Sioux City Active Transportation Plan

The University of Iowa
Iowa Initiative for Sustainable Communities

The University of Iowa
School of Urban & Regional Planning

This plan was created by Master's degree students in the School of Urban and Regional Planning at the University of Iowa as part of the Iowa Initative for Sustainable Communities. The students were:

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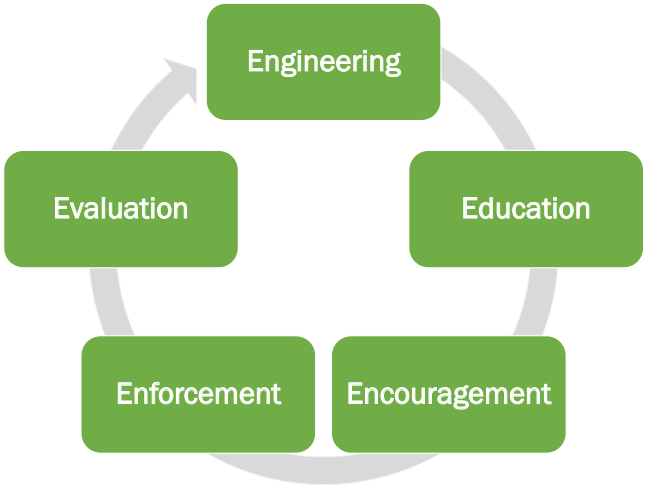
Executive Summary

Source: Anne Westra

This Active Transportation Plan is the result of a public-private partnership between Sioux City, SIMPCO, and Wellmark Blue Cross and Blue Shield. This plan was written by students in the University of Iowa's School of Urban and Regional Planning as a part of the Iowa Initiative for Sustainable Communities. The plan has been designed to promote active forms of transportation, specifically bicycle and pedestrian transportation, which improve public health and wellness. This plan promotes improved safety, increased sustainability, and greater transportation network efficiency. This plan is one of the final requirements for Sioux City to receive its Blue Zone designation status from Wellmark Blue Cross and Blue Shield.

The goals of this plan are to reduce and overcome existing barriers to walking and bicycling, provide safe and accessible connections between neighborhoods and destinations, and to encourage community participation in active transportation. In order to achieve these goals, a holistic planning approach has been used. The recommendations of this plan are structured in the form of five E's that offer a comprehensive planning approach. These categories are Engineering, Education, Encouragement, Enforcement, and Evaluation.



Engineering recommendations focus on infrastructure changes such as the construction of sidewalks, painting of crosswalks, and creation of bicycle lanes and sharrows. The engineering recommendations focus on a series of selected corridors as well as a downtown pedestrian zone that will function as the foundation of the active transportation network in Sioux City. The selected corridors are Jackson Street, Court Street, Faimount Street , Pearl Street / Grandview Boulevard, 6th Street, 5th Street, West 4th Street, West 19th Street, and Morningside Avenue / Transit Avenue. The recommendations made for each corridor are based on its unique characteristics, current conditions, and ability to accommodate infrastructure. The recommended infrastructure will allow for the safe and efficient travel of pedestrians, bicyclists, and vehicles throughout Sioux City. Various state and federal funding sources and grants are described to assist Sioux City in funding these engineering improvements.

Our education recommendations focus on educating the community, stakeholders, motorists, and officials about active transportation. The purpose of the education recommendations is to help make motorists aware of pedestrian and bicyclist rights, promote the safe and proper use of active transportation, and inform the public about active transportation and its benefits. This plan also recommends encouraging the use of active transportation within the community through a variety of programs and events. Such events include, but are not limited to, open

streets events, bicycle races, bicycle helmet giveaways, and the Sioux City Community School District's Safe Routes to School program. These events and programs are designed to promote interest and participation in active transportation.

The enforcement recommendations ensure that recommendations and new programs and policies are being followed by all users of the transportation network. Evaluation recommendations provide tools to determine the success of project implementation over time. Data and information will need to be gathered on measures such as mode share, crash rates, and miles of bicycle lanes. Planners, policy makers, and the public should be called together in evaluating the success of the many recommendations made in this plan at five, ten, and fifteen year milestones.

The Active Transportation Plan represents an important step towards making Sioux City a healthier and safer place to live and work. The adoption of this plan is the beginning of Sioux City's journey towards being a more active community. The implementation of this plan's recommendations will be a continual and ongoing process spanning many years. A dedicated application of this plan and its recommendations will be required to achieve its full potential. The implementation of this plan will make Sioux City a regional leader in the provision of healthy, safe, and accessible transportation for all members of the community.

Chapter 1
Introduction

Introduction

Plan Impetus

This plan was prepared as part of the Iowa Initiative for Sustainable Communities (IISC), which is sponsored through the University of Iowa. The IISC is dedicated to promoting sustainability throughout the state through student and faculty sponsored efforts. This Active Transportation Plan was created by a group of students from the University of Iowa's School of Urban and Regional Planning to address improvements in the urban environment of Sioux City that will lead to improved health, wellness, infrastructure, policy, and transportation connectivity for all residents of Sioux City. Sioux City asked for the development of an Active Transportation Plan with specific attention to fulfilling the requirements for becoming a Blue Zones community.

Blue Zones is a program created by Healthways that is sponsored by Wellmark Blue Cross and Blue Shield. It is designed to increase health and wellness of communities by improving living environments, policy, and lifestyle choices. The Blue Zones designation process requires the adoption of an Active Transportation Plan.

Problem Statement

Sioux City is an auto-oriented Midwestern city with limited bicycling and pedestrian infrastructure. Positive strides have been made to improve these conditions, and this plan will support coordination and City efforts towards the further development of an active community.

Goals

The goals of this plan are to:

- Reduce and overcome existing barriers to walking and bicycling
- Provide safe and accessible connections between neighborhoods and destinations
- Encourage community participation in active transportation

Approach and Methodology

In order to accomplish the goals and address the issues presented above, a pragmatic approach for completing this plan was devised. First, objectives and the scope of the project were identified by meeting with faculty and project partners. From there, the best practices of bicycle and pedestrian plans were identified. After best practices were identified, public input was collected and focus group meetings were conducted in Sioux City. The input gathered was compiled alongside informal interviews (which we are calling "Quick Insights").

Public input helped identify barriers for active transportation and corridors for new active transportation infrastructure. These corridors provide an opportunity to showcase possible improvements that could make active transportation a safe and easy choice for Sioux City residents. The corridor analysis relied upon a set of criteria including crash analysis, potential destinations, and connectedness to the existing transportation network. Infrastructure improvements that have the potential to support and engage bicycle and pedestrian activity within these community corridors are also recommended. Finally, suggestions are made for city-wide encouragement, educational strategies, policy provisions and general infrastructure improvements that will promote a more active community within Sioux City.

Chapter 2

Background

Background

History

Sioux City is located at the confluence of the Big Sioux and Missouri Rivers in the northwest corner of the state of Iowa. The Sioux City area has been settled for thousands of years, first by Native Americans and then by Europeans beginning in the 19th century. The first U.S. citizens to travel through the area were the famous American explorers Merriweather Lewis and William Clark and their crew on an expedition across the great American frontier in 1804. Those moving westward during the late 19th century found the Sioux City area a prime location where eastern goods could be connected with the expanding western territories. The establishment of railroad connections within Sioux City made it an economic trade center in the region.

Settlement of the original suburban areas of Riverside and Morningside prompted city leaders to consider more efficient means of moving not only goods but people across town. Rail yards, rivers, creeks, and dirt roads made traveling throughout Sioux City difficult for early residents. In the late 1800s, Sioux City became the first city in the world to develop a fully electrified passenger rail system.[1] Originally intended to connect the communities of Morningside in the east to Riverside in the west through downtown, the system faced bankruptcy early on, and was forced into closure just before the turn of the 20th century. Cable cars became a popular means for travelers to overcome the hills, streams, and railroad tracks, and were popular until the widespread adoption of the private automobile for personal travel.

Today, Sioux City residents drive across the same rivers and rail yards. Commuters travel between Nebraska, South Dakota, and Iowa on a daily basis, along with tons of freight on roads and rail. Recent initiatives such as Blue Zones and Safe Routes to School have prompted City leaders to recognize the need to improve opportunities for non-motorized transportation modes and transit integration. Thus, the City is developing a more extensive bicycle and pedestrian network to connect people to destinations and encourage more active lifestyles.

1 Iowa Department of Transportation, *Approaching the turn of the century: Discovering historic Iowa transportation milestones*. http://www.iowadot.gov/histbook.pdf

Socioeconomic Demographics

Population

Sioux City has a population of approximately 82,658 in 2013, which has been declining in recent years (Figure 1). This is opposite the trend seen in most other metropolitan areas throughout Iowa which are experiencing population increases.[2]

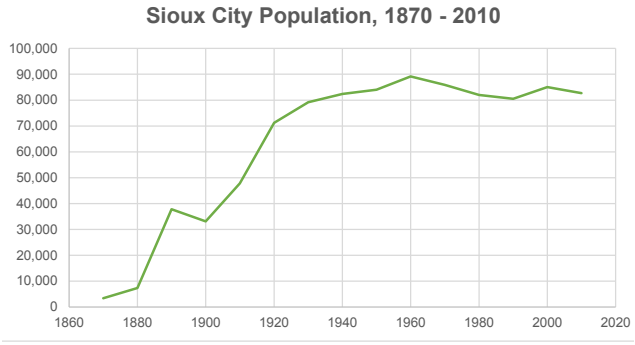


Figure 1. Sioux City population, 1870 - 2010

Race and Ethnicity

Sioux City is more racially diverse than the state of Iowa (Figure 2). Special attention needs to be given to ensure that the Active Transportation Plan is addressing the needs of the entire population.

Economy

Sioux City has an unemployment rate of 4.52%. This is slightly higher than the state average of 3.67%. Median household income is $41,759, which is lower than the state median of $51,653. The poverty rate in Sioux City is approximately 13.43%, compared to the state of Iowa rate of 8.42%. These trends indicate that Sioux City is not faring as well as the rest of the state of Iowa, at least since the 2007 Recession.[2]

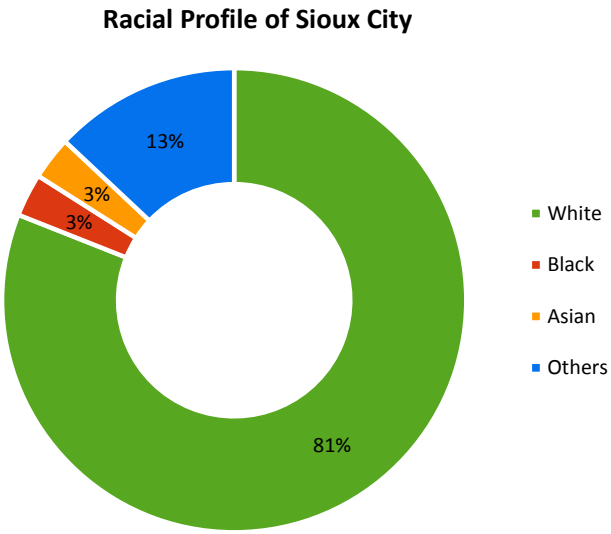


Figure 2. Racial profile in Sioux City

Public Health

By its nature, the Active Transportation Plan is related to improving public health. Sioux City's obesity trends are similar to those seen around the country. Woodbury County's body mass index data can be seen in Table 1. Studies have shown that active lifestyles may lead to decreases in obesity and obesity-related diseases. By increasing the number of people who choose to walk and bicycle on a regular basis, the Active Transportation Plan can help mitigate obesity and health issues in Sioux City.

2 US Census Bureau ACS 3 year 2013

Table 1. Obesity trends - Body mass index Woodbury County and the U.S. 2013

Variable	Woodbury County, IA	USA
% Body mass index - Obese, 2013	26.76%	27.12%
% Body mass index - Overweight	34.53%	34.43%
% Body mass index – Healthy weight	33.82%	33.60%
% Body mass index - Underweight	1.60%	1.60%

Transportation Mode Share

Sioux City is a primarily automobile oriented city. The vast majority of Sioux City residents, approximately 83.3%, drive alone to work. About 7.8% of commuters use a carpool. Thus, this shows that 91.1% of commuters rely on driving. Transit accounts for 1.4% of mode share. Walking comprises only 1% of commuting trips. Bicycling makes up 0.2% of commuter trips. Taxi, motorcycle, and all other means of transportation make up 3.4% of commute trips. The remaining 2.8% work from home. The Active Transportation Plan will attempt to strike a closer balance between private automobiles and non-motorized mode shares. [2]

Chapter 3

Public Input and Participation

Public Input and Participation

Source: Authors

Source: Authors

For a plan to be supported from development through implementation, it must reflect the people, attitudes, preferences, behavior, and values that the plan represents. This Active Transportation Plan incorporates several forms of resident input, including two open houses in October 2014 and March 2015, seven focus groups, and short, informal "Quick Insight" surveys. Input for the Active Transportation Plan was also provided from the group's project partners. These include the Blue Zones project, the Siouxland Interstate Metropolitan Planning Council (SIMPCO), and the City of Sioux City. Public input provided information that was used to guide analysis and corridor selection.

Open House October 2014

A public meeting was held in October of 2014 to provide residents with an opportunity to discuss the issues surrounding the development of this Active Transportation Plan. The meeting was held for two hours on the evening of October 16, 2014. Attendees expressed their opinions and concerns related to walking and cycling.

Connectivity was cited as a major issue. The attendees would like to see more connections from bicycle trails to Stone State Park, the City of Sergeant Bluff, Iowa, and to other existing trails within Sioux City, specifically the riverfront bicycle trails. Several safety concerns were also expressed. There is a perceived safety issue at the Perry Creek Trail. Also, the quality of sidewalks caused concern in the Mercy Hospital area in addition to poorly located pedestrian crossings on Transit Avenue. Overall, the expressed concerns focused around a lack of ADA accessible sidewalks, accessibility of trail infrastructure, and safety features along trails.

Focus Groups

Public input was also sought through a series of focus groups with key stakeholders and organizations. These focus groups provided invaluable insights from individuals who are experts with exceptional knowledge of Sioux City's existing bicycle and pedestrian conditions. The individuals that were asked to participate in discussions were those who represent the interests of residents, bicyclists, pedestrians, or minorities. These groups would be significantly affected by changes to bicycle and pedestrian policy and infrastructure.

Discussions were held with the Missouri River Runners, SIMPCO, Blue Zones, the Sioux City Parks and Recreation Department, staff at the Mary Treglia Community House, community members and educators involved in Safe Routes to School, and the Siouxland Trails Founda-

Source: Authors

tion. Focus group meetings were held on October 16-18, 2014. Each focus group lasted for one hour.

Focus group attendees were asked about issues related to active transportation. A list of questions that guided focus group discussions can be found in the appendix. The questions provided a way to stimulate discussion on important topics, but were not strictly followed. This allowed the focus group to discuss important and relevant issues which may not have been anticipated.

The Missouri River Runners are a recreational running organization based in the Sioux City area. This group expressed concerns regarding safety, both in terms of crashes and crime. Many members felt that there should be better lighting on recreational trails and suggested that certain areas of Sioux City are perceived as unsafe. Several members mentioned problematic motorist behavior including verbal abuse and not yielding to pedestrians or bicyclists when they have the right of way. Interconnectivity throughout the tri-state area and within Sioux City itself was a concern. They expressed a lack of connections between trails in the city, especially at railroads. The group discussed that several promotional activities and events have ceased in recent years, such as the local marathon.

The Director of the Sioux City Parks and Recreation Department discussed how the Active Transportation Plan will fit into his Department's park and trail planning. A local State Representative was also present to discuss the demand for trails in the city and how to turn public support into action. One idea generated at this meeting involved creating a connected trail loop throughout the city. Both expressed that there is a clear demand for trails from the public and that the City should attempt to meet this need. Several suggestions were made to promote bicycling and walking such as a Mayor's Ride or Run and an Open Streets event.

Another focus group involved staff members from the Mary Tregalia Center, a minority advocacy organization within Sioux City. Their input was valuable because non-whites and recent immigrants are steadily increasing in population within the community. Several immigrant groups of Sioux City include people from the Horn of Africa, north and south portions of Vietnam, and a variety of Central American countries. This meeting provided insights into minority and immigrant commuting habits and perceptions of active transportation. It was expressed that many minorities and recent immigrants lack access to a personal vehicle and that transit use is not widespread among these groups. Many minorities work late night, third shift hours that are not serviced by the existing transit schedule. Existing information on transit has not been translated into all languages local minorities and immigrants speak, thereby creating an information barrier to improved transit use among these groups. It was said that this prompted many minorities

Source: Siouxland Trail Foundation.

to carpool for work and errands. The work locations of most minorities are located in South Sioux City, a distance that many think is too far to walk or bicycle, especially at late night work hours. These insights helped shape recommendations to improve upon existing outreach and encouragement strategies as they relate specifically to minorities and recent immigrants.

The Safe Routes to School focus group involved a variety of representatives for this initiative, including principals, teachers, staff, and parents. The existing Safe Routes to School program coordinates a very successful walking school bus program. This program has seen widespread participation at almost every elementary school in Sioux City. The Sioux City Community School District would like to expand the walking school bus program to even more schools and develop additional programs to expand its existing scope. The representatives felt that the development of an Active Transportation Plan would assist in promoting safety for children who walk and bicycle to school.

Representatives from the Siouxland Trails Foundation felt that most bicyclists in Sioux City ride for exercise and recreation, rather than out of necessity or to commute. They feel there are a significant number of residents that depend on bicycling as their only means of transportation. There are currently no trail counts to determine the number of people who use the trails. There were several ideas for events that could help promote cycling in Sioux City, such as road races and promotional events, which would engage the recreational bicyclists and help make bicycling more publically visible in the community.

