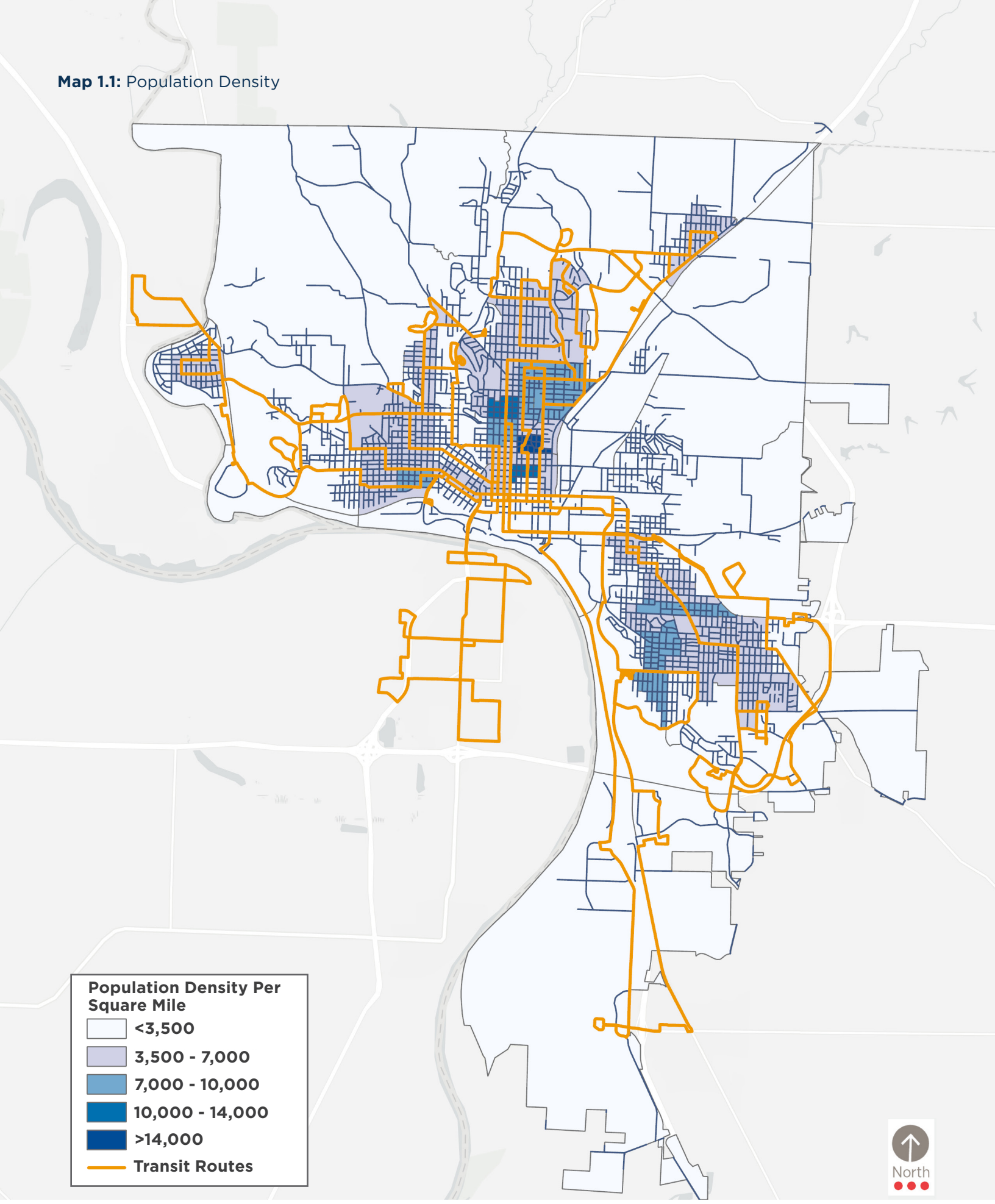
POPULATION DENSITY

Population density is correlated with higher demand for bicycling. Population density makes bicycling, walking, and using public transit easier to support by increasing the number of people and destinations in an area. Higher population density helps decrease the overall length of trips making bicycling a viable option for an increasing number of people.

Map 1.1 shows the population density of Sioux City at the Census block group level. The central core in downtown is not as densely populated but areas around downtown are. West of the railroad, south of 29th Street, and east of Summit Street are some of the most densely populated areas in Sioux City.

The map also shows the current transit system in the region. These are important routes to consider because they can extend the distance a commuter may consider biking by taking part of the trip by bus.

Map 1.1: Population Density

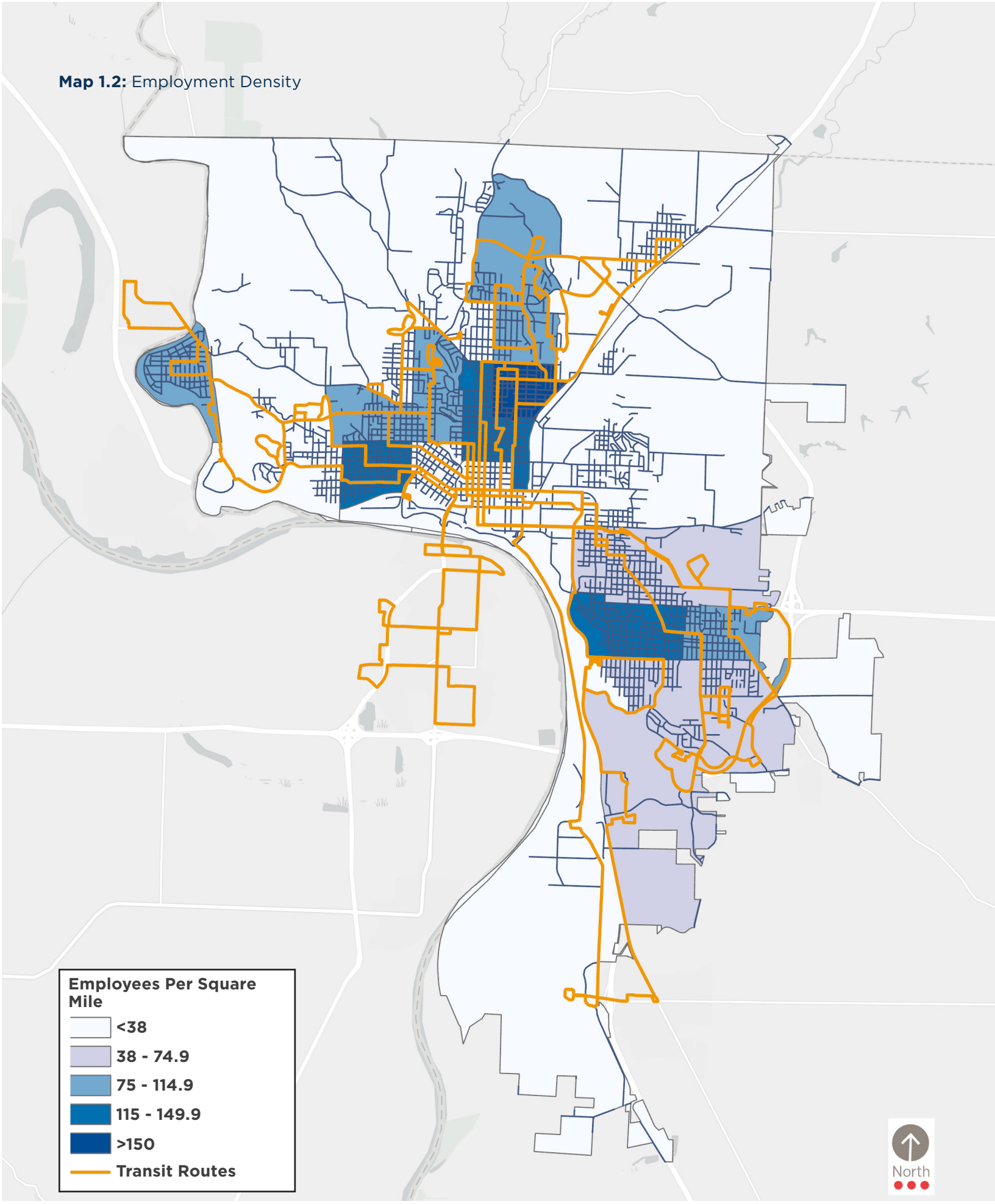


EMPLOYMENT DENSITY

Employment density, like population density, is also correlated with higher demand for bicycling. Higher employment density means an increasing number of jobs in an area that one could bicycling, walk, or use public transit easier to access. Also, the more concentrated businesses are the easier it is for one to cycle and link together multiple trips.

Map 1.2 shows the employment density in Sioux City at the Census block group level. The employment density level is more even across the city than population density. Employment centers are not concentrated in one part of the city. Therefore, there are several potential priority areas to connect by bicycle based on where people work.

Map 1.2: Employment Density



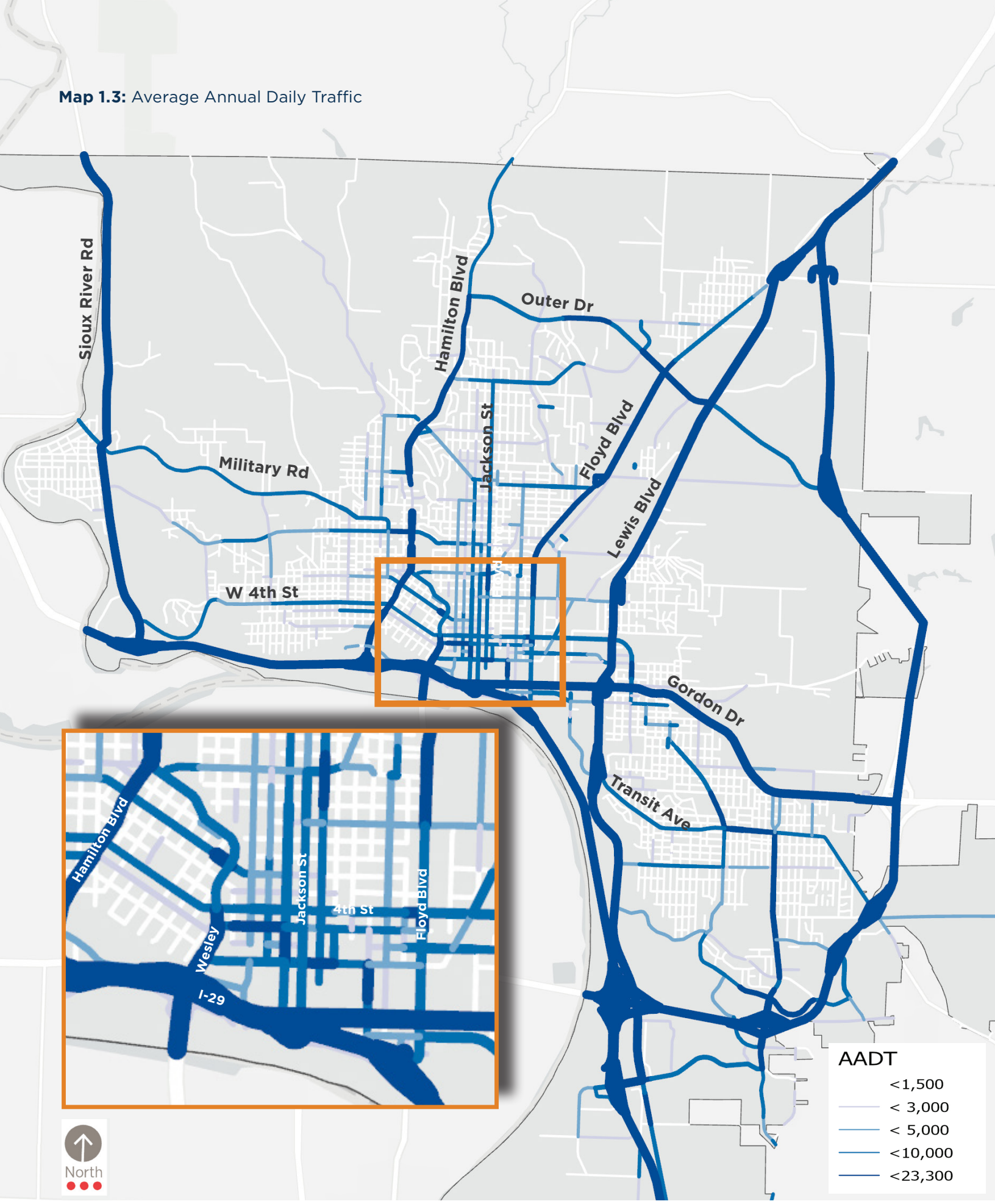
AVERAGE ANNUAL DAILY TRAFFIC

Average annual daily traffic (AADT) shows the volume of car traffic using roads. Traffic volumes are important to understand the type of bicycle treatment necessary for safe and comfortable travel, or which roads to avoid bicycle travel altogether.

Map 1.3 shows the AADT traffic on Sioux City streets. Most streets see below 1,500 vehicles per day, but the streets that allow easy cross town travel have more then 10,000 vehicles per day.

- 0 to 1,500 vpd. Comfortable for most cyclists without extensive infrastructure.
- 1,500-3,000 vpd. May be uncomfortable for inexperienced cyclists. Shared lane markings and conventional bike lanes as volumes approach 3,000 vpd may be required for greater comfort.
- 3,000-5,000 vpd. The typical threshold for conventional bike lanes. Requires well-defined crosswalks, caution signs, and possible traffic controls at key crossings.
- 5,000-10,000 vpd. Requires substantial experience and comfort with shared traffic from cyclists. Conventional bike lanes are typically recommended with protected bike lanes at higher levels. Traffic controls and refuge medians at key crossings are highly desirable.
- Over 10,000 vpd. Protected bike lanes, enhanced sidepaths, or use of alternative routes for cyclists. Traffic controls and refuge medians at key crossings are highly desirable.

Map 1.3: Average Annual Daily Traffic



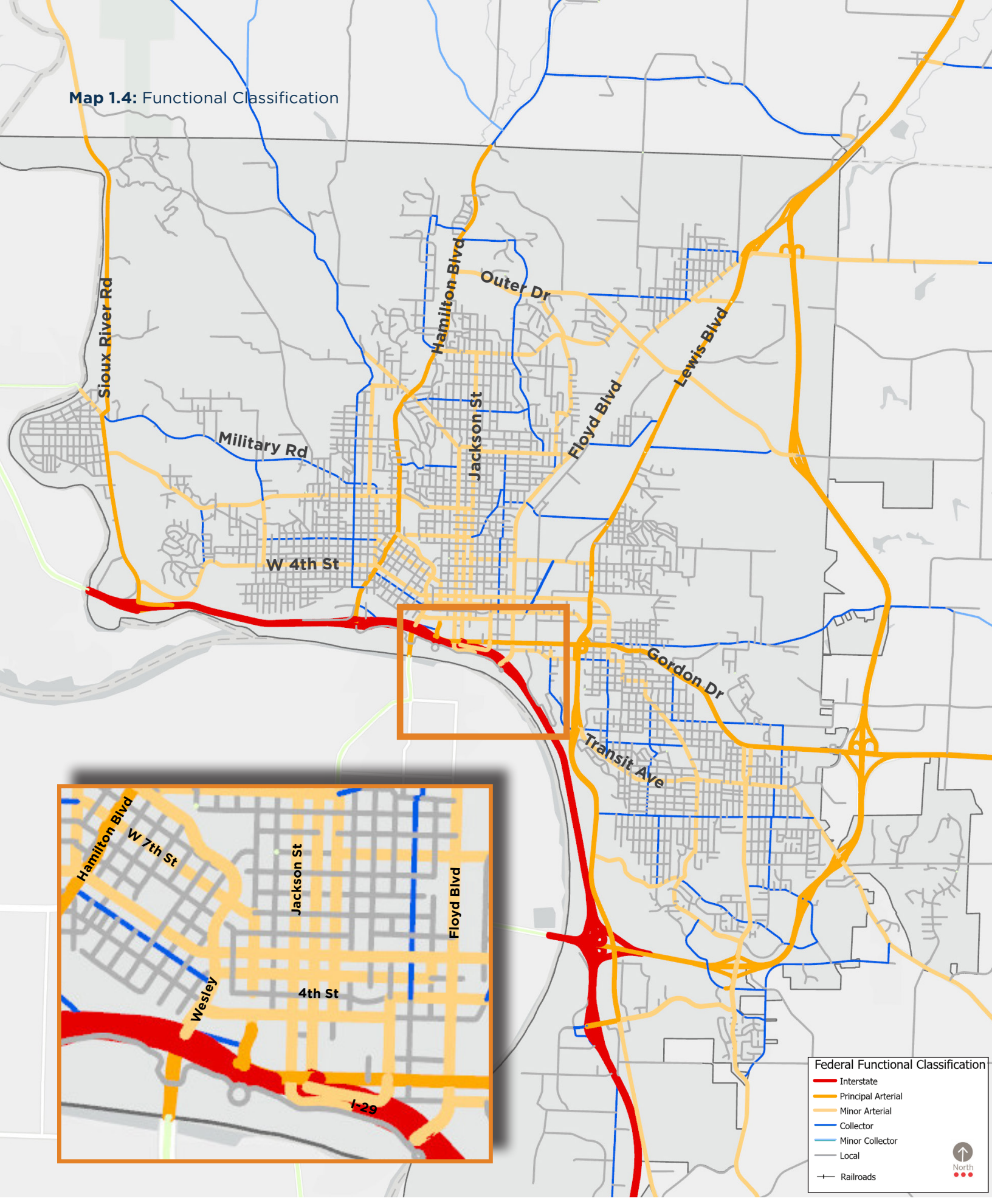
FUNCTIONAL CLASSIFICATION

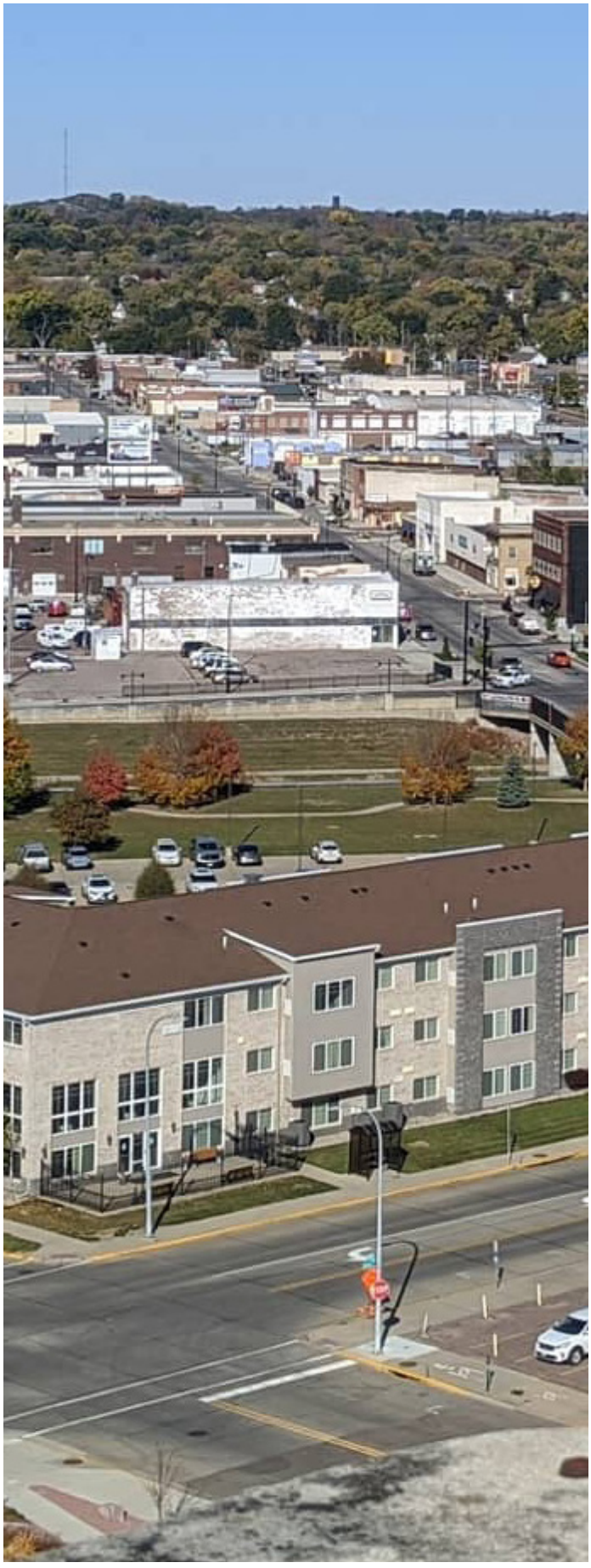
Functional classification is used to show the purpose of a street. Local streets are used mainly by residents. Arterial and collector streets are used to move across the city. Many of the arterial streets that allow for access to jobs and shopping opportunities have high daily traffic counts and are unsafe for bicyclist without bicycle specific infrastructure being put in place.

Also, many major streets are also barriers for cyclists to cross. Lewis Boulevard/Old Hwy 75 is an example of a road many would say is difficult to cross as a pedestrian or bicyclist.

Another important aspect of the transportation system are railroads. Railroad lines split Sioux City north and south. Railroads are barriers to cross, especially with the regularly active lines in Sioux City. However, railroads can also provide opportunities to use extra right-of-way for bike trails where space allows and the railroad company agrees (although not an easy task).

Map 1.4: Functional Classification





LAND USE

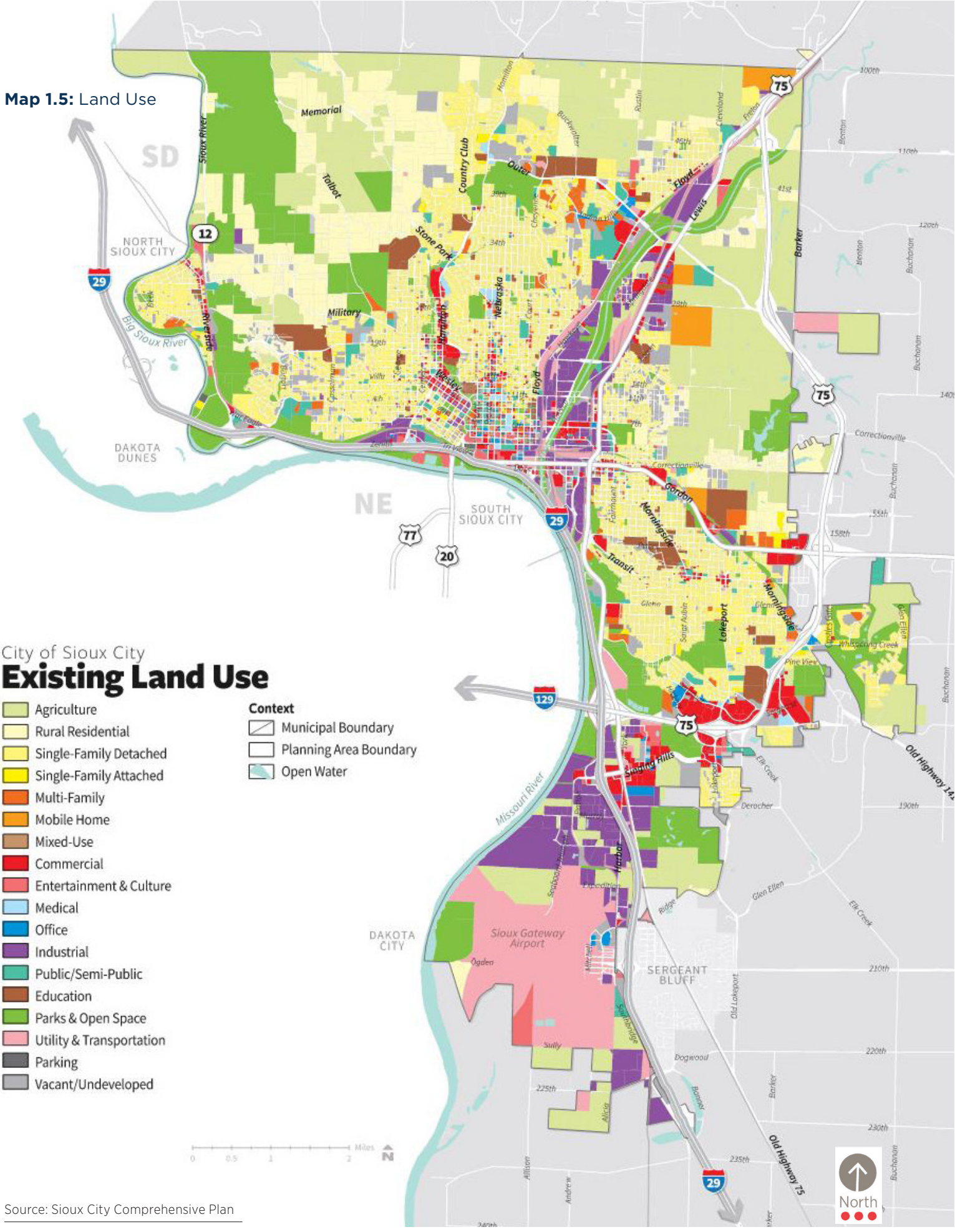
Land use patterns help determine the structure of a bicycle network. The more overlap and connections between residential and commercial land uses, the more opportunities for short bicycle rides for employment, shopping, or entertainment. Towards the center of town this mixing of various land uses is more apparent. Increasing the mix of land uses helps promote an environment nurturing to cyclist and pedestrians.

Key neighborhoods and future growth areas to consider include:

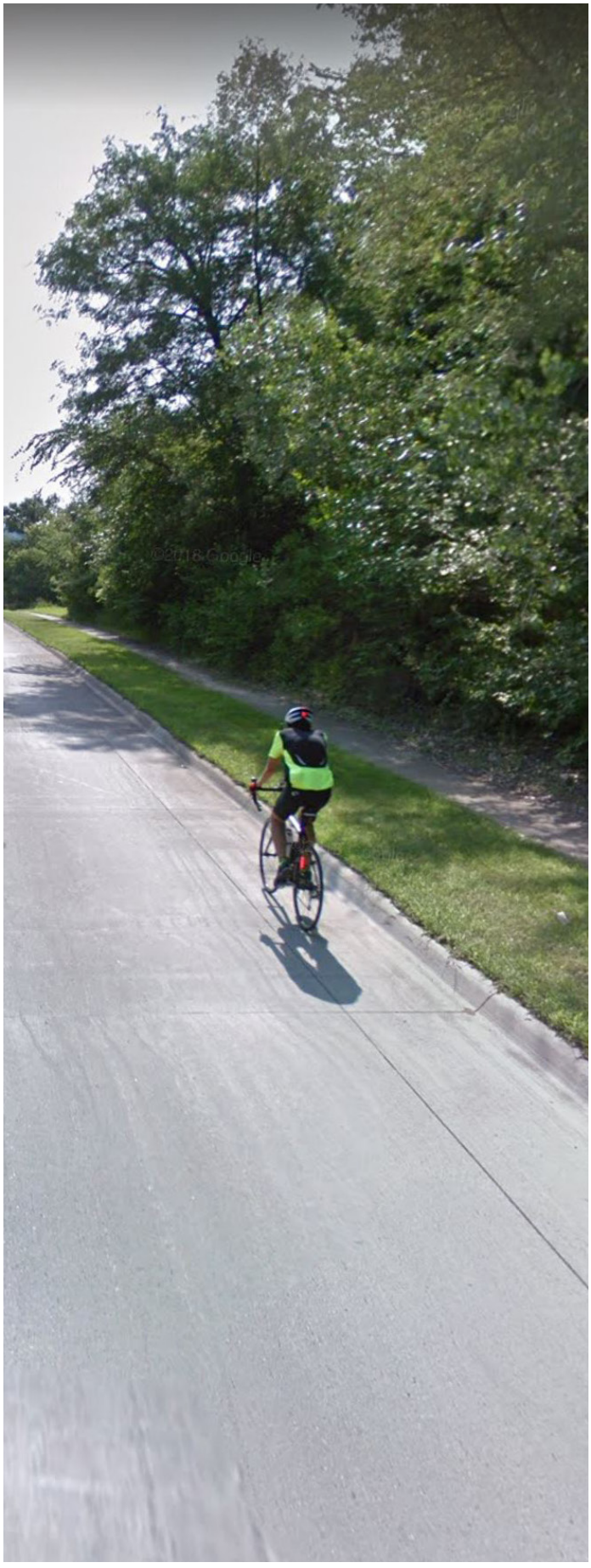
- Sunnybrook Drive near and around Christy Road.
- Whispering Creek Golf Course and Glen Ellen Road subdivisions.
- Downtown.
- More dense neighborhood that typically have lower incomes:
  - › W 4th Street area
  - › Areas just north of downtown
  - › Riverside
- Sergeant Bluff, South Sioux City, and Dakota Dunes.

The City's future land use map indicates growth and land use areas to guide policy decisions and will inevitably guide future walking and bicycling improvements.

Map 1.5: Land Use



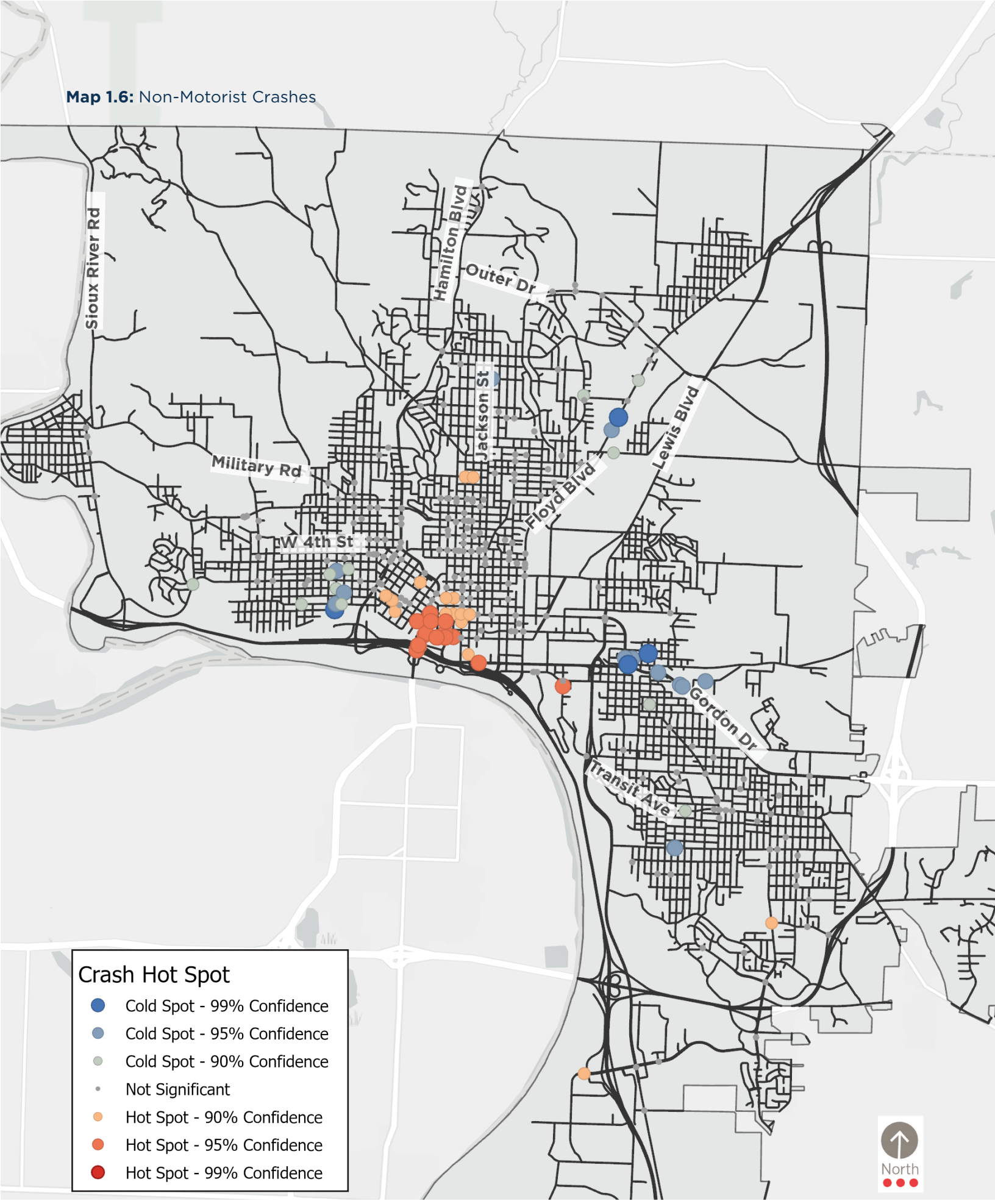
Source: Sioux City Comprehensive Plan



NON-MOTORIST CRASHES

Incidence of bicycle crashes pinpoint specific problems that system planning must strive to address. Map 1.6 shows a hot spot analysis using 2021 crash data. The data shows an area of high non-motorist crashes near the downtown area, much like the 2015 Active Transportation Plan. Within downtown, many of these crash incidences occurred at Hamilton Boulevard and Wesley Parkway - areas where there are various trail access points and the only access to South Sioux City.

Map 1.6: Non-Motorist Crashes



CURRENT TRAILS, PARKS, AND SCHOOLS

Parks and trails are among the most important destinations for a bicycling network. Trails themselves serve as both destinations and a means of reaching community assets like parks and recreation spaces.

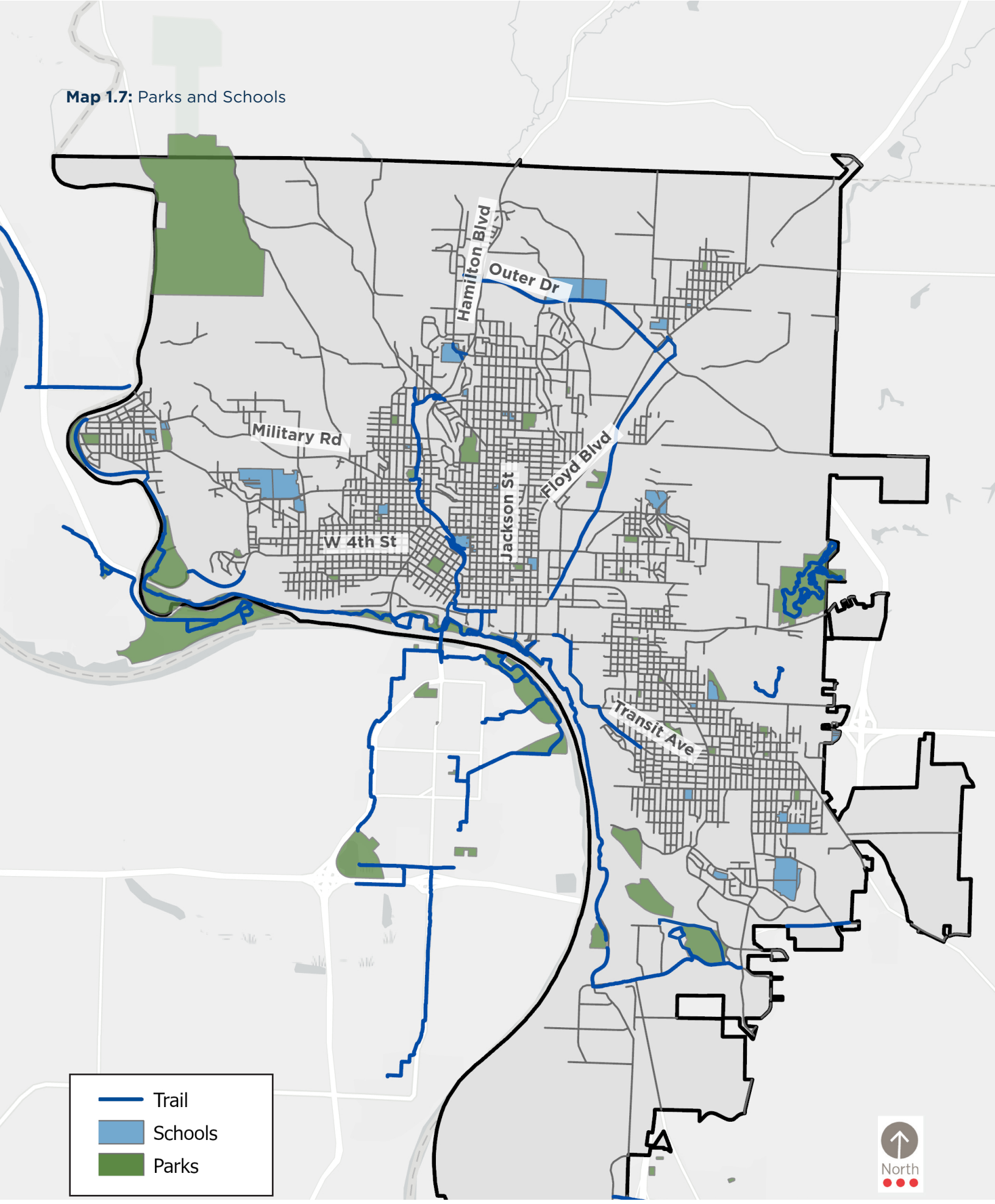
Schools are also primary destinations for the bicycling network, with elementary and middle school students being especially important to consider. High school students, many of whom drive to school, also present a possible growth market if access to sidewalks and trails are developed to create safer and more efficient connections to the school.

Map 1.7 illustrates the distribution of parks. Ideally, all parks in the community should be served by the walking network. Of the major community parks, most are served by trails or planned to be in the future. Smaller neighborhood level parks are typically served by sidewalks and local streets, but not by trails. Additionally, most school sites have good sidewalk access but not all by trails, particularly around East High School.

Significant park and school areas without adjacent trail connections include:

- Stone State Park
- Grandview Park
- Bacon Creek Park
- East High School
- West High School
- Morningside University

Map 1.7: Parks and Schools



DESIGN AND REGULATIONS FOR BIKING

Zoning and subdivision ordinances can directly reduce the ability to create bike routes. Indirectly, ordinances can have regulations, or lack of regulations, that create environments not conducive for active transportation. Examples include:

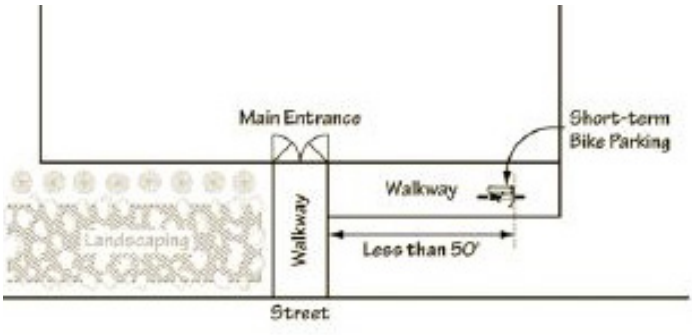
- Wording and overly restrictive statements.
- Direct standards for active transportation are not in place.
- Regulations that are subjective and unspecific on active transportation accommodations. This leaves room for variation and “exceptions” to pass.

Whereas good examples include:

- Medium-to-high densities wherever appropriate.
- Fine-grained mix of land uses.
- Short-to medium-length blocks.
- Street-oriented buildings.
- Parking requirements that reflect actual demand, typically reducing the space committed to auto parking and require bicycle parking.
- Require street design to be connected to create street network that supports walking, bicycling and transit.
- Provide for safe street crossing at locations where there are needs to cross, such as bus stops, schools, parks, and other major destinations.
- Incorporate bicycle facilities into street and building design to provide for access and parking that is convenient and accessible.
    - › This is especially true in business and school zones where the current ordinance does not allow riding “upon a sidewalk within a business zone or a school zone.” (10.52.050)

The zoning and subdivision ordinances are fairly recent and incorporate many of these provisions. The Active Transportation Advisory Committee also monitors codes for improvements to pedestrian and bicycle safety and comfort. One immediate consideration for Sioux City is to allow electric bicycles to operate on streets (10.54.050). The way this section currently reads, electrified bicycles must use sidewalks, but cannot use streets or sidewalks in businesses zones. E-bikes are common and safe, and open up bicycle transportation to many more potential users including people with disabilities, especially with the topography in Sioux City.

Excerpts from the Sioux City Zoning Ordinance



CHAPTER 2:
PRIORITY FACILITIES FOR SIOUX CITY

INTRODUCTION

This chapter presents the performance criteria and framework of Sioux City's proposed bicycle network. These principles, derived from the analysis of existing conditions and opportunities and the community survey generate the overall system concept. The chapter describes the framework of the system and its individual components.

SUMMARY OF PRIMARY ROUTES

Figure 2.1 on the following pages shows the routes proposed as the main arteries of bicycle travel in Sioux City. These routes represent lines of travel that achieve the highest level of connectivity, access to destinations, and feasibility for on-street bike systems. With a local stakeholder group, the routes reflect an analysis based on several guiding principles:

- Integrity. The ability of a system to link starting points continuously to destinations, and to be easily and clearly understood by users.
- Directness. The capacity to provide direct routes with minimum misdirection or unnecessary distance.
- Safety. The ability to minimize hazards and improve safety for users of all transportation modes.
- Comfort. Consistency with the capacities of users and avoidance of mental or physical stress.
- Experience. The quality of offering users a pleasant and positive experience.
- Feasibility. The ability to maximize benefits and minimize costs, including financial cost, inconvenience, and potential political opposition.

Note, there are other routes in Sioux City that warrant on-street bicycle travel. These generally follow the existing on-street bike route signage. However, the priority routes in this section are those of heavier traffic that can be improved with bicycle facilities.

Network Attributes

The Sioux City network design follows the following major attributes:

Tailored to User Groups. These groups include:

- Recreational users, including people traveling to parks and recreational features, especially the trail system, from their homes. It is important to understand that travel to recreational destinations are in fact transportation trips that substitute for trips by car.
- Students walking or biking to school.
- Residents who are actively interested in walking or biking for transportation, but are discouraged by barriers, including major streets, highways, and railroad crossings.
- Workers at major industries who may find bicycle transportation or walking to be an attractive and affordable transportation option.