The final group was the Siouxland Cyclists, an organized recreational group. Connections and access were of key concern among these members, including direct connections into and within the northern suburbs of Sioux City.

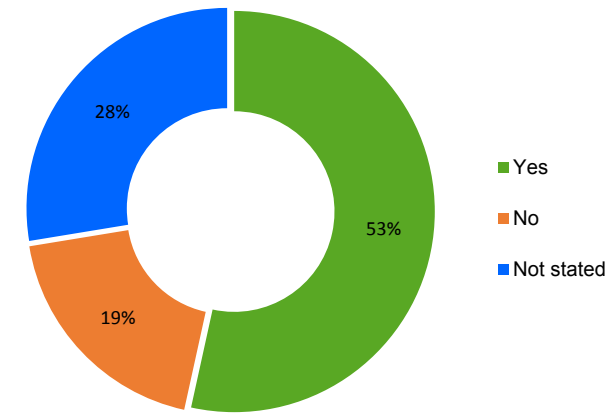
Several recurring themes were identified throughout these groups. These focus groups mentioned connectivity, lack of infrastructure, safety, and awareness as the major areas for necessary improvement. The issues raised by these groups are analyzed and discussed throughout this Active Transportation Plan. Recommendations are made to address the issues and their associated effects on Sioux City.

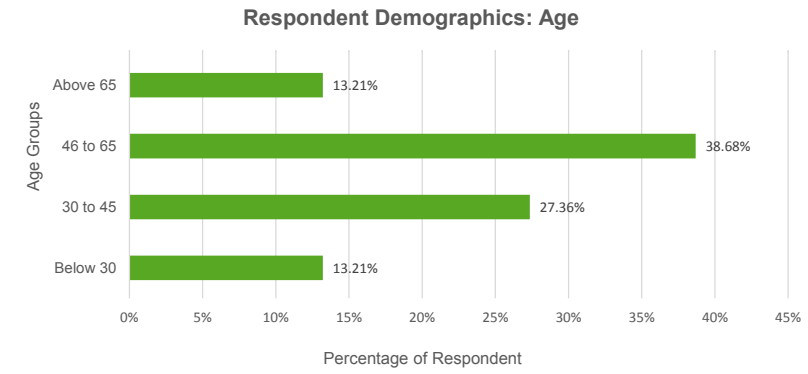
Source: Authors

Quick Insights

In an effort to gather public opinion on active transportation, residents were asked to answer a series of questions while at a Farmer's Market and at a football game in October of 2014. Public responses provided a way to learn about the public's opinions, attitudes, and values about active transportation. Information was collected from 106 respondents using a set of three questions.

We asked the respondents if bicycling and walking were important to them and for what reasons. Respondents were also asked what difficulties existed for bicycling and walking in Sioux City and what they think could be improved to encourage more people to ride a bicycle or walk. Finally, we asked if residents would be willing or able to replace at least one trip per week by walking or bicycling. Demographic data was also recorded for each respondent. A copy of the questions used can be found in the appendix. Figure 3 summarizes the demographics of the respondents.





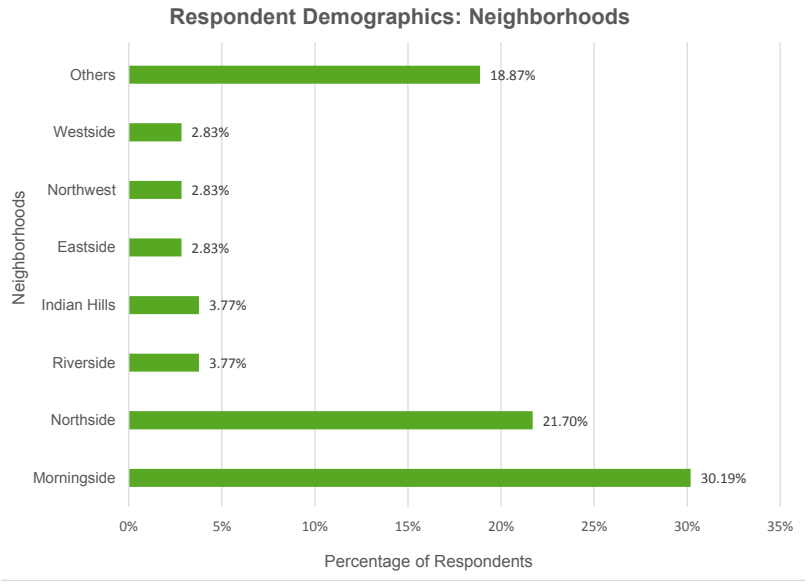


Figure 3. Respondents demographics

Are Walking and Bicycling Important?

Figure 4 shows the key words from the answers we obtained for the question about the importance of walking and bicycling. The size of the words represents the number of times each word was mentioned by respondents. An overwhelming majority of respondents (96%) felt that bicycling and walking are important to promote within Sioux City. A handful of reasons were mentioned as well, including health, attracting young people to the city, getting out for fresh air, and providing a way for children to exercise.

Figure 5 represents the percentage for each reason given for the importance of walking and bicycling. For all 139 answers provided by 106 individuals (each respondent provided one or more responses), health accounts for the majority of responses regarding the importance of active transportation.

Figure 4. Why are walking and cyling important?

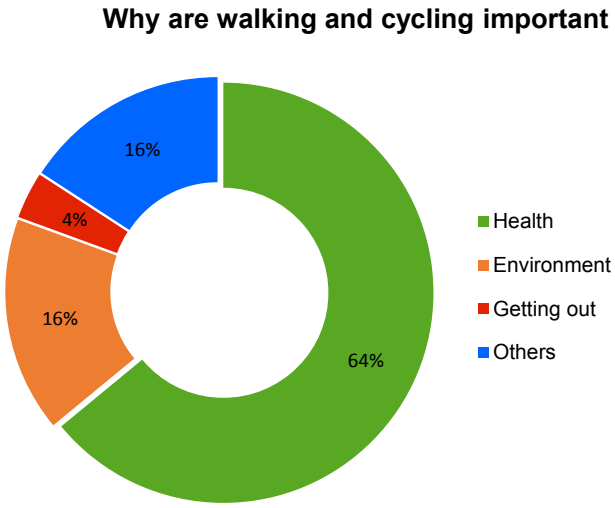


Figure 5. Why are walking and cycling important?

Barriers to Bicycling and Walking in Sioux City

Figure 6 illustrates the key words from responses regarding the difficulties of bicycling and walking in Sioux City. There are clear concerns regarding traffic collisions, the lack of sidewalks or too-narrow sidewalks (non-ADA compliance), bicycle lanes, bicycle trails, lighting, connectivity, and motorist behavior (see appendix). Issues such as signage (wayfinding), hills, and poor public transit are also important issues, despite being mentioned less often.

Figure 7 displays how often each hindering factor was mentioned. Safety, both in terms of traffic collisions and perceptions of security, are among the top concerns. Hills and other geographical features were mentioned only four times. However, many respondents indicated that they only walk or bicycle for exercise on trails, which are typically flat.

Besides hills, other permanent barriers including rivers and railroads in addition to temporary barriers such as weather and construction sites accounted for a small proportion of the total responses. Integrating bicycling or walking with transit was also mentioned.

Further analysis examined whether or not there are differences in opinions about what hinders walking and cycling in Sioux City among participants of various demographic groups. The results indicate that male and female respondents had different concerns about the lack of bike lanes, physical ability to walk or bicycle, and connectivity Different age groups had varied concerns regarding collisions (Table 2).

Figure 6. What hinders bicycling and walking in Sioux City?

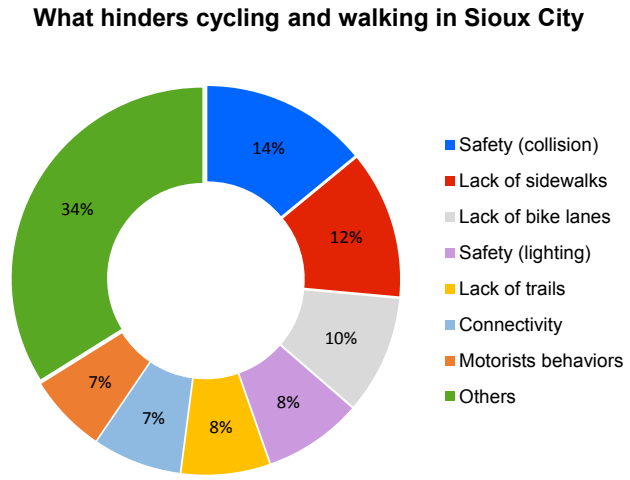


Figure 7. What hinders bicycling and walking in Sioux City?

What Would Support Bicycling and Walking

Respondents were also asked what would support bicycling and walking in Sioux City. Figure 8 represents the most frequently mentioned ways to encourage and increase participation in active transportation. Of all responses, improvements in infrastructure (e.g. bicycle trails, bicycle lanes, sidewalks) and connectivity were mentioned the most (Figure 9).

Further analysis was conducted to examine the differences in perceptions of what would support walking and bicycling between gender, age group, neighborhood, and presence of children in the household. The results indicate that opinions about bike lanes and destinations are different between males and females. Neighborhoods, households with or without of children, and age groups differed on ideas about maintenance, sidewalks, and trails respectively (Table 3).

Figure 8. What supports bicycling and walking in Sioux City?

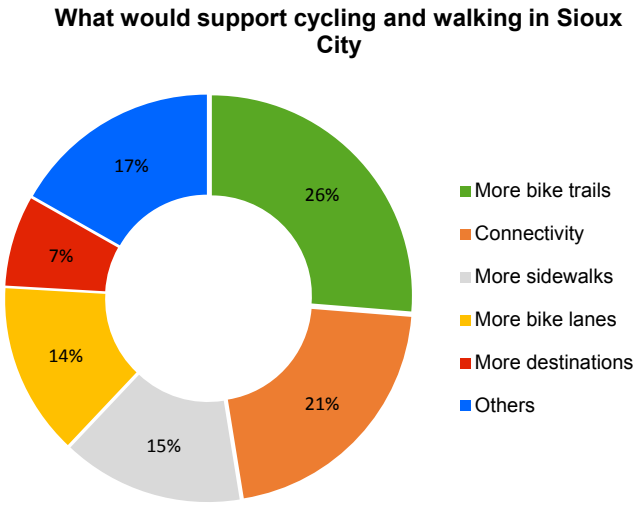


Figure 9. What would support cycling and walking in Sioux City?

Table 2. What hinders walking and bicycling in Sioux City
Responses by gender, neighborhood, presence of children, and age group

		Percentage of respondents who mentioned these barriers									
		Trails	Sidewalks	Bike lanes	Motorists' behaviors	Safety: collisions	Safety: lighting	Signage	Hills	Physical ability	Connectivity
Gender	Female	9%	14%	**17% (*)**	9%2	17%	11%	6%	5%	**0% (*)**	**12% (.)**
	Male	8%	14%	**3% (*)**	5%	16%	8%	0%	0%	**5% (*)**	**3% (.)**
Neighborhood	Morningside	9%	9%	6%	9%	25%	13%	0%	6%	**0% (*)**	13%
	Northside	13%	13%	13%	4%	13%	9%	9%	0%	**0% (*)**	4%
	Other	5%	19%	14%	11%	14%	11%	3%	3%	**5% (*)**	11%
Live with children		10%	10%	10%	8%	13%	10%	6%	2%	0%	8%
Age group	< 30	6%	12%	12%	18%	**0% (.)**	6%	0%	0%	0%	12%
	30 - 45	7%	15%	11%	7%	**7% (.)**	15%	0%	0%	0%	7%
	46 - 65	12%	10%	15%	5%	**27% (.)**	7%	10%	7%	2%	12%
	> 65	0%	31%	8%	0%	**15% (.)**	8%	0%	0%	8%	0%

Table 3. What would support walking and bicycling in Sioux City
Responses by gender, neighborhood, presence of children, and age group

		Percentage of respondents who mentioned these supporting factors						
		Connectivity	Bike lanes	Maintenance	Trails	Sidewalks	Bike racks	Destinations
Gender	Female	29%	**8% (*)**	5%	29%2	18%	2%	**12% (.)**
	Male	27%	**24% (*)**	8%	43%	14%	5%	**3% (.)**
Neighborhood	Morningside	34%	16%	**0% (*)**	34%	28%	3%	6%
	Northside	30%	17%	**17% (*)**	30%	13%	0%	9%
	Other	27%	11%	**5% (*)**	41%	14%	5%	14%
Live with children		29%	15%	6%	27%	**13% (.)**	2%	6%
Age group	< 30	18%	24%	6%	**59% (*)**	24%	6%	18%
	30 - 45	19%	11%	7%	**22% (*)**	19%	0%	15%
	46 - 65	37%	17%	2%	**37% (*)**	12%	0%	2%
	> 65	38%	0%	8%	**15% (*)**	38%	8%	8%

(Note: The total percentage is greater than 100% as each respondent had more than one answer). Significance level for chi-squared tests for counts(*) 0.05; (.) 0.1

Potential for Bicycling or Walking

In the last question, we asked the respondents about replacing some car trips by walking or cycling in the future. Nearly three quarters respondents suggested that they could replace at least one trip per week by cycling or walking.

For trips that can be replaced with active transportation modes, participants mentioned a variety of destinations, including grocery stores, their places of work, downtown, retail stores or other businesses (e.g. restaurants, cafes, convenient stores, and pharmacies), and social events or friends' homes (Figure 10 & Figure 11). A majority of respondents stated that they could make their grocery trips by bicycle or walking. This type of trip, in fact, is associated with heavy carrying and is thus a trip that most people would prefer to make with a car. Nonetheless, these responses indicate that there is a demand for active living and healthy lifestyles, and many residents could walk and bicycle for their daily activities.

Eight percent of respondents indicated that it is not possible for them to replace a car trip with bicycling or walking. The two reasons provided were long distances and a physical disability.

Figure 10. Car trips that can be replaced with bicycling or walking

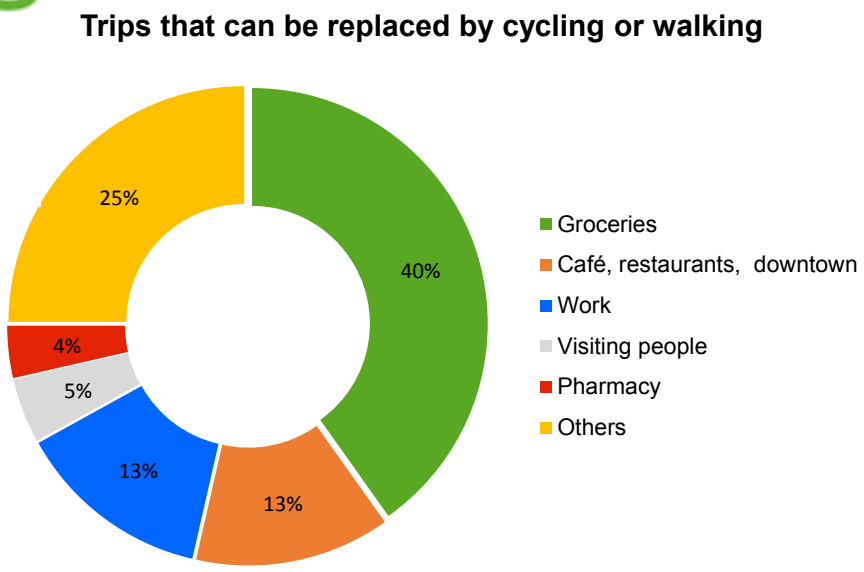


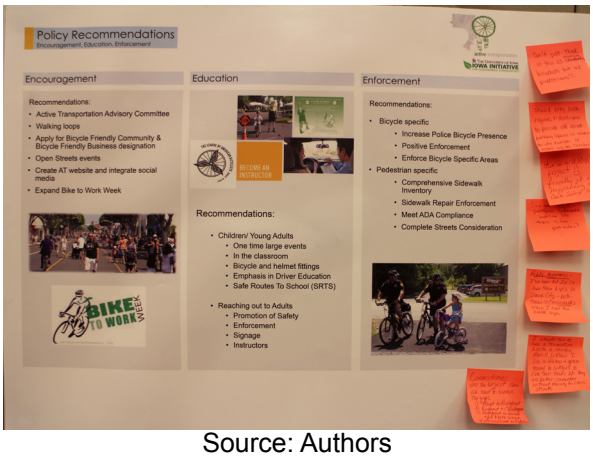
Figure 11. Trips that can be replaced with bicycling or walking

In summary, these quick insight interviews provided valuable knowledge about respondents' perception of bicycling and walking. This was especially useful in identifying barriers. Most importantly, these insights show a high potential for involving residents in active transportation. We strongly suggest that such high potential should be taken into consideration when developing public projects and policies.

We do acknowledge that this analysis has some limitations. The sample is non-representative as a majority of the respondents live in Morningside, which might have different socio-demographic characteristics compared to other neighborhoods in city. Also, a large proportion the participants are above 45 years old, who may have different concerns compared to the younger age group. Furthermore, the interview only accounts for the Farmer's Market attendees, who may be predisposed to have concerns about healthy and active living. Nonetheless, this insight is useful as it sheds a light on the community's attitudes towards active transportation, the public's needs and expectations, as well as the public's support for active transportation policy.

Open House March 2015

Source: Authors



Source: Authors

"This is a WOW project! Finally it is happening in our Sioux City."
(A participant at the open house)

"It's dangerous to cross these streets with the Sioux City drivers."
(A participant at the Open House)

"Difficult to break the pattern of driving fast." (A participant commented on proposal for Jackson St.)