Destination-Based. The network should direct people of all ages to destinations, whether they are parks, trails, schools, business districts, or downtown. The proposed network is more than a map of streets and trails. It is in fact part of a transportation system that takes people to specific places.

Incremental Integrity. The ability of the network to provide a system of value at each step of completion – is an important attribute. The first step in completion should be valuable and increase bicycle access even if nothing else is done. Each subsequent phase of completion follows the same principle of leaving something of clear value and integrity, even if no further phases were developed.

Evolution. As part of the concept of incremental integrity, the system is designed to evolve and improve over time. For example, a relatively low-cost project or design element can establish a pattern of use that supports something better in the future.

Conflict Avoidance. Few important actions are completely without controversy, but successful development of a bicycle transportation system can and should avoid unnecessary controversy. On most streets, shared streets and signage can provide satisfactory facilities that focus on the positive and minimize divisive conflicts. Projects should demonstrate the multiple benefits of street adaptations. For example, bikeway design can slow motorists and keep unwanted through traffic out of neighborhoods, benefiting both cyclists and neighbors.

Use of Existing Facilities. Great existing features are integral to the active transportation system.

Fill Gaps. In some cases, the most important parts of a network involve small projects that make connections rather than long distance components. Often, these short links knit longer street or trail segments together into longer routes or provide access to important destinations. These gaps may include a short trail segment that connects two continuous streets together, or an intersection improvement that bridges a barrier. The development of the overall network is strategic,using manageable initiatives to create a comprehensive system.

Routes of Least Resistance. The Survey showed that much of the city's potential urban cycling market prefers quiet streets or corridors with some separation from motor traffic. It is not necessary to try to force bicycle access on major streets when more comfortable, lower cost options exist. For example, bicycle boulevards – lower volume streets that parallel major arterials – satisfy the comfort principle successfully. However, some important destinations, including major employers and shopping facilities are served by major arterials. Here, complete street guidelines should include bicycle and pedestrian accommodations in new major street projects. Signage systems can also be instrumental in guiding users efficiently to their destinations using comfortable routes made up of different street segments.

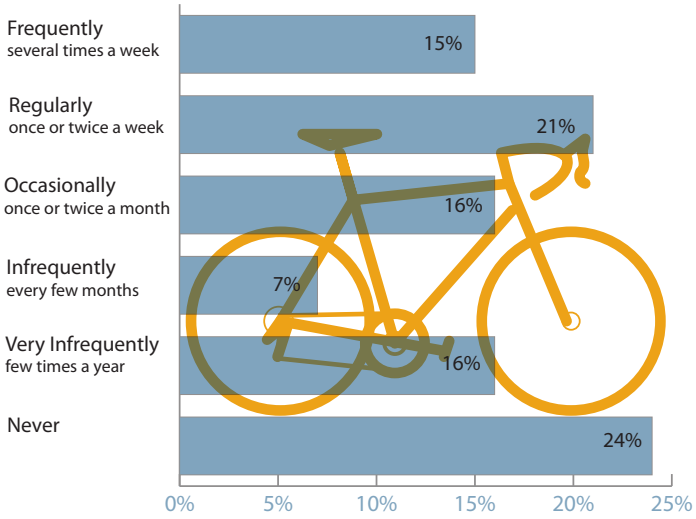
Barriers. In many cases, reducing the dividing impact of barriers such as major highways and streets, can be the most effective way of improving connectivity.

Regional Connectivity. Sioux City's trail network already is starting to extend into the surrounding region.

WHAT SURVEY RESPONDENTS DESIRE

The 320 respondents to the survey describe themselves as bicyclists that are interested in bicycling and use low-traffic streets but are concerned about the safety of riding in mixed automobile traffic. More trails, bike lanes, and routes would increase the number of trips that they make by bicycle. Very few survey respondents consider themselves a committed bicyclist who would ride on every street.

How often to do you ride a BICYCLE for enjoyment or travel to destinations?



If you ride a BIKE, which of the following describes why you use it?

Regular exercise or workout

Trips to parks or recreational facilities

Bicycle touring

Good bicycle access is most important to:

Trails

City Parks

Schools

Respondents rated the effectiveness of each improvement below that would increase the number of trips Sioux City residents make by bicycle.

Very Effective or Effective

OVER 70% OF RESPONDENTS

More trail development.

Widened sidewalks or paths along major streets.

50% - 70% OF RESPONDENTS

A system of designated on-street bicycle routes that lead to important destinations.

Better project design that encourages bicycle access.

Wayfinding and directional signs.

Better pavement markings at intersections.

LESS THAN 50% OF RESPONDENTS

More bicycle parking in strategic locations.

Posting “Bicyclists May Use Full Lane” Signs.

Better motorist education programs.

Enforcement of laws that protect vulnerable road users, such as minimum passing distance laws.

Improved bicycle safety and education activities.

More special events, such as benefit rides.

Bike-sharing program.

Showers and changing facilities at workplaces.

More information about bicycling clubs, events, programs.

How comfortable respondents are using these routes, or other similar streets or paths

Uncomfortable with this street, but might use it for very short distances.

TWO LANE STREET WITH PARKING

Comfortable using this street myself, but do not advise it for inexperienced cyclists or younger riders.

BICYCLE BOULEVARDS

TWO LANE BUSINESS STREET WITH PARKING (PARALLEL OR DIAGONAL)

TWO LANE STREET WITHOUT PARKING

A comfortable cycling route for most users.

BIKE LANE WITH SIDEPATH

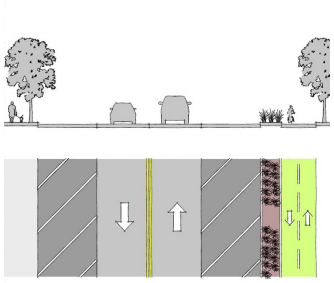
FOUR LANE STREET WITH BIKE LANES

TWO LANE STREET WITH OR WITHOUT PARKING, BIKE LANES

THREE LANE STREET WITH OR WITHOUT PARKING, BIKE LANES

A very safe route that can be used by all people (including families and children) with little hesitation.

CYCLE TRACK



PROTECTED BIKE LANE WITH BARRIERS

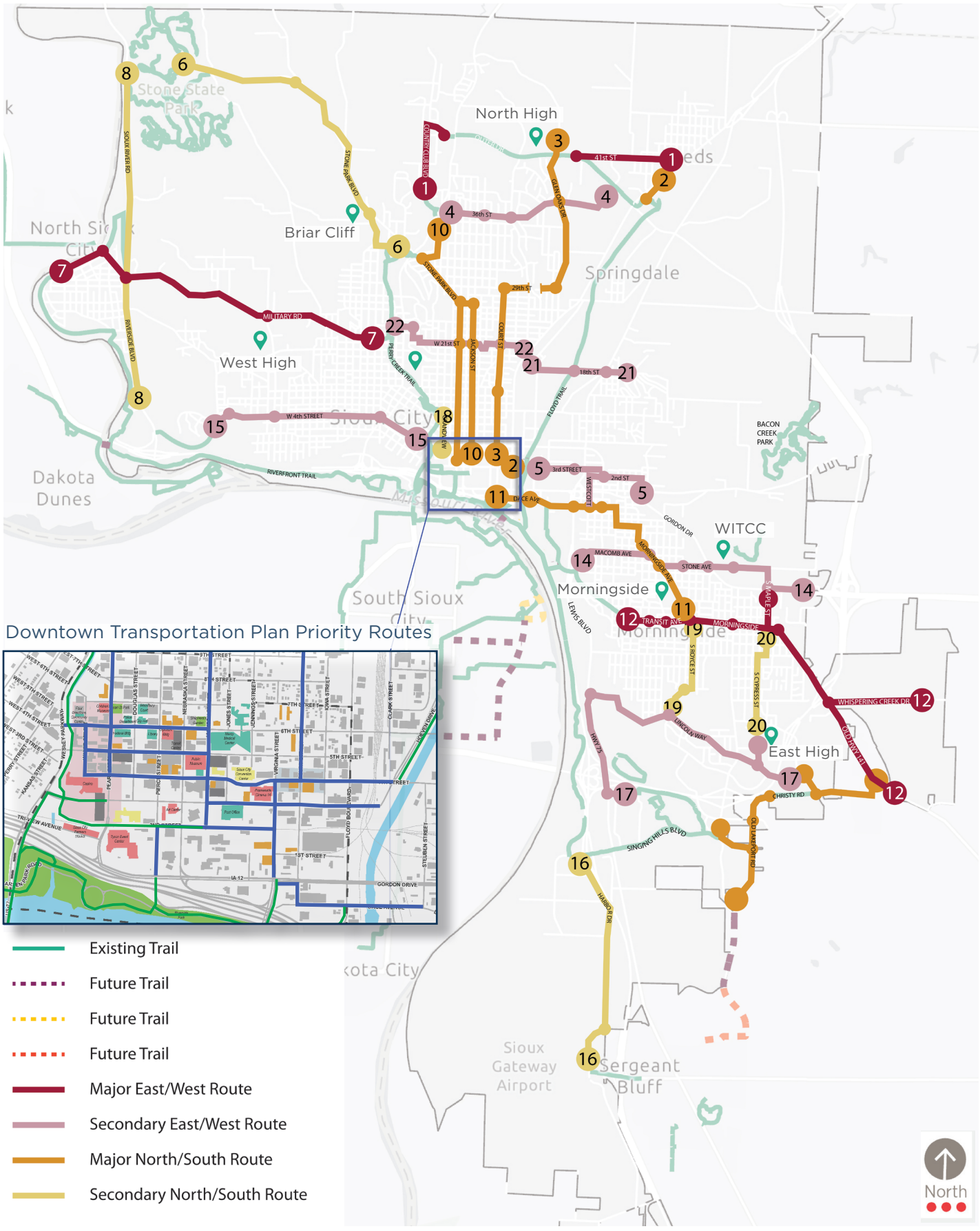
NETWORK ROUTES

Map 2.1 shows the routes proposed as the main arteries of bicycle travel in Sioux City. These routes represent lines of travel that achieve the highest level of connectivity, access to destinations, and feasibility for on-street bike systems. Note, the inset for downtown represents the bicycle recommendation in the Downtown Transportation Plan and are illustrated where appropriate.

Figure 2.1: Priority Bike Network Routes

ID	ROUTE NAME	ENDPOINTS	DESTINATIONS
1	Outer Drive	Tyler St/Floyd Blvd to Country Club Blvd/Perry Creek Elementary	Perry Creek Elementary/North High, Middle/Leeds commercial/Leeds Elementary
2	Floyd River Corridor	Central St/Floyd Blvd to Historic 4th	Downtown/Leeds commercial/Northern Valley Crossing
3	Court/Glen Oaks	Buckwalter Dr/Outer Dr to Historic 4th	Downtown/Mid City Park/Irving Elementary/Leif Erikson Park/Glen Oaks, Indian Hills apartments/North High, Middle
4	36th Street	Outer Dr/Indian Hills to Hamilton Blvd	Outer Dr Trail/Indian Hills services/Perry Creek Elementary
5	East/West Connector 1	4th St/Floyd River Trail to S Logan/Correctionville Rd	Gordon Dr Shopping Center/Downtown
6	Stone Park	Stone Park Blvd/Woodland Way to Stone State Park	Perry Creek Trail head/Briar Cliff University/Stone State Park
7	Military Road	Center Street Park to Dacotah St/River Dr (Riverside Trail)	Center Street Park/West High/Military Rd commercial/River Trail head
8	Sioux River Road	Stone State Park to Riverside Park	Stone State Park/Sioux City Railroad Museum/Military Road commercial/Riverside Elementary/Kirk Hansen Park/Riverside Park
9	Downtown	Downtown Transportation Plan	Many
10	Jackson Street	6th St/Jackson St to Perry Creek Elementary	Downtown/Siouxland District Health/St. Luke's/Grandview Park/Perry Creek Trail/Perry Creek Elementary
11	East/West Connector 2	Dace Ave/Virgina St to Morningside Ave	Chris Larsen Park/Siouxland Expo Center/Fairmount Park/Morningside University/Library - Morningside Branch/Morningside commercial
12	Morningside	Transit Ave/S Cecelia to Whispering Creek Dr/Glen Ellen Rd	Morningside Ave commercial/Library - Morningside Branch/Latham Park
13	Christy Rd	Portland Blvd/Old Hwy 141 to Lakeport Rd/S Lakeport St (Future Sergeant Bluff connector)	Sunnybrook commercial/Future Sergeant Bluff connector
14	North Morningside	Pulaski Park to Gordon Dr/158th St	Pulaski Park/Macomb Park/Spalding Park Elementary/WITCC/Gordon Dr commercial
15	W 4th Street	W 4th St/Wesley Pkwy to War Eagle Park	Perry Creek Trail/Cook Park/War Eagle Park
16	Southbridge	Singing Hills Blvd/Harbor Dr to Discovery Blvd/Aviation Blvd	Southbridge employment area/185th Air Wing
17	Lincoln Way	Sunnybrook Dr/Sergeant Rd to Sioux City Explorers Stadium	Sergeant Rd commercial/Nodland Elementary/East High/South Ravine Park/Prairie Park/Cone Park
18	Pearl	4th St/Pearl St to 11th St/Grandview	Historic Pearl Street/Launchpad/Boys and Girls Club/Heelen High/Perry Creek Trail
19	Morningside North/South	Morningside Ave/S Royce St to Sergeant Rd/Lincoln Way	Morningside Ave commercial
20	S Cypress Street	East High School to Morningside Ave	East High/East Middle/Sunnyside Elementary/Emerson Park
21	18th Street	Floyd Blvd to Unity Elementary	Unity Elementary School/Kelly Park/Floyd River Trail
22	W 21st/21st Street	Perry Creek Trail to Floyd Blvd	Perry Creek Trail/Center Street Park/Pierce Commercial/Spalding Park

Map 2.1: Priority Bike Network Routes



Downtown Transportation Plan Priority Routes

Existing Trail

Future Trail

Future Trail

Future Trail

Major East/West Route

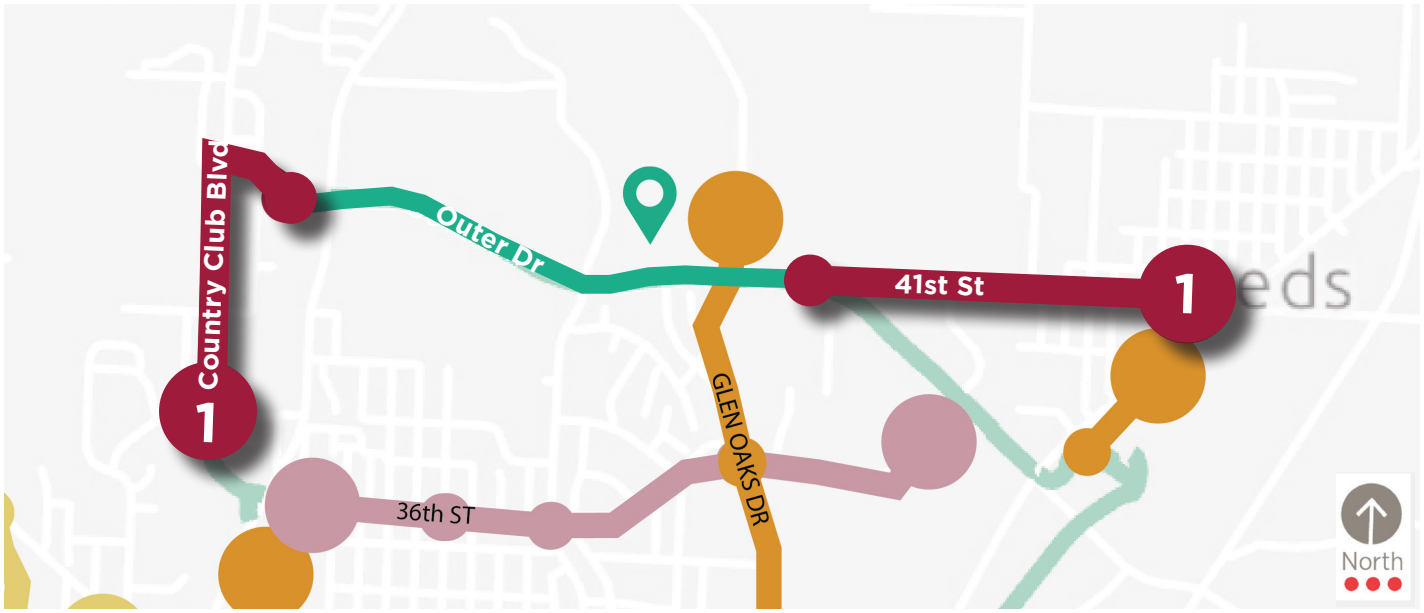
Secondary East/West Route

Major North/South Route

Secondary North/South Route

1. Outer Drive

The Outer Drive route is a primary east/west route on the northern end of Sioux City. The main function is to spur off the Outer Drive Trail to Perry Creek Elementary and Leeds. The route runs on Country Club Blvd. and uses the pedestrian bridge, crossing Hamilton Blvd. to the Outer Drive Trail. The route continues off the trail at 41st St. leading into Leeds.



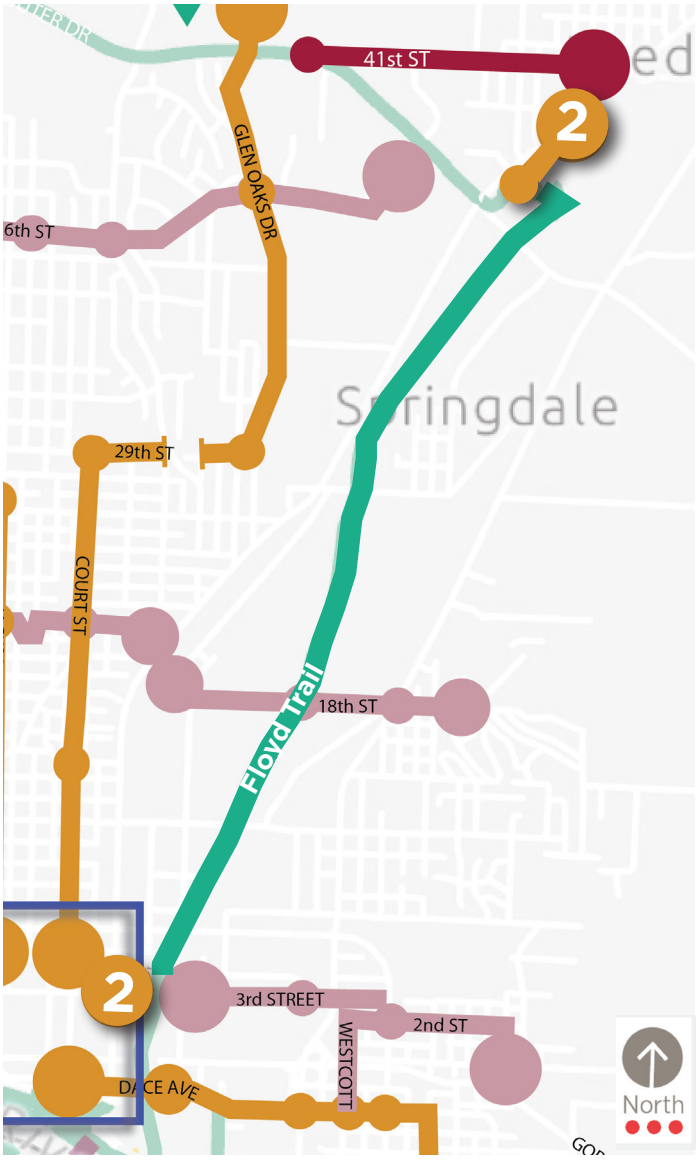
Metrics

ID	ROUTE NAME	ENDPOINTS	DESTINATIONS	BARRIERS
1	Outer Drive	Tyler St/Floyd Blvd to Country Club Blvd/Perry Creek Elementary	Perry Creek Elementary/ North High, Middle/ Leeds commercial/ Leeds Elementary	• Few significant barriers

Existing Trail
Future Trail
Future Trail
Future Trail
Major East/West Route
Secondary East/West Route
Major North/South Route
Secondary North/South Route

2. Floyd River Corridor

The Floyd River Corridor is greatly served by the Floyd River Trail. Several connections to the trail were made in recent years. This route extends the trail from the pedestrian bridge at Jefferson St. northeast along the railroad to connect at Central St. To the southwest, the route follows the trail to its terminus at 4th St., then connecting south on Hoeven Dr. and 3rd St. to reach the Historic 4th Street District.



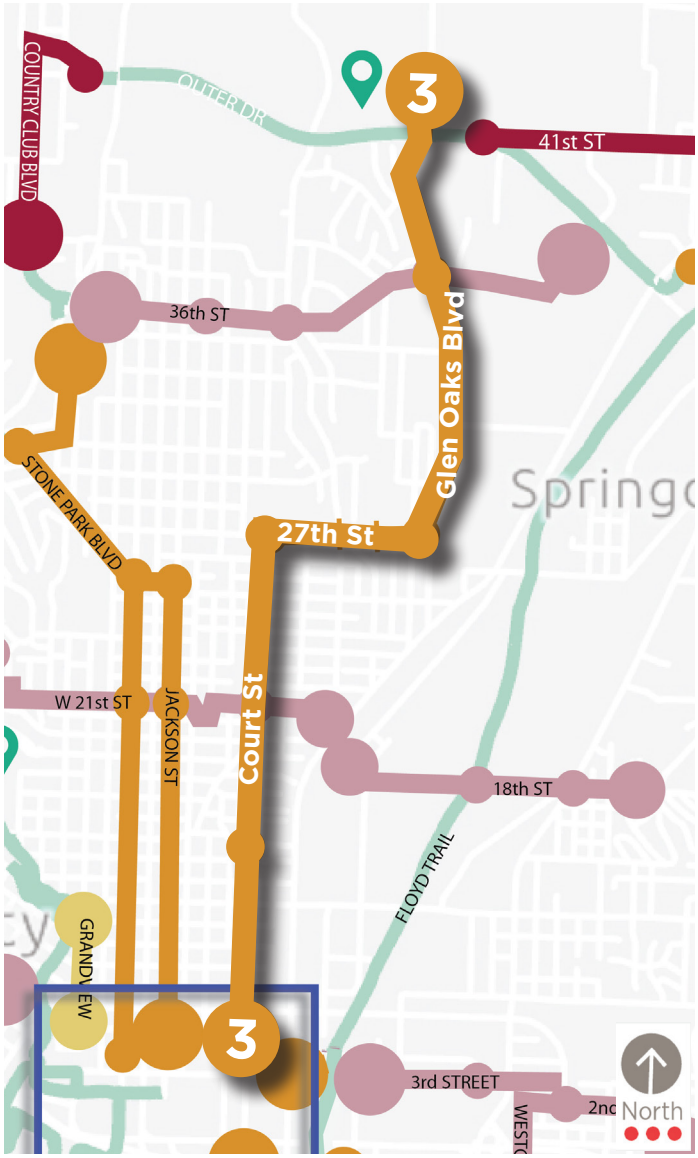
- Existing Trail
- Future Trail
- Future Trail
- Future Trail
- Major East/West Route
- Secondary East/West Route
- Major North/South Route
- Secondary North/South Route

Metrics

ID	ROUTE NAME	ENDPOINTS	DESTINATIONS	BARRIERS
2	Floyd River Corridor	Central St/Floyd Blvd to Historic 4th	Downtown/Leeds commercial/ Northern Valley Crossing	• Property acquisition for trail extensions

3. Court Street/Glen Oaks Boulevard

To achieve north/south access in the central core of the city, this route follows continuous streets that are either significantly wide or lower volume. Starting downtown, the route travels north along Court St. to 27th St. With a short trip along 27th St. the route then continues north on Glen Oaks Blvd. A widening of the sidewalk on the south side of Outer Dr. would connect Glen Oaks to the crossing at Buckwalter Dr.



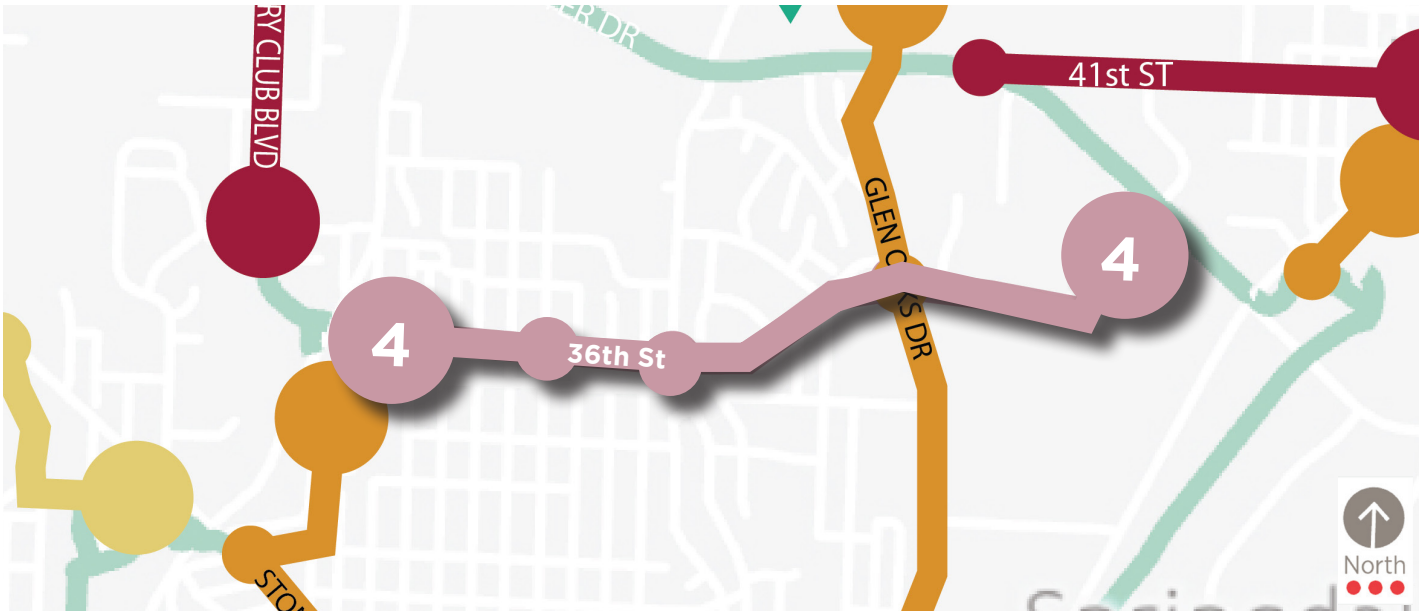
- Existing Trail
- Future Trail
- Future Trail
- Future Trail
- Major East/West Route
- Secondary East/West Route
- Major North/South Route
- Secondary North/South Route

Metrics

ID	ROUTE NAME	ENDPOINTS	DESTINATIONS	BARRIERS
3	Court/ Glen Oaks	Buckwalter Dr/ Outer Dr to Historic 4th	Downtown/Mid City Park/ Irving Elementary/Leif Erikson Park/ Glen Oaks, Indian Hills apartments/North High, Middle	• Narrow street width at times • High traffic on 27th St • No trail on south of Outer Dr

4. 36th Street

The north central neighborhoods are served by a minor east/west route along 36th St. On the west, the route starts at Hamilton Blvd. and goes on 36th St. continuing on Indian Hills Dr. The route connects on the east at the Outer Drive Trail at the Indian Hills Dr. intersection.



Metrics

ID	ROUTE NAME	ENDPOINTS	DESTINATIONS	BARRIERS
4	36th Street	Outer Dr/Indian Hills to Hamilton Blvd	Outer Dr Trail/Indian Hills services/ Perry Creek Elementary	Few significant barriers

Existing Trail
Future Trail
Future Trail
Future Trail
Major East/West Route
Secondary East/West Route
Major North/South Route
Secondary North/South Route

5. East/West Connector - 4th Street

The city network needs several options to navigate east and west across the Floyd River channel and railroad tracks. This route option connects the Floyd River Trail at 4th St. east across the Floyd River. A slight jog south on Steuben St. connects the route to follow 3rd St, a lower volume and more comfortable street. The route continues on 3rd St to cross Lewis Blvd. at Fairmount St., crossing at 2nd St. to hit Logan St. and connect to the Gordon Plaza shopping center.

Metrics

ID	ROUTE NAME	ENDPOINTS	DESTINATIONS	BARRIERS
5	East/West Connector	4th St/Floyd River Trail to S Logan/ Correctionville Rd	Gordon Plaza Shopping Center/Downtown	Few significant barriers

Existing Trail
Future Trail
Future Trail
Future Trail
Major East/West Route
Secondary East/West Route
Major North/South Route
Secondary North/South Route

6. Stone Park

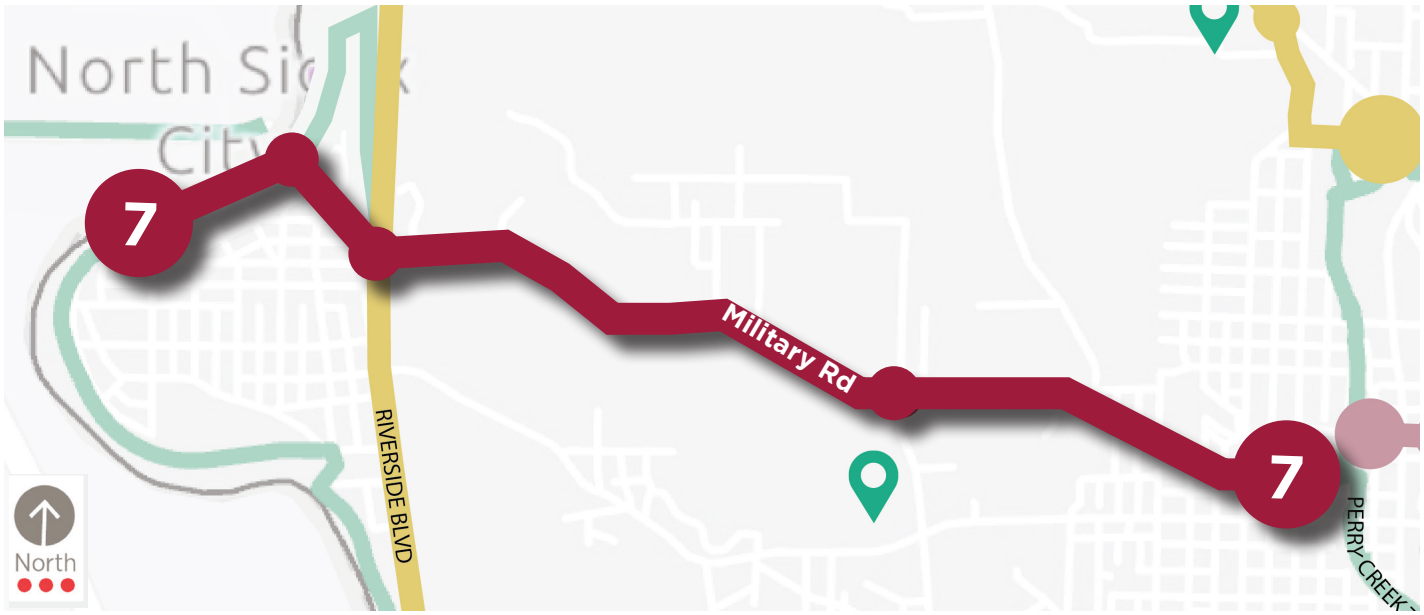
Reaching Stone State Park by bike is mostly for experienced recreational cyclist because of the hilly terrain. However, this route is already well traveled by cyclists. The route connects at the Perry Creek Trail trail head at Woodland Way going on W. Clifton and Broken Kettle Rd. to meet up with Stone Park Blvd. The route continues on Stone Park Blvd. then to Memorial Dr. to reach the State Park.

Metrics

ID	ROUTE NAME	ENDPOINTS	DESTINATIONS	BARRIERS
6	Stone Park	Stone Park Blvd/ Woodland Way to Stone State Park	Perry Creek Trail head/Briar Cliff University/Stone State Park	• Terrain • Stone Park Blvd and Broken Kettle intersection

7. Military Road

Military Road is recommended as the primary east/west connection from the central Sioux City to Riverside. Coming off the Perry Creek Trail at Center Street Park, the route goes on W 21st St. and Military Rd. to the bridge at the Big Sioux River. An on-street extension along River Dr. connects to the Riverfront Trail at Dacotah Ave.



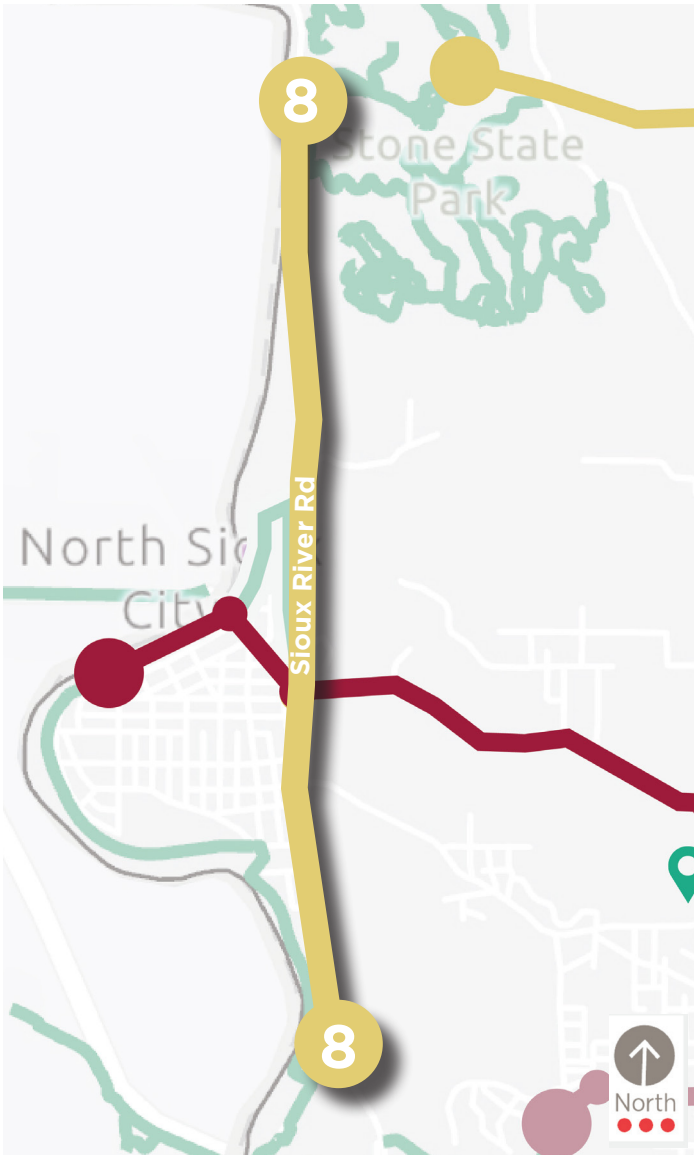
Metrics

ID	ROUTE NAME	ENDPOINTS	DESTINATIONS	BARRIERS
7	Military Road	Center Street Park to Dacotah St/River Dr (Riverside Trail)	Center Street Park/West High/ Military Rd commercial/River Trail head	• Intersections at Riverside Blvd. and railroad

Existing Trail
Future Trail
Future Trail
Future Trail
Major East/West Route
Secondary East/West Route
Major North/South Route
Secondary North/South Route

8. Sioux River Road

Sioux River Road is a popular experienced cyclist route to and from Stone State Park and Highway 12 north of Sioux City. This route enhancement runs from Stone State Park to the north entrance to Riverside Park at Council Oaks Dr.



Riverside Blvd has been lane dieted to three lanes with bike lanes

- Existing Trail
- Future Trail
- Future Trail
- Future Trail
- Major East/West Route
- Secondary East/West Route
- Major North/South Route
- Secondary North/South Route

Metrics

ID	ROUTE NAME	ENDPOINTS	DESTINATIONS	BARRIERS
8	Sioux River Rd	Stone State Park to Riverside Park	Stone State Park/Sioux City Railroad Museum/Military Road commercial/Riverside Elementary/Kirk Hansen Park/ Riverside Park	• Intersections at Military Rd • Heavy traffic

9. Downtown

The Downtown Transportation Plan completed at the same time as this study provides detail into vehicular, pedestrian, and bicycle transportation improvements downtown. This page details the bicycle improvement recommendations.

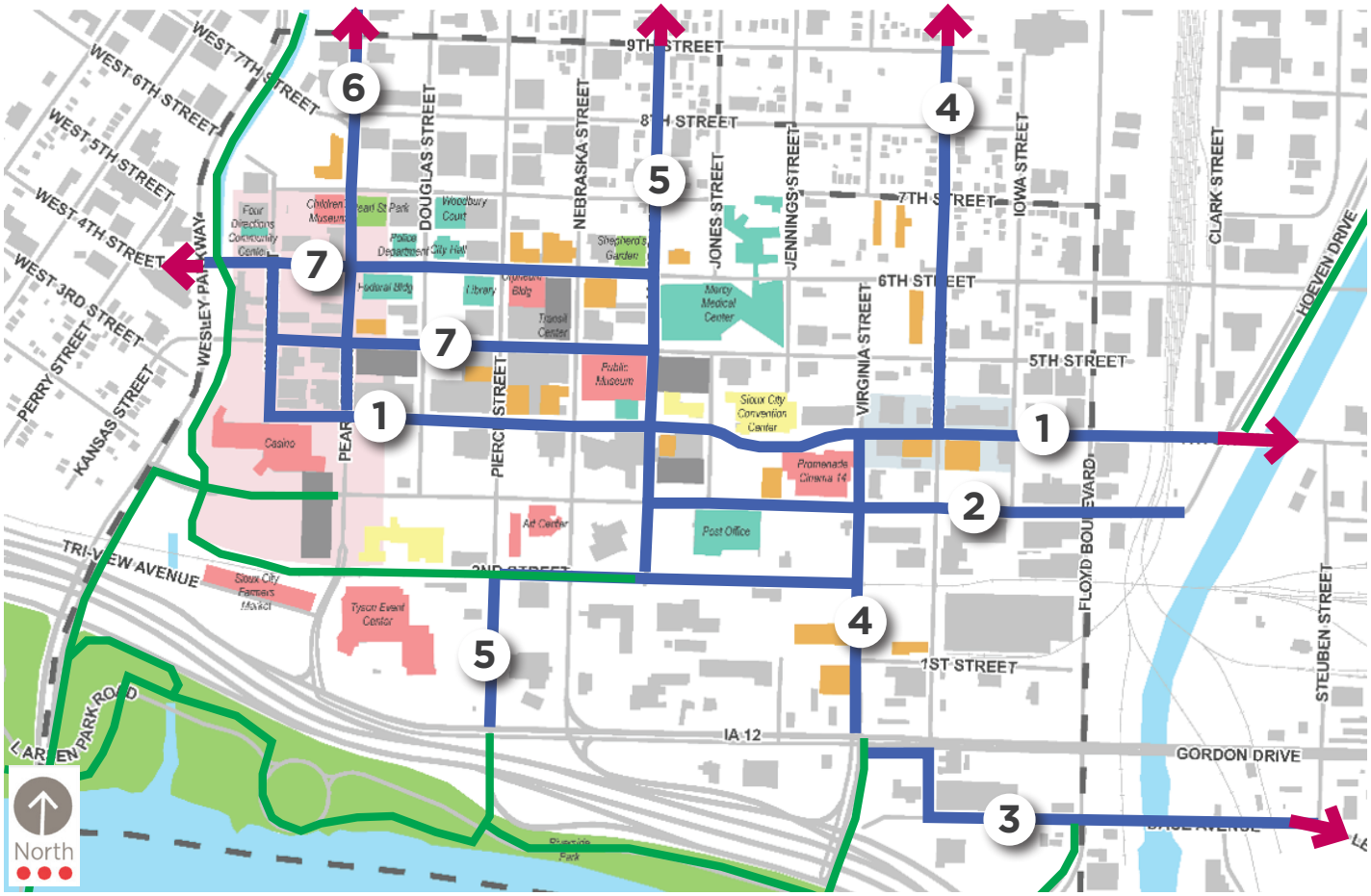
Downtown Complete Street Purpose - Bicycle Emphasis to encourage and facilitate safe downtown biking:

- To access important downtown destinations.
- Provide east-west connection between Perry Creek trail and Floyd River trail.
- Provide north-south connection between Riverfront Park and neighborhood north of downtown.

Priority Route
Trail
Entertainment
Civic Use
Residential
Park

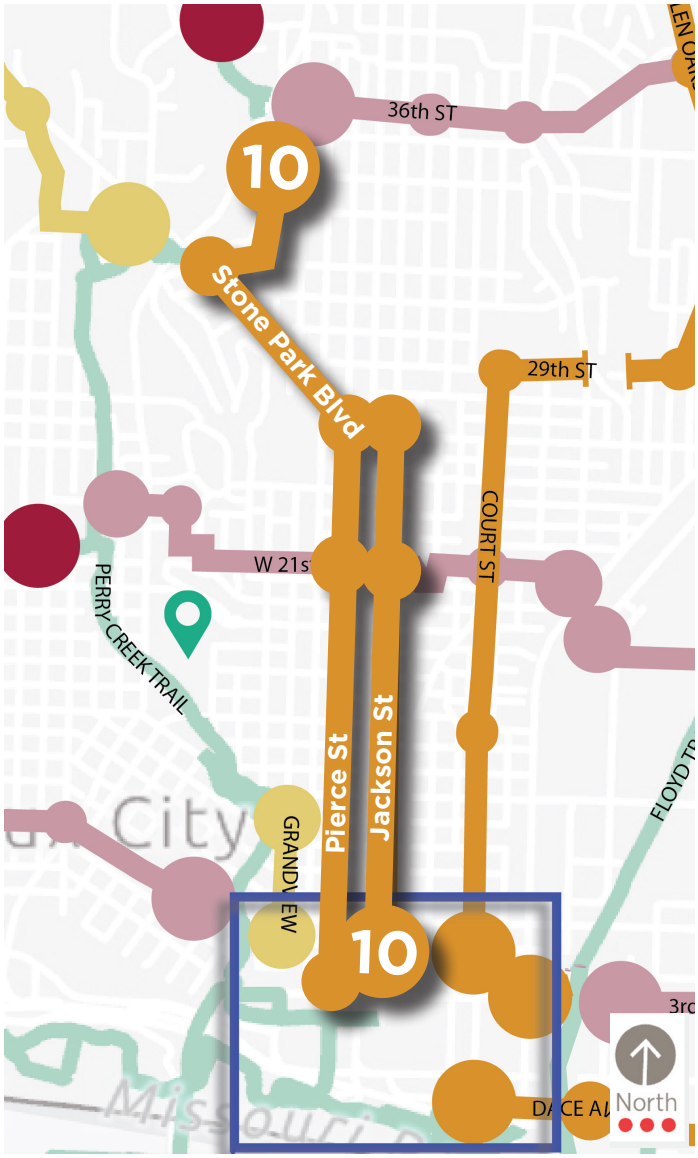
The priority routes in the downtown network include:

1. 4th Street route - would tie into the Floyd River Trail all the way to the Perry Creek Trail.
2. 3rd Street route - a wide street for faster commuter travelers.
3. Dace Avenue connection - a critical connection from downtown and the riverfront eastern Sioux City.
4. Virginia to Court Street - ties in the riverfront trail to 4th Street and northern Sioux City.
5. Pierce and Jackson Street - ties in the riverfront trail to 2nd Street and northern Sioux City.
6. Pearl to Grandview Boulevard route - a route along key destinations like the Children's Museum to the Perry Creek Trail.
7. 5th and 6th Street options based on future decisions whether to transition from one-way to two-way traffic.
8. Trail extensions along the railroad.



10. Jackson Street

Jackson Street is a logical north/south connector from downtown because of its wide street and central location. This route runs along Jackson St. from 3rd St. to 27th St. before running west to connect onto Stone Park Blvd. The route navigates along Dearborn Blvd from Stone Park Blvd. to reach the 36th St. connector. Another alternative could have treatments on Jackson continue north from 27th St. to 36th St.



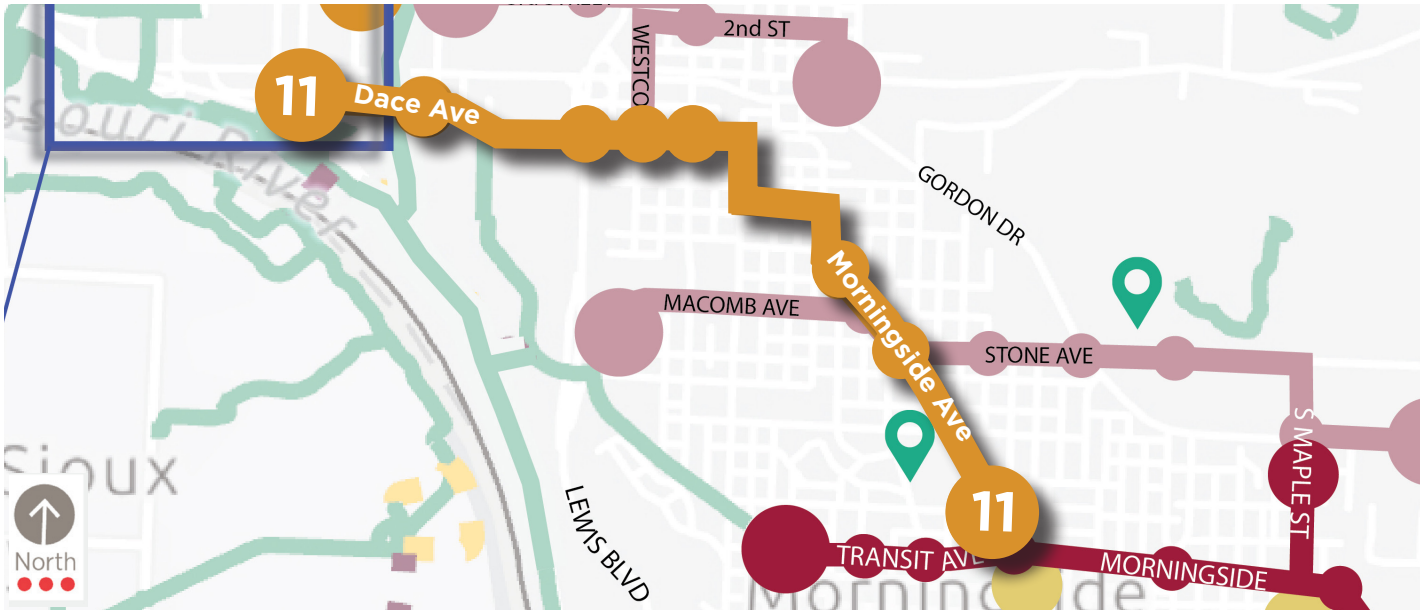
- Existing Trail
- Future Trail
- Future Trail
- Future Trail
- Major East/West Route
- Secondary East/West Route
- Major North/South Route
- Secondary North/South Route

Metrics

ID	ROUTE NAME	ENDPOINTS	DESTINATIONS	BARRIERS
10	Jackson Street	6th St/Jackson St to Perry Creek Elementary	Downtown/Siouxland District Health/St. Luke's/Grandview Park/Perry Creek Trail/Perry Creek Elementary	• Steep slopes at the south end of Jackson, and Stone Park Blvd • Dearborn intersection with Stone Park Blvd

11. East/West Connector - Dace Avenue

Another primary east/west connector from downtown to Morningside is Dace Ave. Dace Ave is a popular route for bicycle commuters. This route connects from the Riverfront Trail at Virgina St. to follow Dace Ave. to Leech Ave. The route continues through northern Morningside along S Rustin, Dodge, and S Cecelia St. to connect to Morningside Ave. and the Morningside commercial node.



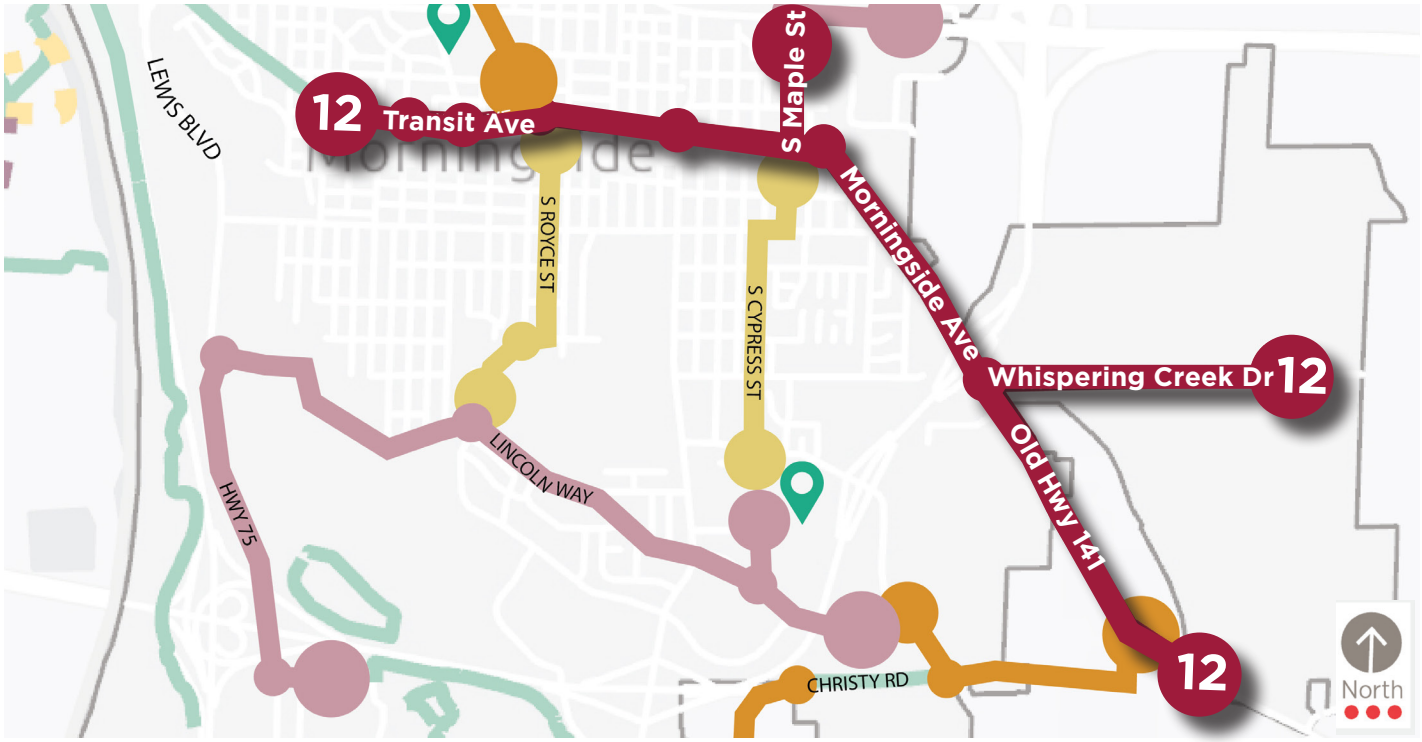
Metrics

ID	ROUTE NAME	ENDPOINTS	DESTINATIONS	BARRIERS
11	East/West Connector 2	Dace Ave/Virgina St to Morningside Ave	Chris Larsen Park/Siouxland Expo Center/Fairmount Park/Morningside University/Library - Morningside Branch/Morningside commercial	• Intersections at Floyd, Lewis Blvd • Steep slope on portions of Leech Ave

Existing Trail
Future Trail
Future Trail
Future Trail
Major East/West Route
Secondary East/West Route
Major North/South Route
Secondary North/South Route

12. Morningside Avenue

Morningside Avenue is an ideal candidate for east/west connectivity in the southeast part of the city. This route uses Transit Ave./Morningside Ave. to connect from the Transit Ave. Trail to Whispering Creek Dr. and Old Highway 141. Existing street conditions change along the route but this is the only primary route to cross Highway 20 to reach the newer neighborhood at Whispering Creek and Glen Ellen Rd.



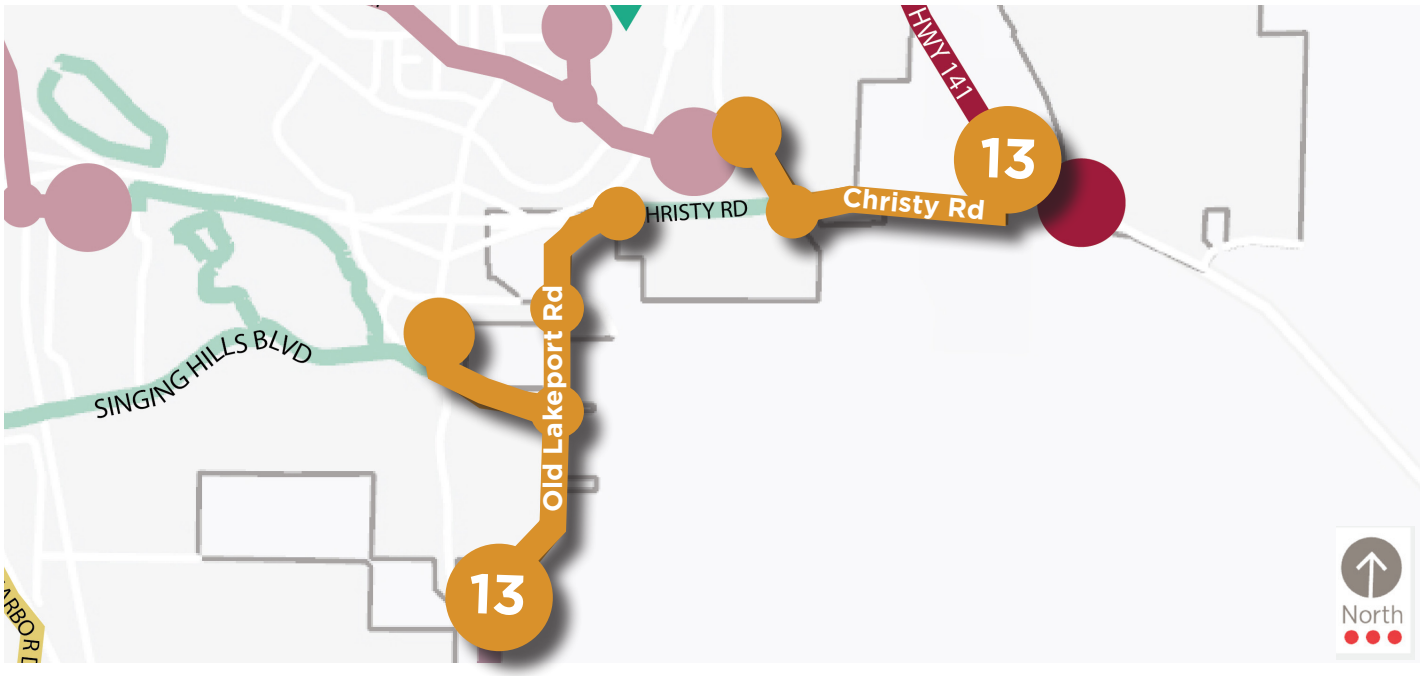
Metrics

ID	ROUTE NAME	ENDPOINTS	DESTINATIONS	BARRIERS
12	Morningside	Transit Ave/S Cecelia to Whispering Creek Dr/Glen Ellen Rd	Morningside Ave commercial/Library - Morningside Branch/ Latham Park	• Traffic on Morningside Ave • Lane width on Morningside Ave. east of Magnolia St • Intersections at Morningside, S Lakeport, and Hwy 20

Existing Trail
Future Trail
Future Trail
Future Trail
Major East/West Route
Secondary East/West Route
Major North/South Route
Secondary North/South Route

13. Christy Road

New development areas on the southeast part of the city prompt connections. This route on Christy Rd. enhances a connection from the Glen Ellen subdivisions to Singing Hills Blvd. and future routes to Sergeant Bluff. Starting at Old Hwy 141, the route follows Portland Blvd. and then Christy Rd., eventually turning into Old Lakeport Rd. Two spur route enhancements go on Sunnybrook Dr. and Singing Hills Blvd. to connect to existing sidepaths/trails.



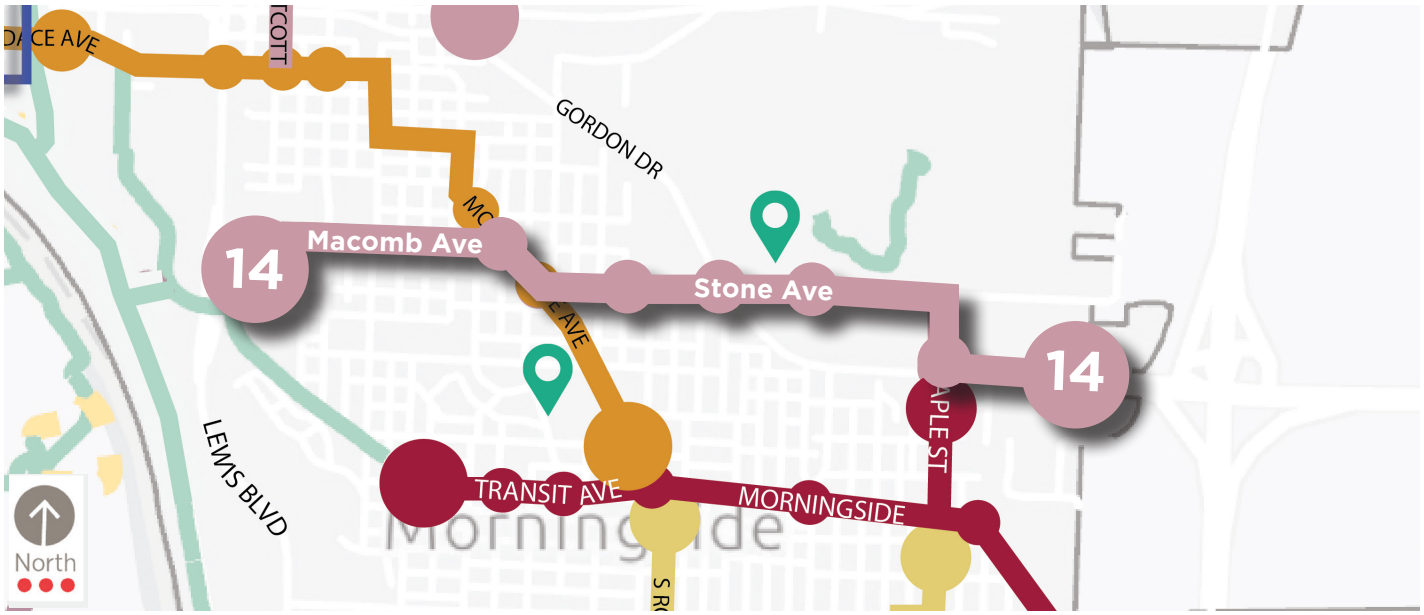
Metrics

ID	ROUTE NAME	ENDPOINTS	DESTINATIONS	BARRIERS
13	Christy Rd	Portland Blvd/Old Hwy 141 to Lakeport Rd/S Lakeport St (Future Sergeant Bluff connector)	Sunnybrook commercial/ Future Sergeant Bluff connector	• Intersections at Sunnybrook, Singing Hills Blvd • Future increases in traffic volume

Existing Trail
Future Trail
Future Trail
Future Trail
Major East/West Route
Secondary East/West Route
Major North/South Route
Secondary North/South Route

14. North Morningside

A secondary east/west connector in the Morningside neighborhood would reach Morningside University and Western Iowa Tech. The route extends from Pulaski Park on Macomb Ave. eventually meeting up with the Morningside Avenue route. This route continues east off Morningside Ave. on Stone Ave. to cross Gordon Dr. and reach WITCC. To reach Gordon Drive shopping destinations, the route runs north/south on S Maple St. to a proposed new sidepath/trail on the north side of Gordon Dr. east of S Maple St.



Metrics

ID	ROUTE NAME	ENDPOINTS	DESTINATIONS	BARRIERS
14	North Morningside	Pulaski Park to Gordon Dr/158th St	Pulaski Park/Macomb Park/ Spalding Park Elementary/ WITCC/Gordon Dr commercial	• Intersections at Gordon Dr., WITCC • Steep slope at Spalding Park Elementary • New sidepath needed to reach eastern shopping areas

Existing Trail
Future Trail
Future Trail
Future Trail
Major East/West Route
Secondary East/West Route
Major North/South Route
Secondary North/South Route

15. W 4th Street

An east/west route from downtown to Riverside is W 4th St. This route connects at the Perry Creek Trail/ Wesley Parkway along W 4th St. to the trail on War Eagle Dr.

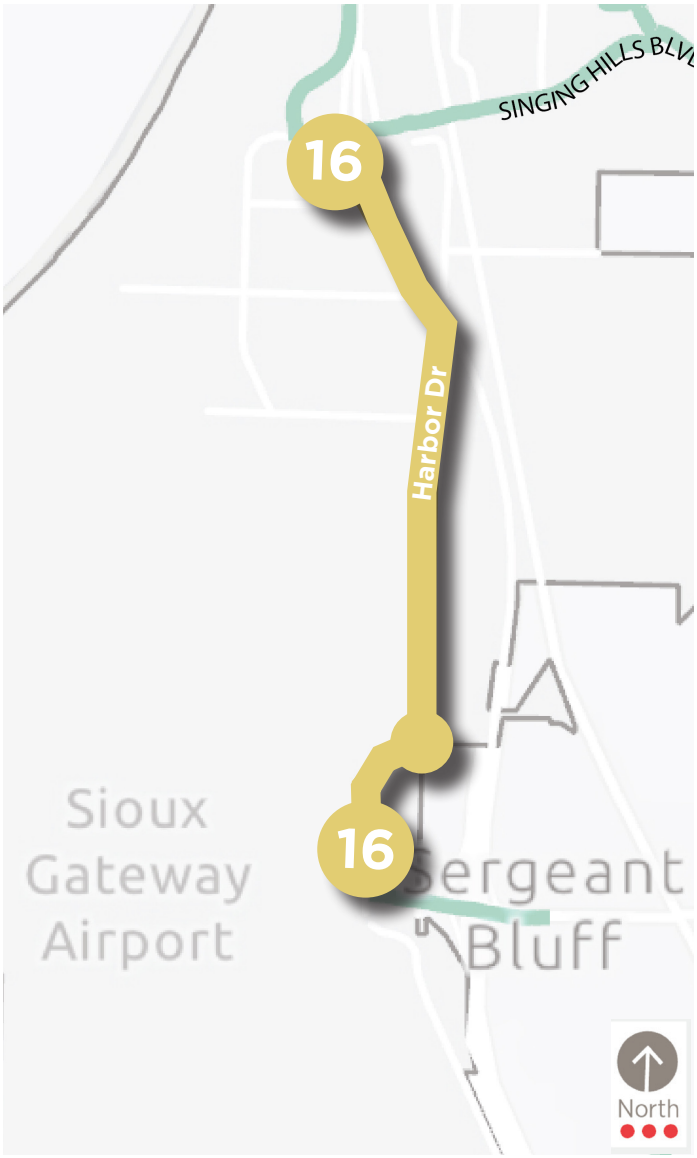
Metrics

ID	ROUTE NAME	ENDPOINTS	DESTINATIONS	BARRIERS
15	W 4th Street	W 4th St/Wesley Pkwy to War Eagle Park	Perry Creek Trail/Cook Park/War Eagle Park	• Intersections at Wesley Way Hamilton • Some slopes • Vehicle traffic

Existing Trail
Future Trail
Future Trail
Future Trail
Major East/West Route
Secondary East/West Route
Major North/South Route
Secondary North/South Route

16. Southbridge

The Riverfront Trail to Chautauqua Park provides preliminary access to southern industrial employment areas. A route along Harbor Dr. would enhance on-street access to employment centers. This route follows Harbor Dr. from S. Patton St. to Discovery Blvd. and then to the existing trail at Aviation Blvd. Note, this is part of a regional route on the Lewis and Clark Trail going from Hamburg to Sioux City.



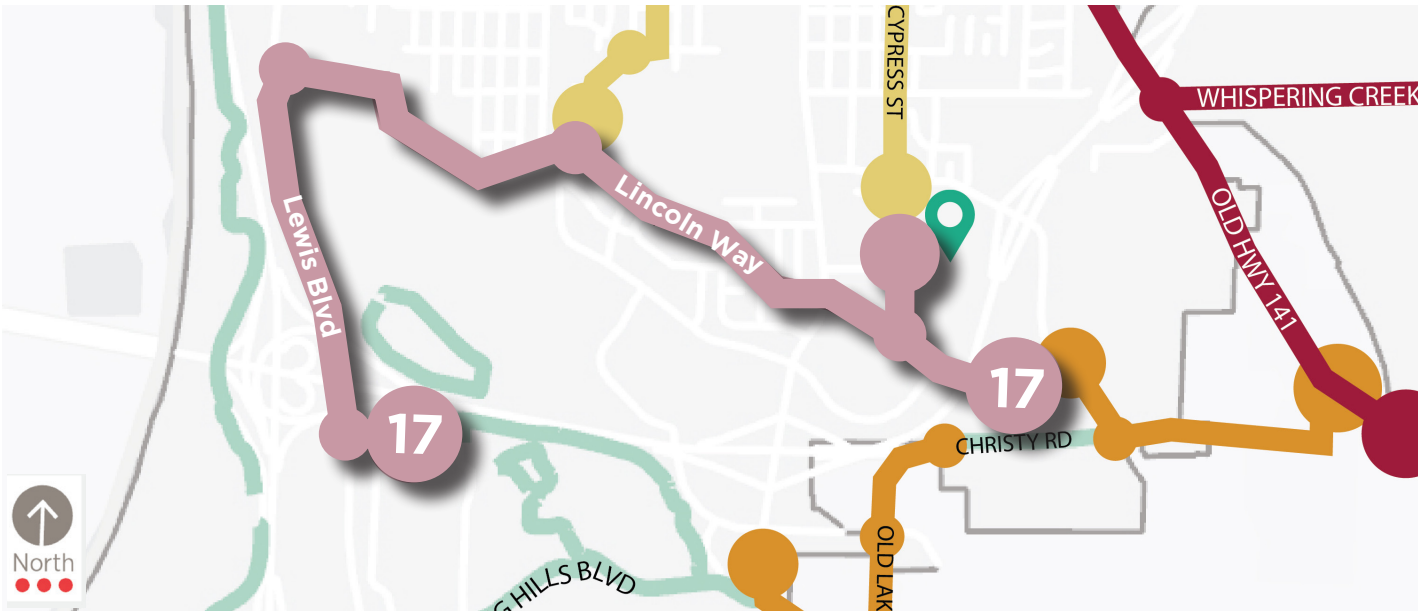
- Existing Trail
- Future Trail
- Future Trail
- Future Trail
- Major East/West Route
- Secondary East/West Route
- Major North/South Route
- Secondary North/South Route

Metrics

ID	ROUTE NAME	ENDPOINTS	DESTINATIONS	BARRIERS
16	Southbridge	Singing Hills Blvd/ Harbor Dr to Discovery Blvd/ Aviation Blvd	Southbridge employment area/185th Air Wing	• High industrial traffic • Intersection at S. Patton

17. Lincoln Way

Lincoln Way is a nice east/west route opportunity for the southern part of Morningside. The main route follows Sergeant Rd/Houlihan Run/Lincoln Way from Sunnybrook Dr. on the east to S. Lewis Blvd. A new trail possibility along S. Lewis Blvd. from Lincoln Way to Line Dr. would provide needed access to Cone Park and other entertainment venues. A spur by extending a trail north off Cypress St. would also reach Each High School.



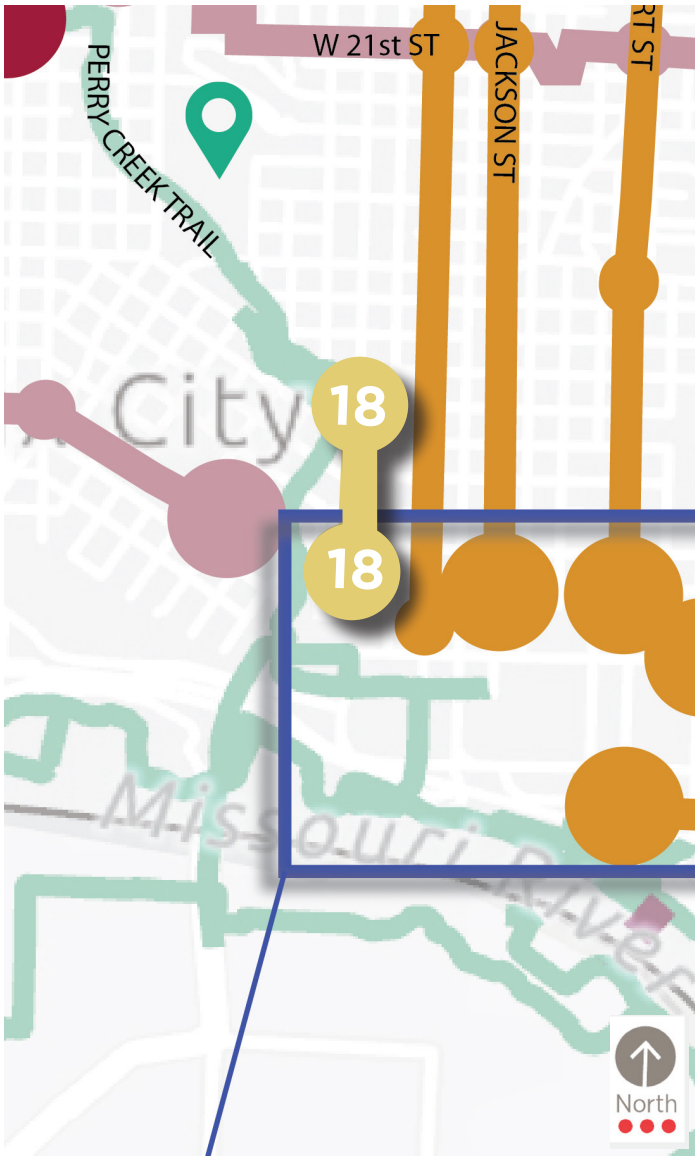
Metrics

ID	ROUTE NAME	ENDPOINTS	DESTINATIONS	BARRIERS
17	Lincoln Way	Sunnybrook Dr/ Sergeant Rd to Sioux City Explorers Stadium	Sergeant Rd commercial/ Nodland Elementary/East High/South Ravine Park/ Prairie Park/Cone Park	• Intersections at S. Lakeport St. • Trail installation needed to reach Cone Park and other venues

Existing Trail
Future Trail
Future Trail
Future Trail
Major East/West Route
Secondary East/West Route
Major North/South Route
Secondary North/South Route

18. Pearl Street

A short stretch of facility enhancement on Pearl Street would increase safety from the Launchpad Children's Museum to the Perry Creek Trail access near 11th St. An extension stub for the trail is already in place on the south side of 11th St.



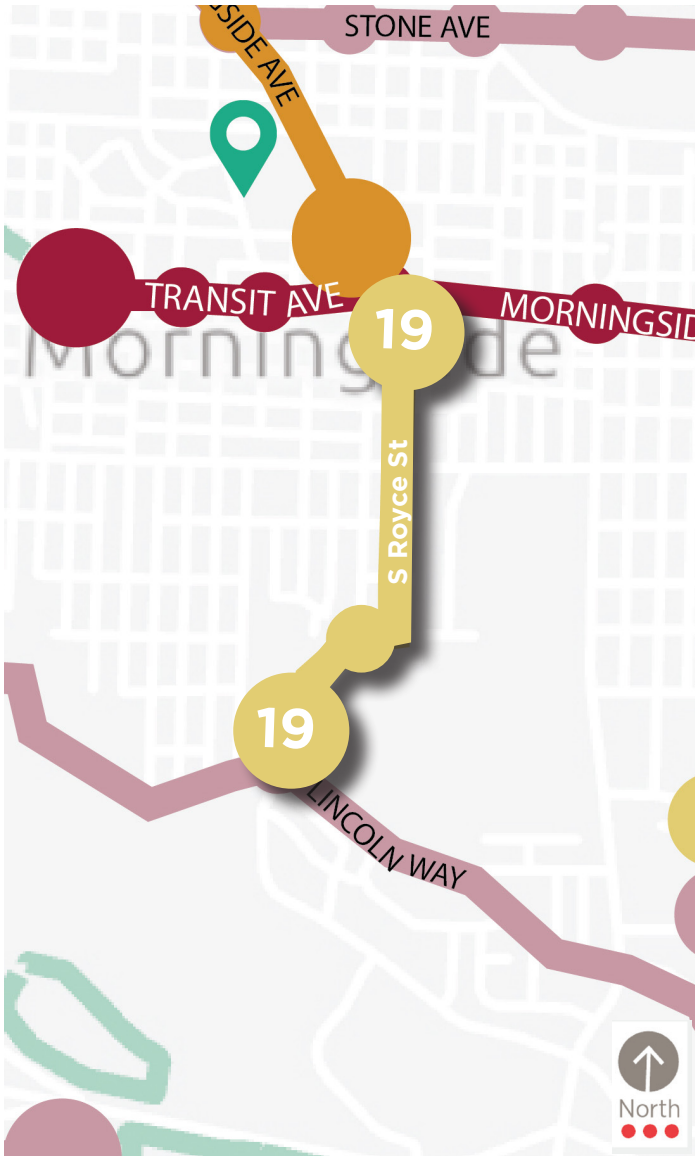
- Existing Trail
- Future Trail
- Future Trail
- Future Trail
- Major East/West Route
- Secondary East/West Route
- Major North/South Route
- Secondary North/South Route

Metrics

ID	ROUTE NAME	ENDPOINTS	DESTINATIONS	BARRIERS
18	Pearl	4th St/Pearl St to 11th St/Grandview	Historic Pearl Street/Launchpad/ Boys and Girls Club/Heelen High/ Perry Creek Trail	Few significant barriers

19. Morningside North/South

There are few direct north/south connection opportunities in the Morningside neighborhood. This route shows an option from Morningside Ave. along S Royce St. to Myers St., then S St Aubin St. to Sergeant Rd. Sergeant Rd. connects to the Lincoln Way route.



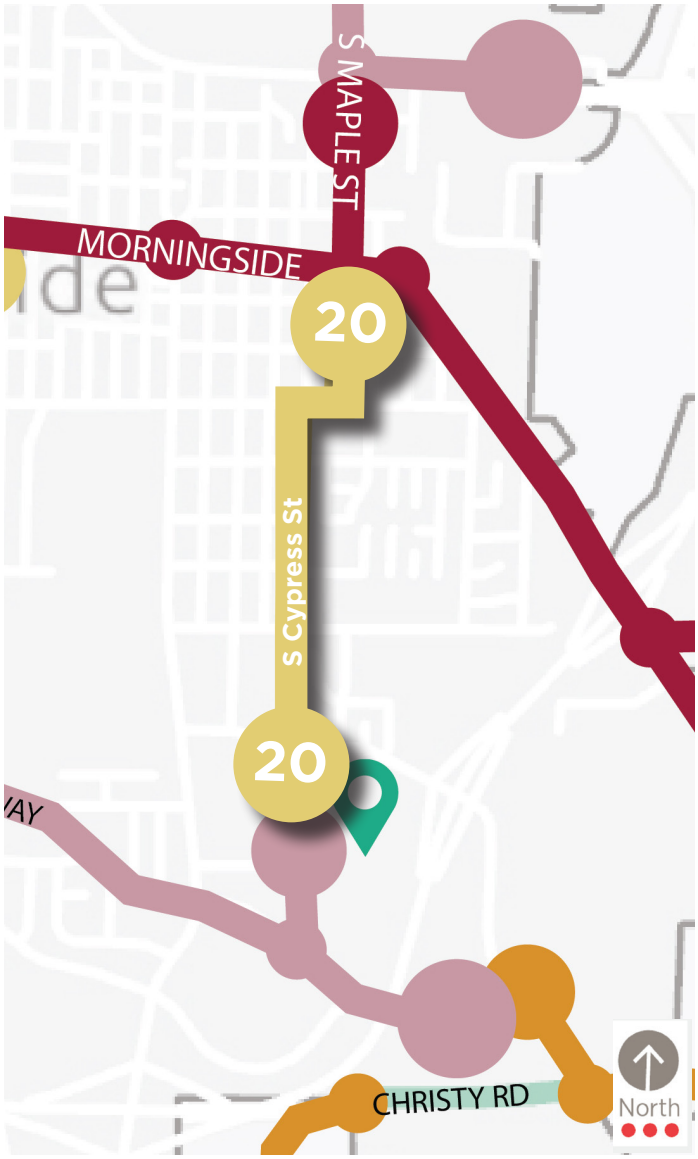
Existing Trail
Future Trail
Future Trail
Future Trail
Major East/West Route
Secondary East/West Route
Major North/South Route
Secondary North/South Route

Metrics

ID	ROUTE NAME	ENDPOINTS	DESTINATIONS	BARRIERS
19	Morningside North/South	Morningside Ave/S Royce St to Sergeant Rd/ Lincoln Way	Morningside Ave commercial	• Areas of steep slopes

20. S Cypress Street

Another north/south connection option in the Morningside neighborhood is shown along S Cypress St. The route follows S Cypress St. from East High School to Glenn Ave. and then continuing along S Maple St. to the connection at Morningside Ave.



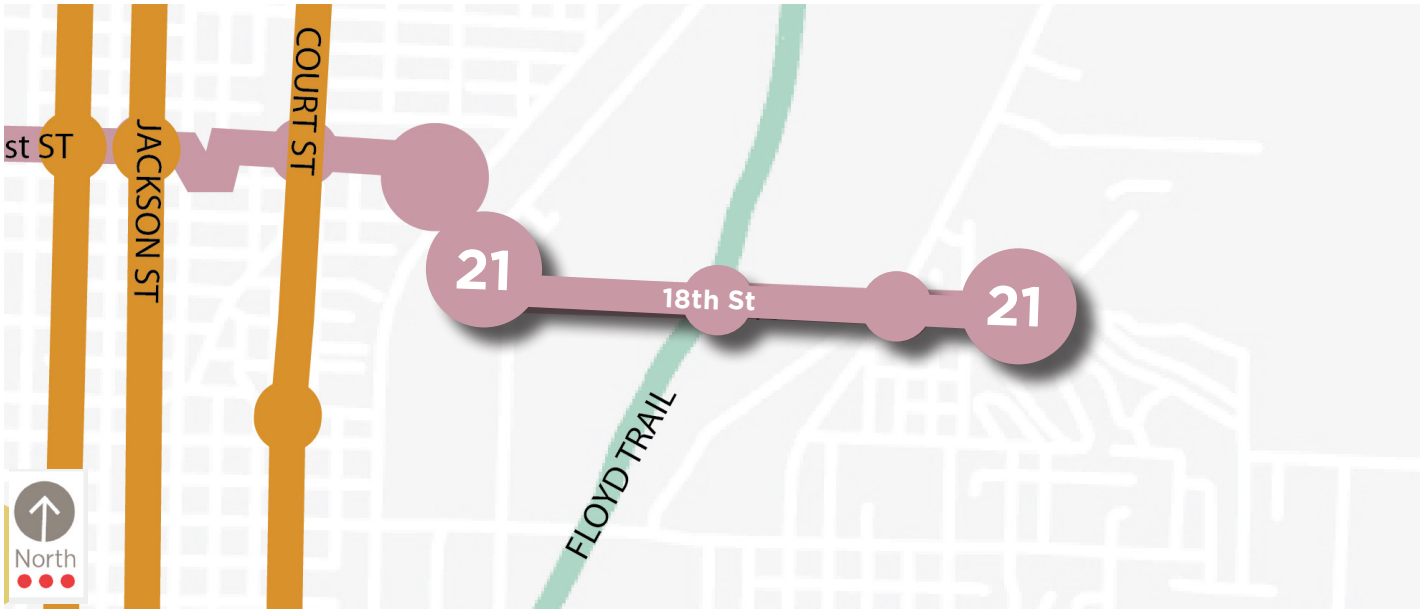
- Existing Trail
- Future Trail
- Future Trail
- Future Trail
- Major East/West Route
- Secondary East/West Route
- Major North/South Route
- Secondary North/South Route

Metrics

ID	ROUTE NAME	ENDPOINTS	DESTINATIONS	BARRIERS
20	S Cypress Street	East High School to Morningside Ave	East High/East Middle/Sunnyside Elementary/Emerson Park	Few significant barriers

21. East/West Connector - 18th Street

The Springdale and Unity Elementary areas are difficult to reach from the west. The only real options are 11th and 18th Streets. This route uses 18th Street to connect the route at Floyd Blvd. with Unity Elementary School.



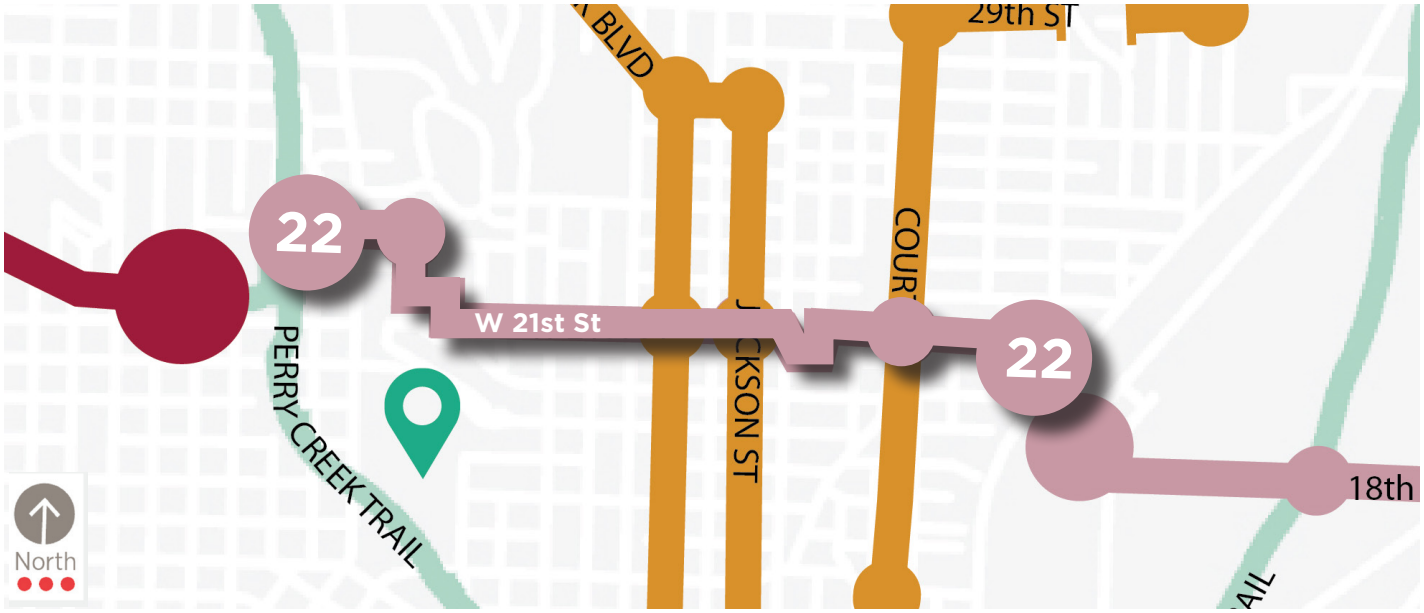
Metrics

ID	ROUTE NAME	ENDPOINTS	DESTINATIONS	BARRIERS
21	18th Street	Floyd Blvd to Unity Elementary	Unity Elementary School/Kelly Park/Floyd River Trail	• Crossing railroad and industrial areas • Intersection at Lewis and Floyd Blvd

Existing Trail
Future Trail
Future Trail
Future Trail
Major East/West Route
Secondary East/West Route
Major North/South Route
Secondary North/South Route

22. W 21st/21st Street

A secondary east/west route in the central city generally follows 21st Street. This route connects the Perry Creek Trail at Center Street Park with Floyd Blvd. The route crosses Perry Creek and Hamilton Blvd. at W 23rd St. and zig-zags to continue along W 21st St. with a slight jog south on Howard St. to reach Floyd Blvd. via 19th St.