After developing a set of recommendations based on public input a final open house was held over the course of two hours on March 23, 2015 at the Sioux City Public Library. The purpose of the event was to gather public opinions on preliminary recommendations. The open house was also an opportunity to inform the public about the active transportation plan for their community, introduce them to different types of infrastructure, and to get more people involved in walking and bicycling.

The recommendations were portrayed using 13 posters that showed different types of engineering concepts for a series of eight selected corridors and the downtown. There were also posters showing education, encouragement, and enforcement programs for pedestrians and bicyclists. Participants were asked to provide comments about the proposals and vote for the corridor they would like to see implemented first.

There were 49 participants in the open house. This included residents who live and work in Sioux City and surrounding areas. City and SIMPCO staff were also in attendance. Overall, the majority of responses from the public were positive and supportive. Many people expressed that this project would make a difference.

Open House participants also expressed concerns about safety and difficult crossings at midblock and intersections, such as Lakeport Street to Morningside Avenue, Pierce Street to Gordon Drive, and 3rd Street to Hamilton Boulevard. The reasons that the public cited for these safety issues were high speeds, driving behaviors, short signal timing, and faded pavement markings.

There were also concerns about lighting for trails to increase safety, as trails are typically separated from the lights of streets and traffic. With regard to phasing, Open House participants prioritized Jackson Street (9 votes), Morningside Avenue and Transit Avenues (8 votes), Pearl Street and Grandview Boulevard (5 votes), and W. 19th Street (4 votes).

We incorporated various information from the public input into our final recommendations, especially in safety improvement through engineering, education, and enforcement efforts.

Chapter 4

Network Analysis

Network Analysis

This section provides an overview of existing infrastructure in Sioux City, particularly its bicycle, pedestrian, and transit networks. This analysis establishes the foundation for policy and design recommendations.

Bicycle and Pedestrian Crash Analysis

In order to identify and select corridors for engineering recommendations, the areas of Sioux City that had crashes involving bicyclists or pedestrians between the years of 2004-2014 were identified using crash data from the Iowa Department of Transportation (Iowa DOT). This section contains a review of the analysis and highlights areas for improvement. Figure 12 shows bicycle and pedestrian related crashes in Sioux City from 2004 to 2014.

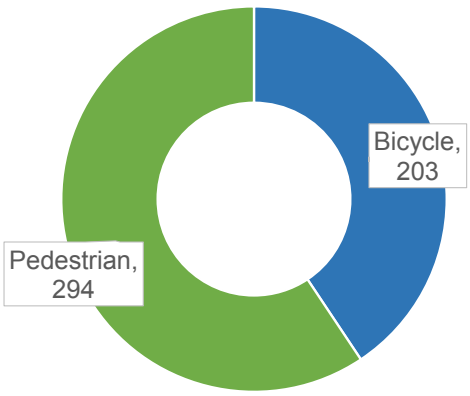


Figure 12. Pedestiran and bicycle crashes 2004-2014

Crashes in General

Between 2004 and 2014, there were 497 vehicular crashes that involved either a pedestrian or bicyclist in Sioux City (Table 4). Of the 497 incidents, 294 involved pedestrians (59%) and 203 involved bicyclists (41%). Sixteen of the incidents were fatal. Fifteen of these fatal crashes involved a pedestrian. In 144 of the accidents, the pedestrian or bicyclists was either improperly crossing or darting across the roadway. In all but 19 of the crashes (including all fatal crashes), the active transportation user was not using safety equipment.

Table 4. Pedestrian and bicyclist crashes in Sioux City by crash severity

Pedestrian and Bicylist Crashes in Sioux City						
	Fatal	Major	Minor	Possible	Property damage only	Total
Pedestrians	15	38	104	137	0	294
Bicyclists	1	16	96	89	1	203
Total	16	54	200	226	1	497

Sioux City Compared to Other Cities

To identify how Sioux City compares with other cities in terms of fatalities, fatal pedestrian crashes were analyzed using the Pedestrian Danger Index (PDI).[1] Using the same calculation, a Bicyclist Danger Index (BDI) was developed to analyze the bicyclist fatalities. The indices indicates the likelihood of a pedestrian or bicyclist being hit by a vehicle and killed within a city or metropolitan area. A higher danger index means that pedestrians and bicyclist are at a greater risk of death or injury. The PDI calculation accounts for different levels of exposure in cities by incorporating population and mode share into the formula. We used the formula below to do our calculations.

$$\frac{\text{Average 2004-2014 (annual pedestrian or bicyclist fatalities/population)*10,000}}{\text{Percentage of commuters walking or biking to work}}$$

The results are shown in Figure 13 & Figure 14. According to these calculations, Sioux City has a high PDI. This indicates that, compared to other cities in Iowa, it is a relatively unsafe location for pedestrians. For example, Sioux City's PDI is 9.32. The city with the next highest is Ankeny at 7.17. For bicyclists, Sioux City is the second highest compared to other cities in Iowa with a BDI of 5.38. The top BDI in this analysis is Mason City at 9.89.

Notably, the downtown area has a high number of crashes relative to the rest of the city, as it is the nexus of several travel modes. See Figure 15, Figure 16 and Figure 17 for crash analysis maps.

1 Smart Growth America, (2014). Dangerous by Design. Retrieved from: http://www.smartgrowthamerica.org/research/dangerous-by-design/dbd2014/national-overview/

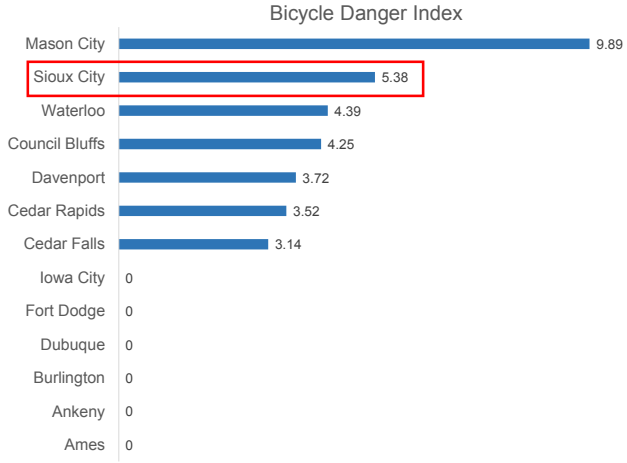


Figure 13. Bicycle Danger Index of selected cities in Iowa

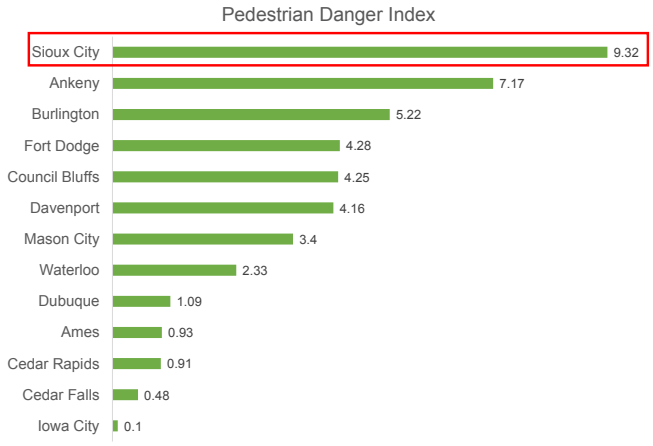


Figure 14. Pedestiran Danger Index of selected cities in Iowa

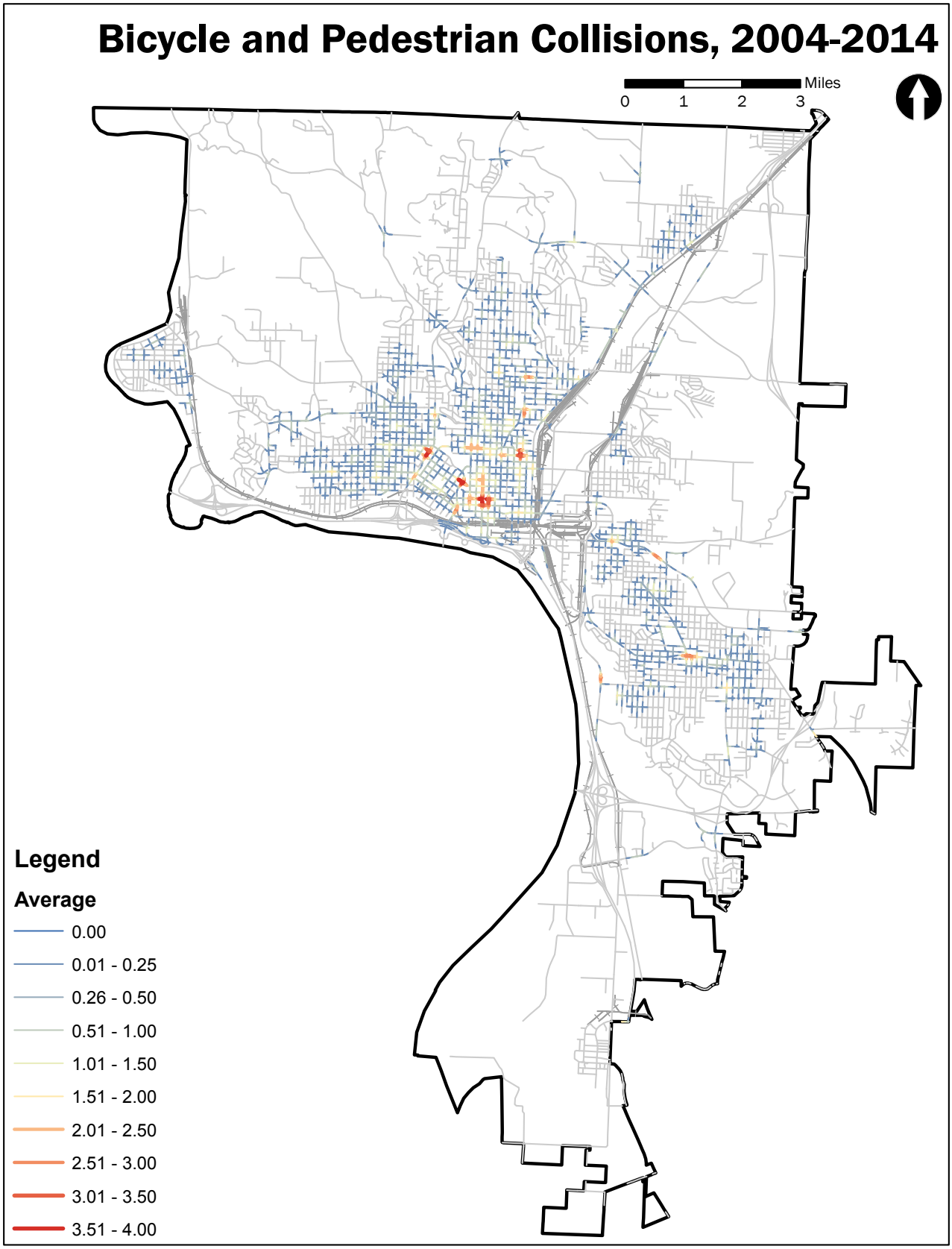


Figure 15. Bicycle and pedestrian collisions, 2004 - 2014

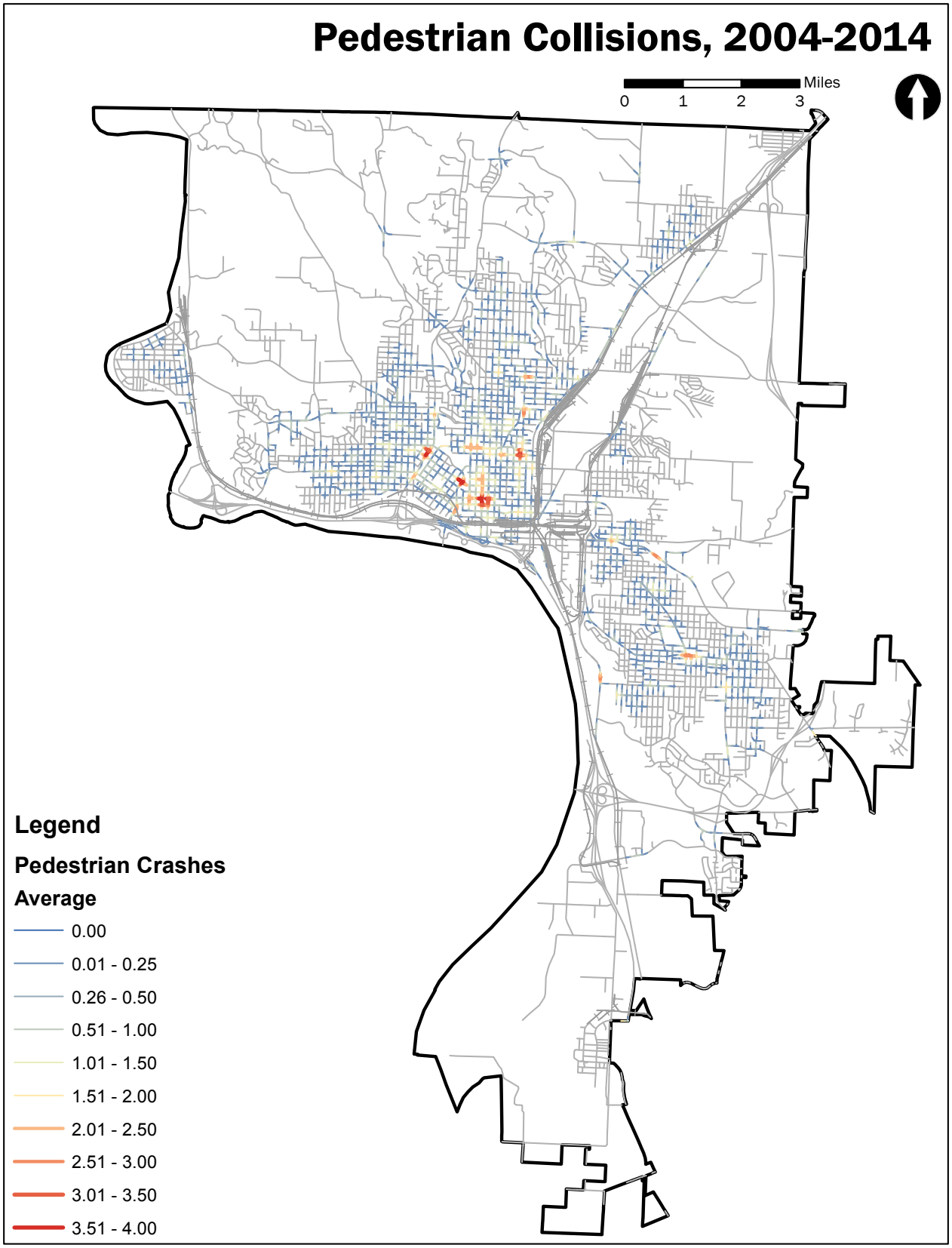


Figure 16. Pedestrian collisions, 2004 - 2014

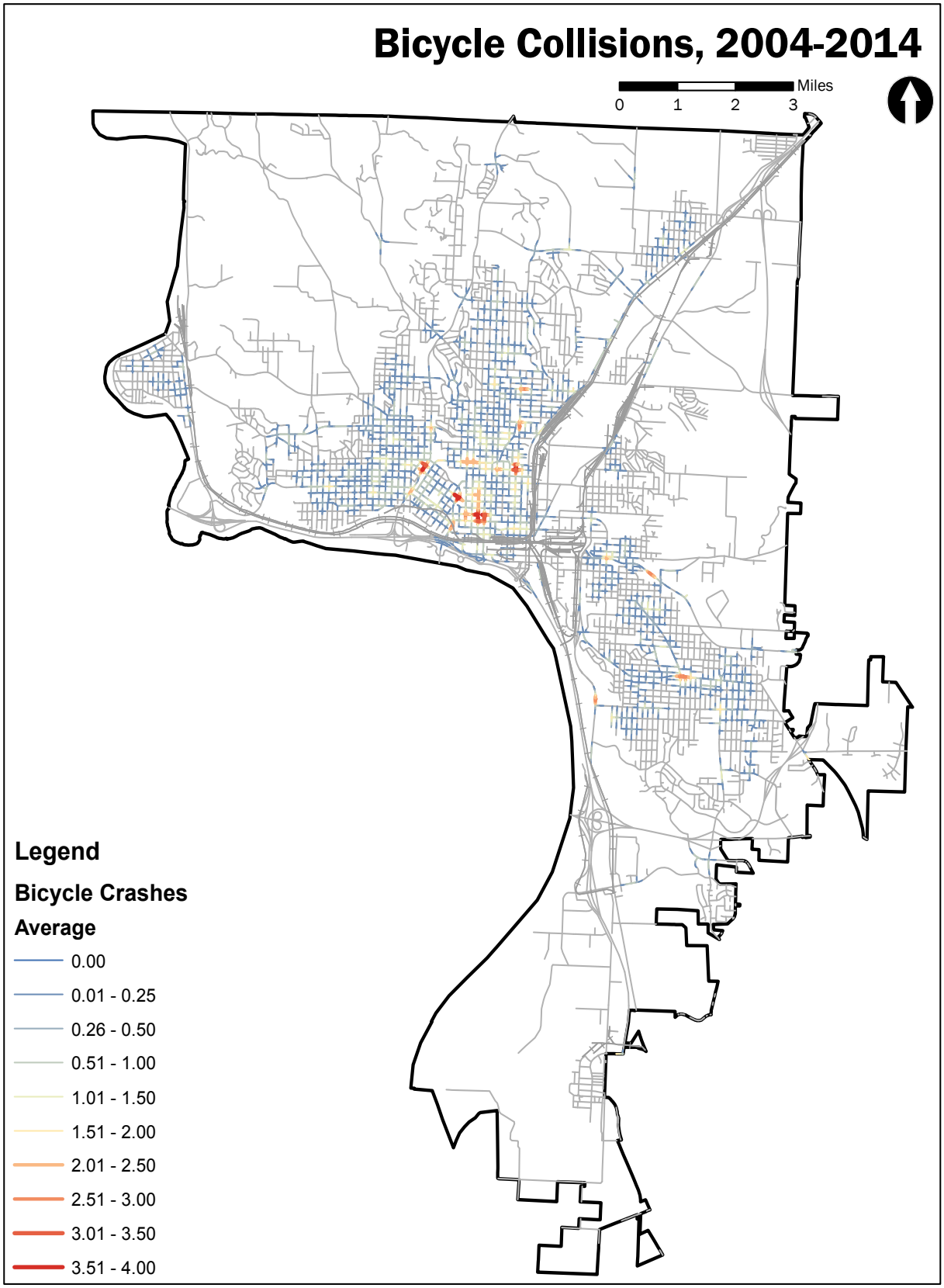


Figure 17. Bicycle collisions, 2004 - 2014

Barriers

Downtown Sioux City is the nexus of its highways, railways, waterways, and trail system. A critical physical barrier to bicycle and pedestrian travel is a limited number of bridges over water and railways (Figure 18). When looking at highways, rail lines, and waterways, it becomes apparent that segmentation prevents easy access from one part of Sioux City to another. The Big Sioux and Missouri Rivers form the western boundary of the city. Large rail lines and the Floyd River bisect Sioux City's eastern development. To the south, the junction of I-29 and US-75 splits a small portion of the City's industrial area off from residential and commercial developments to the north.

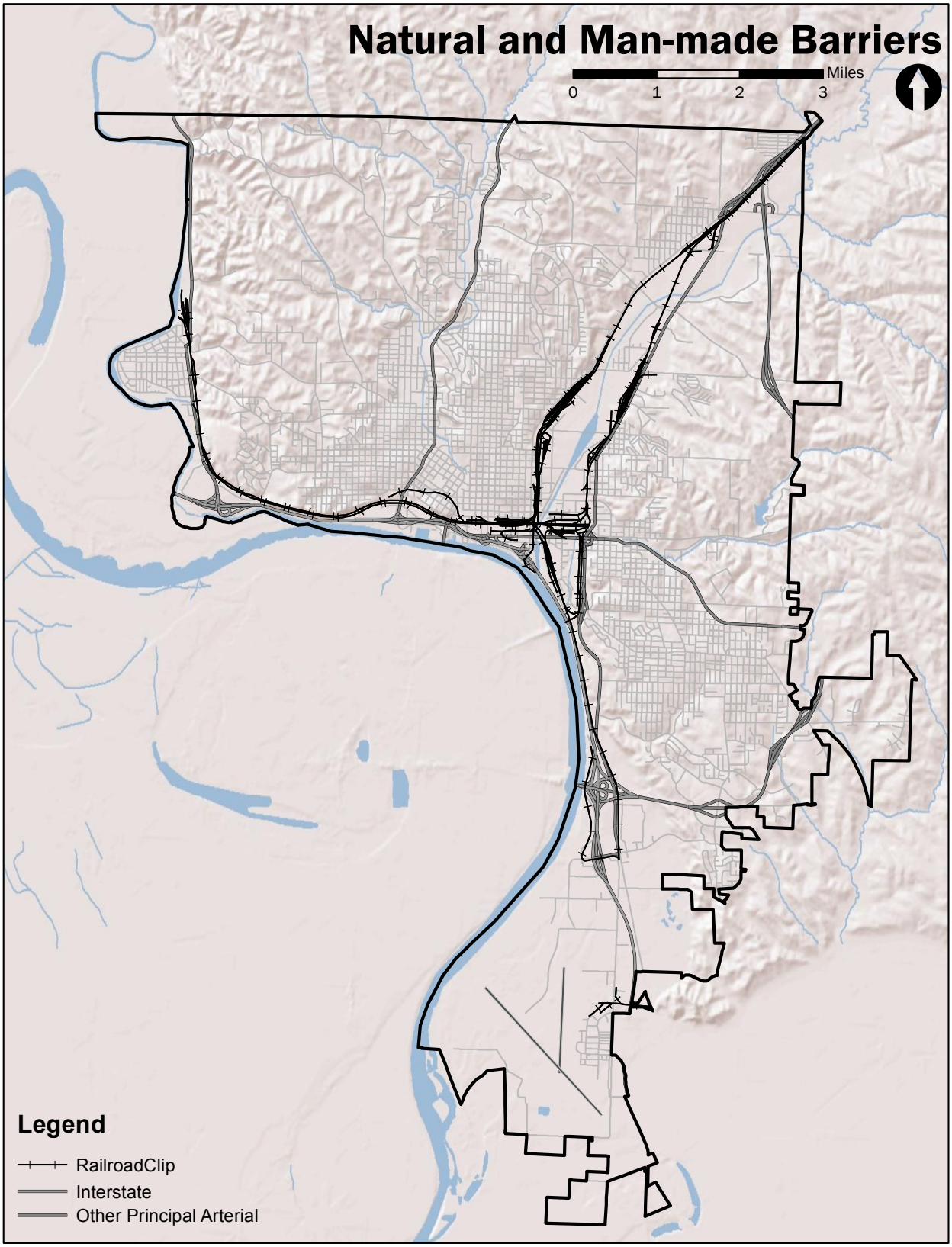


Figure 18. Natural and man-made barriers

Pedestrian Access

Sidewalks are crucial for pedestrian accessibility, as they provide safe, off-road accommodations. When properly designed, sidewalks connect people of all ages and mobility types to multiple locations in a safe and efficient manner. Children, the elderly, and those without access to a personal automobile rely on the sidewalk network for their daily travel needs. Maintaining adequate sidewalks on direct paths to popular destinations such as schools, libraries, places of worship, and parks is an effective means to provide choice of mobility to many residents, as well as to encourage a lively pedestrian culture within communities.

Sioux City currently has 57.4%[2] of its sidewalk network complete (Figure 19). This includes streets with sidewalks on one or both sides, although in some locations, the sidewalk is altogether absent. This could be due to development during a period of time where sidewalks were not required, or topographic limitations such as steep slopes. Most of the older neighborhoods have well-connected sidewalk networks, and efforts are made to maintain these existing facilities. The City should continue to enforce existing policy requiring good repair and snow removal so pedestrians may use sidewalks safely. In areas where sidewalks are incomplete or nonexistent, the City should make completion of the network a priority.

Figure 20 shows distances to schools on the existing sidewalk network. Since children who live closer than 2 miles from their schools are not provided with bus service, parents must make other accommodations in order to get them to school. The Safe Routes to Schools program encourages students to walk or bicycle to school in groups with adult supervision in an effort to promote health and safety in communities as well as reduce some traffic congestion associated with parents dropping their children off at school. Currently, Sioux City has 11 walking school bus routes, many of which rely on the existing sidewalk network to guide from 12 to 56 students to school each day.

Using network analysis to generate paths on the existing sidewalk network, distances of ¼ to ½ mile were generated, as they are the easiest distances for younger students to walk. Distances which form a square pattern are considered more walkable, while those which are more irregular indicate the presence of barriers (either a lack of sidewalk access or other natural or man-made features). Some schools, such as Unity Elementary on the east side of the city, are almost completely isolated from pedestrian networks, while several in the city center are walkable. However, by adding the percentage of the population of school-aged children to the map, areas for improvement become clearer. The areas surrounding North Middle, North High, and Clark Elementary schools have comparatively less walkable street networks,

2 GIS tabulation of Sioux City sidewalk network.

although there is a trail along Outer Drive adjacent to these schools. Filling in the sidewalk networks in areas adjacent to schools should be a priority.

While the completion of the sidewalk network is a necessary step in encouraging pedestrian activity, it is important to consider other elements – often outside of the pedestrian network – which influence pedestrian behavior. Anyone who has ever walked down a busy road where cars move at high speeds can attest that the speed of moving vehicles greatly influences the perception of safety. When automobile speeds are low, around 20 MPH, pedestrians feel more at ease. This is not without reason; pedestrians struck at higher speed have a higher rate of fatal injury or death.[3]

3 Teft, Brian C. 2011. Impact Speed and a Pedestrian's Risk of Severe Injury or Death. AAA Foundation for Traffic Safety.

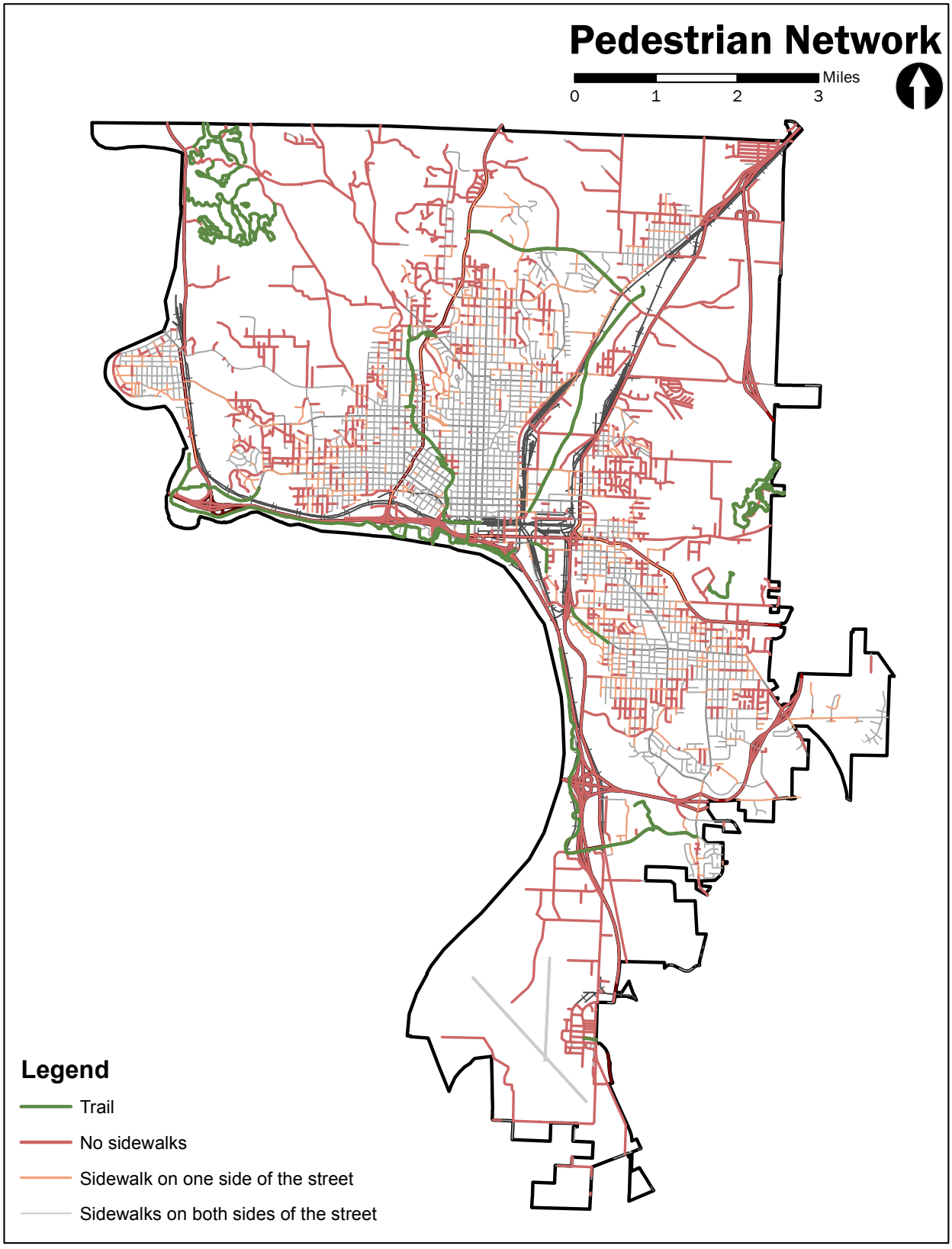


Figure 19. Existing pedestrian network

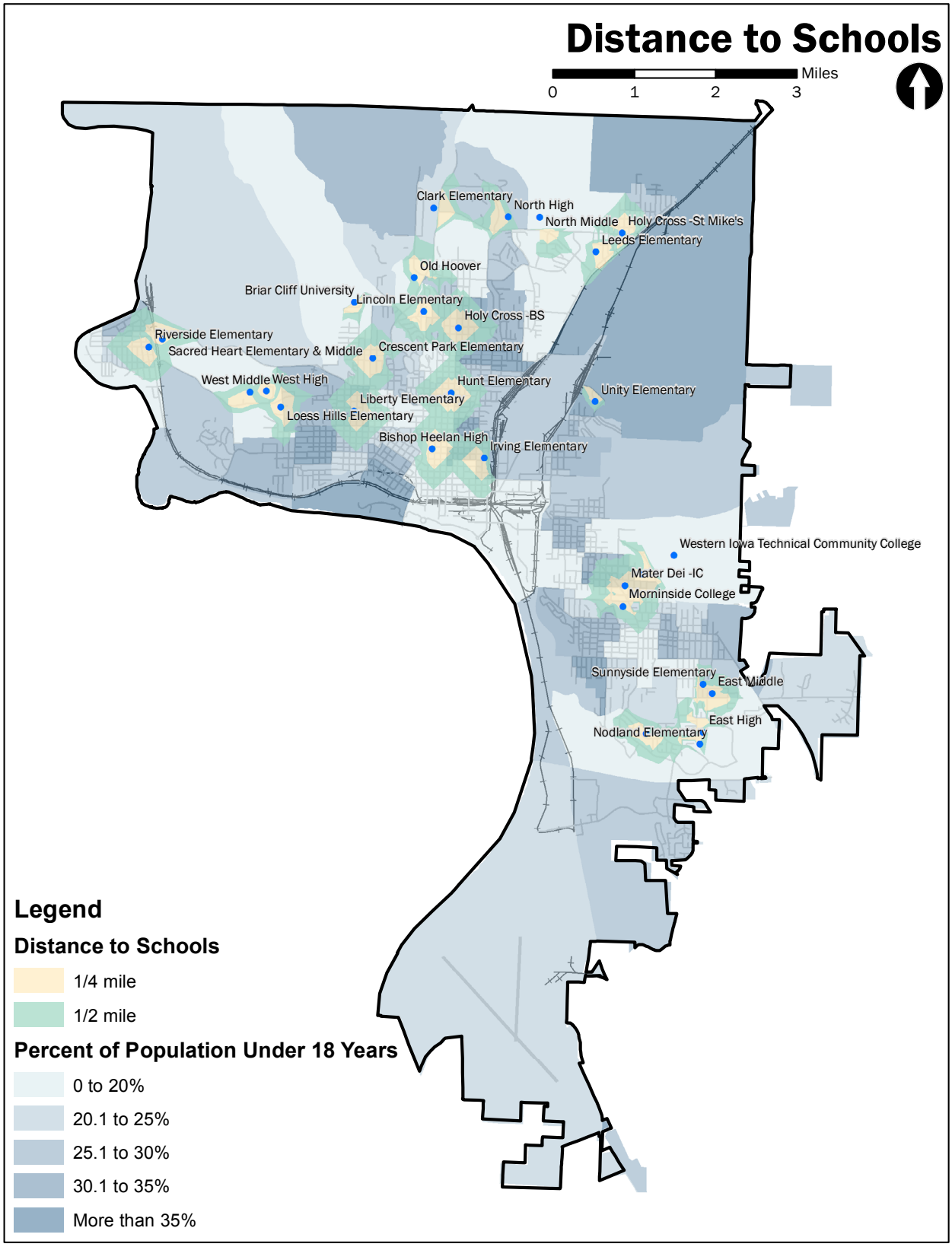


Figure 20. Distance to schools

Bicycle Access

A bicycle network is often composed of a variety of facility types that can accommodate bicyclists of all ages and skill levels. Off-street trails are popular among recreational bicyclists because they can provide scenic, long-distance paths free of automobile traffic, other than a few intersections. These facilities are often used by families with children, the elderly, bicyclists and pedestrians alike. Other bicycle facilities include bicycle lanes, sharrows, and on-street bicycle routes which are denoted by bicycle-specific wayfinding signage. Bicycle lanes are often perceived as the safest of these on-street facilities, since automobile and bicycle traffic are clearly separated. Sharrows and on-street bicycle paths are perceived as less safe due to the ambiguity of right of way between bicycles and automobiles. Other types of infrastructure exist in high-volume bicycle areas in major cities, including cycle tracks, which fully separate bicycles and automobiles with fixed curbs, and bicycle boulevards, which are roads intended primarily for bicycle traffic. Sioux City utilizes both trails and on-street bicycle paths as shown in Figure 21.

Several trails in Sioux City provide residents with recreational, off-road facilities. These are often found along waterways, where the terrain is flat. Other recreational areas such as parks often include their own trail networks. Several of these trails originate in the downtown area, but at the time of this writing, road construction has temporarily cut off access points near I-29, from the southern end of downtown to the Missouri River.

An on-street network exists, denoted by bicycle route signage, which serves to link existing trail networks and provide users with the best routes through city streets. However, respondents of our Quick Insights analysis revealed that these routes may be underused. Some residents interviewed expressed concerns that these signs are confusing, or that the routes are not safe for bicyclists. Although the on-street network was designed with terrain, direct access, and relative safety in mind, other on-street markings and accommodations may be necessary to encourage recreational as well as commuter bicycling within Sioux City.