Metrics

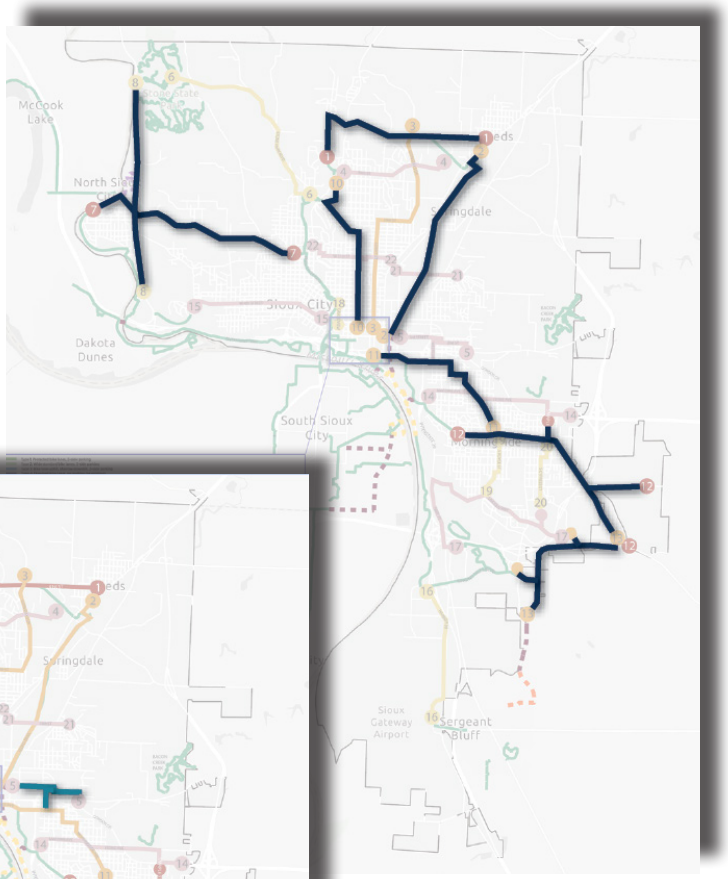
ID	ROUTE NAME	ENDPOINTS	DESTINATIONS	BARRIERS
22	W 21st/21st Street	Perry Creek Trail to Floyd Blvd	Perry Creek Trail/Center Street Park/Pierce Commercial/Spalding Park	• Intersections at Hamilton • Not very continuous route

Existing Trail
Future Trail
Future Trail
Future Trail
Major East/West Route
Secondary East/West Route
Major North/South Route
Secondary North/South Route

WHICH ROUTES ARE MOST IMPORTANT?

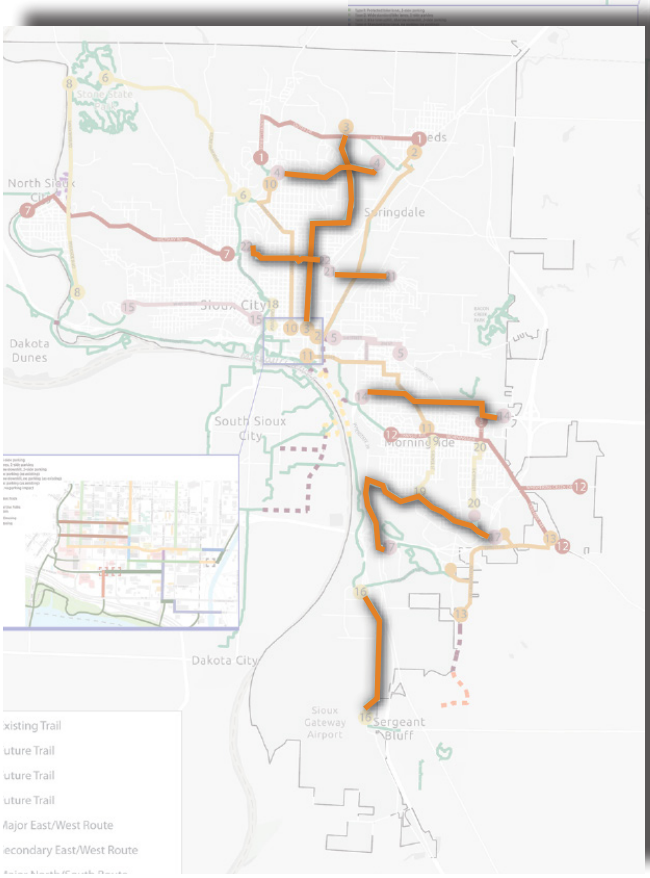
The proposed Sioux City bike network requires implementation in phases and will almost certainly evolve overtime. However, Chapter 4 establishes both an initial phase that guides activity during the next five to ten years, and a concept for how the network emerges incrementally from that foundation. The sequencing of phases requires determining the routes of greatest importance and opportunity.

High Priority



Moderate Priority

Lower Priority



The following criteria establish the priority routes in Figure 2.2, with help from the local Stakeholder Group.

- Quality and Importance of the Route - The ability of the route to fill gaps in the system, fill local demand, and extend existing facilities.
- Phase Ranking - Whether the route is an immediate need or longer term need as the system develops, and its ease of development in line with other street projects.

Figure 2.2: Priority Route Rankings

ID	ROUTE NAME	ENDPOINTS	QUALITY/ IMPORTANCE	PHASE RANKING	OVERALL PRIORITY LEVEL
1	Outer Drive	Tyler St/Floyd Blvd to Country Club Blvd/Perry Creek Elementary	High	High	**High**
2	Floyd River Corridor	Central St/Floyd Blvd to Historic 4th	High	High	**High**
7	Military Road	Center Street Park to Dacotah St/ River Dr (Riverside Trail)	High	High	**High**
8	Sioux River Road	Stone State Park to Riverside Park	High	High	**High**
10	Jackson Street	6th St/Jackson St to Perry Creek Elementary	High	High	**High**
11	East/West Connector 2	Dace Ave/Virgina St to Morningside Ave	High	High	**High**
12	Morningside	Transit Ave/S Cecelia to Whispering Creek Dr/Glen Ellen Rd	High	High	**High**
13	Christy Rd	Portland Blvd/Old Hwy 141 to Lakeport Rd/S Lakeport St (Future Sergeant Bluff connector)	High	High	**High**
14	North Morningside	Pulaski Park to Gordon Dr/158th St	Moderate	Moderate	**Moderate**
5	East/West Connector 1	4th St/Floyd River Trail to S Logan/Correctionville Rd	Moderate	Moderate	**Moderate**
6	Stone Park	Stone Park Blvd/Woodland Way to Stone State Park	High	Moderate	**Moderate**
15	W 4th Street	W 4th St/Wesley Pkwy to War Eagle Park	Moderate	Low	**Moderate**
18	Grandview	4th St/Pearl St to 11th St/ Grandview	Moderate	Moderate	**Moderate**
19	Morningside North/South	Morningside Ave/S Royce St to Sergeant Rd/Lincoln Way	Moderate	Low	**Moderate**
20	S Cypress Street	East High School to Morningside Ave	Moderate	Low	**Moderate**
3	Court/Glen Oaks	Buckwalter Dr/Outer Dr to Historic 4th	Low	Low	**Low**
4	36th Street	Outer Dr/Indian Hills to Hamilton Blvd	Low	Low	**Low**
16	Southbridge	Singing Hills Blvd/Harbor Dr to Discovery Blvd/Aviation Blvd	Low	Low	**Low**
17	Lincoln Way	Sunnybrook Dr/Sergeant Rd to Sioux City Explorers Stadium	Moderate	Low	**Low**
21	18th Street	Floyd Blvd to Unity Elementary	Low	Low	**Low**
22	W 21st/21st Street	Perry Creek Trail to Floyd Blvd	Moderate	Low	**Low**
9	Downtown	Downtown Transportation Plan	N/A	N/A	

CHAPTER 3: SYSTEM DESIGN

INTRODUCTION

There will be different bike facility treatments for and within each of the priority routes in the proposed Sioux City network. To determine costs for implementation, each route is segmented in this chapter with detail on the type of facility best for bicyclist comfort and safety. The priority objective is to create safe environments with minimal changes to existing automobile travel and parking lanes.

NETWORK SEGMENT DETAILS

The overall routes from the last chapter frame each segment detail in this section. Each route displays a map that illustrates each street or pathway segment, intersecting routes, and in some cases of special note, more detailed maps and character renderings. The maps are divided into key segments, corresponding to key dividing points, milestones, or changes in infrastructure treatment. The number key for each segment corresponds to a row in the accompanying table. The tables display:

- The endpoints and length of each segment.
- The existing street conditions like the number of lanes and approximate width of the street pavement, based on aerial photography.
- Recommended infrastructure and other ideas to adapt a segment for safer and more comfortable bicycle use. On-street treatments like marked routes and bicycle boulevards typically use pavement markings and signage. In some cases, existing trail segments fill gaps.
- Intersection enhancements to reduce barriers. These should not prescribe a specific solution but rather is designed to establish a, optimal budget for project types that could substantially reduce the impact of these barrier conditions.
- Planning level opinions of probable costs. These are not based on detailed engineering design, but give an idea of relative costs for planning purposes, using existing infrastructure in place today for cost savings. The estimates include contingencies for design and engineering.

These recommendations may need to be refined further when implementing individual projects. However, they provide guidance to determine priorities and costs of various improvements for Capital Improvement Planning.

FACILITY DESIGN SUMMARY

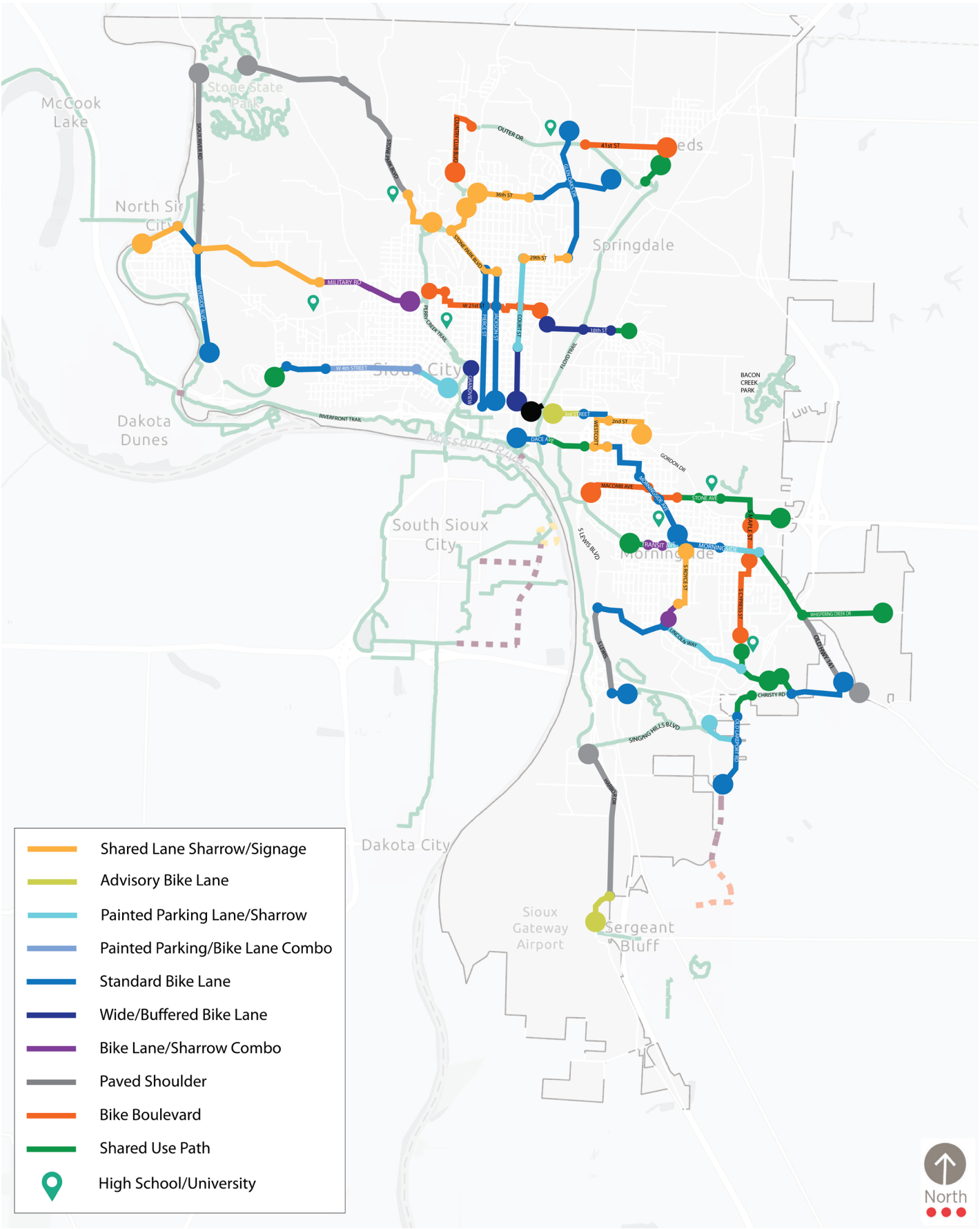
The bike facilities listed in this plan should be applied based on national standards using resources such as:

- The Federal Highway Administration's (FHWA) Manual on Uniform Traffic Control Devices (MUTCD).
- American Association of State Highway and Transportation Officials (AASHTO) Guide for the Development of Bicycle Facilities.
- The National Association of City Transportation Officials' (NACTO) Urban Bikeway Design Guide.
- The AASHTO A Policy on Geometric Design of Highways and Streets.

The following section provides a starting point for applying the recommended bike facilities in each segment. There may be instances where slight fluctuations in design may be required, such as driveway conflicts or short changes in pavement width. The guidelines are not a substitute for a more thorough evaluation by a landscape architect or engineer upon implementation of facility improvements. The facilities used in the proposed Sioux City network include:

- Shared Lane Signage or Markings/Sharrows
- Painted Parking Lanes and Sharrows
- Paved Shoulders
- Advisory Bike Lanes
- Standard/Wide Bike Lanes
- Bike Lane/Sharrow Combination
- Bicycle Boulevards
- Shared Use Paths

Figure 3.1: Network Segment Map



Shared Lane Signage or Markings/Sharrows

Description. Signed and marked shared streets and roads are shared with motor vehicles. These on-street routes may incorporate shared lane markings in a general purpose travel lane and/or bike route signs to identify the street as a bikeway and alert motorists to be aware of bicycle traffic.

Street Characteristics. They typically have relatively low speeds and traffic volumes, commonly at or below 30 mph and 3,000 vehicles per day.

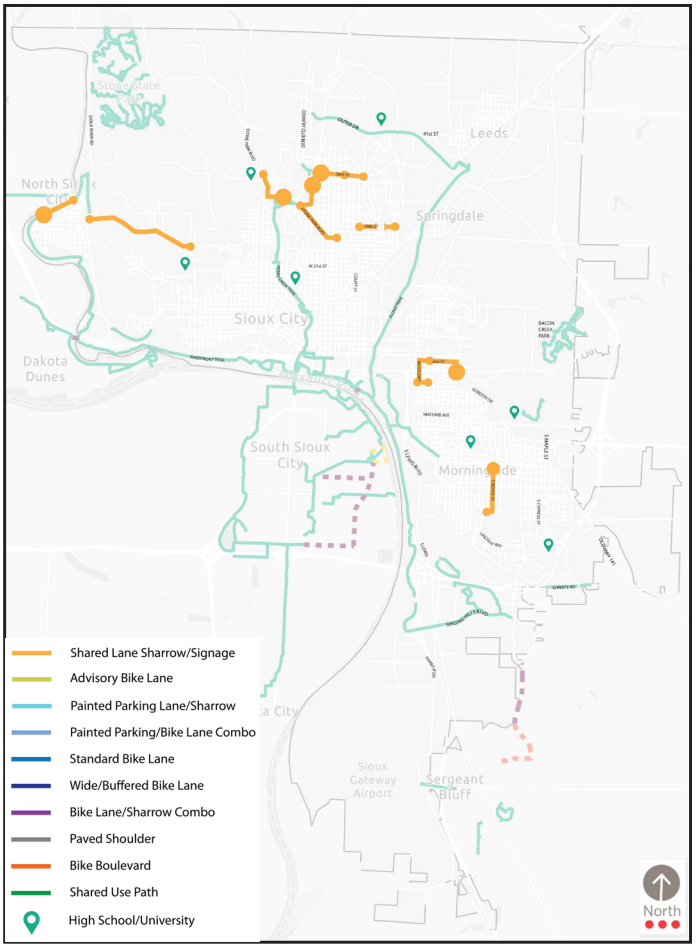
Design. These facilities typically require no additional construction or physical changes other than signage and, where employed, shared lane pavement markings. The "Bicycles May Use Full Lane" sign has also become increasingly popular, replacing the previous "Share the Road" sign and sometimes shared lane markings. This would be an alternative in Sioux City where streets do not warrant pavement markings for traffic.

Safety Features. The shared lane markings (SLM or "sharrows") encourage bicycle travel, assist with wayfinding, and may help cyclists position themselves properly within lanes. Motor vehicle drivers usually must cross over into the adjacent travel lane to pass a bicyclist safely, unless a wide outside lane or shoulder is provided.

Use in Sioux City. Signed and marked streets are used mostly as:

- Neighborhood connectors, linking the major grid to other destinations.
- Relatively short connections to provide continuity for trails and higher order facilities.
- Where space or funding is inadequate or more extensive infrastructure techniques.
- Where such other techniques are not necessary.

Example. An example is portions of Military Road and S. Royce Street.



Painted Parking Lanes and Sharrows

Description. An extra wide designated parking area that can be a place for cyclists to ride with passing traffic.

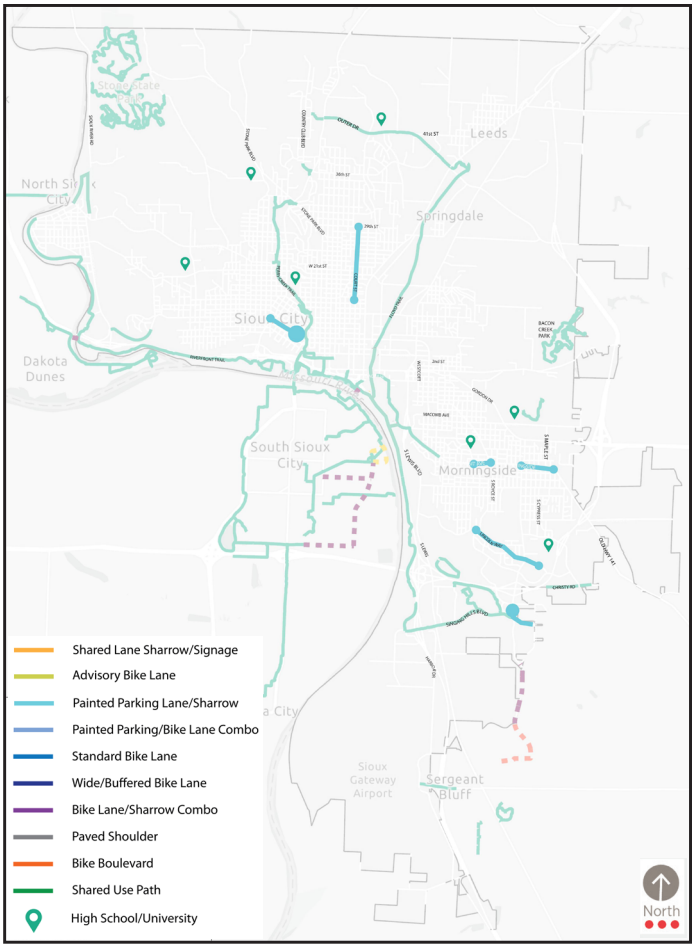
Street Characteristics. Striped parking lanes apply to relatively wide, two- or three lane streets with parking on both sides of the street and inadequate width for bicycle travel outside of shared travel lanes.

Design. Typical minimum width for local streets with parking shoulders on both sides and two travel lanes is 40 feet with 12-foot travel lanes.

Safety Features. On low-volume local streets with on-street parking, striped parking shoulders appear to manage traffic speeds through residential areas, help bicyclists properly track away from car doors, and keep parked cars from encroaching into travel lanes. It is important to note the potential safety hazards of cyclists potentially weaving in and out of a parking lane and, as in other on-street settings, the need for cyclists to stay away from the "door zone" of adjacent parked cars. These hazards are reduced by using the Bicycle May Use Full Lane sign and providing shared lane markings.

Use in Sioux City. Areas where it would not be supported to remove on-street parking but traffic volumes warrant more protection for bicyclists.

Example. An example is Court Street north of 14th Street and eastern parts of Lincoln Way.



Painted Parking Lanes, Sharrows, Bike Lane Combination

Description. Combining several treatments and applying a different treatment on each side of the street.

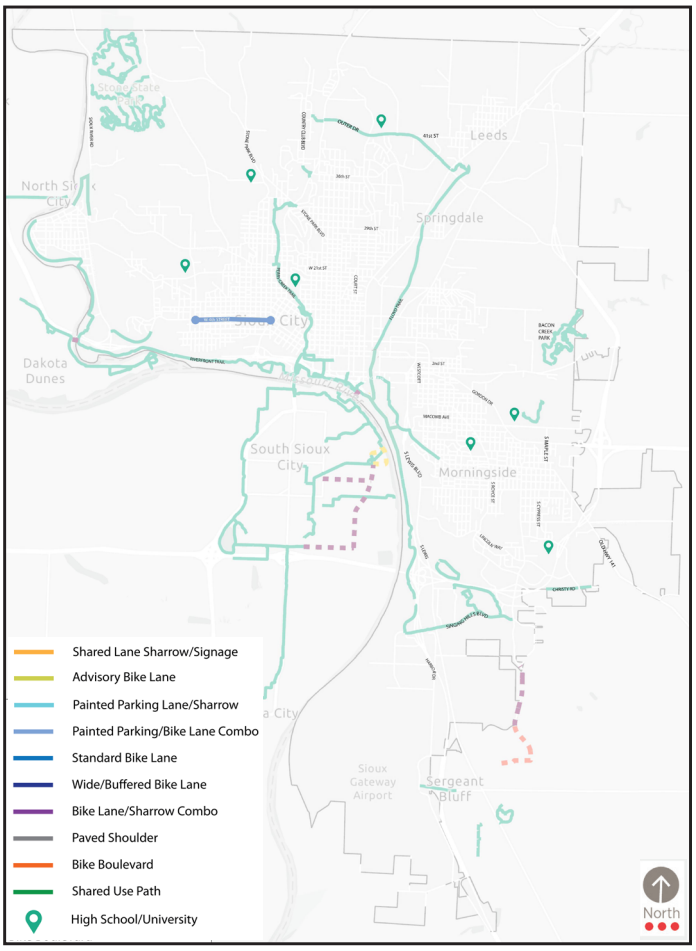
Street Characteristics. Higher traffic volume streets that are wide enough for a bike lane on one side but not on both sides. Parking is present on at least one side of the street and the nature of the neighborhood makes removing parking inadvisable.

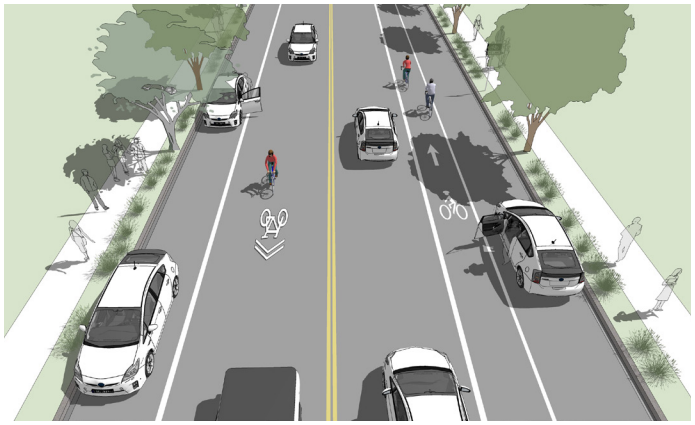
Design. See Bike Lane and Painted Parking Lane sections of this chapter.

Safety Features. See Bike Lane and Painted Parking Lane sections of this chapter.

Use in Sioux City. These could be appropriate for several locations in the network if determined.

Example. In this network the only application is W 4th Street.





Paved Shoulders

Description. A paved section outside of road lines, where a gravel shoulder may typically be located. These shoulders can serve as bikeways with striped separation from travel lanes and adequate width (4'+) for bicycle travel. Prohibits routine use by motorists but are often not exclusively designated for bicyclists.

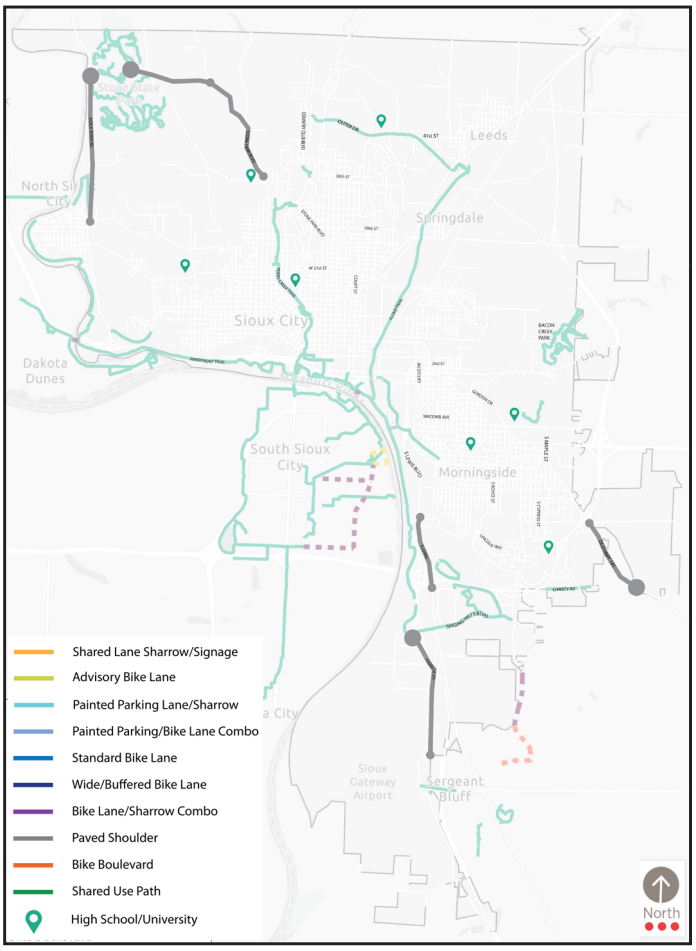
Street Characteristics. Typically found along more rural section roads, including highways, in low-density settings. However, traffic speeds are typically above 35 MPH.

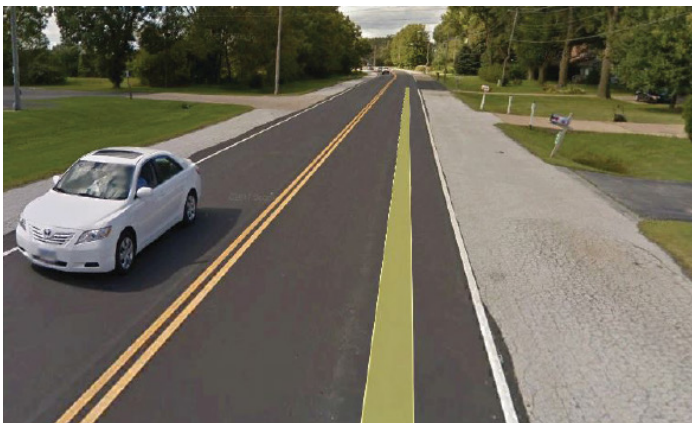
Design. A painted white line for a multi-use shoulder provides territory for multiple uses, including occasional parking, bicycle travel, and other purposes. Often includes signage alerting motorists to expect bicycle travel along the roadway and sometimes include bike lane pavement markings.

Safety Features. Rumble strips, if used, must provide a minimum 4 foot clear path and 12 foot gaps every 40-60 feet to allow access as needed.

Use in Sioux City. Mostly in areas that serve more experienced cyclists who ride for recreation to more regional destinations, often already on these routes.

Example. An example is Sioux River Road leading to Stone State Park.





Advisory Bike Lanes

Description. A type of shared roadway that clarify operating positions for bicyclists and motorists to minimize conflicts and increase comfort. Similar in appearance to bike lanes, advisory bike lanes are distinct in that they are temporarily shared with motor vehicles during turning, approaching, and passing.

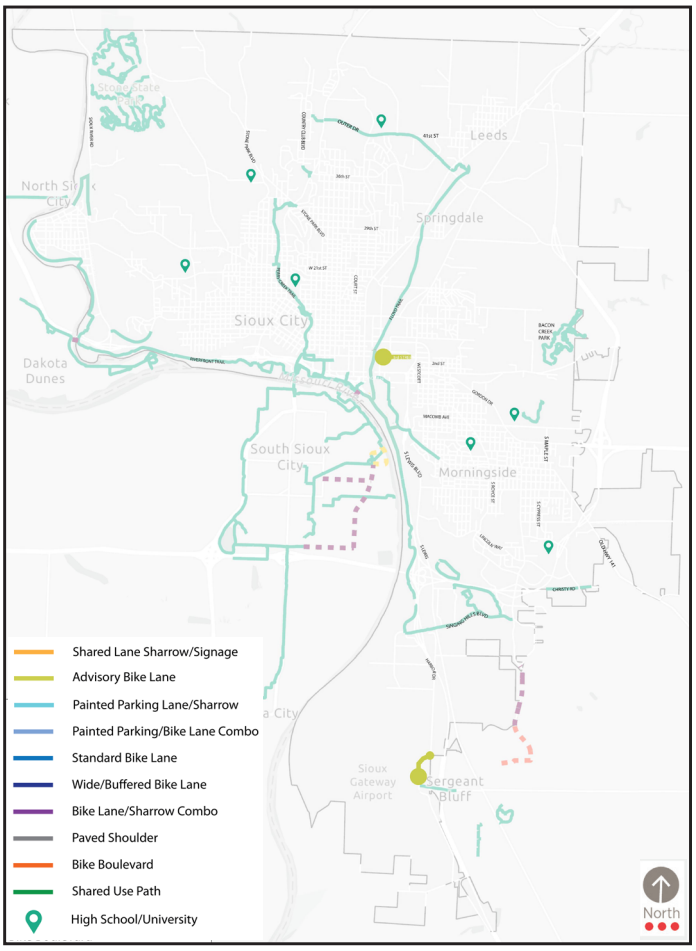
Street Characteristics. Most appropriate where traffic volumes are low to moderate (500 to 3,000 vehicles per day) and where there is insufficient room for bike lanes or credible multi-use shoulders.

Design. Bike lane width of 5-7 feet, generally with no street centerline. Minimum center travel lane of 8-20 feet. If on-street parking is present, parking lanes should be highly utilized or occupied with curb extensions to separate the parking lane from the advisory bike lane.

Safety Features. Like sharrows, indicates to motorists the presence of bicyclists. Provides a separated area for motorist to pass. However, may not be comfortable for inexperienced riders.

Use in Sioux City. Applications include relatively narrow streets with limited traffic or in combination with parking or multi-use shoulders to provide a distinct area that motorists and bicyclists can expect to share.

Example. Only two application proposed in the network at Discovery Boulevard and a portion of 3rd Street.



Standard Bike Lanes

Description. Designates an exclusive space for bicyclists through the use of pavement markings and signs. Located directly adjacent to motor vehicle travel lanes and is used in the same direction as motor vehicle traffic. Bike lanes are typically on the right side of the street, between the adjacent travel lane and curb, road edge or parking lane.

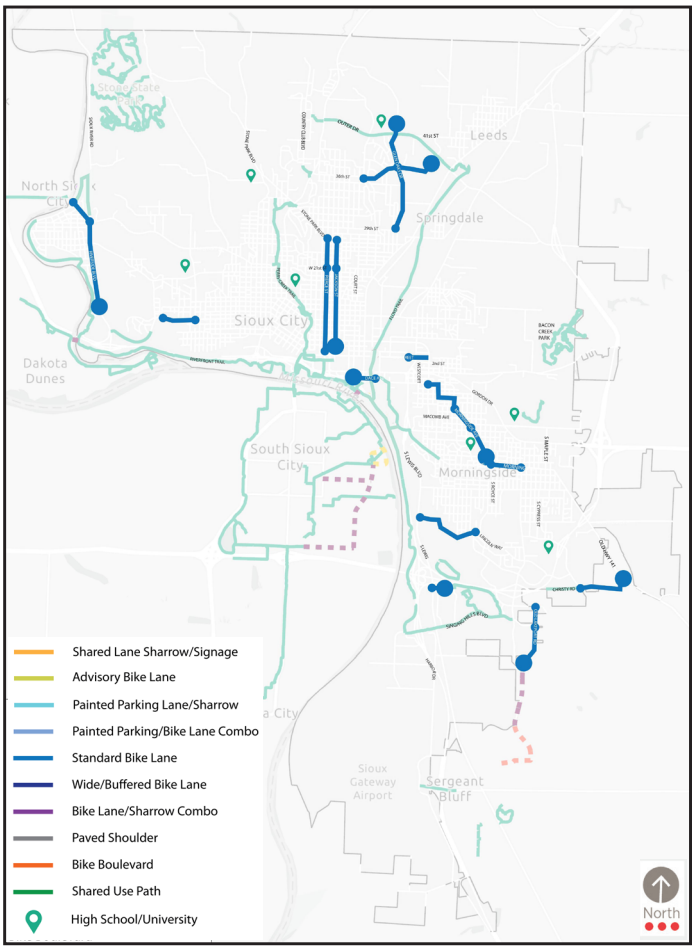
Street Characteristics. Conventional bike lanes may be used wherever there is sufficient width for them, but are most advisable on streets with average daily traffic at or above 3,000 vehicles per day. A safe minimum pavement width required when there is no on-street parking is 34-38 feet.

Design. Preferred bike lane width of 5-6 feet next to curb and gutter, and at least 6 feet wide when next to parking. This includes the painted lane lines. Signage should be placed to designate the bike lane at regular intervals on the route.

Safety Features. Greater degree of separation from traffic than advisory bike lanes and marks a clear area where motorists should not drive. Increased visibility can be made through green background paint. On higher volume streets, painted buffers between the land and traffic can be used where possible to provide a greater degree of user comfort. Potholes, pavement cracks, and other surface obstacles should be remedied before placing the bike lane.

Use in Sioux City. Bike lanes are shown where the street width allows whenever possible in the network on low-moderate traffic volume streets. Some situations shown do require a reduction in vehicle travel lane width or on-street parking.

Example. An example is Glen Oaks Boulevard and Morningside Avenue.



Buffered Bike Lane (Protected Bike Lane)

Description. Buffered bike lanes are on-street facilities that provide a separation or buffer space between bicycle lanes and travel lanes. Buffered bike lanes may be provided either one-way directional movement or two-way movement.

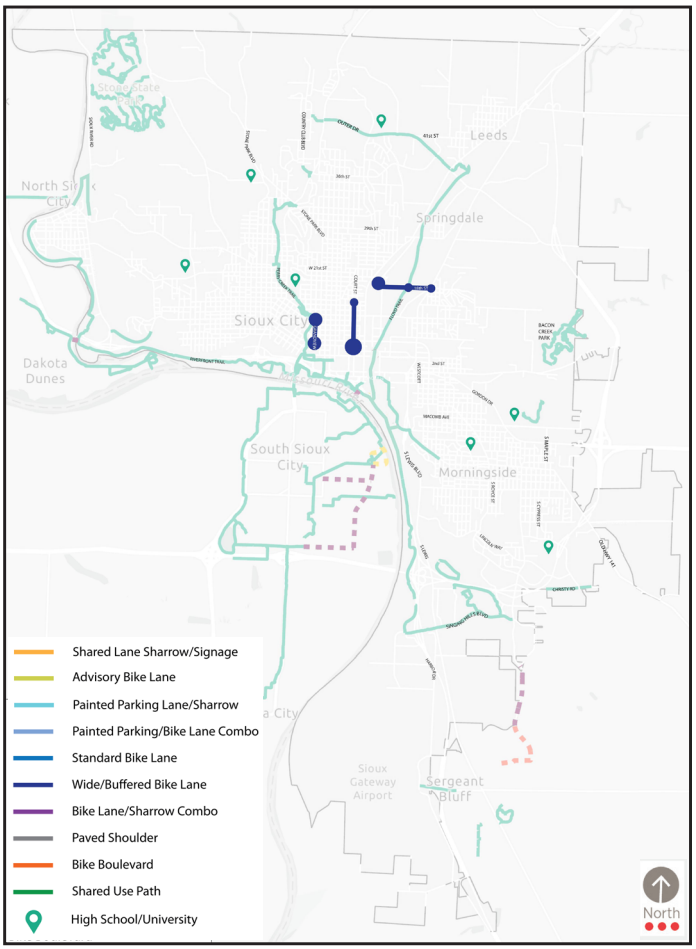
Street Characteristics. Higher traffic volume streets with wide travel lanes. On-street parking can be present, but may limit the feasibility of creating a buffer.

Design. Two-way protected lanes are most effective along street segments with few driveway interruptions. Desirable minimum width for two-way facilities is ten feet, although eight feet is acceptable in very limited conditions.

Safety Features. Extra wide painted lines, flexible vertical delineators from traffic, or curbs. Curbs are only recommended for two-way bicycle movement lanes.

Use in Sioux City. A few areas with heavy traffic or truck traffic where separation is needed but there is no room for shared use paths. Arterials and collectors in new development might consider buffered bike lanes in development design if shared use paths are not provided.

Example. An example is parts of Court Street south of 14th Street and Grandview Boulevard.



Bike Lane/Sharrow Combination

Description. A configuration where one side of the street has a standard bike land and the other side has shared lane markings, following the direction of vehicle traffic.

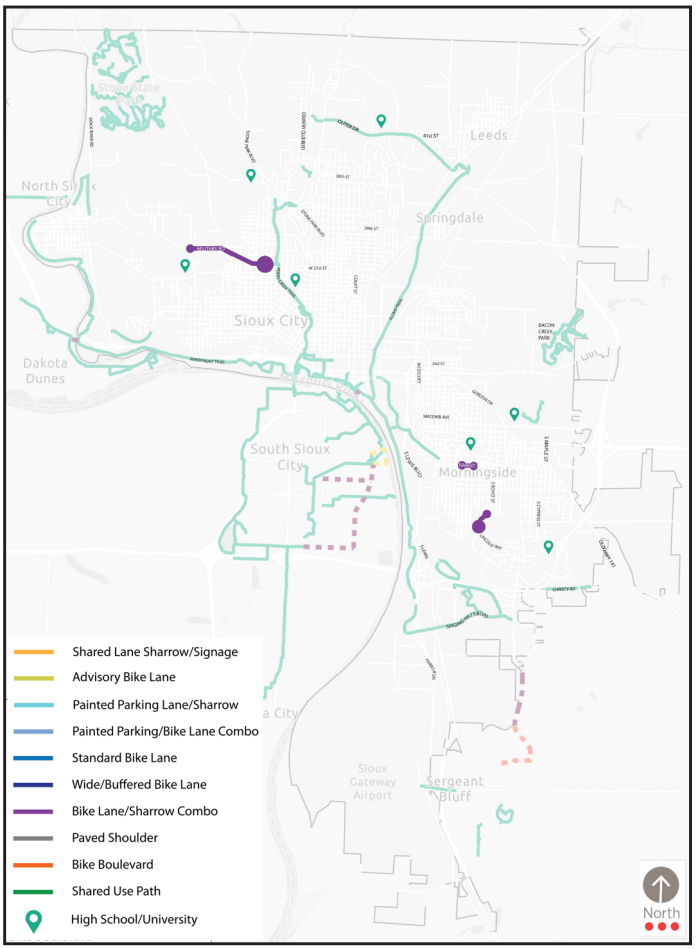
Street Characteristics. Used mostly where there are steep street hills. Can be appropriate on several street widths and traffic volumes as described under "Shared Lane Signage or Markings/ Sharrows" and "Standard/Wide Bike Lanes."

Design. The standard bike lane is placed on the side of the street going up the hill, while the sharrow is on the side going down the hill.

Safety Features. Protects riders who may be going slower up a hill through a designated bicycle lane. For riders going downhill, the grade may be steep enough where speed warrants occupying a whole vehicle traffic lane.

Use in Sioux City. Reserved for areas with the steepest inclines along the network routes or where space may only allow a bike lane on one side of the street

Example. An example is parts of Military Road and Leech Avenue just east of Lewis Boulevard.



Bicycle Boulevards

Description. They are low-volume, low-speed streets, modified to create greater comfort for both pedestrians and bicyclists, using treatments such as special signage, pavement markings (like shared lane markings), traffic calming devices such as bump-outs, and intersection modifications.