Other considerations, including adjacent land use types, automobile speeds, and travel lane widths contribute to the bicyclist's perception of safety. These, in addition to off-street amenities, such as bicycle parking, adequate wayfinding, and policy initiatives such as education for bicyclists and motorists and community-wide encouragement activities, contribute to a greater sense of belonging among bicyclists which further encourages the use of bicycle facilities. The City of Sioux City and Scheels All Sports have partnered to provide bicyclists with ample

bicycle parking downtown in an effort to encourage bicycling and create visible and unique bicycle facilities (Figure 22). SIMPCO staff suggested that business owners and the general public are interested in seeing more of these amenities around town.

According to our Quick Insights analysis and conversations with several bicycle and pedestrian advocacy groups, Sioux City residents are interested in further developing their existing trails system. Figure 23 indicates current access to trail access points via the road network. Distances of ¼ to 1 mile are shown from these points. Many areas of the city do not have convenient access to trail heads, which corroborates many concerns that there are insufficient connections between residential areas and trails. On-street bicycle paths are intended to link existing trails, but these facilities may intimidate younger or less-experienced bicyclists.

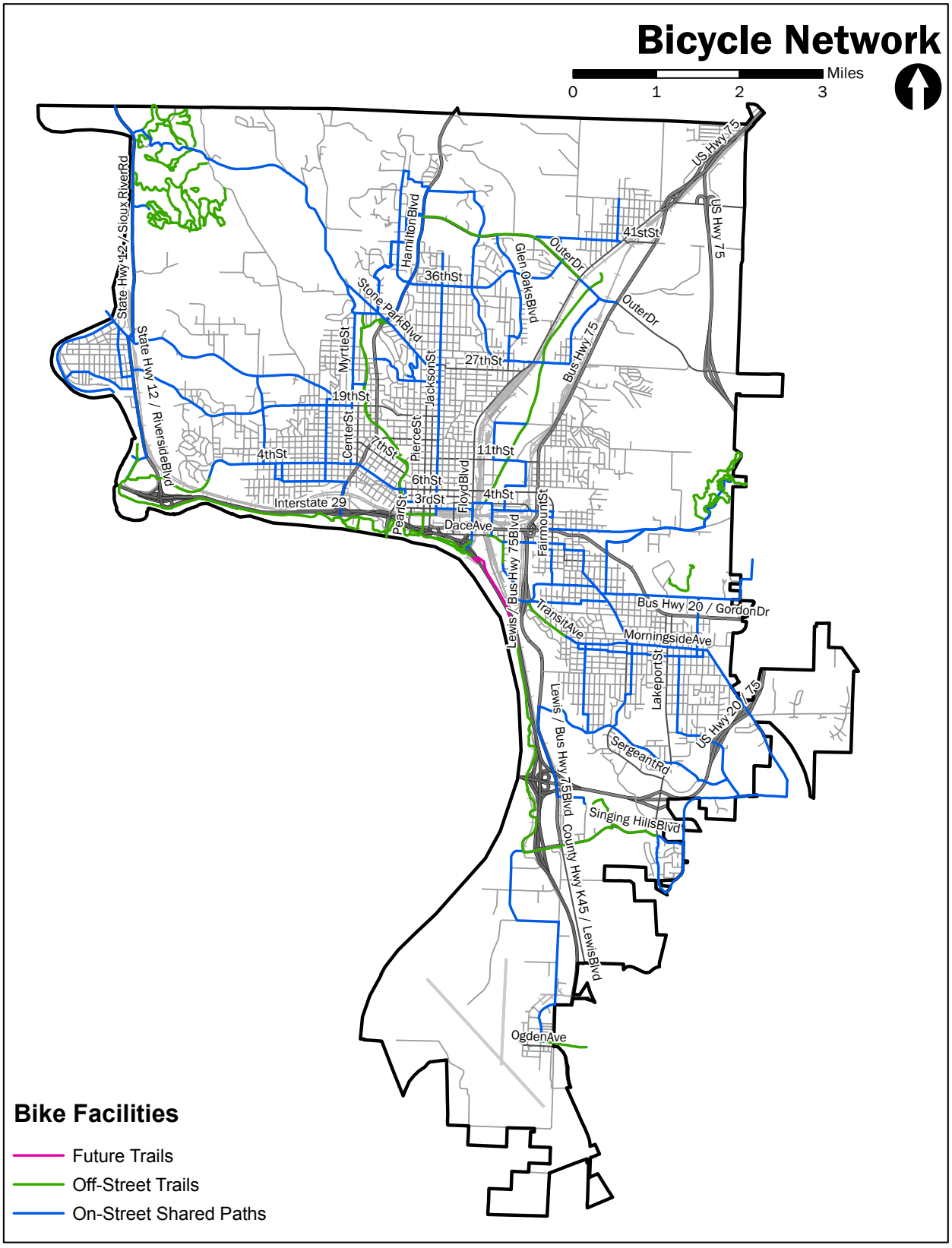


Figure 21. Bicycle network

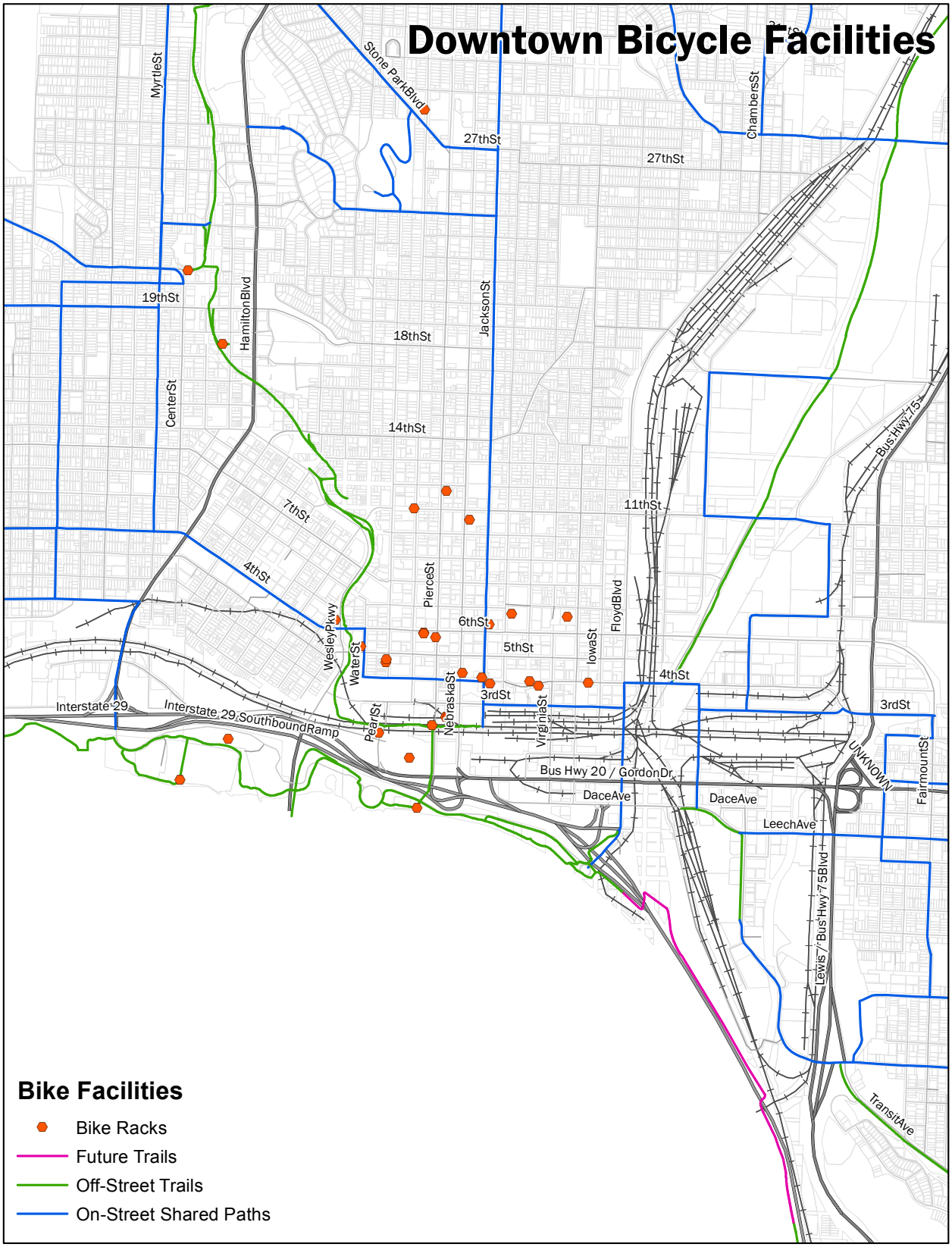


Figure 22. Downtown bicycle facilities

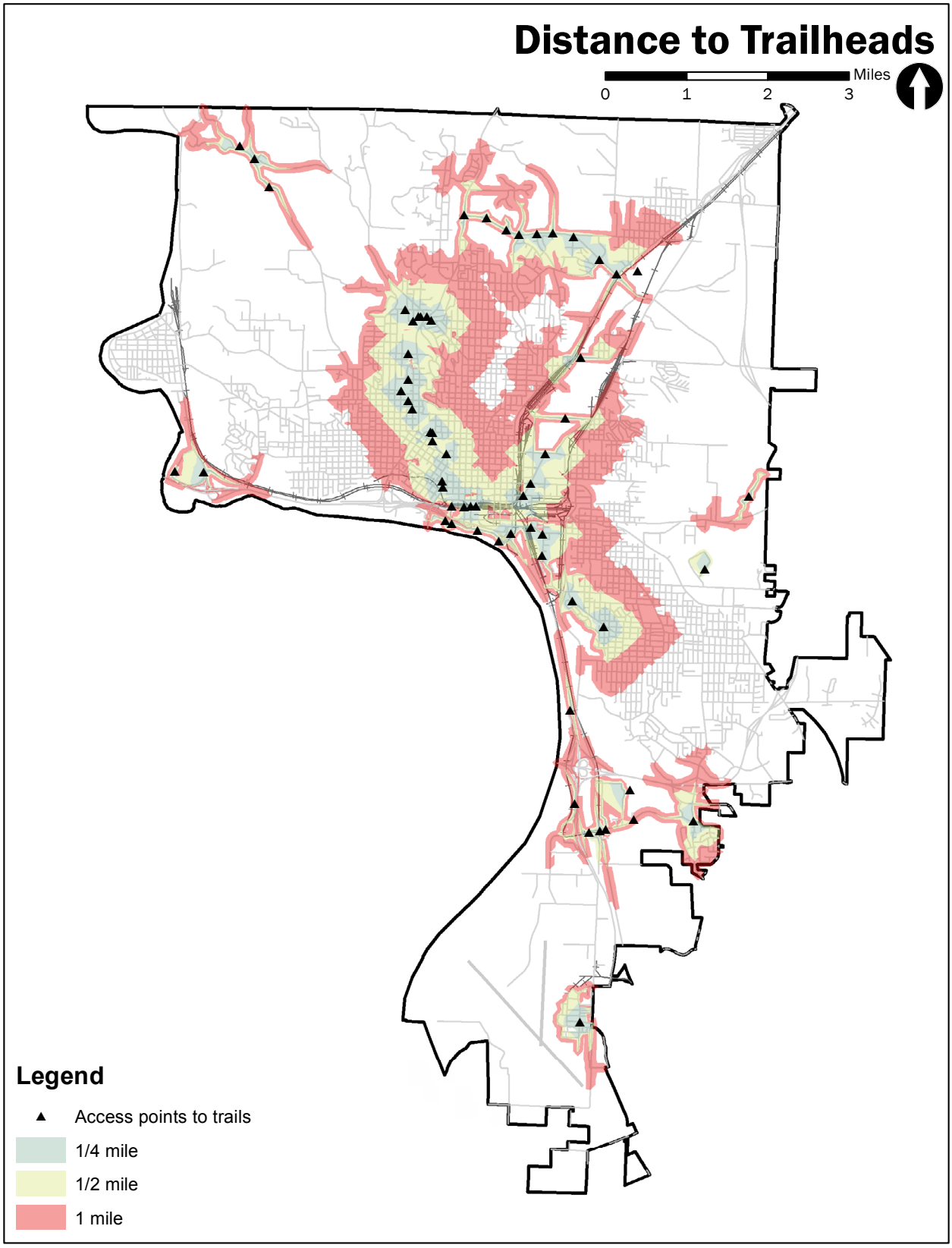


Figure 23. Access to trailheads

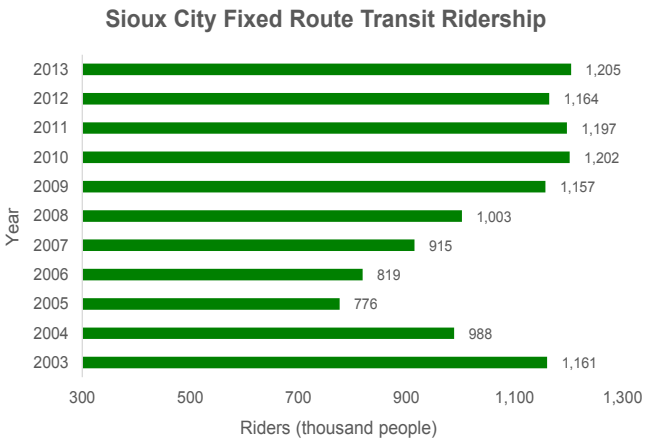


Figure 24. Ridership for Sioux City fixed-route transit, 2003-2013.

Transit

The Sioux City Transit System provides bus service for the metropolitan area. Bus trips account for a modest mode share in Sioux City, approximately 1.3% in 2012[4]. The number of trips per capita in 2012 for the metropolitan area is 10.3, ranking the Sioux City metropolitan area 147th out of 290 American urban areas surveyed[5].

The Sioux City Transit System currently operates 10 routes, including Southern Hills, Pierce-Jackson, Marketplace, Leeds, Riverside, Airport, Council Oaks, Indian Hills, South Sioux City, and Common. All of these routes have one bus per hour and run 12 hours per day (from 6:00 AM to 6:00 PM) from Monday through Friday, and 11 hours on Saturday (from 7:00 AM to 6:00 PM)[6]. There is no service on Sunday and most holidays. This schedule may not meet the needs of those who have non-traditional work hours or require frequent trips.

Bus fare is $1.80 per adult for each one-way trip and is lower for the disabled, older adults, and students. Monthly passes ($48/month) and tokens are also available, which are priced similarly compared to other cities in Iowa. All buses are ADA and bicycle accessible. Bicycle racks are available on each bus.

Figure 24 presents the ridership from 2000 to 2014. Ridership was lowest in 2005 (770,000 trips), and increased from 2006 to 2010, then remained relatively stable from 2010 to 2014. The Pierce – Jackson route (which serves the downtown area and north side of Sioux City) and Council Oaks route (which serves west Sioux City) are among the routes with highest ridership.

A ridership survey conducted in Sioux City in 2008 revealed that the socioeconomic characteristics of bus riders in Sioux City are very similar to the national trend. A great majority of riders are either low income, have no car available, have no driver's license, or are unable to drive. Most riders speak English, and around 39% of Sioux City riders are non-white (while Sioux City as a whole is 19.2% non-white[7]). This fact indicates that bus service in the city mainly serves captive riders who do not have another travel option, and that it is less attractive to choice riders. It also suggests that riders who are not fluent in English (e.g. immigrants) might not find buses accessible and thus do not use ride buses as often.

4 US Census Bureau ACS 5 year 2013

5 Reuben Fischer-Baum (2014) How Your City's Transit Stack Up. Retrieved from http://fivethirtyeight.com/datalab/how-your-citys-public-transit-stacks-up/ on November 17, 2014.

6 Sioux City Transit. Retrieved from https://www.sioux-city.org/transit on November 3, 2014

7 American Community Survey, 2008 – 2012

Figure 25. Bus stop flag sign
Source: Author

Bus stops are marked with signs. Bus flag signs contain an image of a bus, but do not include stop numbers, routes, or schedule information (Figure 25). Shelters present at 32 bus stops (6% of total bus stops) enhance comfort for waiting passengers[8]. With reduced headways, more amenities, and real-time information, transit may become a more attractive transportation option for Sioux City residents.

Further information on sociodemographics as they relate to public transit can be found in the appendix.

Bus Connectivity

Integrating transit with the bicycle and pedestrian network is important because each transit trip begins and ends with some walking or bicycling. This integration also benefits transit riders, bicyclists, and pedestrians. Improved transit integration can increase the transit catchment area and increase the travel distance for pedestrians and bicyclists. Furthermore, integration can help bicyclists and pedestrians avoid inclement weather, terrain difficulties, and gaps in the bicycle and pedestrian network in addition to providing an alternative method of transportation in case of bicycle mechanical failure or physical fatigue.

Figure 26 shows the connectivity from the pedestrian network to the transit network. Sidewalks are absent or only available on one side of the street in many of the areas that are served by bus service, such as the west side (Riverside and Council Oaks routes), the northwest area (Briar Cliff University and Marketplace route), the Northside (Sioux City Country Club and Pierce Jackson routes), and many places in the south of the city.

Figure 27 displays bicycle routes in relation to bus routes. Bicycle trails, although fragmented, are somewhat connected by bus routes. Two bicycle racks are provided on each bus make it easier for bicyclists to use the buses to connect separated trails.

Figure 28 presents the connectivity from bus stops to schools. Most schools are within a five minute walking distance of a bus stop, except for Unity Elementary School, Longfellow-Washington Elementary School, and Mater Dei Middle School. Given that these schools are not connected to the pedestrian and bicycle networks, improving multimodal connectivity to these locations is considered in this plan.

The transit system connects to the city's multimodal system as all buses arrive at the Martin Luther King Jr. Transportation Center downtown. This multimodal center connects with nearby vehicle and bicycle parking, the skywalk systems, as well as other destinations, such as shops, restaurants, banks, and offices, among others.

8 Sioux City Transit System's data

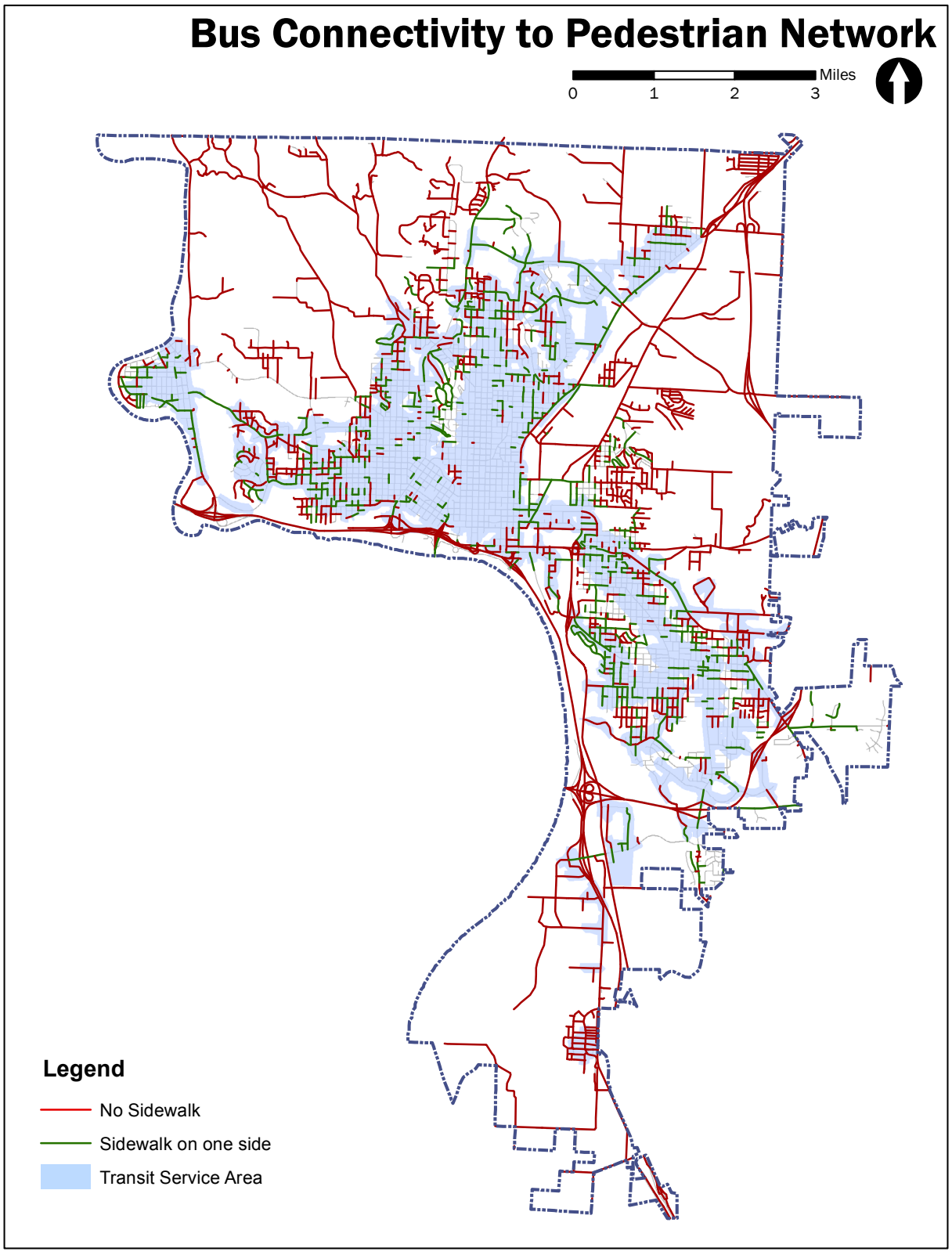


Figure 26. Bus connectivity to pedestrian network

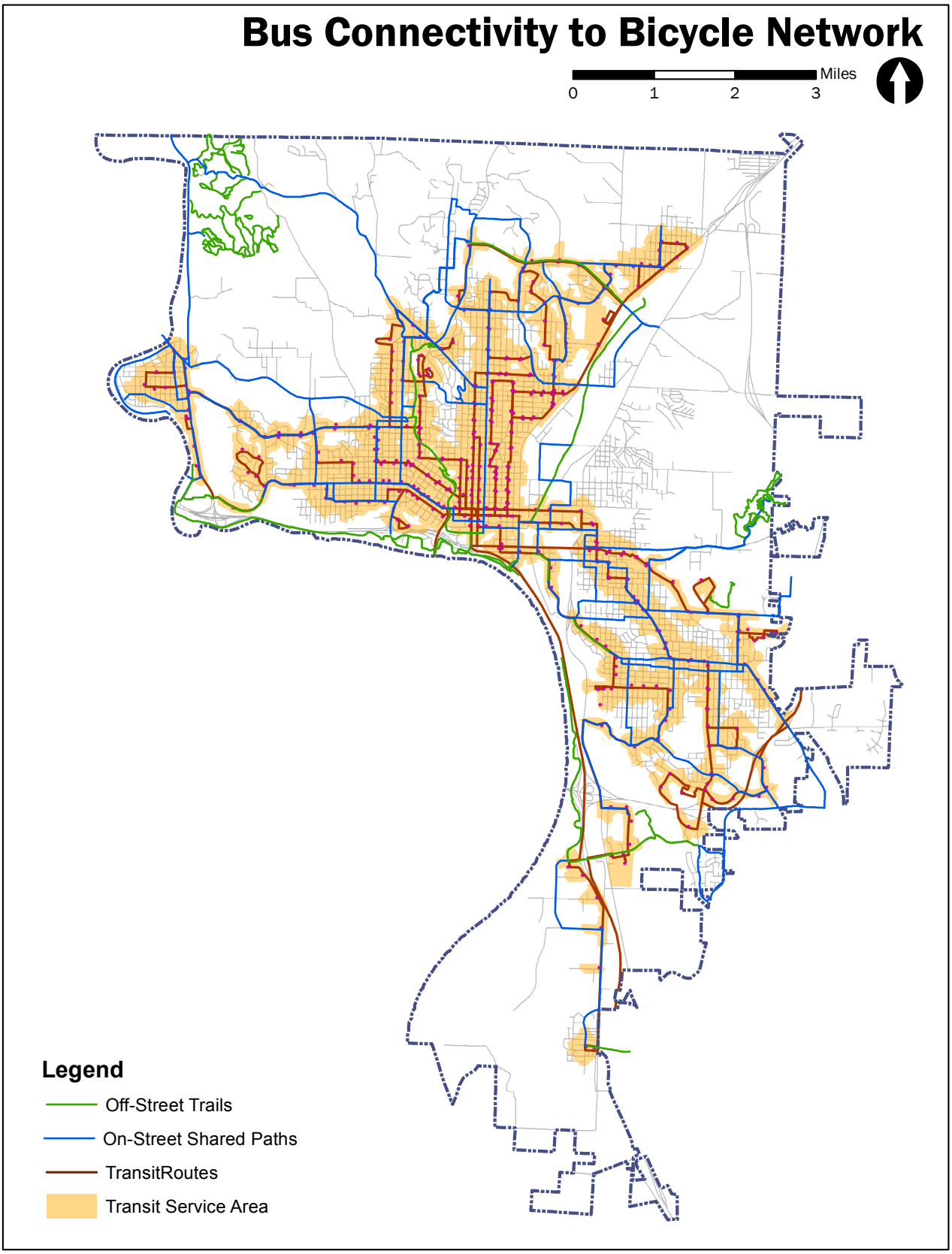


Figure 27. Bus connectivity to bicycle network

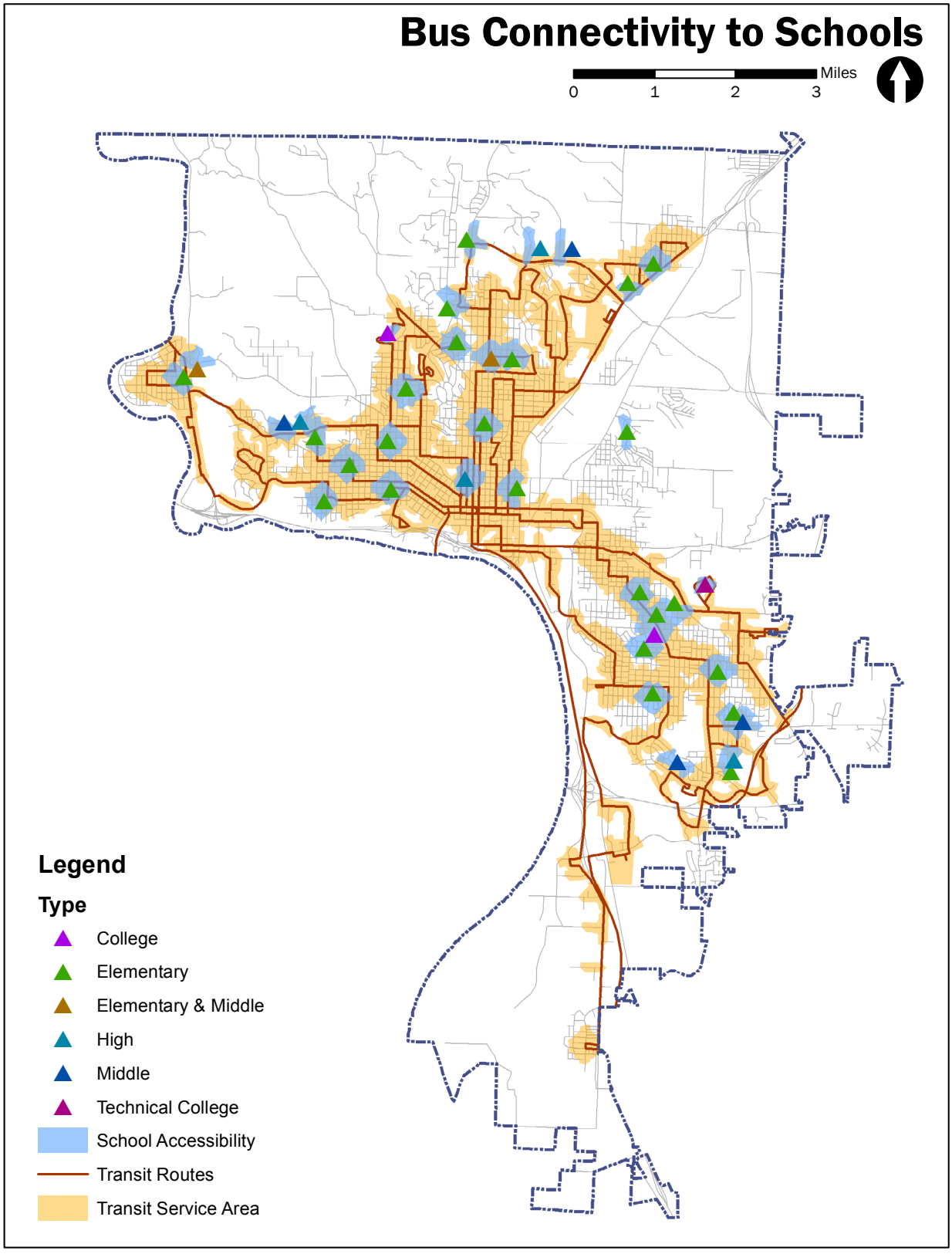


Figure 28. Bus connectivity to schools

Transit Education and Promotion

Information about bus routes, schedules, and hours of service are available on the City's website. Detailed instructions on how to use the bus and purchase fare are also provided, which is useful for getting non-frequent bus riders familiar with the public transit system.

The City website also provides bus system information in Spanish. However, detailed schedules and other specific information has not yet been translated into Spanish or other languages. Providing adequate information in Spanish and other languages would help transit become more accessible for non-native English speakers in the community.

Accessibility Analysis

With the goal of creating more travel options to increase the number of bicycle and pedestrian trips, accessible destinations that may potentially attract pedestrians and bicyclists were identified and analyzed. This included high density areas that have important destinations and a high concentration of activities.

Figure 29 displays the density of households and employees by traffic analysis zone. The shaded areas represent zones that have higher densities, more than 3 households per acre or 4 employees per acre, which are considered economically suitable to support transit service.[9] Integrating such locations with pedestrian and bicyclist activity can improve the network and allow for longer distance trips.

Activity centers represent areas that concentrate a high number of activities, such as schools, parks, recreational centers, retail businesses, and employment centers, among others. These centers should be highly prioritized in order to serve a greater number of residents.

Activity centers are extracted from parcel data and Google Earth. Trip generation was then calculated based on the Institute of Transportation Engineers' trip generation rate[10] and the scale of each center. This number of trips was then weighted by the possibility of using non-automotive modes to access these destinations and by the importance of each destination. For example, there should be a higher percent of walking and bicycle trips to parks and schools than a major retailer. Also, schools are highly prioritized, thus are assigned higher weight, followed by retail and businesses, office and employment centers, and other similar destinations. The lowest weights are assigned to industrial zones (see appendix). Accessibility is shown in Figure 30 & Figure 31.

9 TCRP Report 165 (2013) Transit Capacity and Quality of Service Manual. Retrieved from http://www.trb.org/Publications/Blurbs/169437.aspx