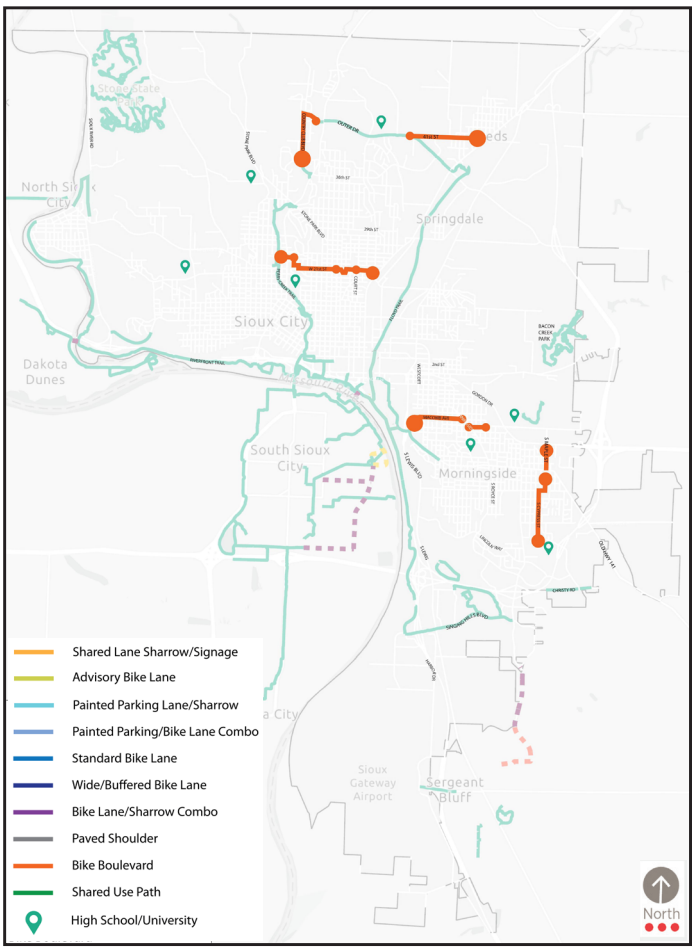
Street Characteristics. Has traffic speeds at or below 25 mph, and average daily traffic below 3,000 vehicle per day.

Design. The ideal bicycle boulevard provides both a direct route and good continuity. Bicycle boulevards should have excellent pedestrian facilities, including continuous sidewalks and properly designed crosswalks and ramps for people with disabilities.

Safety Features. Provide alternative and more comfortable routes to major traffic ways while providing access to the same destinations.

Use in Sioux City. These are neighborhood streets that connect destinations or trails.

Example. An example is Macomb Avenue and Country Club Boulevard.



Shared Use Paths

Description. Typically two-way paths located adjacent to streets and are separated from the stream of traffic by curbs. The sidepath accommodates pedestrians well and responds to potential cyclists who are uncomfortable riding in mixed traffic.

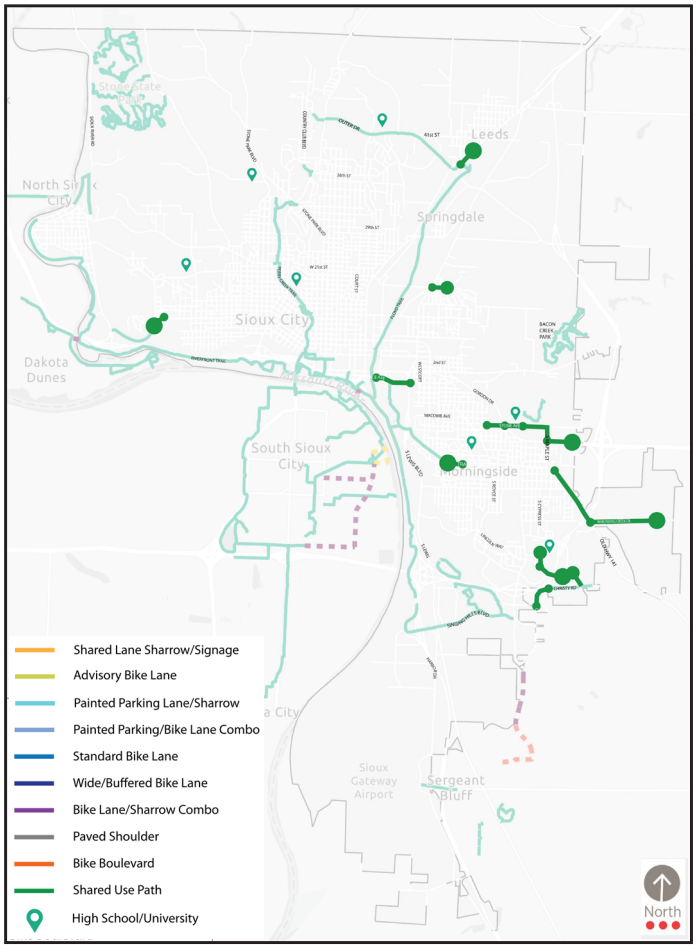
Street Characteristics. Generally along arterial streets or high vehicle traffic areas.

Design. 10-12 foot wide paved path. Center striping helps delineate movement of pedestrians and cyclists. In constrained situations the path can be a minimum of 8 feet wide.

Safety Features. The actual riding or walking surface should be separated from the back of the curb by landscaping or a contrasting pavement material. Research indicates that, to maximize safety, separation of the sidepath from a roadway should increase as road speeds increase. Sidepath crossings should be clearly defined by high visibility crosswalks and advisory signage to make motorists aware of the presence of the path.

Use in Sioux City. Most of the shared use paths in the network are already existing. Others shown are extensions to make connections to other bike systems or destinations.

Example. An example is Stone Avenue west of Gordon Drive and Whispering Creek Drive.

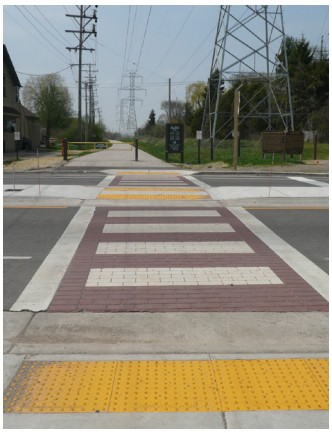


INTERSECTION ENHANCEMENT SUMMARY

The intersections identified in this chapter are presented as those creating the highest barriers in using the system at the time of the study. All intersections will need evaluation when implementing the bike network for appropriate markings, signage, or other treatments that may be warranted at the time of construction. Also note, each crossing at a signalized intersection, regardless of traffic speed or volume, requires additional review by a registered engineer.

Enhancement Definitions

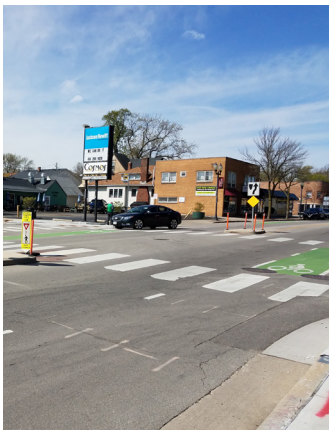
Median Refuge Island. An island in the middle of a two-way street, allowing pedestrians and bicyclists to address crossing traffic in one direction at a time from a protected place.

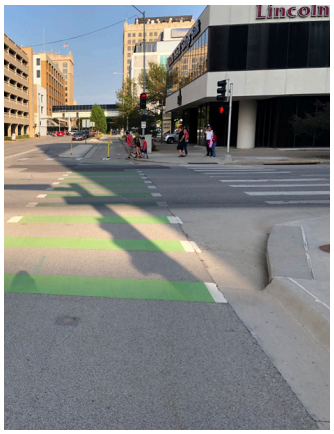


High Visibility Crosswalks. Well-defined crosswalks, using durable reflective materials and typically using Continental or Zebra/Ladder crosswalk markings. These may be for both pedestrians and bicyclists.



Bicycle Intersection Crossing Markings. Guide bicyclists on a safe, direct path through the intersection and provide a clear boundary between the paths of through bicyclists and vehicles in the adjacent lane. Also can include green or chevron markings to guide bicycle path or lane across intersection separate from pedestrians.



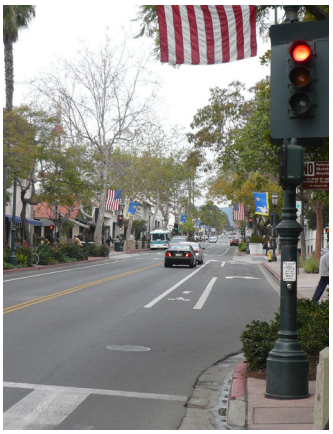


Bike/Ped Crossing Signs. Static signs that notify motorists of crossings and frequent pedestrian or cyclist activity.

Pedestrian Activated Signals/HAWK Beacon. Often used at mid-block and for trail crossings and include flashing yellow and solid red stop sequence.

Bike Boxes. Painted area behind the stop bar defined for use by bicyclists. Locations (often signalized intersections) where bike routes intersect or other locations that involve a significant number of left-turning movements for bicyclists otherwise traveling in a bike facility or "as far to the right as practicable." Motor vehicles must queue behind the white stop line at the rear of the bike box. On a green signal, all bicyclists can quickly clear the intersection. There are few necessary applications in the Sioux City network.

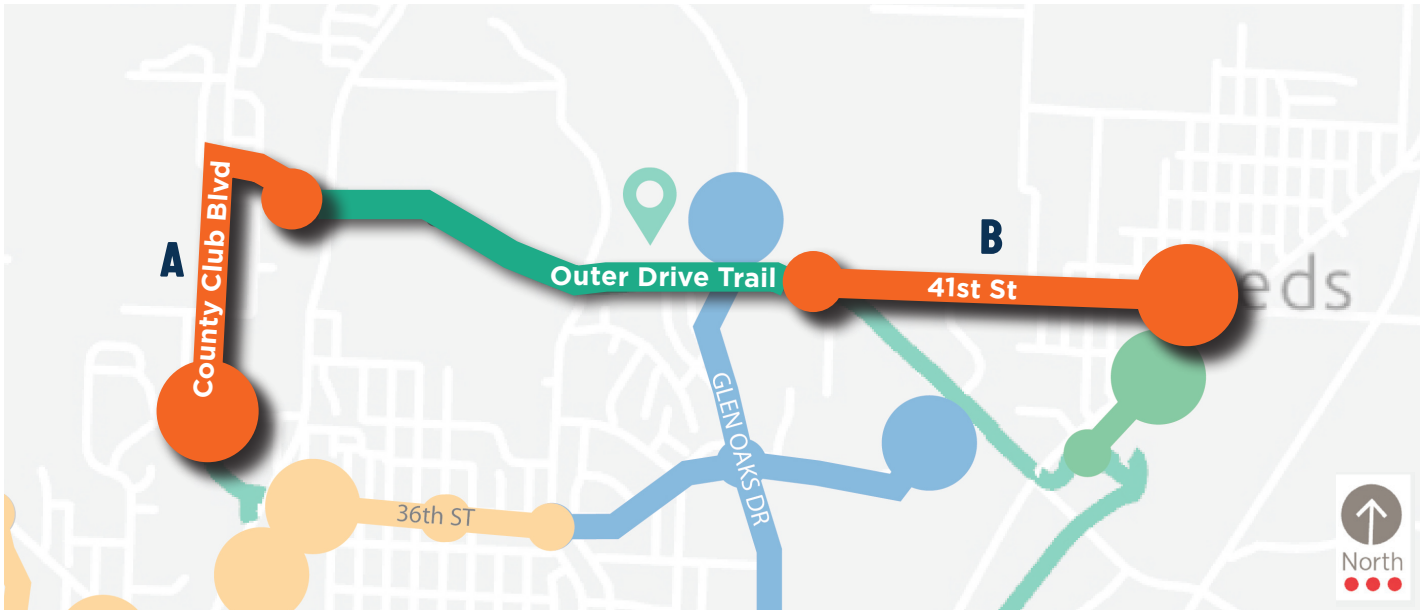
Vehicle Turn Lane Conflict Markings. Where a vehicle needs to cross a bicycle lane to turn, colored pavement within a bicycle lane may be used to increase the visibility of the bicycle facility, raise awareness of the potential to encounter bicyclists and reinforce priority of bicyclists in conflict areas. Signage should indicate that motorists must yield to bicyclists through the conflict area.



1. Outer Drive

Priority Level Ranking: HIGH

The Outer Drive segments uses the existing Outer Drive Trail but extends the route using bike boulevards on Country Club Boulevard and 41st Street.



Segment Description

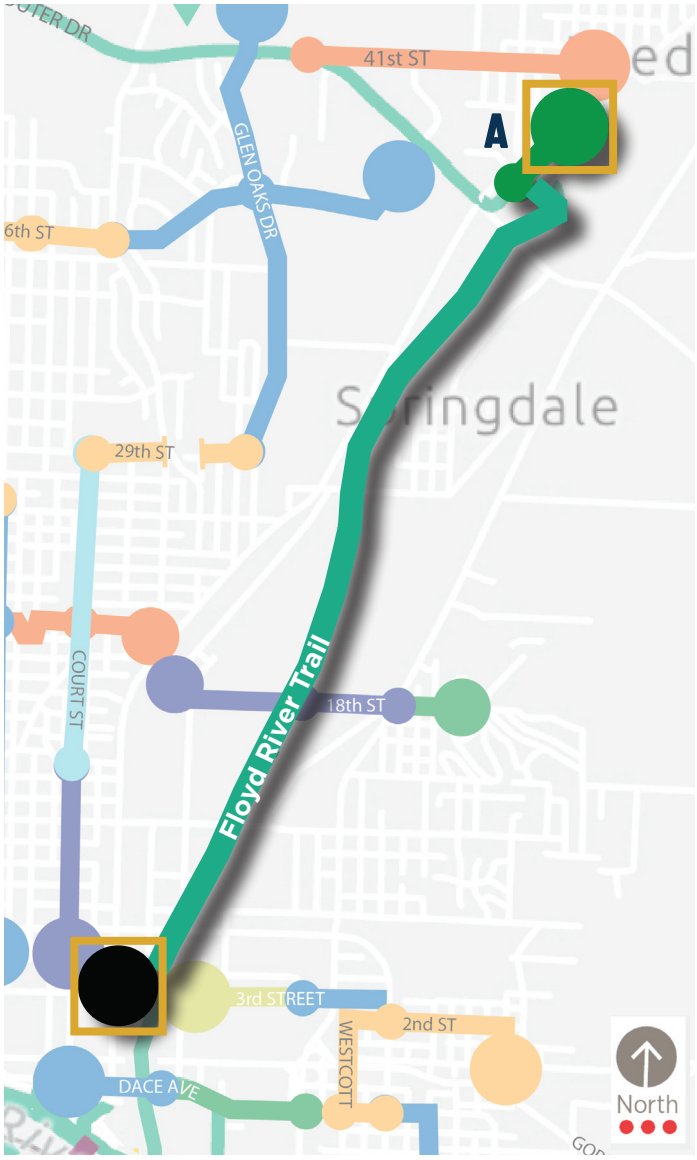
KEY	SEGMENT	LENGTH (MILES)	EXISTING STREET CONDITIONS	BIKE FACILITY TYPE	COST ESTIMATE	NOTES
A	Country Club Blvd: Perry Creek Elementary to 43rd Street/Perry Way/Pedestrian Bridge at Clark School	0.83	• Parking: Both sides • Pavement Width: 30' • Travel Lanes: 2	Enhanced Shared Lane/Bike Boulevard	$20,000-$21,000	Pavement in good condition
B	41st St: Outer Dr to Floyd Blvd	1.01	• Parking: None • Pavement Width: 30' • Travel Lanes: 2	Enhanced Shared Lane/Bike Boulevard	$18,000-$19,000	Pavement generally in good condition

Existing Trail
Future Trail
Future Trail
Future Trail
Shared Lane Sharrow/Signage
Advisory Bike Lane
Painted Parking Lane/Sharrow
Painted Parking/Bike Lane Combo
Standard Bike Lane
Wide/Buffered Bike Lane
Bike Lane/Sharrow Combo
Paved Shoulder
Bike Boulevard
Shared Use Path
High School/University

2. Floyd River Corridor

Priority Level Ranking: HIGH

The Floyd River Corridor mainly uses the existing Floyd River Trail, but makes critical connection enhancements into Leeds and downtown via trails and intersection improvements.



- Existing Trail
- Future Trail
- Future Trail
- Future Trail
- Shared Lane Sharrow/Signage
- Advisory Bike Lane
- Painted Parking Lane/Sharrow
- Painted Parking/Bike Lane Combo
- Standard Bike Lane
- Wide/Buffered Bike Lane
- Bike Lane/Sharrow Combo
- Paved Shoulder
- Bike Boulevard
- Shared Use Path
- High School/University

Priority Intersection Enhancements

INTERSECTION	ENHANCEMENT METHOD
Crossing Floyd Blvd at Central Street	Mid-block crossing with flashing beacon and signage
Floyd River Trail at 4th St and Hoeven Dr	High visibility crosswalks across Hoeven on the north side and 4th St on the east side. Crossing signage, No signalization

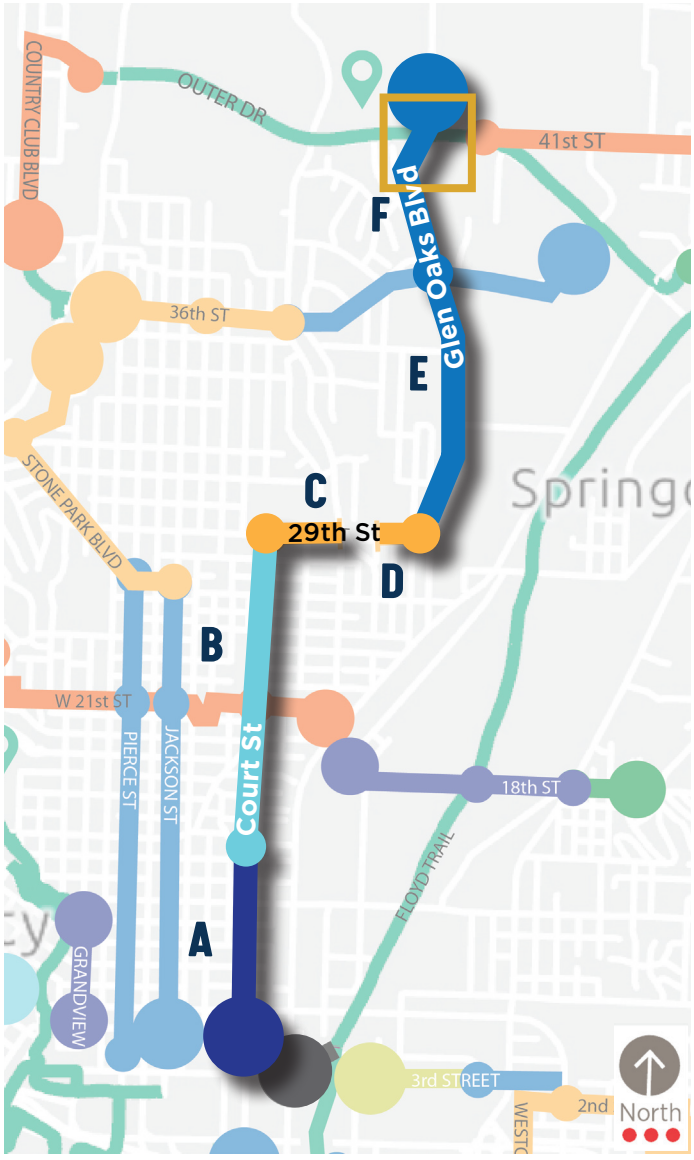
Segment Description

KEY	SEGMENT	LENGTH (MILES)	EXISTING STREET CONDITIONS	BIKE FACILITY TYPE	COST ESTIMATE	NOTES
A	Central St to follow railroad to the southwest and connect with the Floyd River Trail	0.46	• Parking: - N/A • Pavement Width: - N/A • Travel Lanes: - N/A	Shared Use Path/ Trail	$60,000-$62,000	Land owned by the City for possible connection

3. Court Street/Glen Oaks Boulevard

Priority Level Ranking: LOW

Court Street and Glen Oaks Boulevard provides an option for north/south connectivity. However, several different treatments are needed to fit within the changing street environment.



- Existing Trail
- Future Trail
- Future Trail
- Future Trail
- Shared Lane Sharrow/Signage
- Advisory Bike Lane
- Painted Parking Lane/Sharrow
- Painted Parking/Bike Lane Combo
- Standard Bike Lane
- Wide/Buffered Bike Lane
- Bike Lane/Sharrow Combo
- Paved Shoulder
- Bike Boulevard
- Shared Use Path
- High School/University

Priority Intersection Enhancements

INTERSECTION	ENHANCEMENT METHOD
Crossing Outer Drive at Glen Oaks Blvd	Widen sidewalk on south side of Outer Dr to reach the Buckwalter crossing

Bike Lane Next to Parking Example

Segment Description

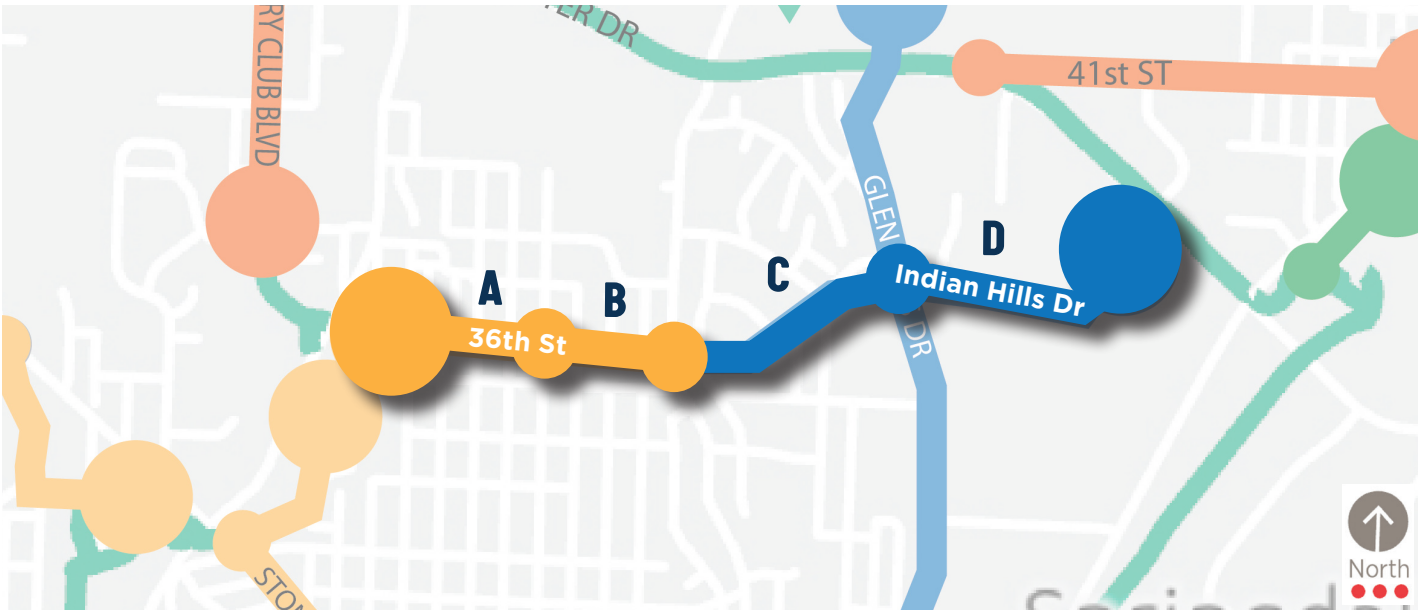
KEY	SEGMENT	LENGTH (MILES)	EXISTING STREET CONDITIONS	BIKE FACILITY TYPE	COST ESTIMATE	NOTES
A	Court St: 4th St to 14th St	0.74	• Parking: Both sides • Pavement Width: 52' • Travel Lanes: 2	Wide Standard Bike Lane	$18,000-$19,000	Pavement generally in good condition
B	Court St: 14th St to 29th St	1.08	• Parking: Both sides • Pavement Width: <42' • Travel Lanes: 2	Painted Parking Lane with sharrows	$27,000-$28,000	Dashed bike lane or sharrow to direct cyclists at the "jag" at 14th and 28th Streets
C	29th St: Court St to Cheyenne Blvd	0.29	• Parking: One side • Pavement Width: 26' • Travel Lanes: 2	Shared Lane Markings	$7,000-$8,000	Maintain potholes and street condition
C1	29th Street path south of Vietnamese Church	0.11	• Parking: - N/A • Pavement Width: - N/A • Travel Lanes: - N/A	Shared Use Path/Trail	$15,000-$16,000	Would require land acquisition
C2	Cheyenne Blvd to Dupont St to 29th St	0.23	• Parking: • Pavement Width • Travel Lanes	Shared Lane Markings	$2,000-$3,000	Alternative to C1 route; Pavement in good condition
D	29th Street: Dupont St to Chambers St	0.07	• Parking: One side • Pavement Width: 30' • Travel Lanes: 2	Shared Lane Markings	$1,000-$2,000	29th St is gravel between Dupont and Morgan St
E	Chambers St/Glen Oaks Blvd: 29th St to Indian Hills Dr	0.16	• Parking: None • Pavement Width: 30' • Travel Lanes: 2	Standard Bike Lane	$4,000-$5,000	Pavement in good condition
		0.81	• Parking: Both sides • Pavement Width: 48' • Travel Lanes: 2	Standard Bike Lane	$24,000-$25,000	Eliminate one side of parking
F	Glen Oaks Blvd: Indian Hills Dr to Outer Dr	0.50	• Parking: Both sides • Pavement Width: 48' • Travel Lanes: 2	Standard Bike Lane	$15,000-$16,000	Eliminate one side of parking

Sidewalk widening at the end of the Glen Oaks Blvd route to reach the Buckwalter Dr crossing.

4. 36th Street

Priority Level Ranking: LOW

A route on 36th Street would provide east/west connectivity through north side neighborhoods. However, with the Outer Drive trail, this route is lower importance in the near term.



Segment Description

KEY	SEGMENT	LENGTH (MILES)	EXISTING STREET CONDITIONS	BIKE FACILITY TYPE	COST ESTIMATE	NOTES
A	36th Street: Hamilton Blvd to Jackson St	0.41	• Parking: One Side • Pavement Width: 30' • Travel Lanes: 2	Shared Lane Markings	$6,000-$7,000	Good pavement condition
B	36th Street: Jackson St to Cheyenne Blvd	0.36	• Parking: None • Pavement Width: 25' • Travel Lanes: 2	Shared Lane Markings	$5,000-$6,000	Generally good pavement condition
C	Indian Hills Dr: Cheyenne Blvd to Glen Oaks Blvd	0.59	• Parking: None • Pavement Width: 36' • Travel Lanes: 2	Standard Bike Lane	$14,000-$15,000	Good pavement condition
D	Indian Hills Dr: Glen Oaks Blvd to Outer Dr	0.66	• Parking: None • Pavement Width: 40' • Travel Lanes: 2	Standard Bike Lane	$16,000-$17,000	Good pavement condition

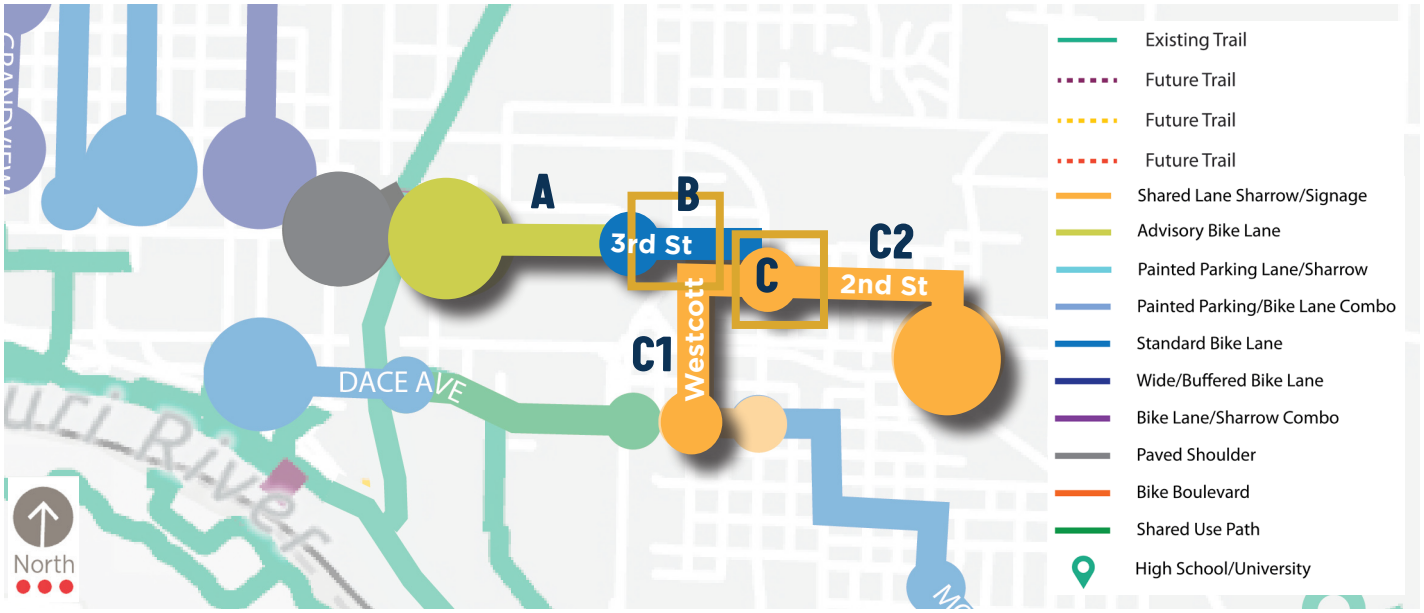
Existing Trail
Future Trail
Future Trail
Future Trail

Shared Lane Sharrow/Signage
Advisory Bike Lane
Painted Parking Lane/Sharrow
Painted Parking/Bike Lane Combo
Standard Bike Lane
Wide/Buffered Bike Lane
Bike Lane/Sharrow Combo
Paved Shoulder
Bike Boulevard
Shared Use Path
High School/University

5. East/West Connector - 4th Street

Priority Level Ranking: MODERATE

There are few feasible options to reach Morningside from downtown. This route along 4th and 3rd Street provides one opportunity with a couple of needed intersection enhancements.



Segment Description

KEY	SEGMENT	LENGTH (MILES)	EXISTING STREET CONDITIONS	BIKE FACILITY TYPE	COST ESTIMATE	NOTES
A	4th Street: Steuben to 3rd St to railroad crossing	0.53	• Parking: • Pavement Width: 32' • Travel Lanes:	Advisory Bike Lane	$9,000-$10,000	Generally good pavement condition
B	3rd Street: Lewis Blvd to Fairmount St	0.19	• Parking: None • Pavement Width: 36' • Travel Lanes: 2	Standard Bike Lane	$4,000-$5,000	Fill potholes/ pavement cracks in bike lanes
C	Fairmount Street: 3rd St to 2nd St	0.07	• Parking: N/A • Pavement Width: N/A • Travel Lanes: N/A	Shared Use Path	$8,000-$9,000	Expand existing sidewalk on the east side of street
C1	2nd Street: Fairmount St to Logan St to Gordon Dr Shopping Center	0.62	• Parking: Both sides • Pavement Width: 30' • Travel Lanes: 2	Shared Lane Markings	$15,000-$16,000	Mark crossings at Correctionville Rd
C2	2nd Street: Fairmount St to Westcott St to Gordon Dr	0.29	• Parking: Both sides • Pavement Width: 36' • Travel Lanes: 2	Shared Lane Markings	$7,000-$8,000	Generally good pavement condition

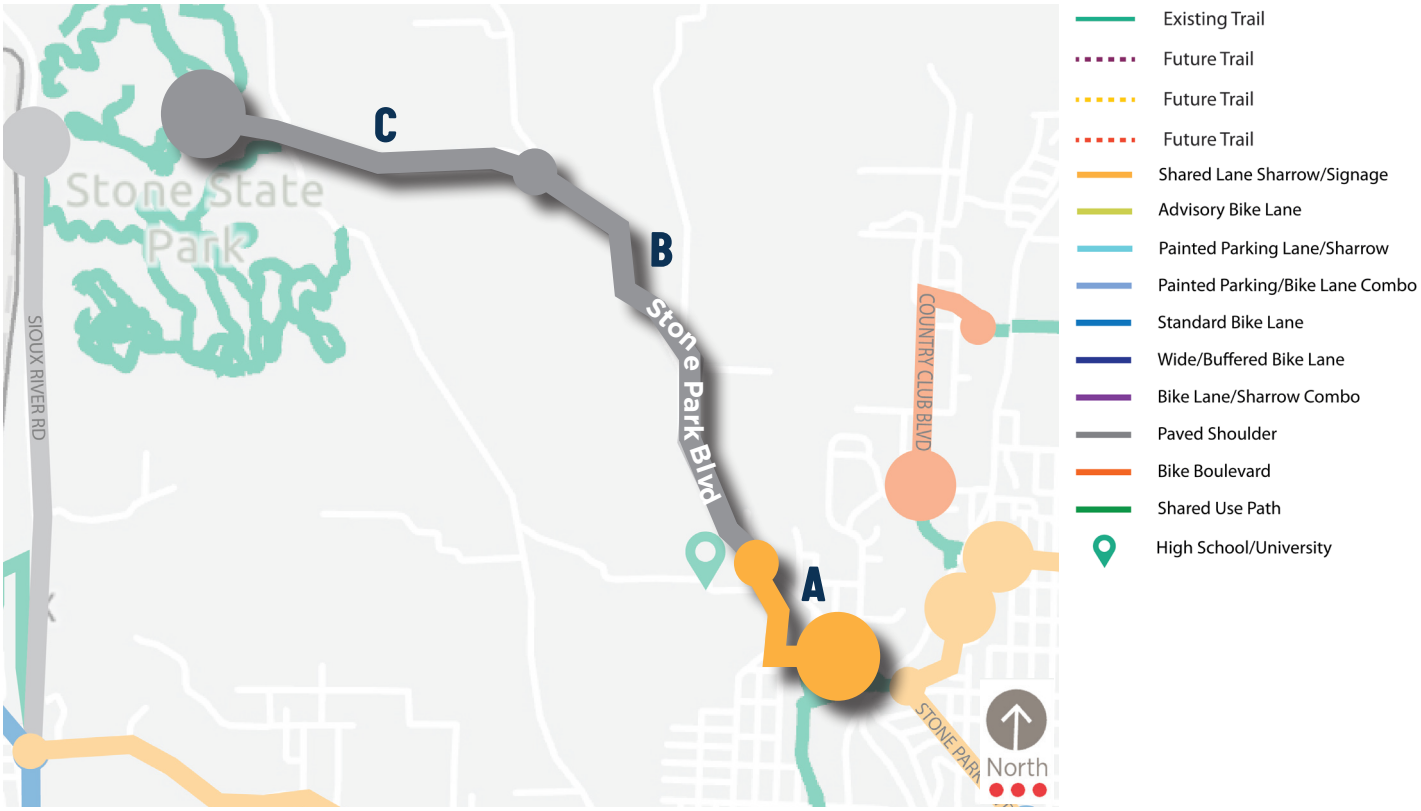
Priority Intersection Enhancements

INTERSECTION	ENHANCEMENT METHOD
Railroad crossing to Lewis Blvd crossing	Lewis Blvd high visibility painted crossings; bicycle crossing markings; bike box
Fairmount St and 2nd St Intersection	High visibility painted crossings. flashing beacons, and signage

6. Stone Park

Priority Level Ranking: MODERATE

Stone Park Boulevard is a popular recreational route that sees decent bicycle traffic. Safety improvements on the route are higher priority to increase comfort and access for more cyclists.



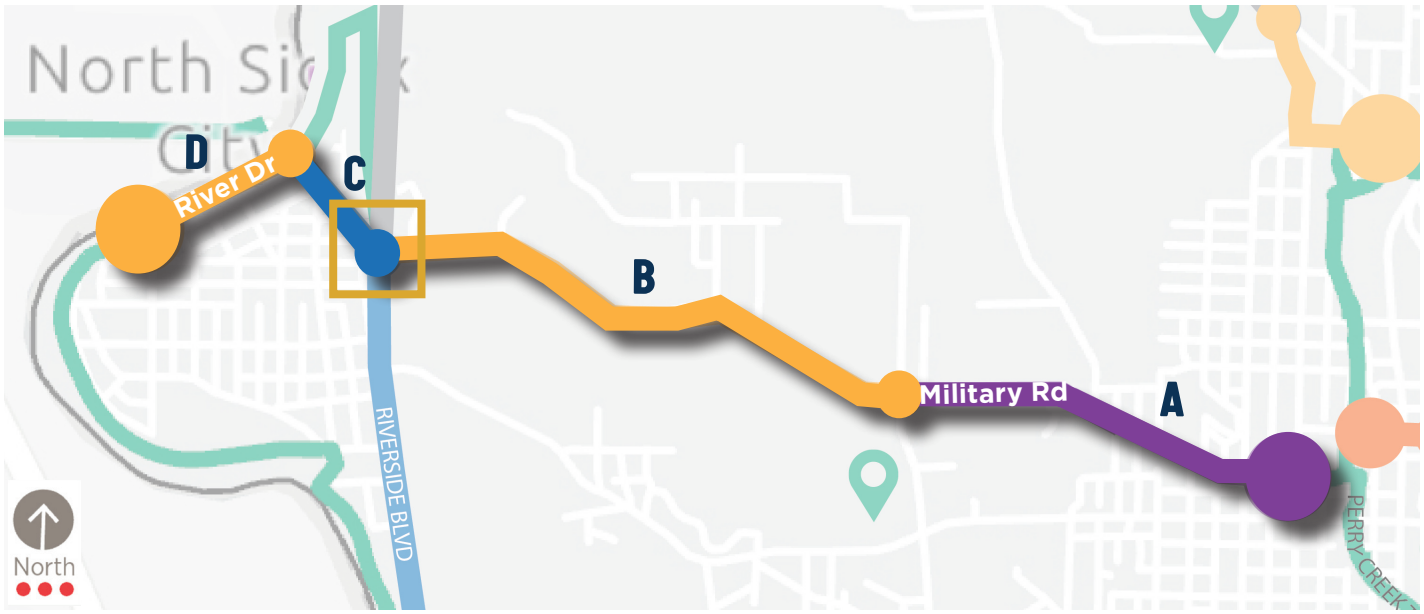
Segment Description

KEY	SEGMENT	LENGTH (MILES)	EXISTING STREET CONDITIONS	BIKE FACILITY TYPE	COST ESTIMATE	NOTES
A	W. Clifton Ave: Perry Creek Trail to Broken Kettle to Stone Park Blvd	0.48	• Parking: None • Pavement Width: 24' • Travel Lanes: 2	Shared Lane Markings	$8,000-$9,000	Pavement in good condition
B	Stone Park Blvd: Broken Kettle Rd to Memorial Dr	1.62	• Parking: None • Pavement Width: 24' • Travel Lanes: 2	Shared Use Path or paved shoulders	$720,000-$750,000	Pavement in good condition
C	Memorial Drive: Stone Park Blvd to Stone Park	2.21	• Parking: None • Pavement Width: 20' • Travel Lanes: 2	Shared Use Path or paved shoulders	$975,000-$1,000,000	Signage or markings at Memorial Drive turnoff from Stone Park Blvd

7. Military Road

Priority Level Ranking: HIGH

Military Road is a primary east/west route to Riverside and a popular route today. Enhancements involve using the street width for bike lanes and shared lane markings in the near term.