10 ITE Trip Generation http://www.ite.org/tripgeneration/otherresources.asp

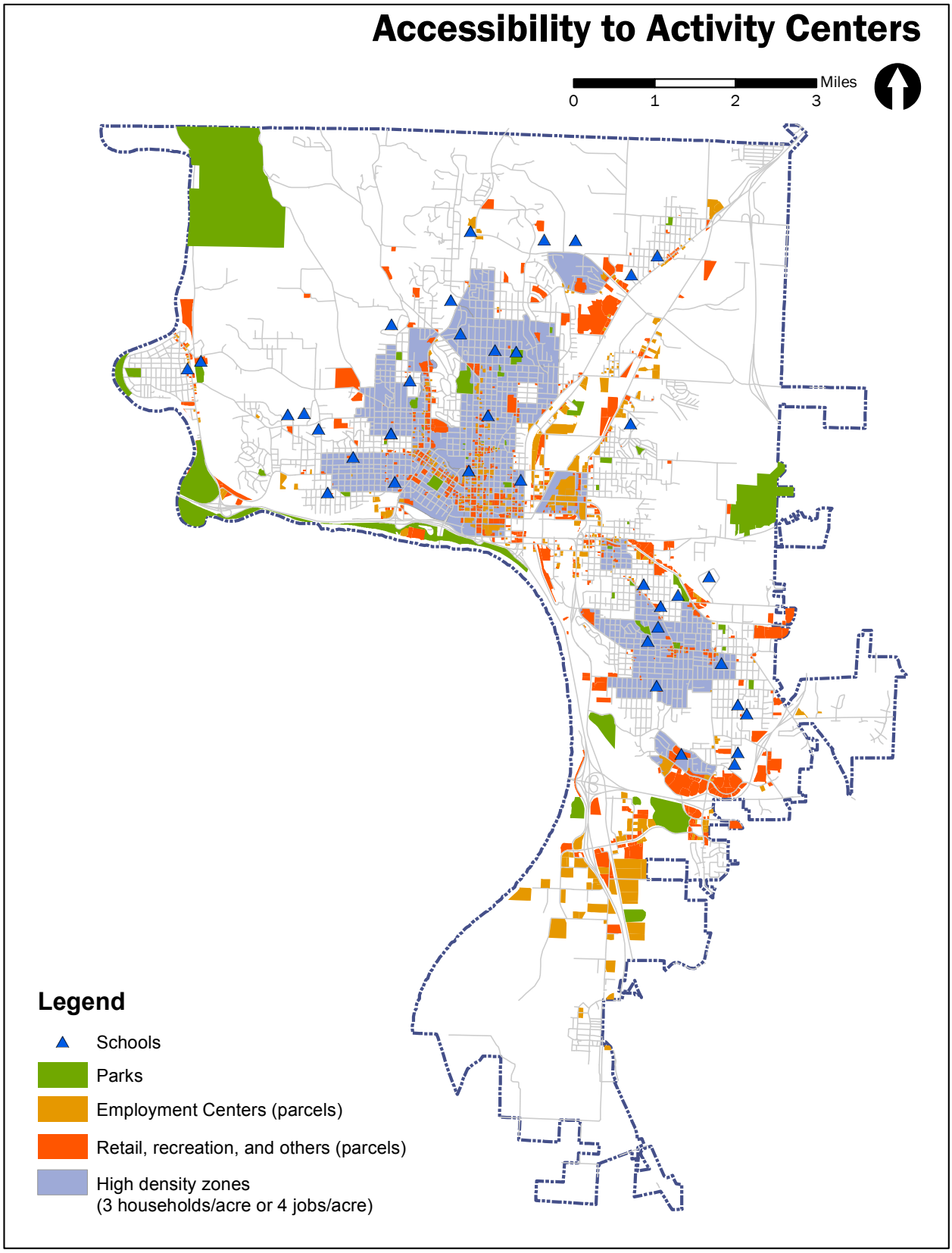


Figure 29. Accessibility to activity centers

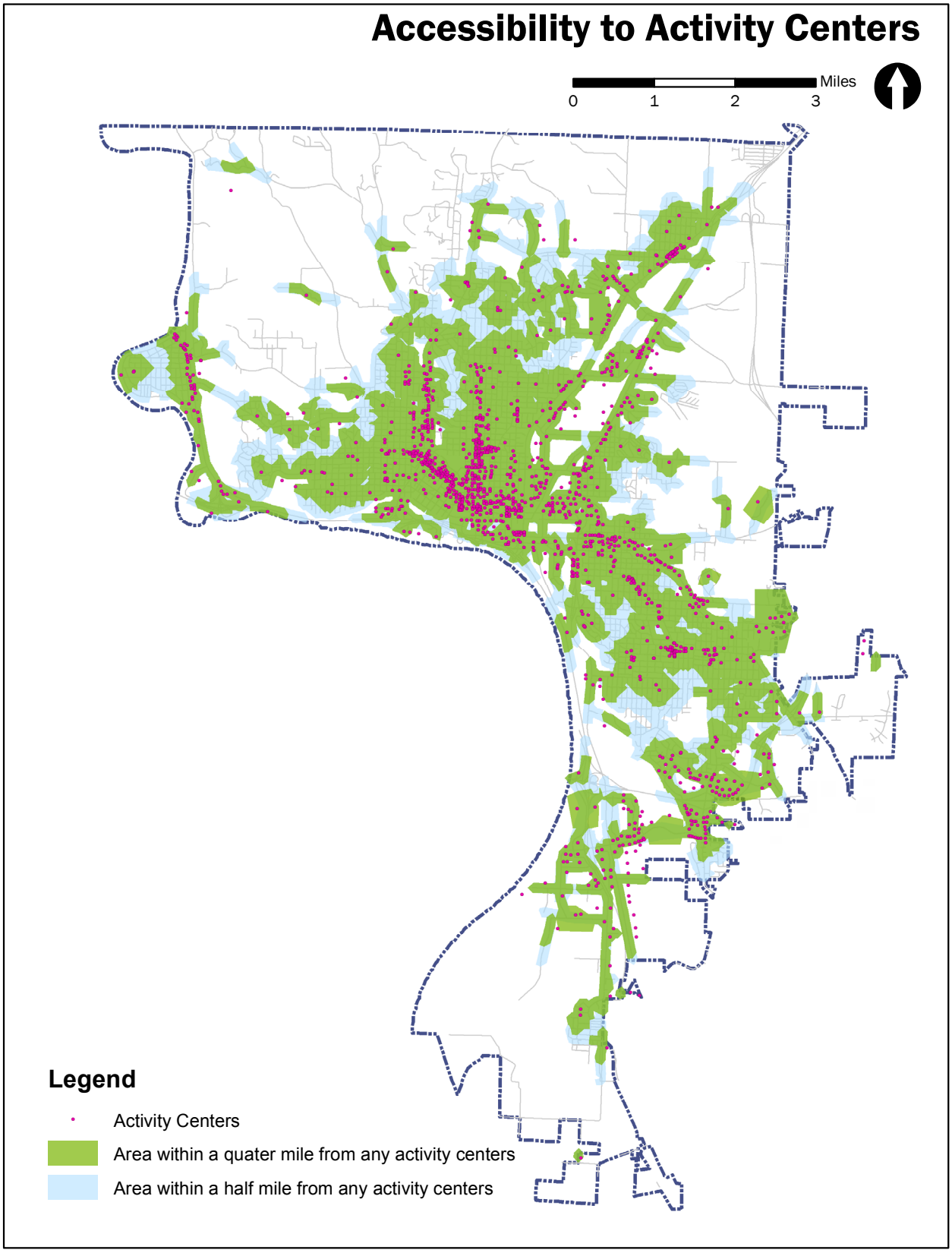


Figure 30. A quarter mile and half mile access to activity centers

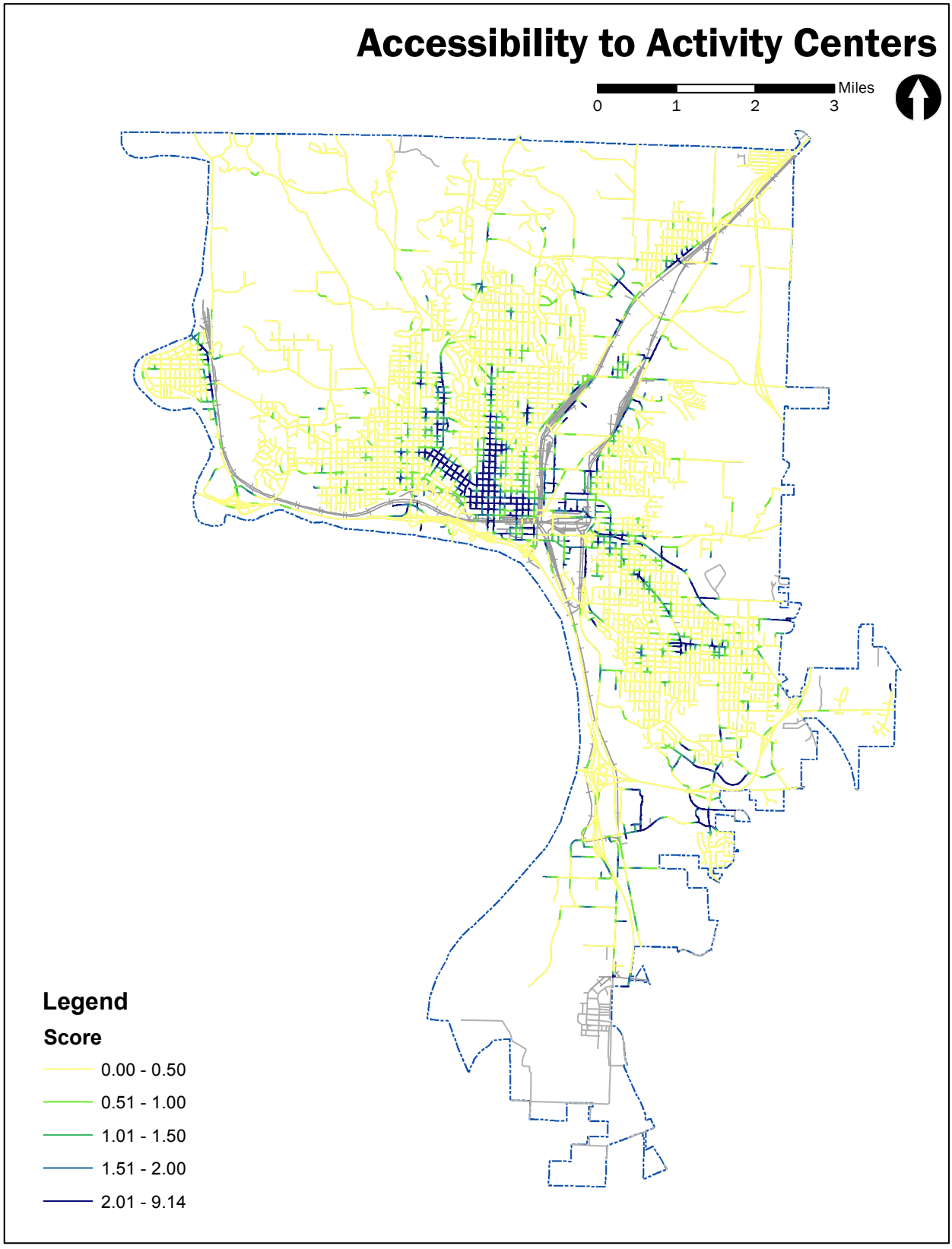


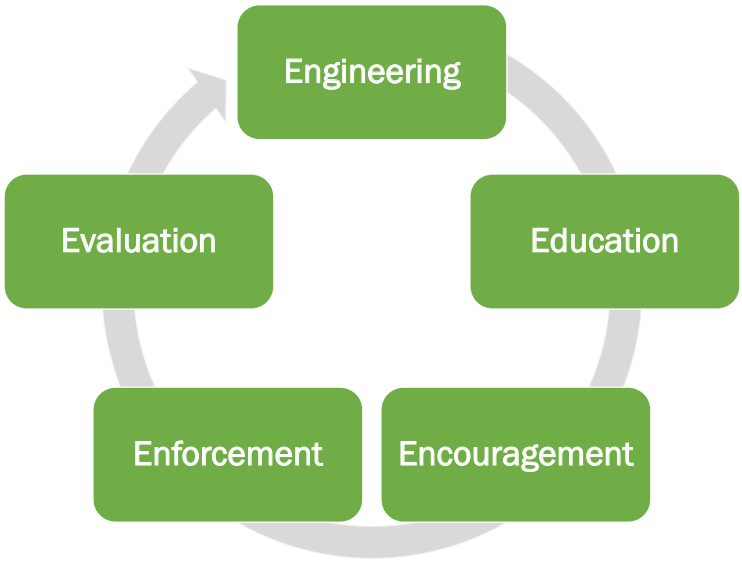
Figure 31. Accessibility to activity center - Network map

Chapter 5
Recommendations

Recommendations

This section presents the recommendations proposed by this plan. The recommendations are structured in a comprehensive 5 E's approach which includes engineering, education, encouragement, enforcement and evaluation.

The engineering section presents specific infrastructure for pedestrian and bicycle facilities on selected corridors. Within the education, section proposed recommendations are intended to compliment the already existing efforts. The education section is broken into two categories, one focusing on children and young adults and another focusing on parents and adults. The encouragement section presents proposed recommendations which include the creation of an Active Transportation Advisory Committee (ATAC) and events such as Open Streets and hill challenges. The enforcement section includes recommendations to improve the pedestrian and bicyclist environment through things such as sidewalk repair and bicycle police presence. Finally, the evaluation section provides recommendations on data collection and measures to evaluate the plan as it progress through its phases.



Corridor Selection

This plan concentrates on developing the pedestrian and bicycle networks in Sioux City, while emphasizing interconnections within the multimodal network. While it is important to develop a wide extent of infrastructure treatments, constraints in budget and time require a concentration on a number of corridors that have the largest potential effects on mobility. Prioritizing these corridors allows the City to focus investments in areas that benefit the greatest number of residents.

The corridor selection process includes three stages. First, a set of criteria was developed to select corridors that are most beneficial for the community at large. This resulted in a selection of about 20 corridors. Next, corridors were scored based on the above criteria. Finally, the high scoring corridors were examined in close detail using local expertise from SIMPCO staff. This resulted in eight final corridors selected for site specific treatments.

First stage

Corridors were selected based on the following criteria:

- **Accessibility:** Providing access to destinations that have high concentration of activities, such as schools, retail and business, recreational centers, parks, and employment centers
- **Connectivity:** Connecting gaps and providing continuity in the networks
- **Mobility:** Providing access to overcome natural and man-made barriers, such as hills, rivers, railroads, and interstate highways
- **Safety:** Requiring improved safe access to areas that have a high number of pedestrian and bicyclist traffic crashes to improve the comfort and safety for these users
- **Necessity:** Connecting to areas that have high need of non-motorized and transit travelling, such as neighborhoods that have (a) a high proportion of school-aged children, older adults, people with mobility challenges, and low income persons; and (b) large existing walking, cycling and transit mode shares. Maps can be found in appendix.

The scoring criteria was based on the previous analyses of the existing network, accessibility, and demographic and socio-economic data (Figure 32). We examined accessibility, crashes, networks, and demographics to identify a list of corridors that are suitable for pedestrian and bicycle infrastructure (Table 5). This list does not include highways which are not suitable to accommodate non-motorized infrastructure.

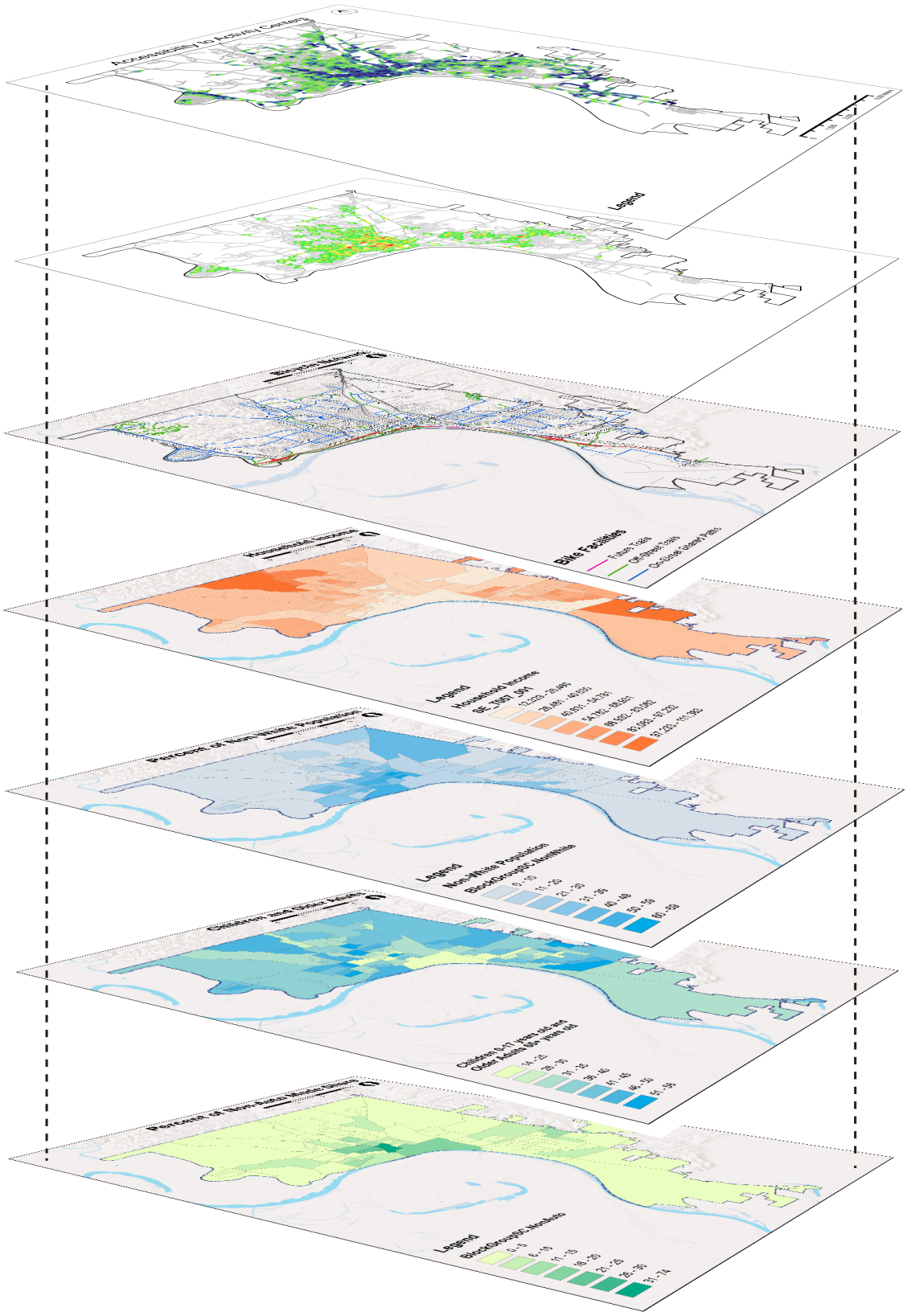


Figure 32. Synthesized analysis for corridor selection

Second Stage

We developed a score on a 10-point scale in each criterion for each corridor in the list, in which a 10 score means the corridor perfectly satisfies a criterion (Table 5). For example, W. 4th and 6th Street score 10 for connectivity criterion as this corridor directly connects Riverside to the Floyd River Trail. Morningside and Transit Avenue score 6 for necessity as this corridor provide access to neighborhoods with a medium proportion of low income, or high non-auto mode shares.

The scores for each corridor were added to create the total score. A higher total score indicates that the corridor can better provide accessibility, safety, mobility, and connectivity for Sioux City residents than a lower scoring corridor.

Table 5. Selected corridors and scoring

Corridor	Accessibility	Connectivity	Mobility	Safety	Neccessity	Total	Direction
6th + W4th St	9	10	5	9	8	41	E-W
5th	8	7	5	9	8	37	E-W
7th + W6th St	8	8	5	8	8	37	E-W
8th St + W7th St	9	7	5	8	8	37	E-W
Morningside + Transit	8	9	6	8	6	37	E-W
W 19th St	6	8	5	6	9	34	E-W
14th ST	7	6	4	9	8	34	E-W
3rd St	7	6	5	7	6	31	E-W
Pierce	10	9	9	10	8	46	N-S
Hamilton	10	8	9	9	8	44	N-S
Jackson	8	8	9	8	8	41	N-S
Court	8	7	5	8	8	36	N-S
Pearl + Grandview	6	8	5	8	8	35	N-S
Fairmount	7	7	8	7	6	35	N-S
Nebraska	6	6	7	8	8	35	N-S
Douglas	7	6	5	8	7	33	N-S
Floyd Blvd	6	7	6	5	5	29	N-S

Third Stage

The next stage of the selection process incorporated local input from SIMPCO and City staff. The factors taken into account included terrain (e.g. hilly streets), on-going projects, existing infrastructure on the corridors (e.g. traffic control devices, width, parking area), and the ease of putting bicycle and pedestrian facilities in order to narrow down the list of corridors to the final selection of eight. These corridors are:

- 6th Street
- W. 4th Street
- 5th Street
- W. 19th Street
- Jackson Street
- Pearl Street / Grandview Boulevard
- Fairmount Street
- Morningside Avenue/ Transit Avenue

Figure 33 shows the selected corridors and recommended infrastructure.