Existing Trail
Future Trail
Future Trail
Future Trail

Shared Lane Sharrow/Signage
Advisory Bike Lane
Painted Parking Lane/Sharrow
Painted Parking/Bike Lane Combo
Standard Bike Lane
Wide/Buffered Bike Lane
Bike Lane/Sharrow Combo
Paved Shoulder
Bike Boulevard
Shared Use Path
High School/University

Priority Intersection Enhancements

INTERSECTION	ENHANCEMENT METHOD
Riverside Blvd/Military Rd/ Sioux River Rd Triangle	Detailed design consideration needed

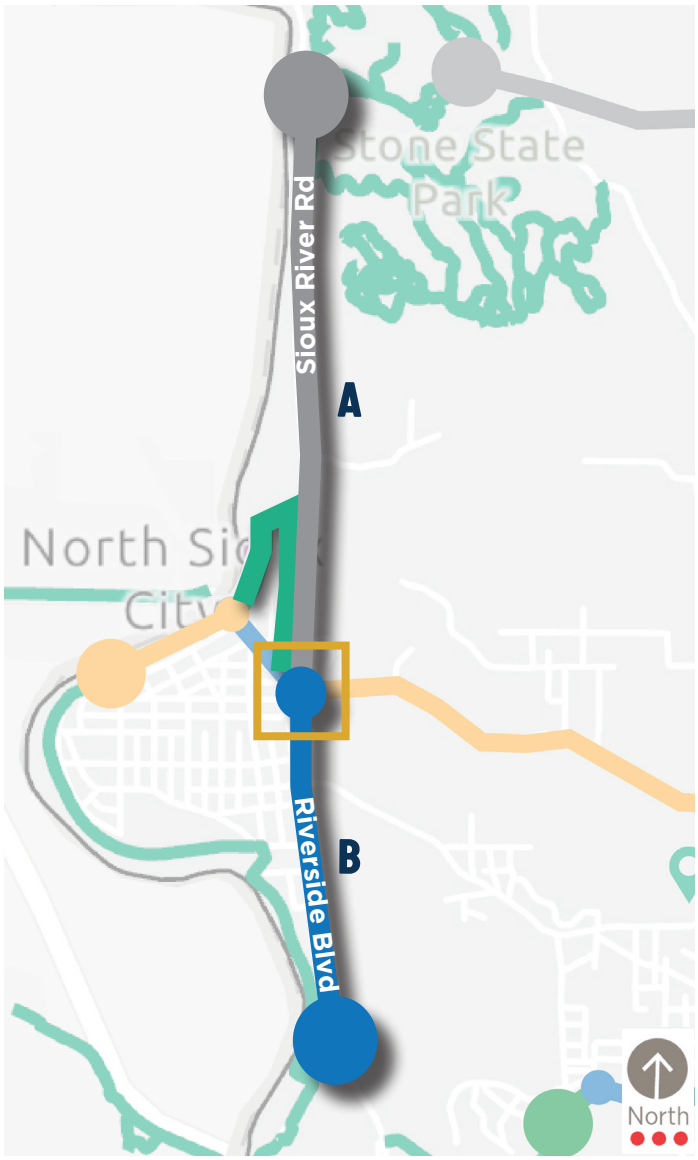
Segment Description

KEY	SEGMENT	LENGTH (MILES)	EXISTING STREET CONDITIONS	BIKE FACILITY TYPE	COST ESTIMATE	NOTES
A	Military Road: Perry Creek Trail at Center Street Park to Casselman St	1.26	• Parking: • Pavement Width: <37' • Travel Lanes: 2	Standard Bike Lane	$31,000-$32,000	Reduce travel lane, sharrows at left turns
B	Military Road: Casselman St to Riverside Blvd	1.65	• Parking: None • Pavement Width: 30' • Travel Lanes: 2	Shared Lane Markings	$16,000-$17,000	Generally good pavement condition
C	Military Road: Riverside Blvd to River Dr	0.34	• Parking: • Pavement Width: 42' • Travel Lanes: 2	Standard Bike Lane	$8,000-$9,000	Good pavement condition, recently reconstructed
D	River Drive: Military Blvd to Riverfront Trail connection at Dacotah Ave	0.61	• Parking: Both sides • Pavement Width: 26' • Travel Lanes: 2	Shared Lane Markings	$15,000-$16,000	Generally good pavement condition

8. Sioux River Road

Priority Level Ranking: HIGH

Sioux River Road is used mostly today by experienced cyclists, but a paved shoulder treatment can make it a safer route from Stone Park. Some improvements are already in place along Riverside Boulevard south of Military Road.



Segment Description

KEY	SEGMENT	LENGTH (MILES)	EXISTING STREET CONDITIONS	BIKE FACILITY TYPE	COST ESTIMATE	NOTES
A	Stone State Park at North entrance to Railroad Museum Trail	1.85	• Parking: None • Pavement Width: 24' • Travel Lanes: 2	Paved Shoulder	$760,000-$800,000	Generally good pavement condition; Maintain rumble strips
B	Riverside Blvd: Military Rd to Riverside Park entrance at War Eagle Dr	1.46	• Parking: • Pavement Width: 48' • Travel Lanes:	Standard Bike Lane	$42,000-$44,000	Recently repaved

9. Downtown

Priority Level Ranking: HIGH

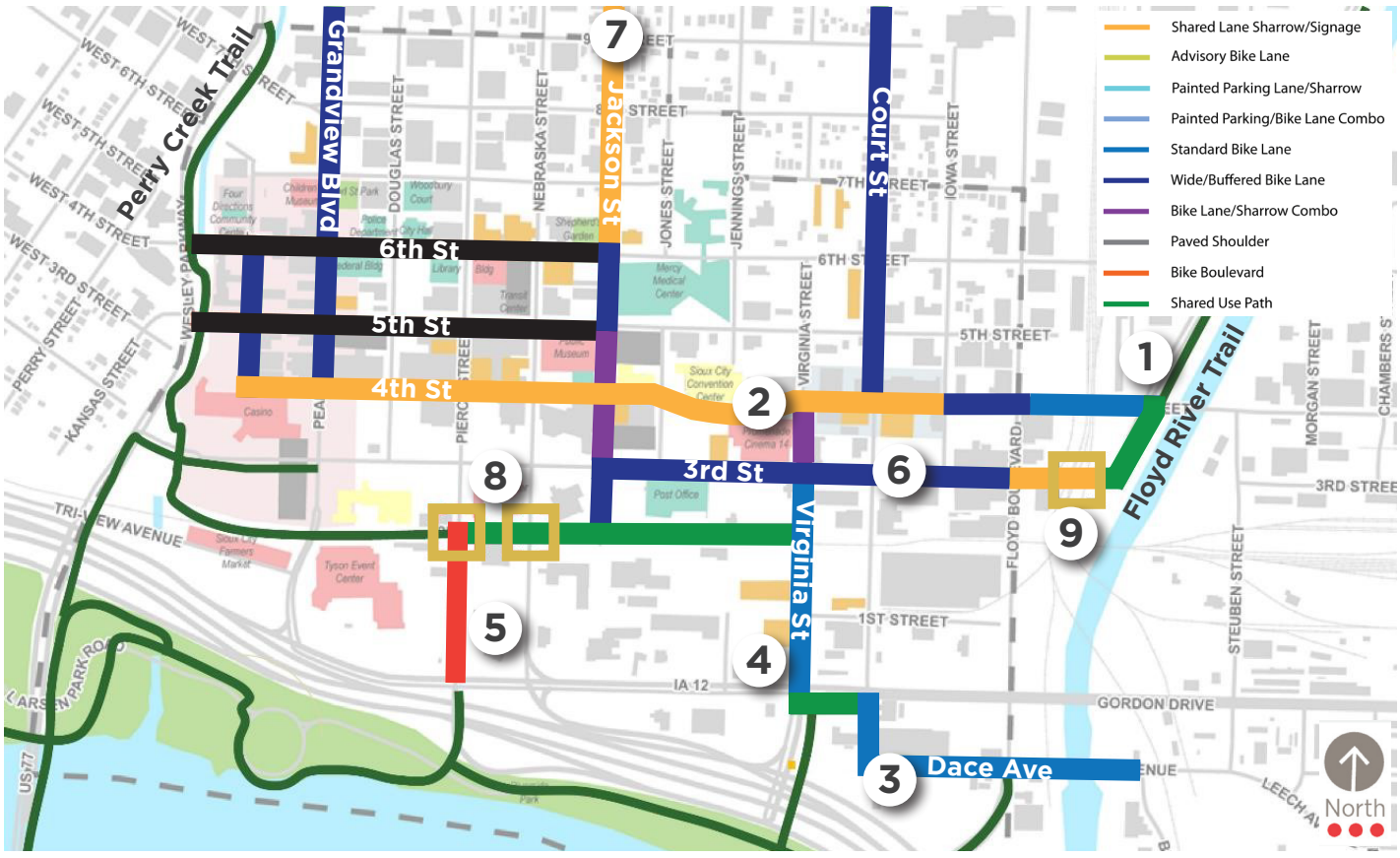
There are many components to improve bicycle safety and comfort downtown. The high vehicular and pedestrian traffic downtown warrants more careful consideration of on-street bike facilities. The Downtown Transportation Plan proposes the following bicycle network for downtown that includes:

The network as shown has:

- Very little reduction of on-street parking.
- No modification of curb lines.
- Only one lane reduction (on Virginia St south of 3rd, from 4 travel lanes to 3 with a center turn lane).
- A little lane narrowing, but nothing below 11 feet.
- Back-in diagonal parking on 4th Street, which is safer for cyclists and pedestrians than front-in parking.

NETWORK DESCRIPTION

1. Link the Floyd River Trail to the Perry Creek Trail by way of 3rd St to Jackson.
2. Slightly enhance 4th St as a shared-use bicycle boulevard.
3. Connect Bluff St and Dace Ave. Bluff St is important for connection to the Expo Center and Floyd River Bridge.
4. Continue that connection to Virginia St via a small piece of path south of Gordon Dr.
5. Convert outer parking row of the Tyson Center and a piece of Pierce St to a cycletrack or sidewalk expansion.
6. Bike lanes buffered from traffic by parking spots on 3rd St (increasingly accepted by practitioners)
7. Shared-lane markings, on 4th St and Jackson north of 6th St, ideally enhanced with obvious green paint.
8. Protected pedestrian crossings on Pierce and Nebraska Streets at the Perry Creek Trail.
9. Improved railroad crossing at 3rd Street near Floyd Blvd.

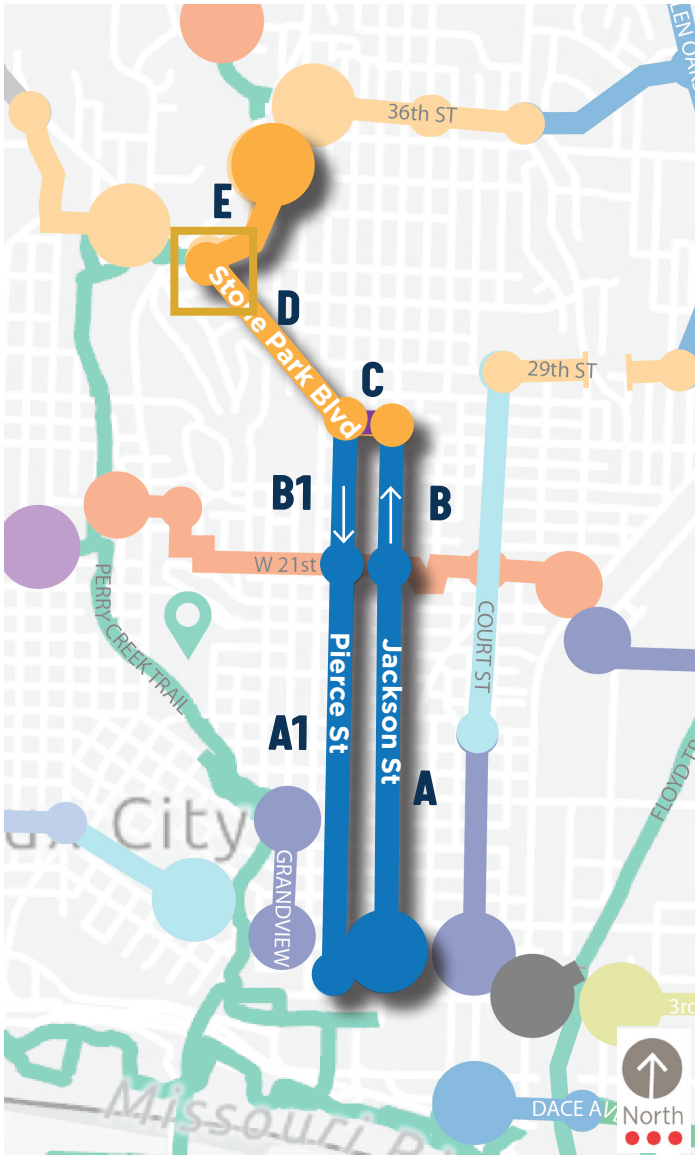


10. Jackson Street

Priority Level Ranking: HIGH

Jackson Street is a natural choice for on-street bike facilities because of the wider street. To retain on-street parking, this segment proposes a one-way bike lane northbound on Jackson Street with a southbound one-way bike lane on Pierce Street. The enhancement would be relatively easy to implement in the near term.

The pavement width on Stone Park Boulevard is not enough for conventional bike lanes and instead uses shared lane markings to reach the Perry Creek Trail.



- Shared Lane Sharrow/Signage
- Advisory Bike Lane
- Painted Parking Lane/Sharrow
- Painted Parking/Bike Lane Combo
- Standard Bike Lane
- Wide/Buffered Bike Lane
- Bike Lane/Sharrow Combo
- Paved Shoulder
- Bike Boulevard
- Shared Use Path
- High School/University
- Existing Trail
- Future Trail
- Future Trail
- Future Trail

Priority Intersection Enhancements

INTERSECTION	ENHANCEMENT METHOD
Stone Park Blvd and Perry Creek Trail	High visibility crosswalks on south side of Stone Park and crossing to Perry Lane; Signage

Segment Description

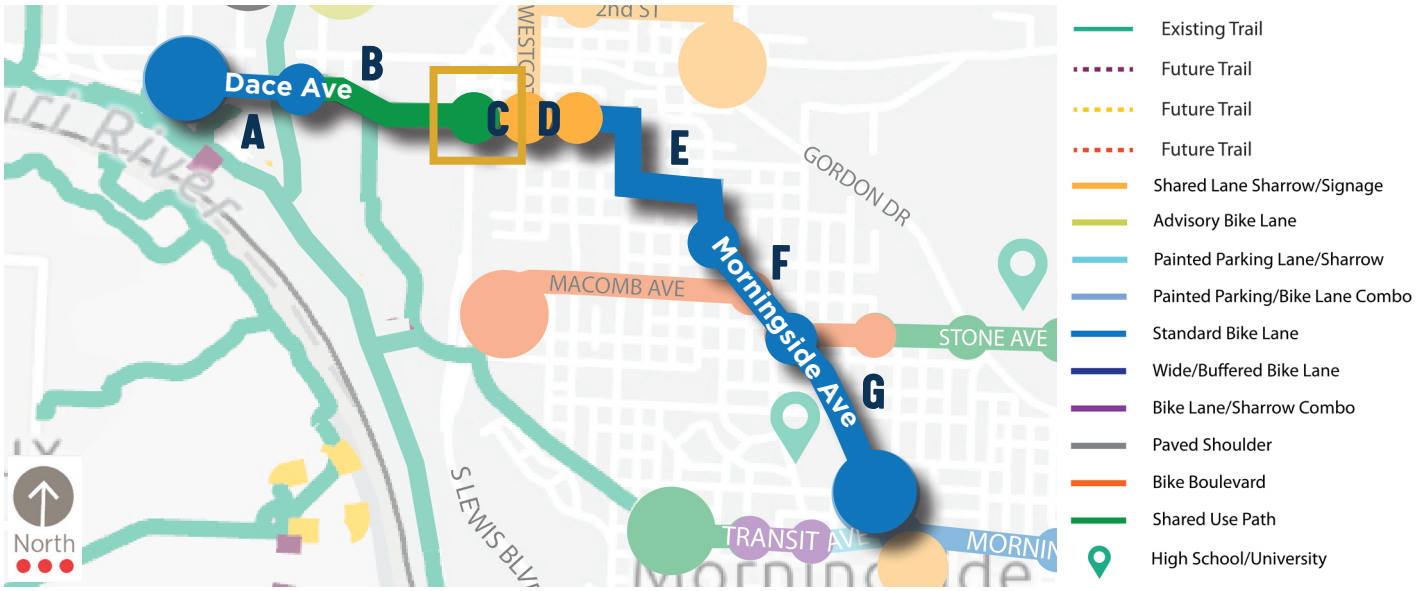
KEY	SEGMENT	LENGTH (MILES)	EXISTING STREET CONDITIONS	BIKE FACILITY TYPE	COST ESTIMATE	NOTES
A	Jackson Street: 6th St to W. 21st St	1.09	• Parking: Both sides • Pavement Width: 42' • Travel Lanes: 2	Standard bike lane; One side	$17,000-$18,000	One-way northbound
B	Jackson Street: W 21st St to Stone Park Blvd	0.41	• Parking: Both sides • Pavement Width: 42' • Travel Lanes: 2	Standard bike lane; One side	$6,000-$7,000	One-way northbound
A1	Pierce Street: 4th St to 18th St	1.24	• Parking: Both sides • Pavement Width: 52' • Travel Lanes: 3	Standard bike lane; One side	$19,000-$20,000	One-way southbound
B1	Pierce Street: 18st St to Stone Park Blvd	0.84	• Parking: Both sides • Pavement Width: 48' • Travel Lanes: 2	Standard bike lane; One side	$13,000-$14,000	One-way southbound
C	27th Street: Jackson St to Pierce St	0.15	• Parking: One side • Pavement Width: 36' • Travel Lanes: 2	Bike Lane Uphill, Sharrow Downhill	$1,000-$2,000	Repair potholes and pavement cracks
D	Stone Park Blvd: Pierce St to Perry Creek Trail	0.67	• Parking: One side • Pavement Width: 30' • Travel Lanes: 2	Shared Lane Markings	$16,000-$17,000	Good pavement condition
E	Perry Lane: Stone Park Blvd to Dearborn to Dead end	0.56	• Parking: Both sides • Pavement Width: 30' • Travel Lanes: 2	Shared Lane Markings	$13,000-$14,000	A small path exists today at the dead end to reach Hamilton Blvd from Dearborn

Intersection treatment at Stone Park Blvd and Perry Creek Trail

11. East/West Connector - Dace Avenue

Priority Level Ranking: HIGH

Dace Avenue is the most feasible near term route for on-street connectivity from downtown to Morningside. While the Riverfront trail does provide connection, the Dave Avenue route is more direct for commuting cyclists.

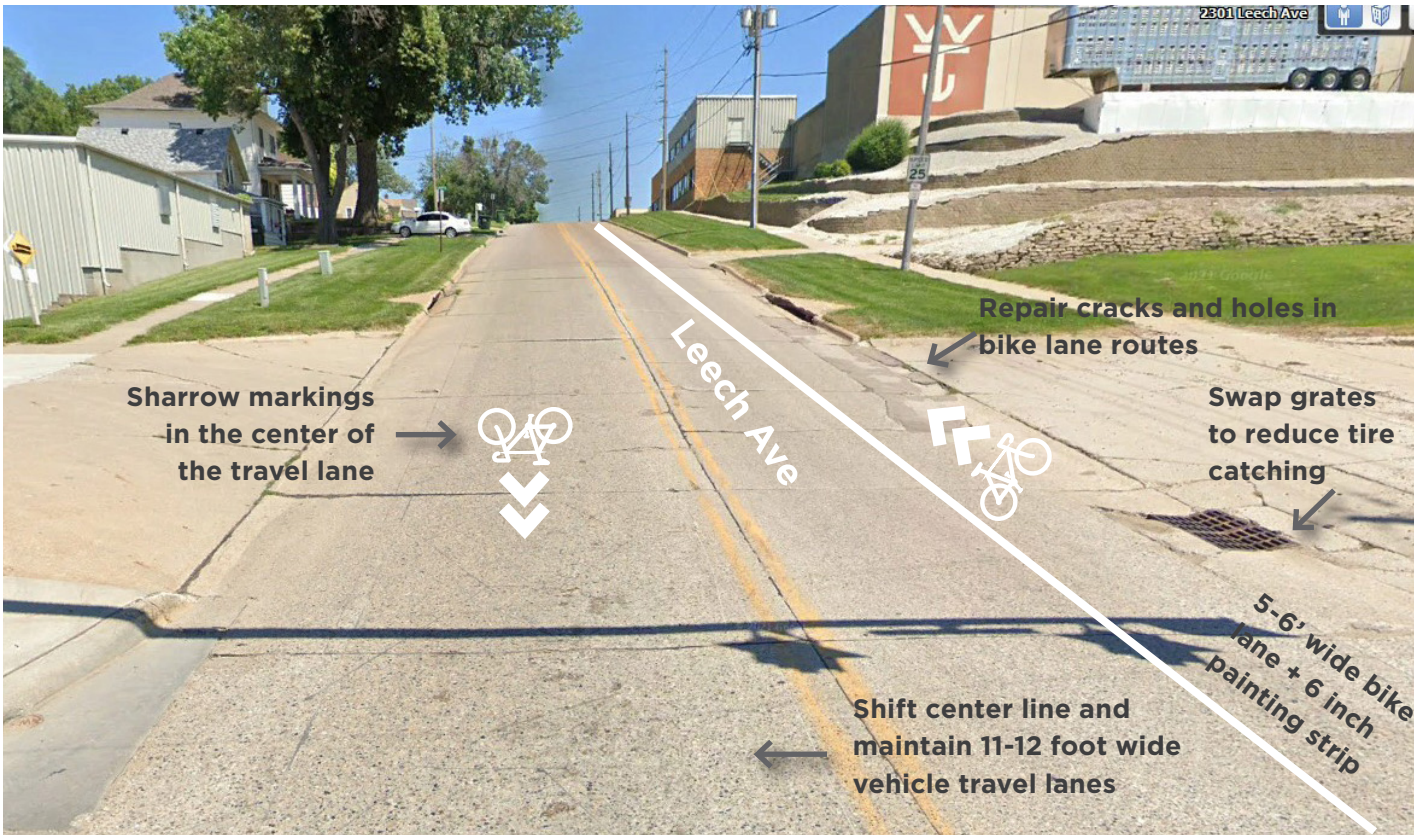


Segment Description

KEY	SEGMENT	LENGTH (MILES)	EXISTING STREET CONDITIONS	BIKE FACILITY TYPE	COST ESTIMATE	NOTES
A	Dace Avenue: Court St to Sidepath	0.34	• Parking: None • Pavement Width: 45' • Travel Lanes: 2-4	Standard Bike Lane	$8,000-$9,000	Crosswalks needed at Floyd Blvd; Rail crossing improvements
B	Leech Ave: Cunningham Dr to Lewis Blvd/Hwy 75	0.27	• Parking: None • Pavement Width: 52' • Travel Lanes: 4	Shared Use Path	$33,000-$35,000	Generally good pavement condition
C	Leech Ave: Lewis Blvd/Hwy 75 to S Westcott St	0.15	• Parking: None • Pavement Width: 30' • Travel Lanes: 2	Bike Lane Uphill, Sharrow Downhill	$1,000-$2,000	Fill potholes/ pavement cracks in bike lanes
D	Leech Ave: S Westcott St to Fairmount St	0.15	• Parking: One side • Pavement Width: 30' • Travel Lanes: 2	Shared Lane Markings	$3,000-$4,000	Generally good pavement condition
E	Leech Ave: Fairmount St to S Rustin to Dodge Ave to S Cecelia St to Morningside Ave	0.73	• Parking: Both sides • Pavement Width: 48' • Travel Lanes: 2	Standard Bike Lane	$18,000-$19,000	Generally good pavement condition
F	Morningside Ave: S Cecelia St to Stone Ave	0.33	• Parking: Both sides • Pavement Width: 52' • Travel Lanes: 2	Standard Bike Lane	$8,000-$9,000	Generally good pavement condition
G	Morningside Ave: Stone Ave to Transit Ave	0.67		Standard Bike Lane	$16,000-$17,000	Generally good pavement condition

Priority Intersection Enhancements

	INTERSECTION	ENHANCEMENT METHOD
	Leech Ave and Lewis Blvd Intersection	High visibility crosswalks with bike boxes; railroad crossing bicycle signage



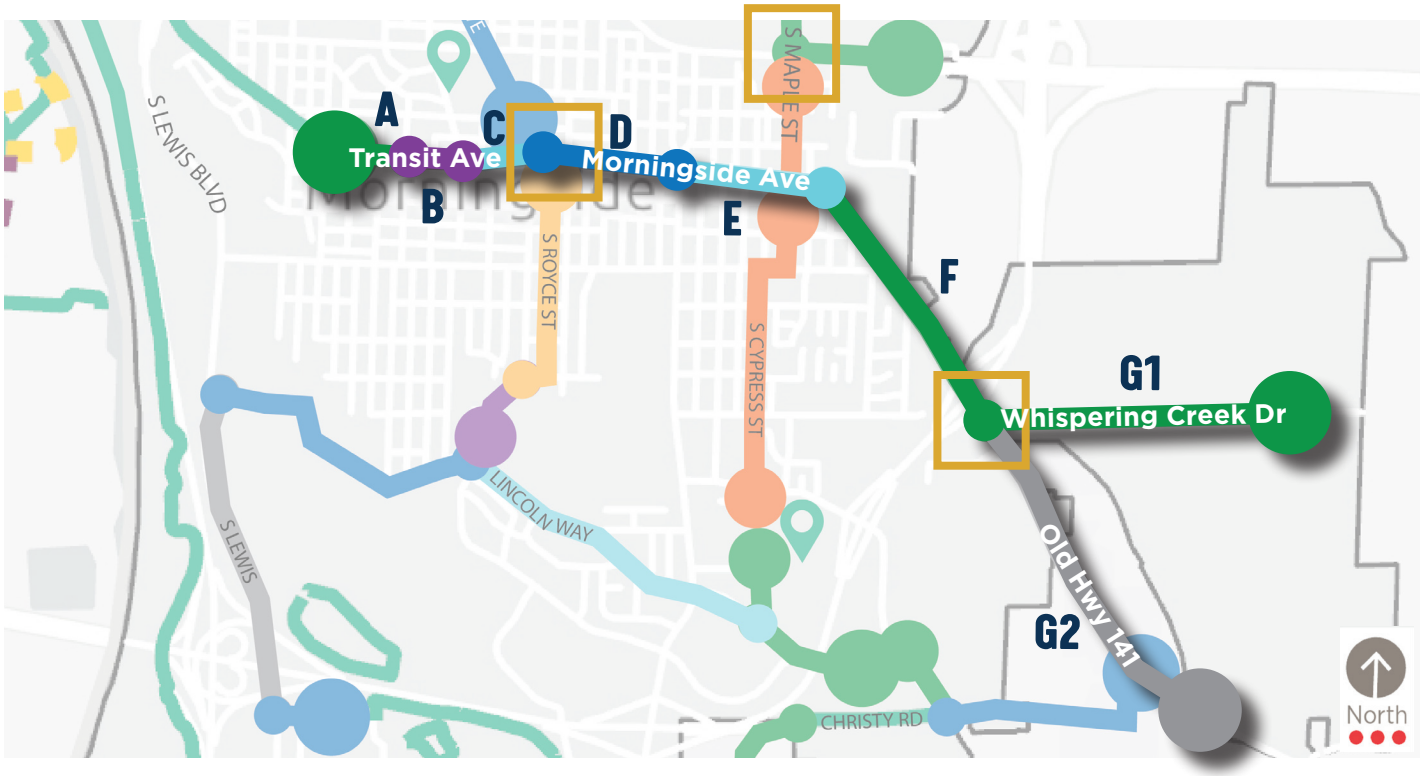
Leech Avenue east of the Lewis Boulevard Crossing - Example of bike lane uphill, sharrow downhill treatment and other treatments for bike lanes

Outlining markings with green paint further calls attention not just to motorists, but also to help cyclists navigate the system.

12. Morningside Avenue

Priority Level Ranking: HIGH

Transit and Morningside Avenue are the east/west spine of the Morningside area and provides the only connection to the Whispering Creek neighborhoods. Bike enhancements are crucial to achieve a looped network of bike routes.



Priority Intersection Enhancements

INTERSECTION	ENHANCEMENT METHOD
Morningside Ave and Transit Ave Intersection	Bike boxes and bicycle crossing markings (separate from pedestrian crossings)
Maple Street and Gordon Drive Intersection	High visibility crosswalks; pedestrian activated crossing timers
Hwy 20 and Morningside Ave Intersection	High visibility crosswalks on Morningside Ave crossings where sidewalk will be extended for a shared use path

- Existing Trail
- Future Trail
- Future Trail
- Future Trail
- Shared Lane Sharrow/Signage
- Advisory Bike Lane
- Painted Parking Lane/Sharrow
- Painted Parking/Bike Lane Combo
- Standard Bike Lane
- Wide/Buffered Bike Lane
- Bike Lane/Sharrow Combo
- Paved Shoulder
- Bike Boulevard
- Shared Use Path
- High School/University

Segment Description

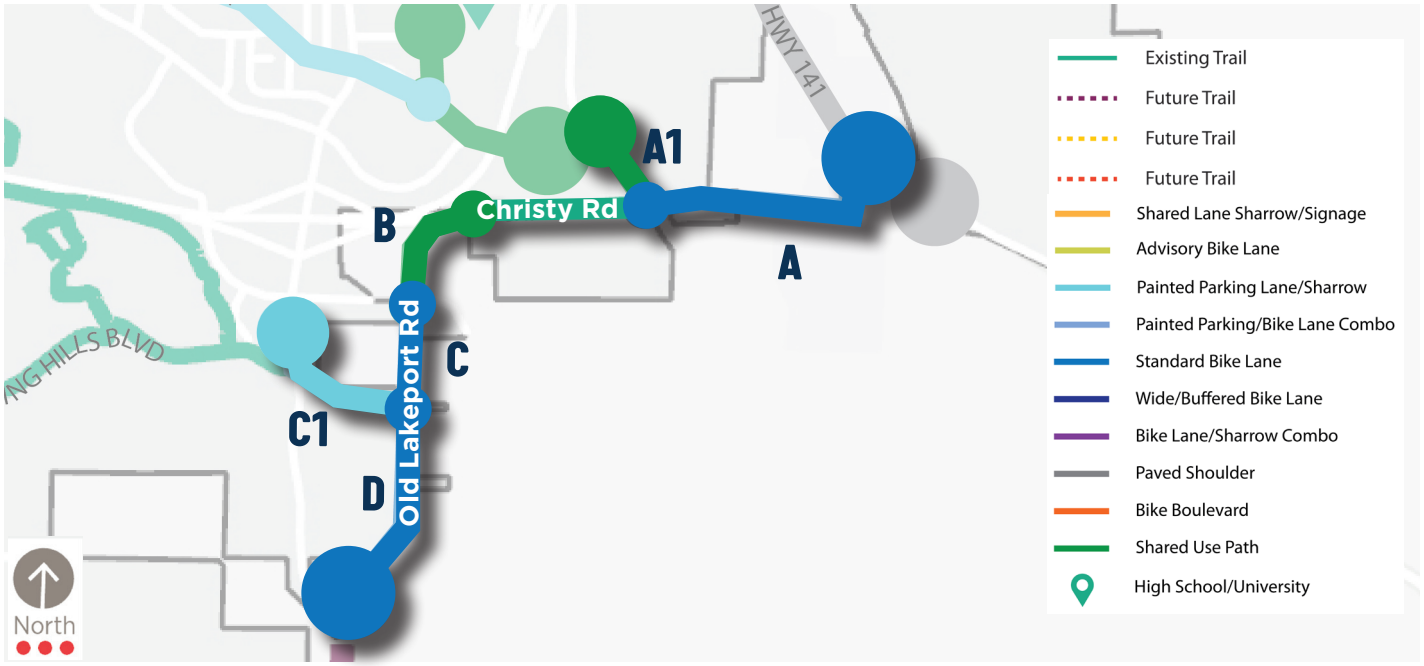
KEY	SEGMENT	LENGTH (MILES)	EXISTING STREET CONDITIONS	BIKE FACILITY TYPE	COST ESTIMATE	NOTES
A	Transit Ave: S Helen St to S Cecelia St	0.16	• Parking: - • Pavement Width: - • Travel Lanes: -	Shared Use Path	$19,000-$20,000	Good pavement condition
B	Transit Ave: S Cecelia St to S Glass St	0.27	• Parking: Both sides • Pavement Width: 42' • Travel Lanes: 2	Bike Lane Uphill, Sharrow Downhill	$2,000-$3,000	Good pavement condition
C	Transit Ave: S Glass St to S St Aubin St	0.32	• Parking: Both sides • Pavement Width: 42' • Travel Lanes: 2	Painted Parking Lane with sharrows	$8,000-$9,000	Good pavement condition
D	Morningside Ave: Transit Ave to S Lakeport St	0.49	• Parking: • Pavement Width: 52' • Travel Lanes: 4	Standard Bike Lane	$6,000-$7,000	At some point go to three lane section and 1 side parking
E	Morningside Ave: S Lakeport St to S Magnolia St	0.48	• Parking: Both sides • Pavement Width: 42' • Travel Lanes: 2	Painted Parking Lane with sharrows	$12,000-$13,000	Generally good pavement condition
F	Morningside Ave: S Magnolia St to Hwy 20	0.79	• Parking: None • Pavement Width: 30' • Travel Lanes: 2	Shared Use Path	$95,000-$100,000	Mostly expanding sidewalks where possible
G1	Whispering Creek Dr: Hwy 20 to Glen Ellen Rd	1.14	• Parking: None • Pavement Width: 24' • Travel Lanes: 2	Shared Use Path	$138,000-$145,000	Widen existing sidewalk on one side
G2	Old Hwy 141: Hwy 20 to Glen Ellen Rd	1.33	• Parking: None • Pavement Width: 24' • Travel Lanes: 2	Paved Shoulder or Share the Road signs	$550,000-$600,000	No shoulder today

Painted Parking Lane with Sharrows Example

13. Christy Road

Priority Level Ranking: HIGH

Land around Christy Road is developing, adding traffic and increased potential for bicycle demand. Shared use paths are proposed when possible to maintain safety and comfort as traffic levels increase.



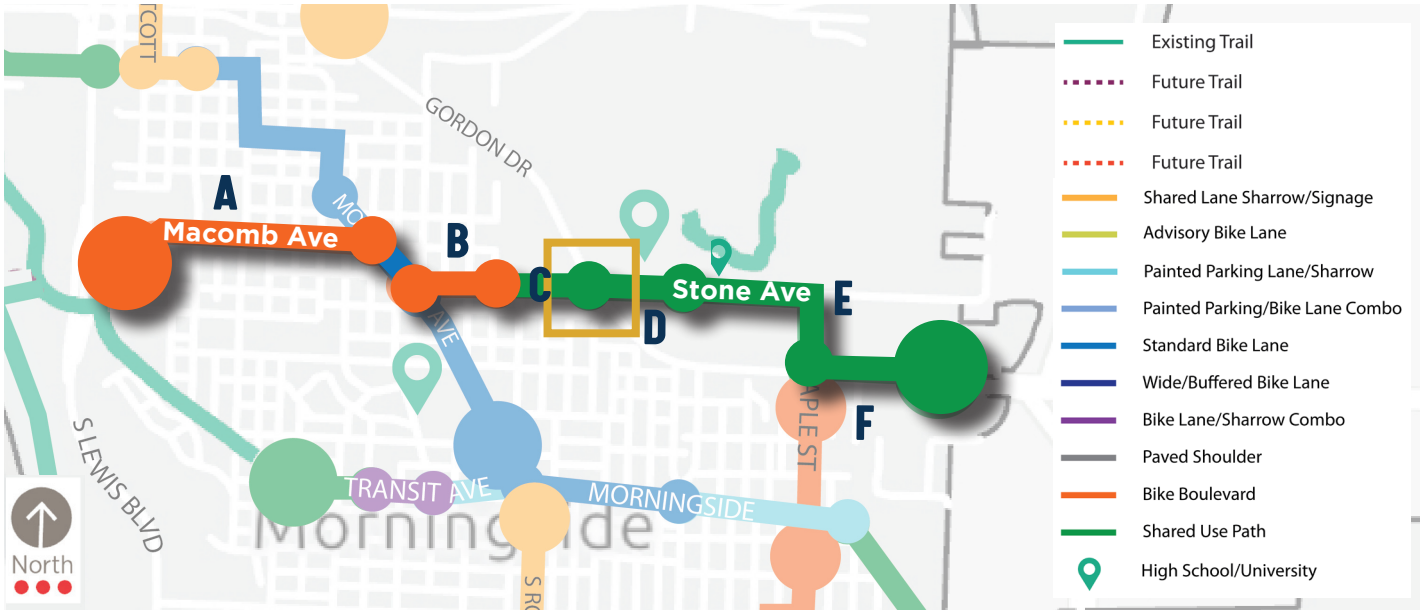
Segment Description

KEY	SEGMENT	LENGTH (MILES)	EXISTING STREET CONDITIONS	BIKE FACILITY TYPE	COST ESTIMATE	NOTES
A	Portland Blvd/Christy Rd: Old Hwy 141 to Sunnybrook Dr	0.77	• Parking: None • Pavement Width: 30' • Travel Lanes: 2	Standard Bike Lane	$19,000-$20,000	Good pavement condition
A1	Sunnybrook Dr: Christy Rd to Sergeant Rd	0.25	-	Shared Use Path	$30,000-$31,000	Could be completed with potential future street project
B	Christy Rd: Overbrook Dr to Southern Hills Dr	0.36	-	Shared Use Path	$43,000-$44,000	If choosing to expand the sidewalk on the south side, will need crossing markings at Old Lakeport transition to bike lanes.
C	Old Lakeport Rd: Southern Hills Dr to Singing Hills Blvd	0.30	• Parking: None • Pavement Width: 30' • Travel Lanes: 2	Standard Bike Lane	$7,000-$8,000	Good pavement condition; maintain gutter seam
C1	Singing Hills Blvd: Old Lakeport Rd to S Lakeport St	0.34	• Parking: Both sides • Pavement Width: 42' • Travel Lanes: 2	Painted Parking Lane with sharrows	$8,000-$9,000	Good pavement condition
D	Old Lakeport Rd: Singing Hills Blvd to S Lakeport St	0.66	• Parking: None • Pavement Width: 30' • Travel Lanes: 2	Standard Bike Lane	$15,000-$16,000	Good pavement condition; maintain gutter seam

14. North Morningside

Priority Level Ranking: HIGH to MODERATE

The proposed route along Macomb Avenue provides a quieter east/west route through Morningside. At Gordon Drive, Stone Avenue provides access to WITCC but requires negotiating obstructions to create a shared use path for maximum safety.



Segment Description

KEY	SEGMENT	LENGTH (MILES)	EXISTING STREET CONDITIONS	BIKE FACILITY TYPE	COST ESTIMATE	NOTES
A	Macomb Ave: Vine St to Morningside Ave	0.98	• Parking: Both sides • Pavement Width: 24' • Travel Lanes: 2	Bike Boulevard	$113,000-$115,000	Generally good pavement condition, spot treatment for cracks
B	Stone Ave: Morningside Ave to S Mulberry St	0.25	• Parking: Both sides • Pavement Width: 30' • Travel Lanes: 2	Bike Boulevard	$29,000-$30,000	Generally good pavement condition
C	Stone Ave: S Mulberry St to Gordon Dr	0.27	• Parking: None • Pavement Width: 38' • Travel Lanes: 3	Shared Use Path	$32,000-$35,000	Expand sidewalk on north side
D	Stone Ave: Gordon Dr to WITCC	0.25	• Parking: None • Pavement Width: 36' • Travel Lanes: 3	Shared Use Path	$30,000-$32,000	Expand sidewalk on north side as much as possible
E	Stone Ave: WITCC to S Maple St to Gordon Dr	0.72	• Parking: None • Pavement Width: 22' • Travel Lanes: 2	Shared Use Path	$87,000-$95,000	Width may need to vary based on existing obstacles, property acquisition
F	Gordon Drive: S Maple St to Shopping Center	0.36	-	Shared Use Path	$44,000-$50,000	Can use Eastview Dr for part of the route

Priority Intersection Enhancements

INTERSECTION	ENHANCEMENT METHOD
Gordon Drive and Stone Ave Intersection	Maintain existing high visibility crosswalks

15. W. 4th Street

Priority Level Ranking: HIGH to MODERATE

W 4th Street is a second network route to reach Riverside but not as optimal for on-street routes as Military Road. Options for increasing cyclists comfort on W 4th Street include eliminating on-street parking at various locations of limited pavement width.

Segment Description

KEY	SEGMENT	LENGTH (MILES)	EXISTING STREET CONDITIONS	BIKE FACILITY TYPE	COST ESTIMATE	NOTES
A	W. 4th Street: Wesley Prky to Hamilton Blvd	0.57	• Parking: One side • Pavement Width: <42' • Travel Lanes: 2	Painted Parking Lane with sharrows	$14,000-$15,000	Option of painted parking lane + 1 side directional bike lane on 42' section
B	W. 4th Street: Hamilton Blvd to Casselman St	1.15	• Parking: One side • Pavement Width: 36' • Travel Lanes: 2	Painted Parking Lane with sharrows; Standard Bike Lane	$35,000-$37,000	Painted parking lane on one side, directional bike lane along curb on opposite side
C	W. 4th Street: Casselman St to Berry St	0.51	• Parking: None • Pavement Width: 36' • Travel Lanes: 2	Standard Bike Lane	$15,000-$16,000	Good pavement condition
D	W. 4th Street: Berry St to side path	0.30	-	Shared Use Path	$36,000-$38,000	-

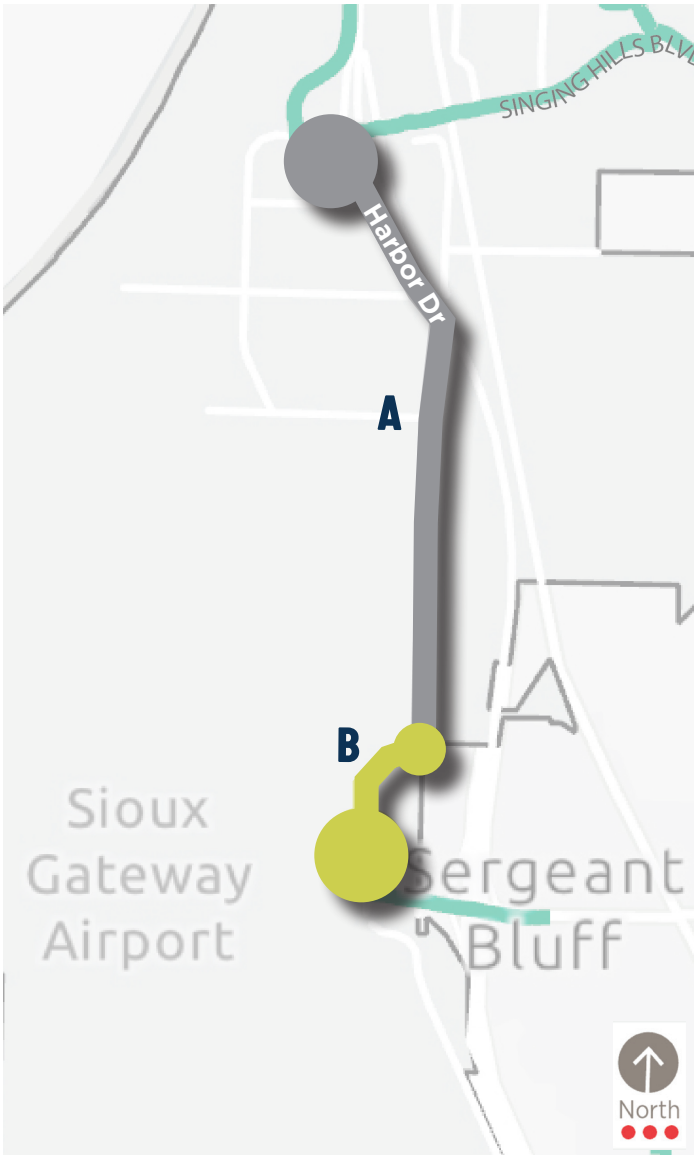
Existing Trail
Future Trail
Future Trail
Future Trail

Shared Lane Sharrow/Signage
Advisory Bike Lane
Painted Parking Lane/Sharrow
Painted Parking/Bike Lane Combo
Standard Bike Lane
Wide/Buffered Bike Lane
Bike Lane/Sharrow Combo
Paved Shoulder
Bike Boulevard
Shared Use Path
High School/University

16. Southbridge

Priority Level Ranking: LOW

Access for employees to commute to jobs in the southern industrial parks is not ideal. Expanded and paved shoulders along Harbor Drive would significantly increase safety and comfort for bike commuters along the heavy truck route.



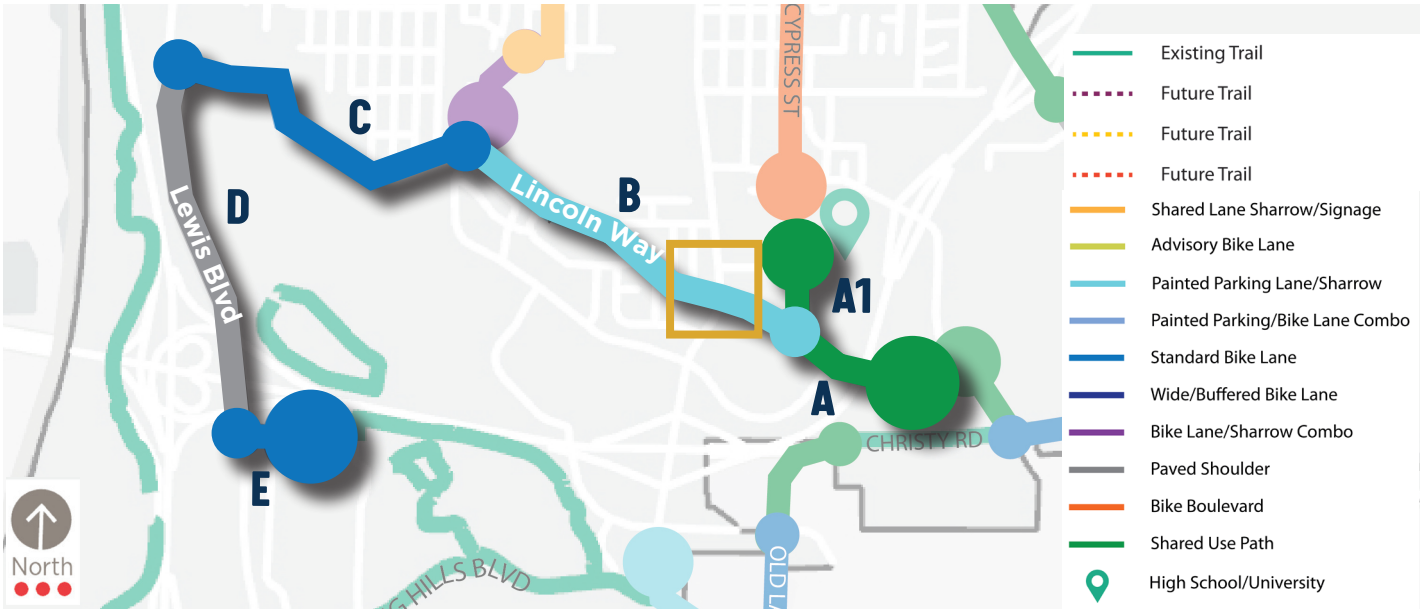
Segment Description

KEY	SEGMENT	LENGTH (MILES)	EXISTING STREET CONDITIONS	BIKE FACILITY TYPE	COST ESTIMATE	NOTES
A	Harbor Drive: Singing Hills Blvd to Discovery Blvd	2.03	• Parking: None • Pavement Width: 24' • Travel Lanes: 2	Paved Shoulder	$840,000-$890,000	Very little shoulder today
B	Discovery Blvd: Harbor Dr to 1st St	0.59	-	Advisory Bike Lane	$10,000-$11,000	Good pavement condition

17. Lincoln Way

Priority Level Ranking: LOW

Lincoln Way is an attractive street for on-street bike routes. A combination of facility treatments can make Lincoln Way a more comfortable and safe east/west route. Additionally, a small segment of improved paved should on Lewis Boulevard opens up access to the Cone Park areas.



Segment Description

KEY	SEGMENT	LENGTH (MILES)	EXISTING STREET CONDITIONS	BIKE FACILITY TYPE	COST ESTIMATE	NOTES
A	Sergeant Road/Lincoln Way: Sunnybrook Dr to S Cypress St	0.61	-	Shared Use Path	$74,000-$76,000	Expand sidewalk on the north side
A1	S Cypress St: Houlihan Run to East High School	0.29	-	Shared Use Path	$35,000-$36,000	Through City owned right-of-way
B	Lincoln Way: S Cypress St to Sergeant Rd	1.01	• Parking: Both side • Pavement Width: 40' • Travel Lanes: 2	Painted Parking Lane with sharrows	$25,000-$27,000	Consider high visibility crosswalk at S Lakport St
C	Lincoln Way: Sergeant Rd to Lewis Blvd/Hwy 75	1.04	• Parking: None • Pavement Width: 40' • Travel Lanes: 2	Standard Bike Lane	$30,000-$32,000	Good pavement condition
D	Lewis Blvd/Hwy 75: Lincoln Way to Line Dr	0.15	-	Paved Shoulder	$62,000-$65,000	Most of this is already in place, there is only a 0.15 mile stretch needed on the north end
E	Line Drive: Lewis Blvd/Hwy 75 to Ballpark	0.30	-	Standard Bike Lane	$9,000-$10,000	Or expand sidewalk on the north

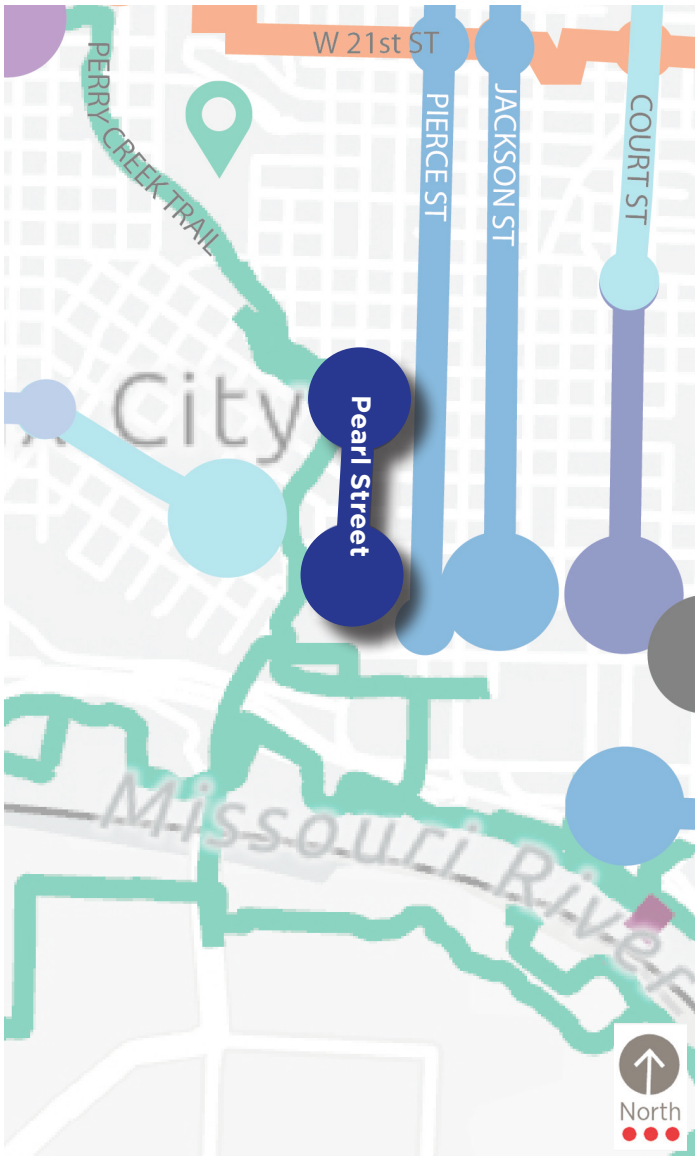
Priority Intersection Enhancements

INTERSECTION	ENHANCEMENT METHOD
Lincoln Way and S Lakeport St Intersection	Change to high visibility crosswalks on both sides of Lincoln Way, consider separate painted bike crossings.

18. Pearl Street

Priority Level Ranking: MODERATE

A relatively short segment on Pearl Street requires buffered bike lanes for optimal safety given the potential younger people using the route to reach downtown from the Perry Creek Trail.



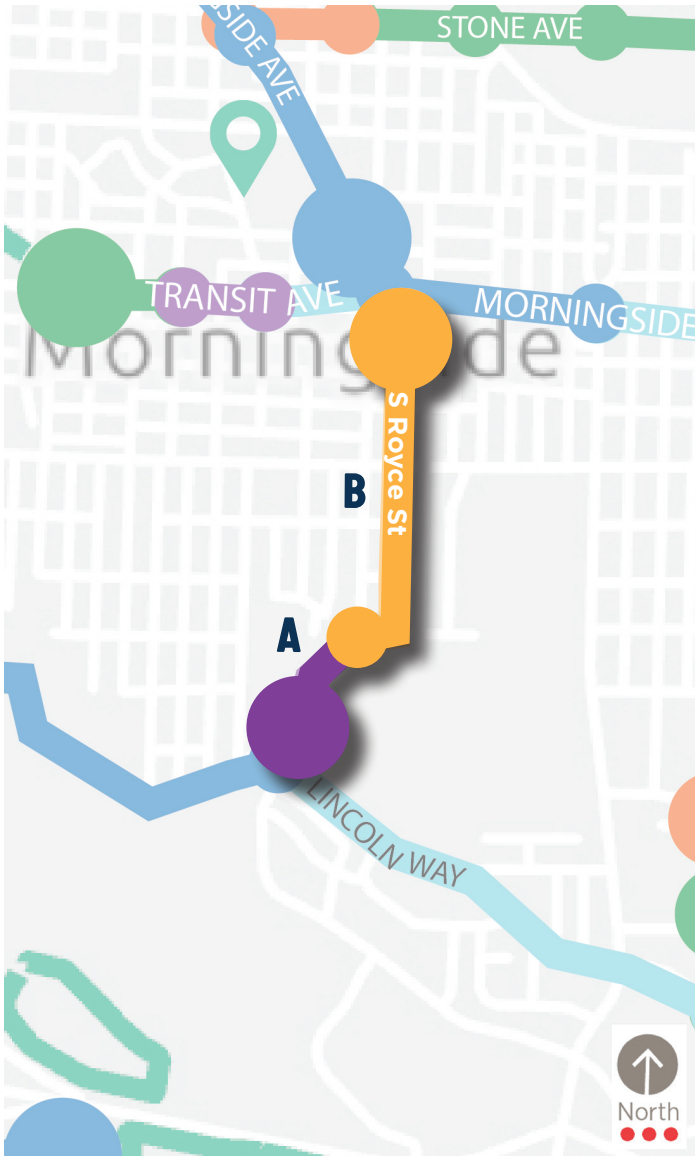
Segment Description

KEY	SEGMENT	LENGTH (MILES)	EXISTING STREET CONDITIONS	BIKE FACILITY TYPE	COST ESTIMATE	NOTES
A	Pearl St: 4th St to 11th St	0.53	• Parking: Both sides • Pavement Width: 52' • Travel Lanes: 2	Wide/Buffered Standard Bike Lane	$13,000-$14,000	Good pavement condition
B	Pearl St. to Perry Creek Trail Connection	-	-	Shared Use Path		Next to Heelan parking lot to trail stub at 11th St.

19. Morningside North/South

Priority Level Ranking: MODERATE

The S Royce Street route is a secondary route to connect the Lincoln Way route with the Morningside Avenue route. Shared lane markings can suffice on this low volume street to direct cyclists and alert motorists.



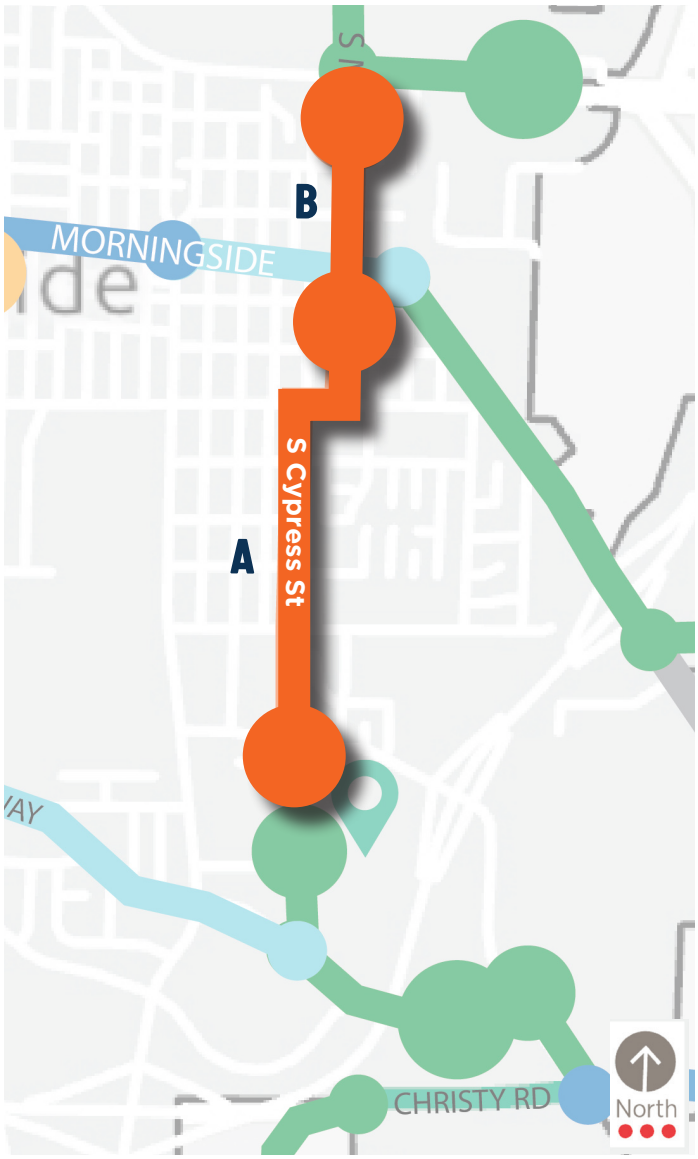
Segment Description

KEY	SEGMENT	LENGTH (MILES)	EXISTING STREET CONDITIONS	BIKE FACILITY TYPE	COST ESTIMATE	NOTES
A	S Royce St: Morningside Ave to Seger Ave, Sergeant Rd	0.79	• Parking: Both sides • Pavement Width: 24' • Travel Lanes: 2	Shared Lane Markings	$8,000-$9,000	This relatively short route could be considered a connector in a wayfinding system rather than a full route.
B	Sergeant Rd: Lincoln Way to Seger Ave	0.33	• Parking: None • Pavement Width: 30' • Travel Lanes: 2	Bike Lane Uphill, Sharrow Downhill	$3,000-$4,000	

20. S Cypress Street

Priority Level Ranking: MODERATE

Similar to the S Royce Street route, the S Cypress route is also a needed north/south connector in the Morningside area. This route is slightly more important because of providing access to East High School, Middle School, and an elementary school.



Existing Trail
Future Trail
Future Trail
Future Trail
Shared Lane Sharrow/Signage
Advisory Bike Lane
Painted Parking Lane/Sharrow
Painted Parking/Bike Lane Combo
Standard Bike Lane
Wide/Buffered Bike Lane
Bike Lane/Sharrow Combo
Paved Shoulder
Bike Boulevard
Shared Use Path
High School/University

Segment Description

KEY	SEGMENT	LENGTH (MILES)	EXISTING STREET CONDITIONS	BIKE FACILITY TYPE	COST ESTIMATE	NOTES
A	S Cypress St: East High School to Morningside Ave	0.83	• Parking: One side • Pavement Width: <28' • Travel Lanes: 2	Bike Boulevard	$96,000-$98,000	Generally good pavement condition
B	S Maple St: Gordon Dr to S Cypress St via Glenn Ave	0.40	• Parking: Two sides • Pavement Width: 24' • Travel Lanes: 2	Bike Boulevard	$46,000-$48,000	Sign and mark crossing at Morningside Ave

21. East/West Connector - 18th Street

Priority Level Ranking: LOW

East/west connections on the north side of Sioux City are difficult because of the Floyd River channel and railroads. A route at 18th Street is possible but would require a minimum of buffered bike lanes for optimal safety along this heavy truck route.

Segment Description

KEY	SEGMENT	LENGTH (MILES)	EXISTING STREET CONDITIONS	BIKE FACILITY TYPE	COST ESTIMATE	NOTES
A	18th Street: Floyd Blvd to Floyd River Trail	0.57	• Parking: None • Pavement Width: 48' • Travel Lanes: 4	Buffered Bike Lane	$102,000-$110,000	Two-way on one side
B	18th Street: Floyd River Trail to Hwy 75	0.35	• Parking: None • Pavement Width: 24' • Travel Lanes: 2	Buffered Bike Lane	$62,000-$65,000	Two-way on one side
C	18th Street: Hwy 75 to Cecelia St	0.32	• Parking: One side • Pavement Width: 24' • Travel Lanes: 2	Shared Use Path	$39,000-$42,000	Widen sidewalk on one side

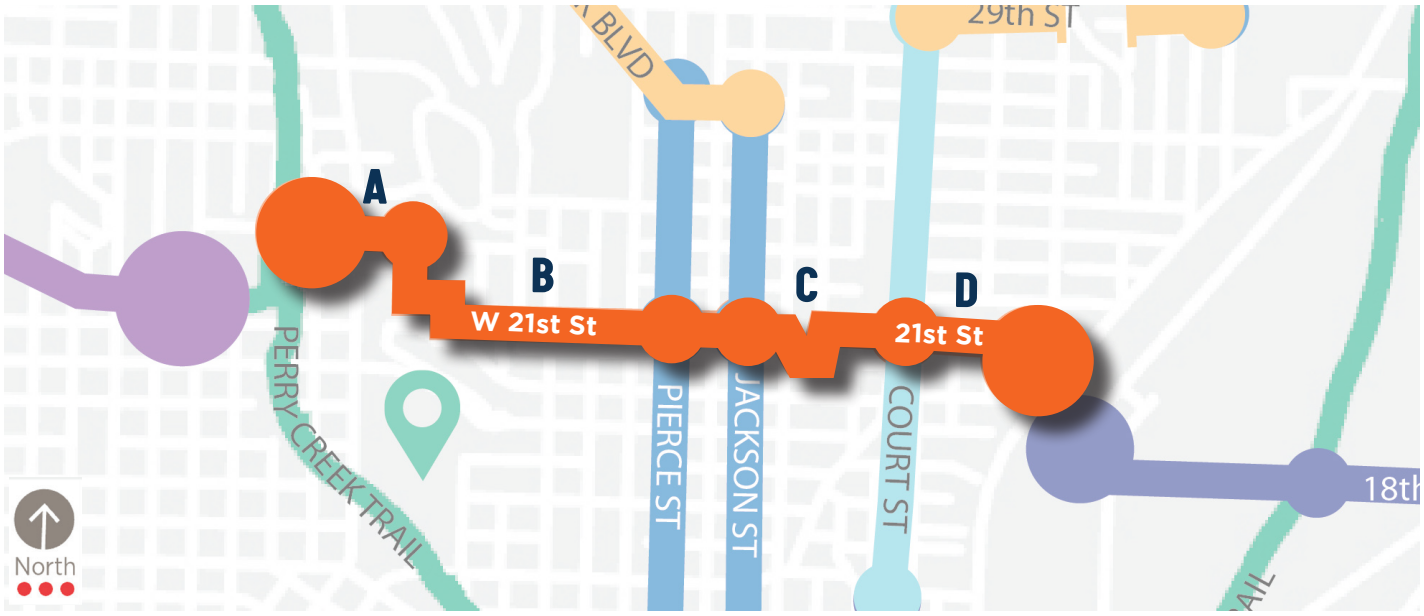
Priority Intersection Enhancements

INTERSECTION	ENHANCEMENT METHOD
18th Street and Lewis Blvd/Hwy 75 Intersection	High visibility crosswalks with bike boxes and bike crossing markings; railroad crossing bicycle signage

22. W 21st/21st Street

Priority Level Ranking: LOW

A central east/west route through meanders along 21st Street to connect the Perry Creek Trail with Floyd Boulevard. While it is not a direct, continuous route, the streets are lower volume and more comfortable for cyclists as a bike boulevard.



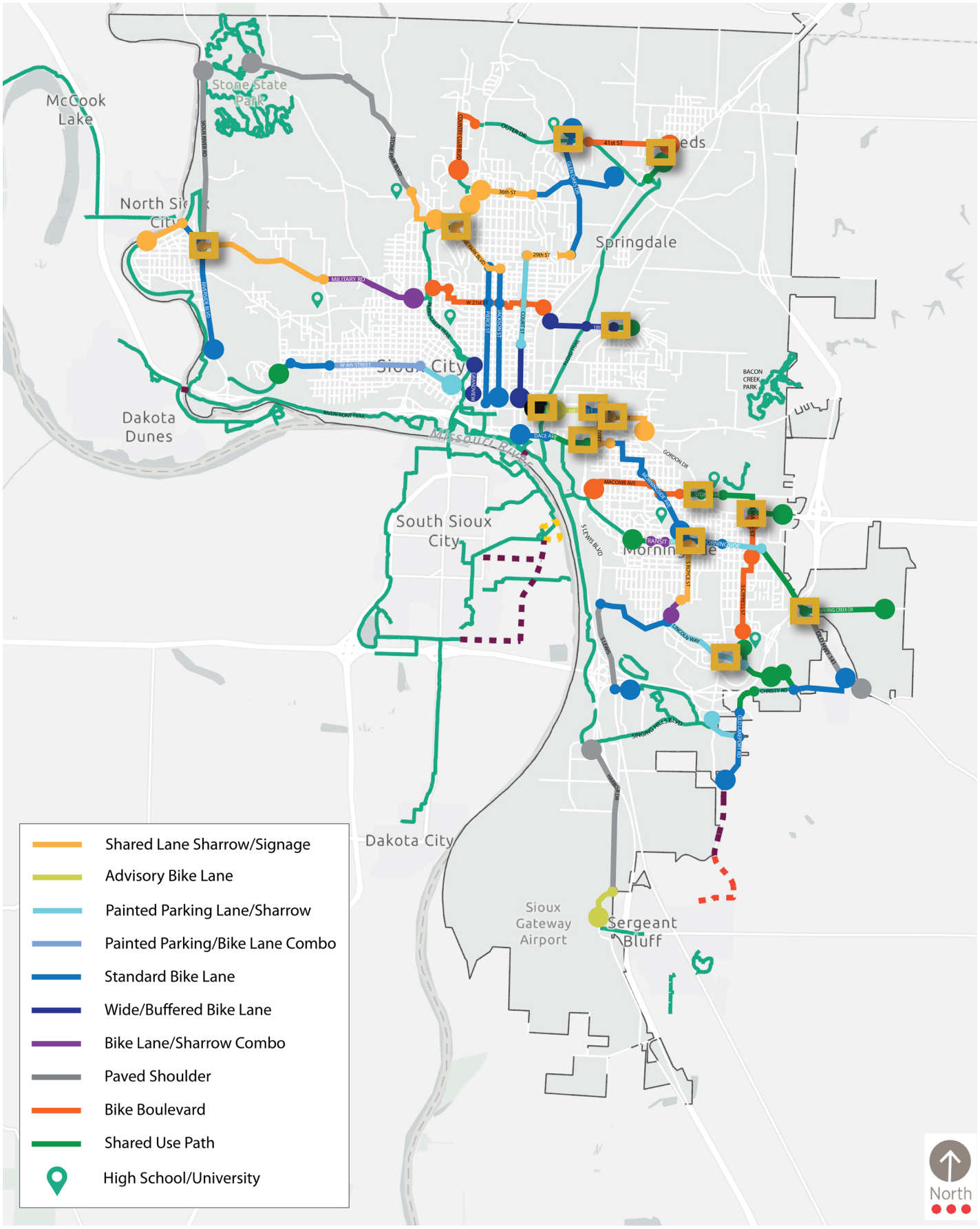
Segment Description

KEY	SEGMENT	LENGTH (MILES)	EXISTING STREET CONDITIONS	BIKE FACILITY TYPE	COST ESTIMATE	NOTES
A	W 23rd St: Perry Creek Trail to Terrace Pl	0.25		Bike Boulevard	$29,000-$30,000	Spot treatment for cracks and potholes
B	Terrace Pl/W 21st St: to Jackson Street	0.81	• Parking: One side • Pavement Width: 24' • Travel Lanes: 2	Bike Boulevard	$93,000-$95,000	Spot treatment for cracks and potholes
C	W 21st St: Jackson St to Court St	0.38		Bike Boulevard	$44,000-$46,000	Spot treatment for cracks and potholes
D	21st Street: Court St to Howard St to 19th St to Floyd Blvd	0.34		Bike Boulevard	$40,000-$42,000	High visibility crossings at Floyd Blvd

Existing Trail
Future Trail
Future Trail
Future Trail

Shared Lane Sharrow/Signage
Advisory Bike Lane
Painted Parking Lane/Sharrow
Painted Parking/Bike Lane Combo
Standard Bike Lane
Wide/Buffered Bike Lane
Bike Lane/Sharrow Combo
Paved Shoulder
Bike Boulevard
Shared Use Path
High School/University

Map 3.1: Significant Intersection Enhancement Location Map



The cost estimates on the previous pages are planning level estimates. Cost factors are based on regional experience and focus on painting, adjustments to street lines where necessary, and existing infrastructure that may already be in place which saves costs (such as sidewalk segments).

The estimates do not include any improvements to pavement, intersections, major drainage structures, or extraordinary grading expenses. The cost estimates also do not include additional signage above the current existing bike route signage. Figure 3.2 illustrates a general understanding of cost differences between various bike facilities, if stand alone facilities without previous infrastructure in place.

Figure 3.2: Cost Factors in 2021 Dollars (generally for planning purposes)

FACILITY TYPE	COST PER MILE 2021 DOLLARS	FEATURES
Marked and signed bike route	~ $20,000	Signage, 2 sharrows/block
Bicycle Boulevard-Basic	~ $30,000	Signage, shared lane markings, routine crosswalks, stop sign modifications
Bicycle Boulevard-Enhanced	~ $71,000	Signage, shared lane markings, routine crosswalks, stop sign modifications, traffic calming techniques, enhanced crossings
Multi-use parking shoulders or virtual bike lanes	~ $71,000	Signage, single white line dividing shoulder or parking lane from travel lane or single dashed line in from pavement edge
Bicycle boulevard with parking shoulder	~ $88,000	Bicycle boulevards that also include multi-use shoulders or advisory bike lanes, appropriate on wider streets
Standard bike lanes	~ $120,000	Bi-directional bike lanes with biker lane markings and signage (assumes pavement preparation/installation is needed)
Buffered bike lane - single direction	~ $75,000	Painted bike lanes with cross-hatched buffer area between bike lane and travel lane
Buffered bike lane - bi-directional	~ $135,000	Painted bike lanes with cross-hatched buffer area between bike lane and travel lane
Protected bike lane-one-way	~ $235,000	Painted bike lanes with cross-hatched buffer area and vertical delineators between bike lane and travel lane
Protected bike lane-two-way	~ $392,000	Painted bike lanes with cross-hatched buffer area and vertical delineators between bike lane and travel lane
Sidepath	~ $615,000	10-foot shared use path separated from but generally parallel to roadway
Trail/shared use path - Type 1	~ $615,000	10-foot shared use path with relatively few construction difficulties and limited grading
Trail/shared use path - Type 2	~ $761,000	10-foot shared use path with relatively moderate construction difficulties and grading
Trail/shared use path - Type 3	~ $936,000	10-foot shared use path with substantial construction difficulties and grading
Trails - granulated stone surfacing	~ $295,000	10-foot trail with moderate grading
INTERSECTIONS		
Major modification	~ $585,000	Major projects such as protected intersections. Cost varies widely depending on specific design
Arterial crossing	~ $235,000	Changes such as high visibility crosswalks, signal modifications, bump-outs, minor construction
HAWK installation	~ $147,000	Installation of hybrid beacon with enhanced crosswalks
Rectangular Rapid Flashing Beacon installation	~ $47,000	Installation of flashing beacon with enhanced crosswalks
Crossing median	~ $60,000	8-10' wide pedestrian refuge median with concrete surface
High-visibility crosswalks	~ $24,000	High-visibility continental crosswalks

CHAPTER 4: IMPLEMENTING THE SYSTEM

INTRODUCTION

The cost estimates illustrate the need to phase bicycle facility improvements over time. The implementation phasing in this chapter represents the priorities identified by the local Stakeholder Group, alignment with future street projects, and reasonable funding allocations per year.

In summary, the implementation of the system focuses on:

- Creating an initial network that serves all parts of the city with strategic routes and path segments.
- Phases which may be developed as resources are available, but probably over a ten-year period.
- The phases which may be realized within an additional five to ten year period.

When decisions on funding one segment over another in any given year, leaders should consider the following criteria:

Implementation without change. Segments that can be put in place with minimum change, primarily pavement markings and supporting graphics. They involve the lowest cost and least impact. Typical examples are streets with sharrows or enough width for bicycle lanes without other lane modifications.

Implementation with minor changes. Segments that typically involve lane reconfigurations, such as narrower lanes, or parking change, such as possible limitation of parking to one side of the street. However, they do not require changes in the number of available travel lanes.

Major lane modifications. Segments that use existing street channels but require major lane modifications such as road diets that reduce the number of available lanes while still remaining fully capable of accommodating current traffic volumes.

Minor roadway widening. Segments that widen existing streets to provide shoulders or bicycle lanes.

Major roadway construction. These projects include new streets or major reconstructions of existing streets, designed as complete streets to include bicycle and pedestrian accommodations.

Connecting links. Segments that connect major routes in the system. Typically, they fall within the "implementation without change" category, requiring only pavement markings and information and identification graphics.

Projects under development. Segments that are opportunities that take advantage of projects either under construction or in the short-term pipeline.

Existing trails. Facilities in place and incorporated into the bicycle network in their current form.

Minor path development and gap filling. Separated segments include short pathways that fill gaps in the system or relatively short stretches of new sidepaths within existing right-of-way.

Intersection projects. These projects involve intersections of a bike route with a major arterial street. These projects generally include refuge medians or short cycle tracks that resolve offset intersections.

CORRIDOR PRIORITY PHASING SCHEDULE

Available resources are extremely important. Facilities that meet user demands and preferences can be expensive because they require a greater degree of separation from motor vehicles.

The Sioux City network will not happen at once. This section identifies a basic and full build-out plan. The basic system establishes the foundation of the built out network and is designed to:

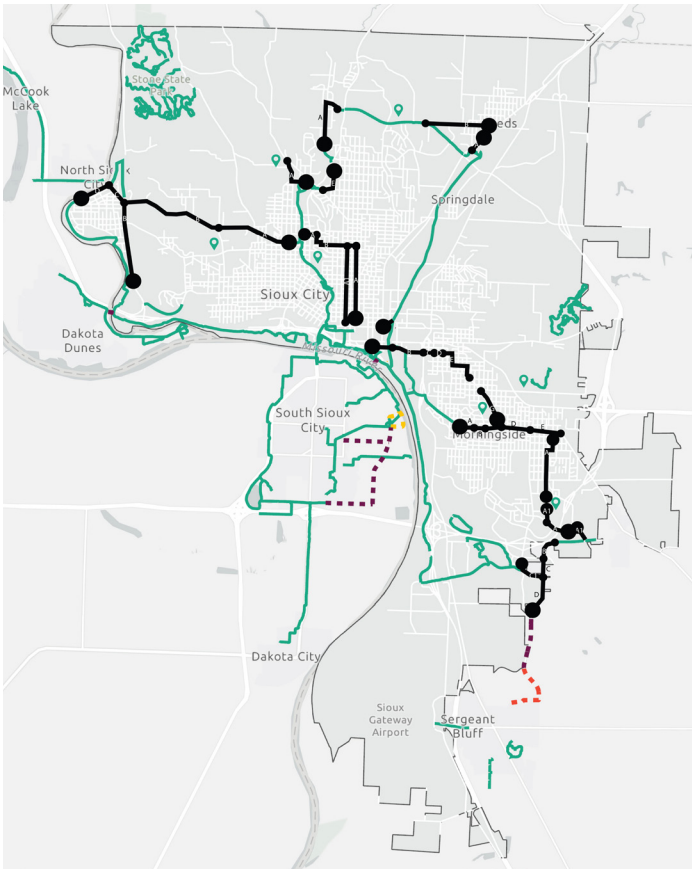
- Provide maximum impact for the minimum initial investment.
- Link all parts of the city and in one way or another serve most of its key destinations.
- Work toward the priority rankings in the previous chapters.

The following diagrams in this section apply the priority criteria to identify a basic network that would provide a high level of service to the community even if no further progress is made. The basic system is divided into three six year implementation phases, which may be viewed as different capital programs.

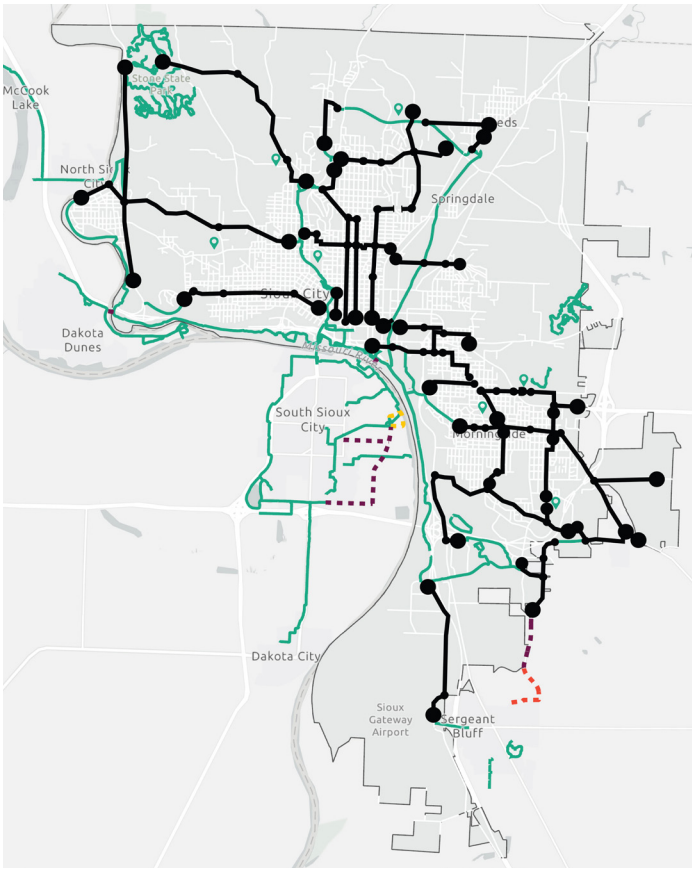
The Basic Network, implemented over six years, translates into a proposed investment of almost $1 million, or about $300,000 annually in 2021 dollars from all sources, including federal, state, local, and private funds. Clearly implementation depends on availability of funding and some large projects or overall efforts could receive federal and state funds that could advance certain projects. This implementation sequence represents a suggested scenario that may change over time.

Full build-out of the network in this study is a proposed investment of around $6.1 million including design and contingency estimates. Additional funds will be needed for the intersection enhancements identified in this study.

Map 4.1: Basic Network



Map 4.2: Full Build-out Network



Basic Bicycle Network Phase 1

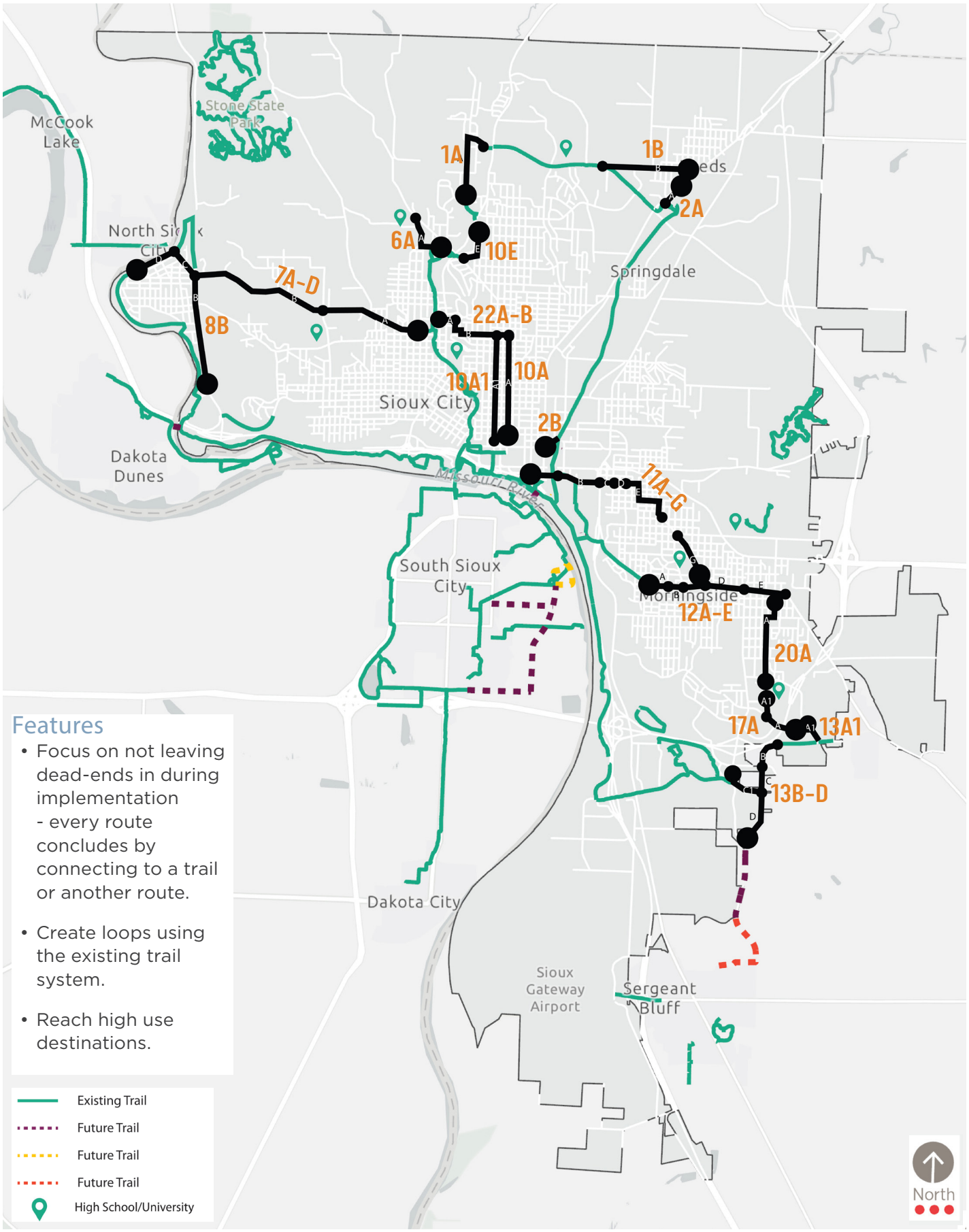
The goal of phase one is to accomplish a network that would serve as a legitimate network on its own. Completion of Phase 1 should provide access to major destination and have routes that reach all parts of the city. Phase 1 provides a high level of service to the community even if making no further progress.

Figure 4.1: Basic On-Street Bike System Phase 1

ROUTE: SEGMENT	OPINION OF PROBABLE COSTS (2021 DOLLARS)			INTERSECTION IMPROVEMENTS
1A - Country Club Blvd: Perry Creek Elementary to 43rd St/Perry Way/Ped Bridge at Clark School		$20,000-$21,000		
1B - 41st St: Outer Dr to Floyd Blvd		$18,000-$19,000		
2A - Central St to follow railroad to the southwest and connect with the Floyd River Trail		$60,000-$62,000		Crossing Floyd Blvd at Central St
2B - Floyd Trail connection to Downtown				Floyd River Trail at 4th St and Hoeven Dr
6A - W Clifton Ave: Perry Creek Trail to Broken Kettle to Stone Park Blvd		$8,000-$9,000		
7A-D - Military Rd: Perry Creek Trail at Center St Park to Riverfront Trail at Dacotah Ave		$70,000-$72,000		Riverside Blvd/Military Rd/ Sioux River Rd Triangle
8B - Riverside Blvd: Military Rd to Riverside Park entrance at War Eagle Dr		$42,000-$44,000		
10A - Jackson Street: 6th St to W. 21st St		$17,000-$18,000		
10A1 - Pierce Street: 4th St to 18th St		$19,000-$20,000		
10E - Perry Lane - Stone Park Blvd to Dearborn St dead end		$13,000-$14,000		Trail creation to 36th St Perry Creek Trail to Dearborn Blvd
11A-G - Dace Avenue: Court St to Sidepath to Morningside Ave; Stone Ave to Transit Ave		$88,000-$90,000		Leech Ave and Lewis Blvd/Hwy 75
12A - Transit Ave: S Helen St to S Cecelia St		$19,000-$20,000		
12B - Transit Ave: S Cecelia St to S Glass St		$2,000-$3,000		
12C - Transit Ave: S Glass St to S St Aubin St		$8,000-$9,000		Morningside Ave and Transit Ave
12D -Morningside Ave: Transit Ave to S Lakeport St		$6,000-$7,000		
12E - Morningside Ave: S Lakeport St to S Magnolia		$12,000-$13,000		Maple St and Gordon Dr
13A1 - Sunnybrook Dr: Christy Rd to Sergeant Rd		$30,000-$31,000		
13B - Christy Rd: Overbrook Dr to Southern Hills Dr		$43,000-$44,000		
13C - Old Lakeport Rd: Southern Hills to Singing Hills		$7,000-$8,000		
13C1 - Singing Hills Blvd: Old Lakeport to S Lakeport		$8,000-$9,000		
13D - Old Lakeport Rd: Singing Hills to S Lakeport		$15,000-$16,000		
17A - Sergeant Rd/Lincoln: Sunnybrook to S Cypress		$74,000-$76,000		
17A1 - S Cypress St: Houlihan Run to East High School		$35,000-$36,000		
20A - S Cypress St: East High to Morningside Ave		$96,000-$98,000		
22A - W 23rd St: Perry Creek Trail to Terrace Pl		$29,000-$30,000		
22B - Terrace Pl/W 21st St to Jackson St		$93,000-$95,000		
	$ YEAR 1-2	$ YEAR 3-4	$ YEAR 5-6	
PERIOD TOTAL	$300,000	$300,000	$300,000	
PHASE TOTAL without Intersections and Maintenance	**$800,000-$900,000**			

Cost estimates include design and contingency estimates

Map 4.3: Basic Bike Network Phase 1



Basic Bicycle Network Phase 2

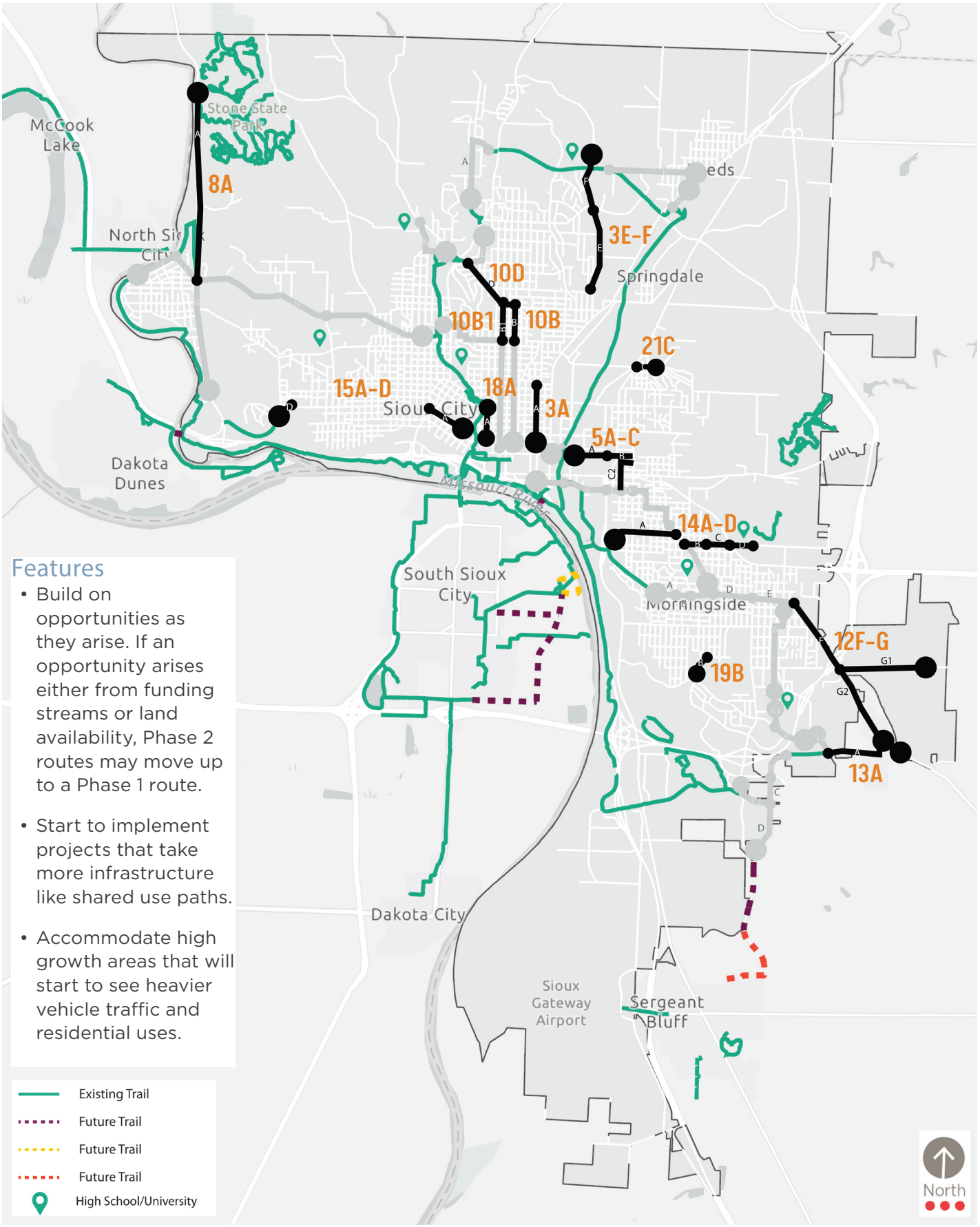
Phase 2 looks to build on Phase 1 to reach more neighborhoods and provide alternative routes to different parts of the city. These may be less traveled potential routes or routes that would take more infrastructure investment and planning to achieve.

Figure 4.2: Basic On-Street Bike System Phase 2

ROUTE: SEGMENT	OPINION OF PROBABLE COSTS (2021 DOLLARS)			INTERSECTION IMPROVEMENTS
3A - Court St: 4th Street to 14th St			$18,000-$19,000	
3E - Chambers St/Glen Oaks Blvd: 29th St to Indian Hills Dr			$28,000-$30,000	
3F - Glen Oaks Blvd: Indian Hills Dr to Outer Dr			$15,000-$16,000	Crossing Outer Dr at Glen Oaks Blvd
5A - 4th Street: Steuben to 3rd St to railroad crossing			$9,000-$10,000	
5B - 3rd Street: Lewis Blvd to Fairmount St			$4,000-$5,000	
5C - Farimount Street: 3rd St to 2nd St			$8,000-$9,000	
5C2 - 2nd Street: Fairmount St to Westcott St to Gordon Dr			$7,000-$8,000	Farimount St and 2nd St
8A - Stone State Park at North entrance to Railroad Museum Trail			$760,000-$800,000	
10B - Jackson Street: W 21st Street to Stone Park Blvd			$6,000-$7,000	
10B1 - Pierce Street: 18st Street to Stone Park Blvd			$13,000-$14,000	
10D - Stone Park Blvd: Pierce St to Perry Creek Trail at Perry Lane			$16,000-$17,000	
12F - Morningside Ave: S Magnolia St to Hwy 20			$95,000-$100,000	Hwy 20 and Whispering Creek
12G1 - Whispering Creek Dr: Hwy 20 to Glen Ellen Rd			$138,000-$145,000	
12G2 - Old Hwy 141: Hwy 20 to Glen Ellen Rd			$550,000-$600,000	
13A - Portland Blvd/Christy Rd: Old Hwy 141 to Sunnybrook Dr			$19,000-$20,000	
14A - Macomb Ave: Vine St to Morningside Ave			$113,000-$115,000	
14B - Stone Ave: Morningside Ave to S Mulberry St			$29,000-$30,000	
14C - Stone Ave: S Mulberry St to Gordon Dr			$32,000-$35,000	Gordon Dr and Stone Ave
14D - Stone Ave: Gordon Dr to WITCC			$30,000-$32,000	
15A - D - W 4th Street: Wesley Prky to Berry St to side path			$100,000-$110,000	
18A - Pearl Street: 4th St to 11th St			$13,000-$14,000	Pearl St to Perry Creek Trail Connection
19B - Sergeant Rd: Lincoln Way to Seger Ave			$3,000-$4,000	
21C - 18th Street: Lewis Blvd/Hwy 75 to Cecelia St			$39,000-$42,000	18th St and Lewis Blvd/Hwy 75
	$ YEAR 7-8	$ YEAR 9-10	$ YEAR 11-12	
PERIOD TOTAL	$750,000	$750,000	$750,000	
PHASE TOTAL without Intersections and Maintenance	**$2,000,000-$2,500,000**			

Cost estimates include design and contingency estimates

Map 4.4: Basic Bike Network Phase 2



Full Build Out Network

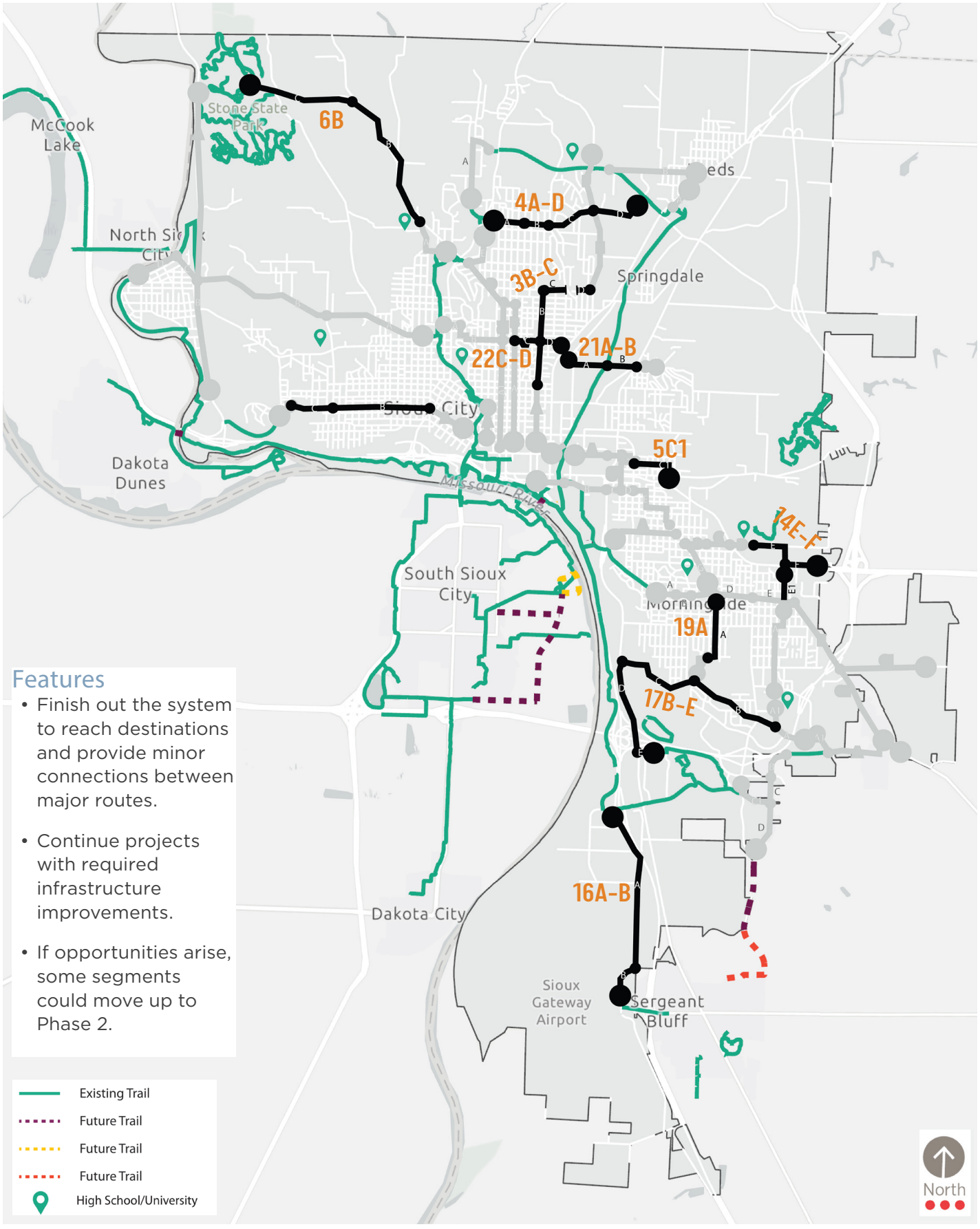
Phase 3, or full build-out, implements various connectors between routes and lower priority routes. These lower priority routes may be already used as common bicycle routes today but enhancements would improve their safety and comfort.

Figure 4.3: Full Build-Out On-Street Bike System Phase 3

ROUTE: SEGMENT	OPINION OF PROBABLE COSTS (2021 DOLLARS)				INTERSECTION IMPROVEMENTS
3B - Court St: 14th Street to 29th St			$27,000-$28,000		
3C - 29th St: Court St to Cheyenne Blvd			$7,000-$8,000		
3C1 - 29th St path south of Vietnamese Church			$15,000-$16,000		
3C2 - Cheyenne Blvd to Dupont St to 29th St			$2,000-$3,000		
3D - 29th St: Dupont St to Chambers St			$1,000-$2,000		
4A - D - 36th St: Hamilton Blvd to Outer Dr			$42,000-$45,000		Railroad crossing to Lewis Blvd crossing
5C1 - 2nd St: Fairmount St to Logan St to Gordon Dr Shopping Center			$15,000-$16,000		
6B - Stone Park Blvd: Broken Kettle Rd to Memorial Dr			$720,000-$750,000		
6C - Memorial Dr: Stone Park Blvd to Stone Park			$975,000-$1,000,000		
14E - Stone Ave: WITCC to S Maple St to Gordon Dr			$87,000-$95,000		
14F - Gordon Dr: S Maple St to Shopping Center			$44,000-$50,000		
16A - B - Harbor Dr: Singing Hills Blvd to Discovery Blvd; Harbor Dr to 1st St			$850,000-$900,000		
17B - Lincoln Way: S Cypress St to Sergeant Rd			$25,000-$27,000		Lincoln Way and S Lakeport St Intersection
17C - Lincoln Way: Seargeant Rd to Lewis Blvd/ Hwy 75			$30,000-$32,000		
17D - Lewis Blvd/Hwy 75: Lincoln Way to Line Dr			$62,000-$65,000		
17E - Line Dr: Lewis Blvd/Hwy 75 to Ballpark			$9,000-$10,000		
19A - S Royce St: Morningside Ave to Seger Ave, Sergeant Rd			$8,000-$9,000		
21A - 18th St: Floyd Blvd to Floyd River Trail			$102,000-$110,000		
21B - 18th St: Floyd River Trail to Lewis Blvd/Hwy 75			$62,000-$65,000		
22C - W 21st St: Jackson St to Court St			$44,000-$46,000		
22D - 21st St: Court St to Floyd Blvd			$40,000-$42,000		
	$ YEAR 13-14	$ YEAR 15-16	$ YEAR 17-18	$ YEAR 18+	
PERIOD TOTAL	$800,000	$800,000	$800,000	$800,000	
PHASE TOTAL without Intersections and Maintenance	**$3,000,000-$3,500,000**				

Cost estimates include design and contingency estimates

Map 4.5: Full Build Out Bike Network



MAINTENANCE GUIDANCE

Projects need to be maintained through their life cycle. The costs illustrate the importance of planning for maintenance. Paint must remain visible to continue to function as planned and capital improvements like paths and trails require repairs to continue to serve their users. Maintenance costs may also vary from year to year, depending on factors such as weather and level of use. Figure 4.4 indicates the minimum required maintenance for the bike facilities used in the Sioux City network.

Winter maintenance is particularly important for places like Sioux City. Winter maintenance contributes to a bicycling network that is usable year-round by more than the most ardent cyclist. Ensuring snow is removed from unprotected bicycle lanes can best be done by designing with winter maintenance in mind. Having adequate right of way for snow to be pushed off the road leaving the bike lane cleared is a factor to consider during design. For bicycle lanes with a buffer, such as buffered and protected bicycles lanes, using the buffer space for snow storage can help keep bicycle and pedestrian spaces open and safe and create another barrier between bicyclist and moving vehicles.

For areas that are harder for traditional snow plows to reach, such as protected bicycles lanes, having smaller equipment such as a lawnmower mounted snowblower or ATV with snowplows are necessary.

Figure 4.4: Maintenance Requirements

FACILITY TYPE*	MINIMUM MAINTENANCE	ANNUAL PLANNING LEVEL COST PER MILE** (2021 DOLLARS)
Shared Lane Signage or Markings/ Sharrows	Sign and shared lane marking stencil replacement	$1,500
Paved Shoulders	Sweeping, trash removal, mowing, weed abatement, snow removal, crack seal, sign repair	$2,500
Advisory Bike Lanes	Repainting, debris removal/sweeping, snow removal, signage replacement; Sign and shared lane marking stencil replacement	$2,750
Standard/Wide Bike Lanes	Repainting, debris removal/sweeping, snow removal, signage replacement	$3,000-$5,000
Bike Lane/Sharrow Combination	Repainting, debris removal/sweeping, snow removal, signage replacement; Sign and shared lane marking stencil replacement	$2,000
Bicycle Boulevards	Sign and shared lane marking stencil replacement	$1,500
Shared Use Paths	Sweeping, trash removal, mowing, weed abatement, snow	Same as trail maintenance today

*Pavement marking materials and the method of installation can help to assist in supporting year-round bicycling. Updating pavement marking specifications for longer-lasting materials, such as switching from latex paint to thermoplastic, or by specifying recessed pavement markings to minimize wear degradation caused by snow plows can help to extend the life of a pavement marking and also help maintain its visibility.
**This does not mean repainting every year, but an annualized budget for staggered repainting. For example, the cost of replacing shared lane markings would be $6,000-$7,000 per mile, but each would only need replacement every 5 years. Additionally, some costs could be included with normal street maintenance, such snow removal which is happening anyway.

Sweeping – Schedule: As needed, plan for more in summer/fall.

- Establish a seasonal sweeping schedule that prioritizes roadways with major bicycle routes.
- Sweep bikeways whenever there is an accumulation of debris on the facility.

Signage – Schedule: As needed

- Check regulatory and wayfinding signage along bikeways for signs of vandalism, graffiti, or normal wear.
- Replace signage along the network as needed.
- Perform a regularly-scheduled check on the status of signage with follow-up as necessary.
- Create a Maintenance Management Plan.

Roadway Surface – Schedule: Seasonal inspection

- Maintain a smooth pothole-free surface.
- Ensure on new street construction, the finished surface on bikeways does not vary more than ¼".
- Maintain pavement so ridge buildup does not occur at the gutter-to-pavement transition or adjacent to railway crossings.

Gutter to Pavement Transition

- Ensure that gutter-to-pavement transitions have no more than a ¼" vertical transition.

Drainage Grates – Schedule: Inspect before winter and after major storms

- Require all new drainage grates be bicycle-friendly, including grates that have horizontal slats on them so that bicycle tires and assistive devices do not fall through the vertical slats.
- Create a program to inventory all existing drainage grates, and replace hazardous grates as necessary.

Landscaping – Schedule: Twice a year; middle of growing season and early Fall.

- Ensure that shoulder plants do not hang into or impede passage along bikeways.
- After major damage incidents, remove fallen trees or other debris from bikeways as quickly as possible.

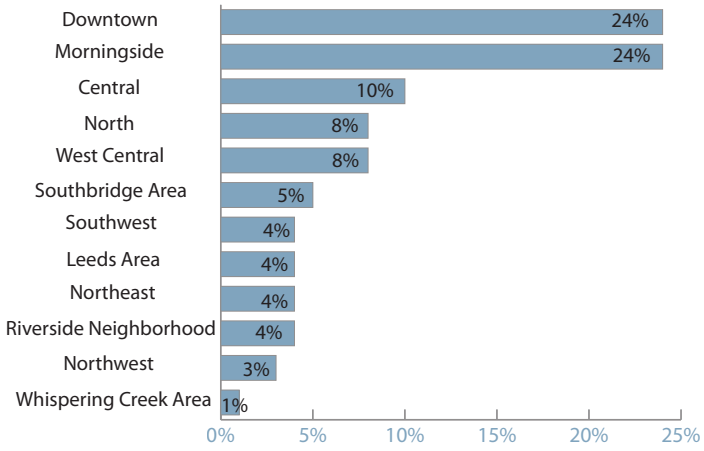
Maintenance Management Plan

- Provide fire and police departments with map of system.
- Enforce speed limits and other rules of the road.
- Enforce all trespassing laws for people attempting to enter adjacent private properties.
- Replace/repaint on-street bike lanes/signage promptly as needed.

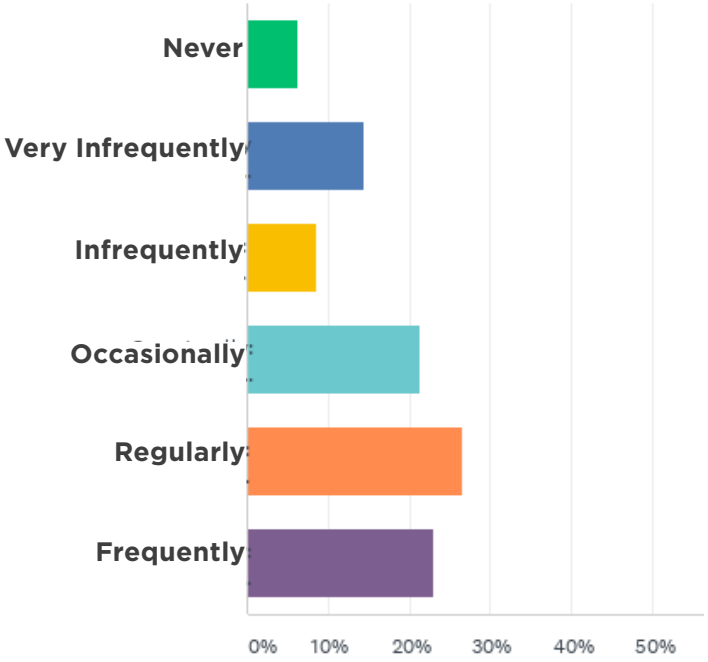
APPENDIX

SURVEY RESPONSE SUMMARY

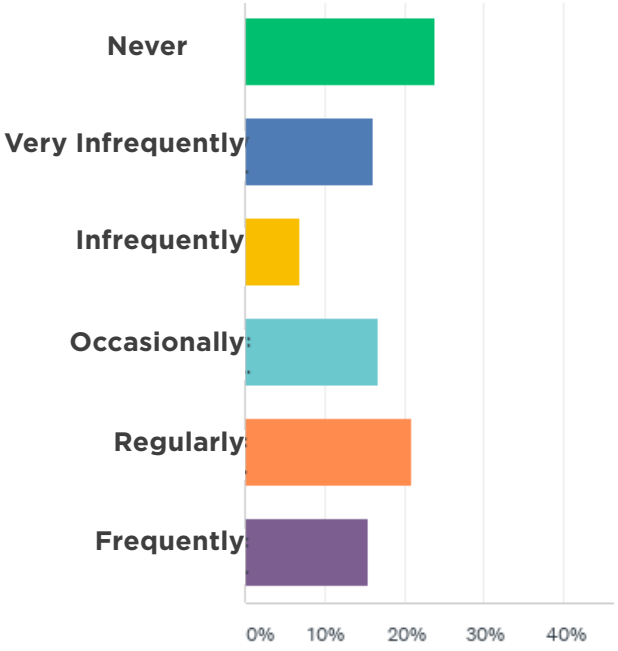
What part of Sioux City is your most frequent destination (workplace, office, schools, etc.)?



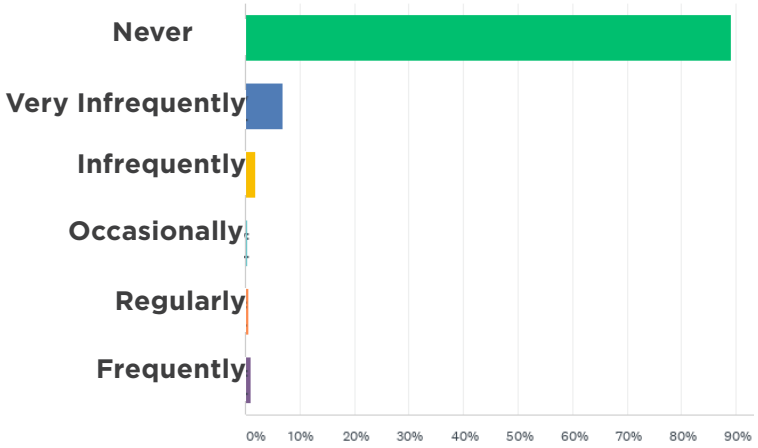
How often do you walk for enjoyment or travel to destinations?



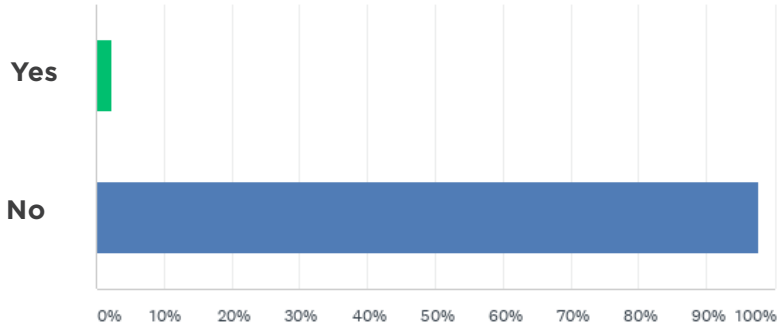
How often do you ride a bicycle for enjoyment or travel to destinations?



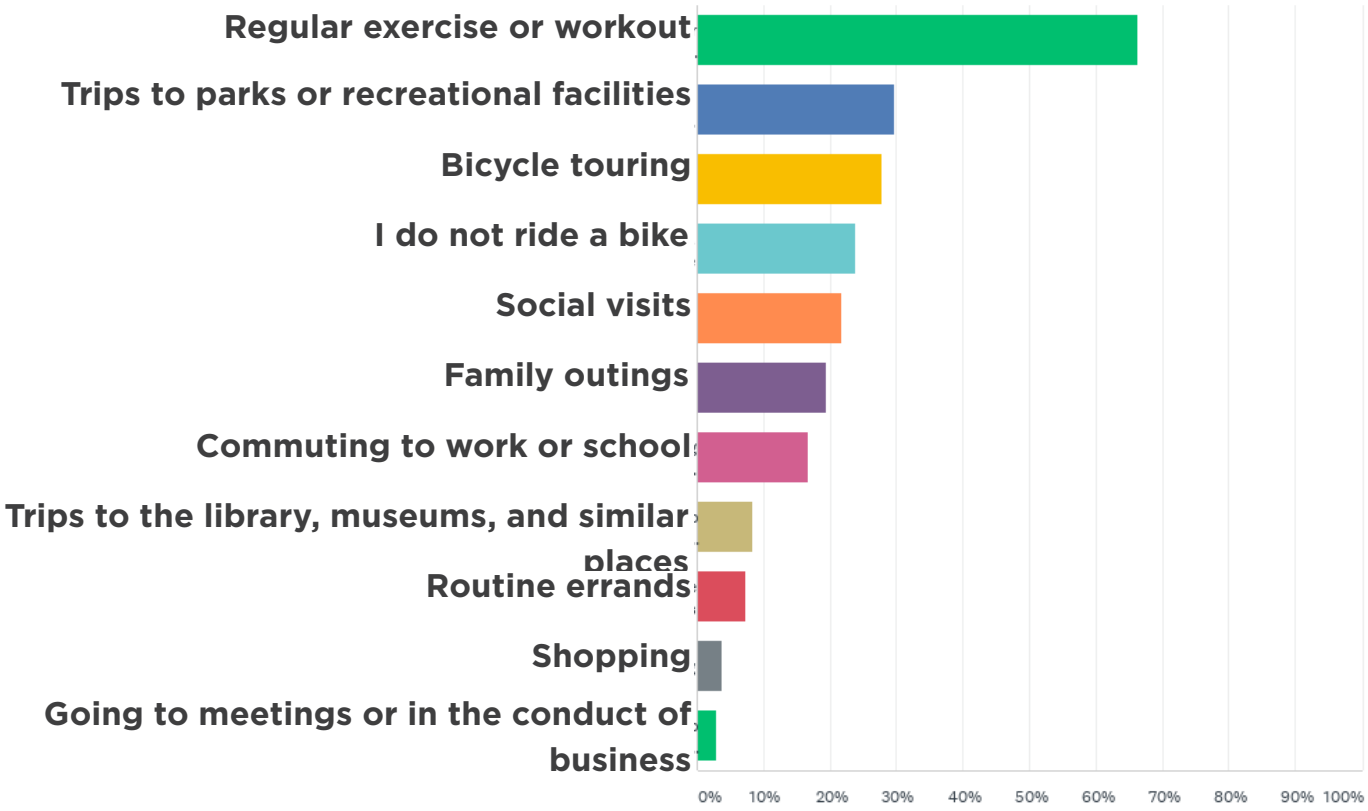
How often do you use Public Transit for travel to destinations?



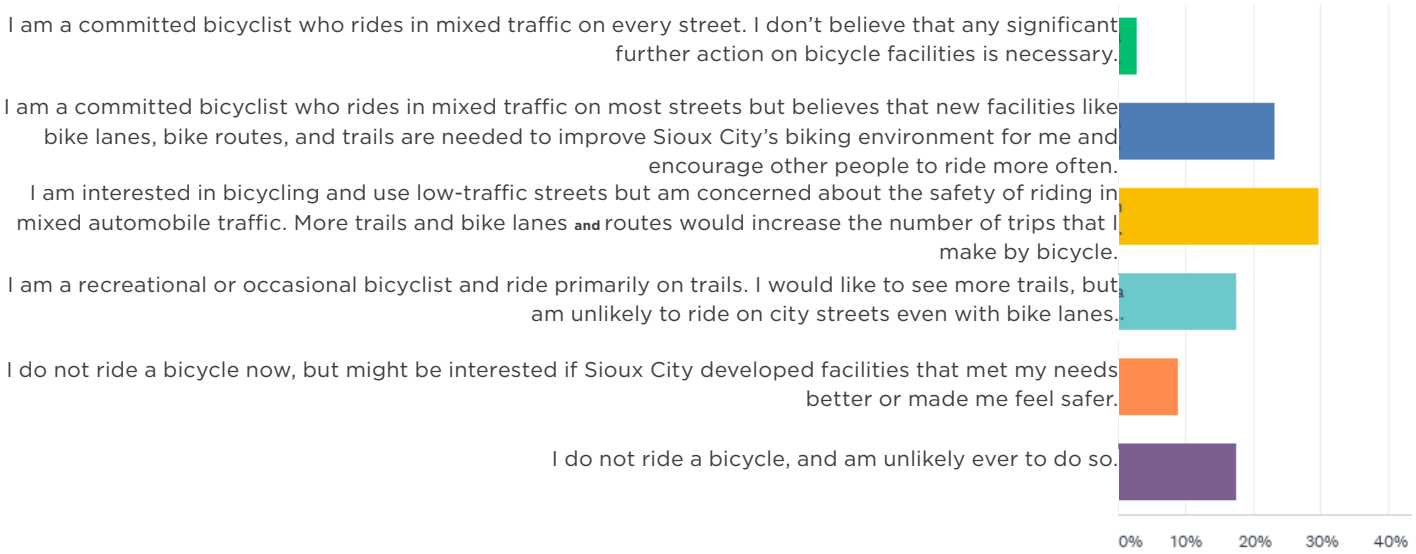
Do you make combined bus and bike trips?



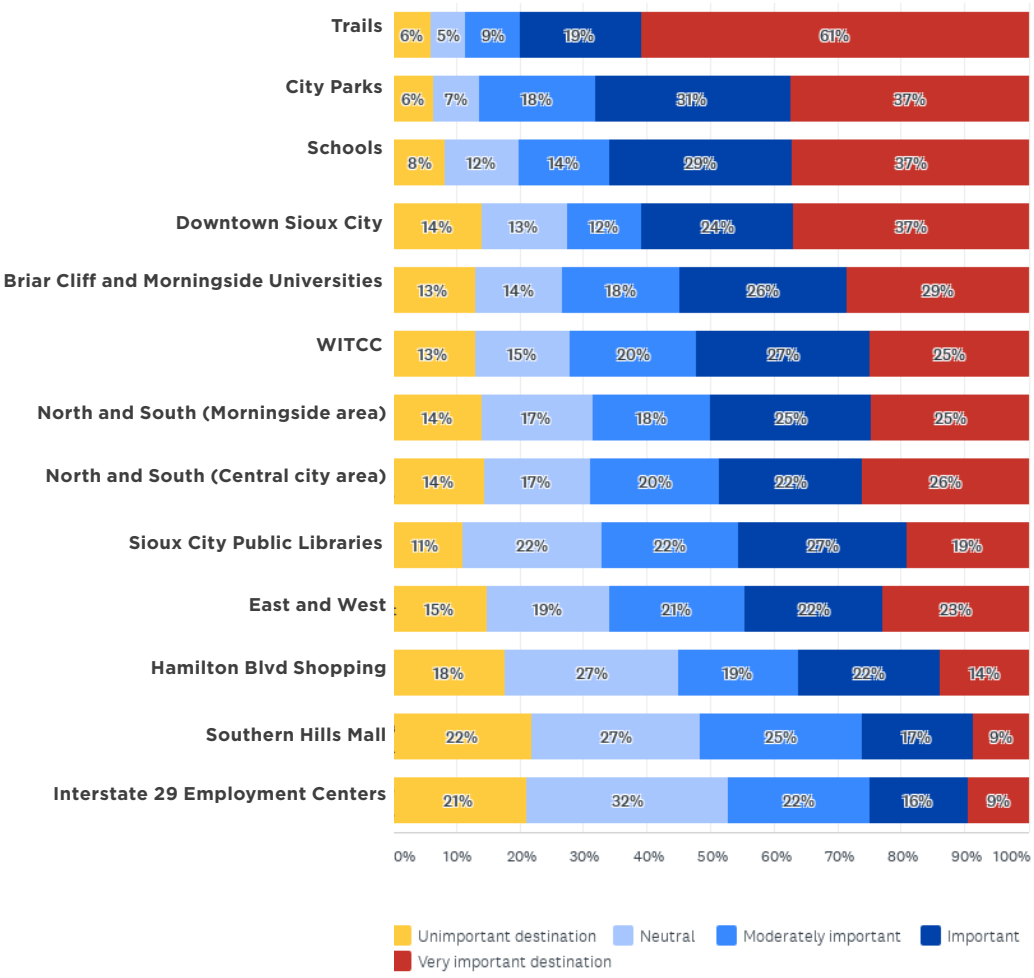
If you ride a BIKE, which of the following describes why you use it. Check all those that apply.



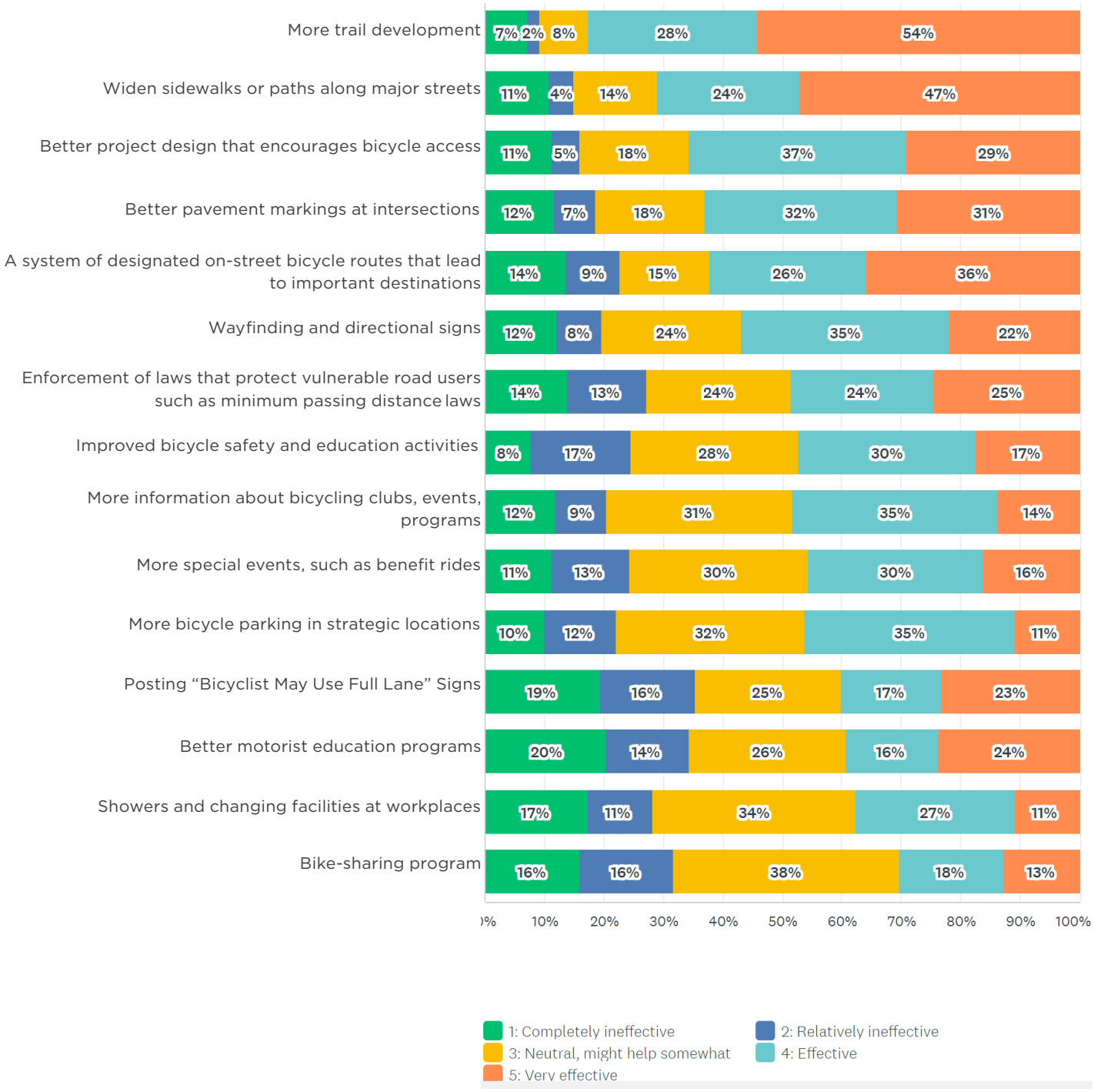
Which of the following best describes you as a BICYCLIST?



Please rate how important you think good bicycle access is to each of the following destinations or groups of destinations



How effective do you believe each of the following improvements would be in increasing the number of trips that residents of Sioux City make by bicycle?



% OF PARTICIPANTS REPORTING THE FACILITY IS COMFORTABLE FOR MOST USERS

Less then 50%

Two Lane Street with Parking

Two Lane Street without Parking

Three Lane Street with Parking and Wide Sidewalks

Four Lane Street with Wide Sidepath

Two Lane Business Street with Parking (parallel or diagonal)

Bicycle Boulevard

Two Lane Street with or without Parking and Bike Lane(s)

% OF PARTICIPANTS REPORTING THE FACILITY IS COMFORTABLE FOR MOST USERS (CONTINUED)

50% - 70%

Three Lane Street with or without Parking and Bike Lane(s)

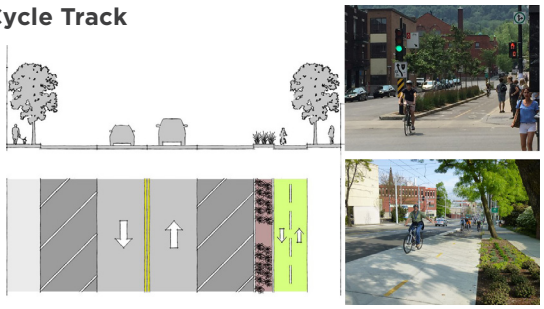
Four Lane Street with Bike Lane(s)

Bike Lane(s) with Sidepath/Wide Sidewalk

Over 70%

Protected Bike Lanes with Barriers on High Traffic Streets

Cycle Track



IOWA CASE STUDIES OF ON-STREET BIKE FACILITIES

Council Bluffs

Description. Council Bluffs has an exemplary example of a raised separated bicycle lane. The bicycle lane is found on Avenue A, a mixed use street. The bicyclists are buffered from moving traffic by a raised path, parked cars, and a landscaping buffer. The intersection are raised providing a smooth surface for cyclist while forcing vehicles to slow down before crossing. The bicycle facility is located in a mixed-use development along Avenue A. The design provides safety, easy access to housing and businesses, and aesthetically pleasing space. Incorporating trees, benches, and bicycle parking.

Cedar Rapids

Description. Cedar Rapids made a dramatic change to their downtown streetscape by not only reverting streets from one way streets to two way streets but incorporating protected bicycle lanes into the streetscape. (https://www.thegazette.com/news/work-restoring-two-way-streets-in-downtown-cedar-rapids-nears-end/) The standard bicycle lanes and protected bicycle lanes provide safety to and efficient travel space for cyclist through the downtown region. The protected bicycle lanes help narrow the vehicle lanes and planters provide both protection as well as add greenery and color to the streetscape.

Iowa City

Description. Iowa City has incorporated bicycle lanes into their street network. Around the downtown area single way buffered bicycle lanes parallel each other on two one-way streets. These buffered bicycle lanes cross two bicycle lanes allowing for bicyclist to have multiple directions and destinations they can move towards. The bicycle lanes are frequented by students and employees commuting to the University of Iowa and the downtown area.