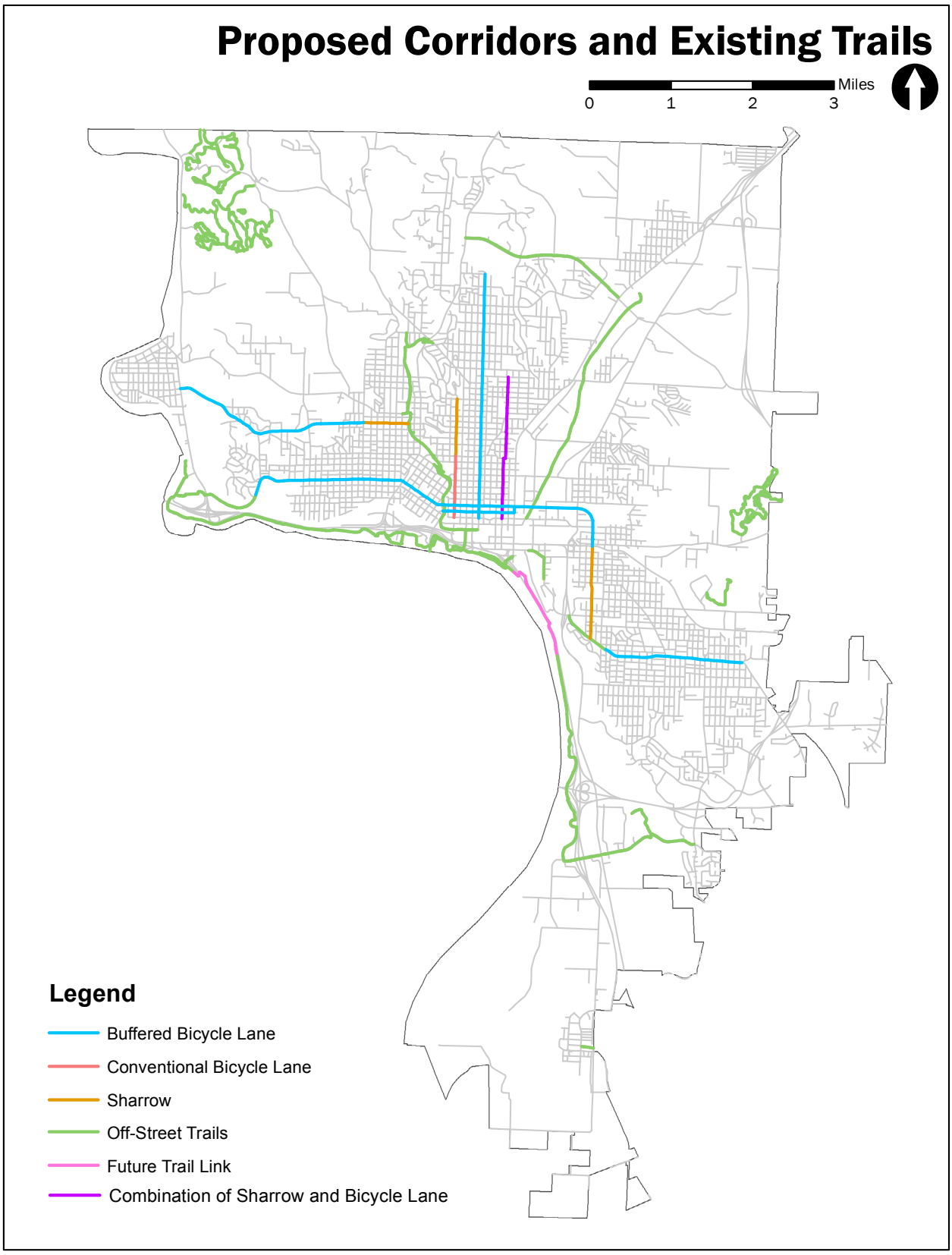


Figure 33. Proposed corridors and existing trails

Engineering

The Engineering recommendations propose physical infrastructure changes along the corridors selected for improvements. These improvements can be implemented in other locations across the city as needed.

Glossary

Below is a list of terms commonly used throughout this plan.

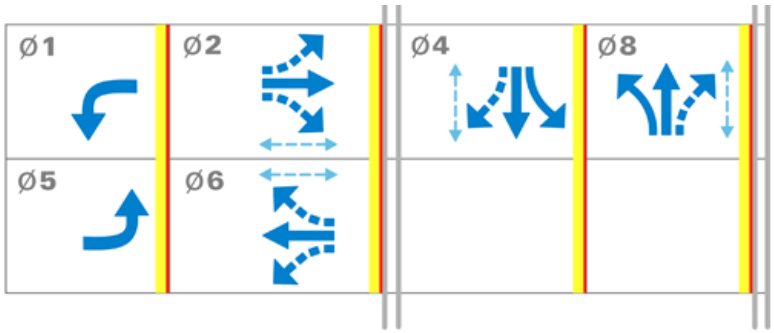
- Active Transportation
- Bicyclist
- Pedestrian
- Pedestrian actuated signal timing
- Split signal phasing
- Leading pedestrian walk interval
- Crosswalk
- Curb ramp
- Truncated dome pad
- Stop controlled intersection
- Traffic calming
- Compliance
- Spot enforcement
- Trail
- Bicycle Lane
- Sharrow (shared bicycle lane)
- Buffered bicycle lane
- Wide sidewalk
- Bicycle Box
- Bicycle route wayfinding

Active transportation: commuting by bicycling or walking

Bicyclist: any user of the on-street or off-street bicycle network

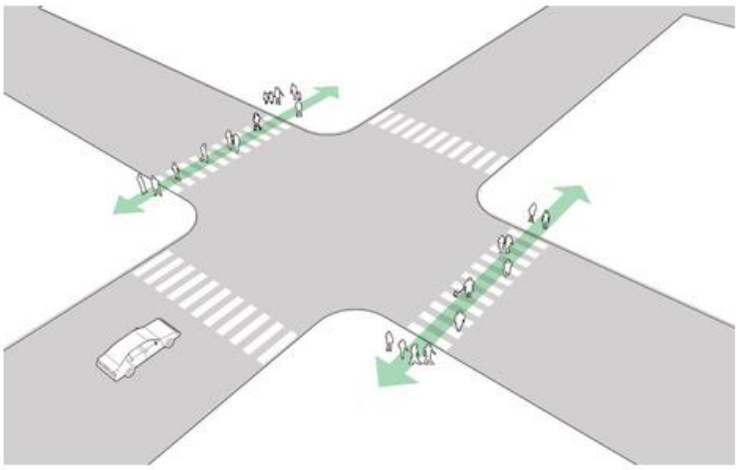
Pedestrian: any user of the sidewalk network

Pedestrian actuated signal timing: Pedestrian crossing intervals which are phased in when the pedestrian pushes a button.

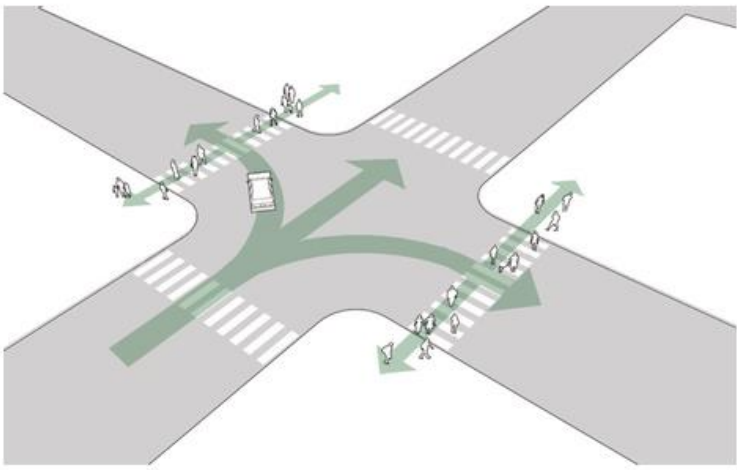


Split signal phasing: allows for protected movements from all approaches, reducing conflicts resulting left-turn movements. This signal sequence also allows for safer pedestrian crossing by providing the pedestrian interval in a phase free of conflicting traffic.

Protected Phase
Permissive Phase
Pedestrian Phase



Phase 1: Pedestrians only



Phase 2: Pedestrians and cars

Leading pedestrian walk interval: Allows pedestrian crossing during an all-red phase, usually for 1-3 seconds.

Crosswalk: An area of an intersection separated by markings which indicate the appropriate location for a pedestrian to cross the roadway.

Curb ramp: A sloped section of the sidewalk leading to the roadway which meets the pavement at grade. This provides appropriate accommodations for wheelchair users and other persons with mobility difficulty, as well as the visually impaired.

Truncated dome pad: a textured surface, usually placed on a curb ramp near the roadway, which provides tactile indication of an entrance to a roadway for the visually impaired.

Stop-controlled intersection: any intersection with a stop sign or traffic signal, designed to control the flow of traffic.

Traffic calming: Any number of design and engineering strategies intended to reduce vehicle speeds, generally used in areas with high numbers of pedestrians, bicyclists, and transit users. Strategies may include curb extensions, speed humps, and chicanes.

Compliance: Legal and appropriate use of public roadways, sidewalks, and bicycle networks.

(Spot) Enforcement: Police or radar presence to encourage compliance in a given area or particular intersection.

Trail: Shared-use paths which form a portion of the bicycle and pedestrian networks, often fully separated from vehicle traffic. They can be used for walking, cycling or other uses, including riding and snowmobiling.

Bicycle lane: A portion of the roadway that has been designated by striping, signage, and pavement markings for the preferential or exclusive use of bicyclists. Bicycle lanes enable bicyclists to ride at their preferred speed without interference from prevailing traffic conditions and facilitate predictable behavior and movements between bicyclists and motorists.

Sharrow (shared bicycle lane): Road markings used to indicate a shared lane environment for bicycles and automobiles. Among other benefits shared lane markings reinforce the legitimacy of bicycle traffic on the street and recommend proper bicyclist positioning. The shared lane marking is not a facility type, it is a pavement marking with a variety of uses to support a complete bikeway network.

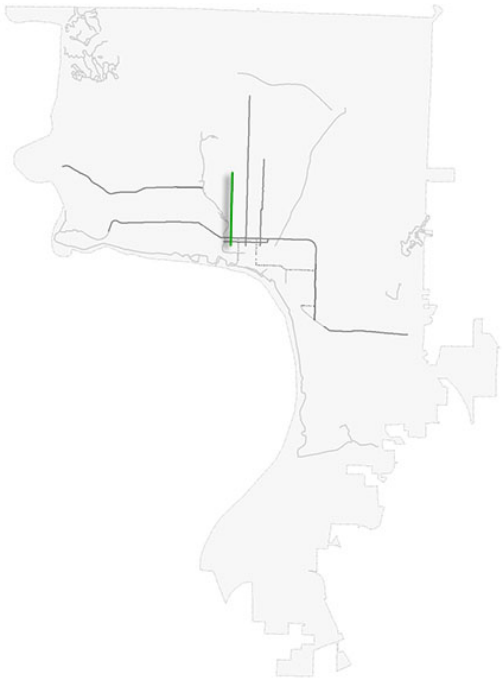
Buffered bicycle lane: Buffered bicycle lanes are conventional bicycle lanes paired with a designated buffer space separating the bicycle lane from the adjacent motor vehicle travel lane and/or parking lane. A buffered bike lane is allowed per MUTCD guidelines for buffered preferential lanes (section 3D-01). Buffered bicycle lanes may also be used as climbing lanes on uphill portions of a bike route. On a two-way bike route, different infrastructure may be used on the downhill side.

Wide sidewalk: A portion of the sidewalk network wider than the recommended 5 feet. This could be a facility separated by an easement along the right of way, or may be adjacent to buildings and roadways. Because it is intended for exclusive pedestrian use, this facility is not considered a trail.

Bicycle box: A bicycle box is a designated area at the head of a traffic lane at a signalized intersection that provides bicyclists with a safe and visible way to get ahead of queuing traffic during the red signal phase.

Bicycle route wayfinding: A bicycle wayfinding system consists of comprehensive signing and/or pavement markings to guide bicyclists to their destinations along preferred bicycle routes. Signs are typically placed at decision points along bicycle routes – typically at the intersection of two or more bikeways and at other key locations leading to and along bicycle routes.

Pearl St. & Grandview Blvd.



	Length	Width	Number of Lanes	Posted Speed	AADT (2011)
Grandview	0.70 miles	30 to 53 feet	2	30 MPH	2,270
Pearl	0.76 miles	53 feet	2 - 3	25 MPH	4400

Pearl Street & Grandview Boulevard

The Pearl Street/Grandview Boulevard corridor serves as a connection between Grandview Park and northern neighborhoods with Sioux City's downtown. Grandview Park and single family residential housing highlight the north end of this corridor with parking on both ends of the street. The northern section of this corridor has a low volume of traffic. It is also very walkable with sidewalks on both sides of the street for most of the corridor. However, many of the intersections should be updated to include ADA compliant ramps and also crosswalks to facilitate a safer pedestrian environment.

Continuing south, land use diversifies as Grandview transitions to Pearl. Between 14th Street and 10th Street, there is a large hill which naturally increases southbound traffic speeds. At that point the dominant land use is mainly commercial. The posted speed in this area decreases, but traffic volumes increase. There is also an increase in lane width from 40 to 50 feet and number of lanes from 2 to 3 where Grandview Boulevard transitions into Pearl Street. At this point, there is also metered parking on both sides of Pearl Street. Again, sidewalks are consistent on both sides of the street. However ADA compliance and crosswalks are inconsistent or not present throughout this area.

Bicycle Recommendations:

- Install sharrows on Grandview Boulevard on both sides from 29th Street to 14th Street
- Remove one side of on-street parking and reduce lane widths to 11 feet on Pearl Street.
- Install bicycle lanes on Pearl Street on both sides from 9th Street to 4th Street (Figure 37) In the downtown commercial area where speeds are low but volume is high bicycle lanes will provide adequate protection for bicyclists.

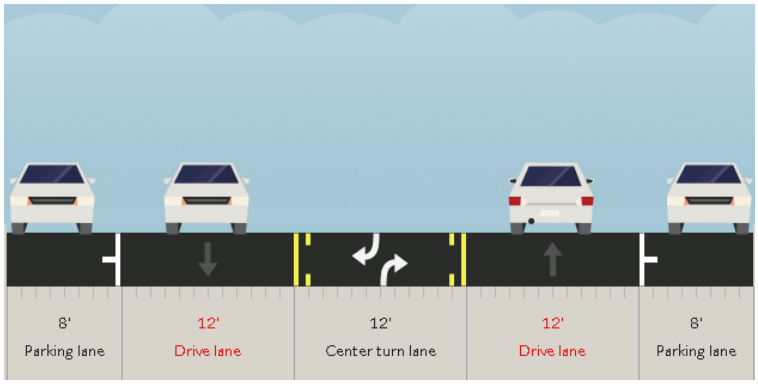


Figure 34. Pearl St.: Existing conditions

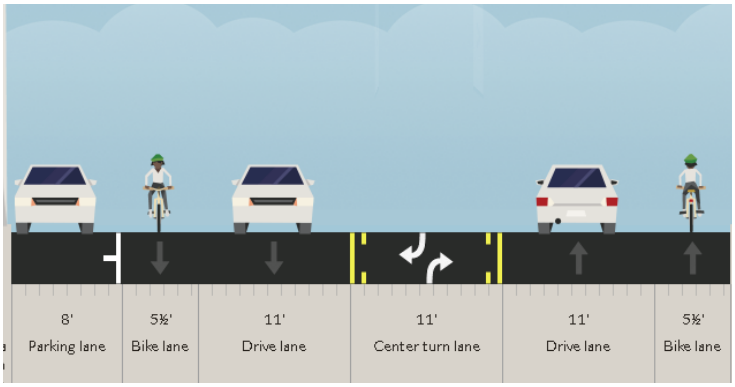


Figure 35. Pearl St.: Proposed Improvements

Pearl St. & Grandview Blvd.

- Install buffered bicycle lanes on Pearl Street on both sides from 14th Street to 9th Street heading south on Grandview Boulevard where land-use intensifies and speeds increase downhill, buffered bicycle lanes will provide adequate protection for northbound bicyclists.

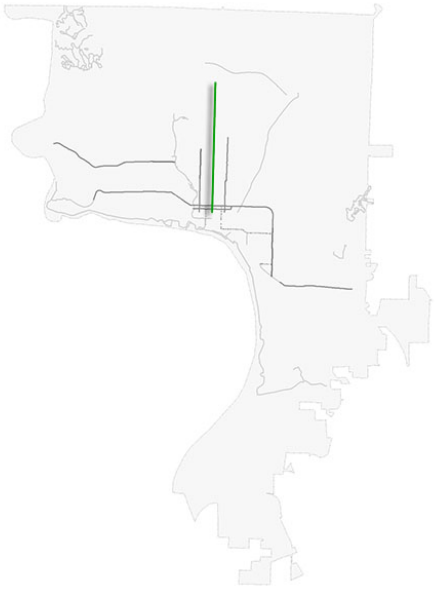
Pedestrian Recommendations:

- All sidewalks along the corridor should be improved to meet ADA compliance.
- Crosswalks should be installed at all signalized intersections.

Figure 36. Pearl St.: Existing conditions

Figure 37. Pearl St.: Proposed bicycle lane

Jackson St.



Length	Width	Number of lanes	Posted Speed	AADT (2011)
3.03 miles	36 to 55 feet	2 to 4	20-35 mph	8,475

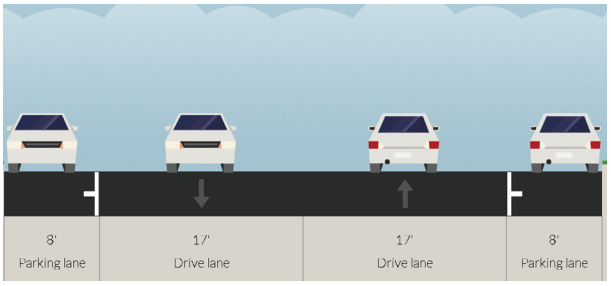


Figure 38. Jackson St.: Existing condition

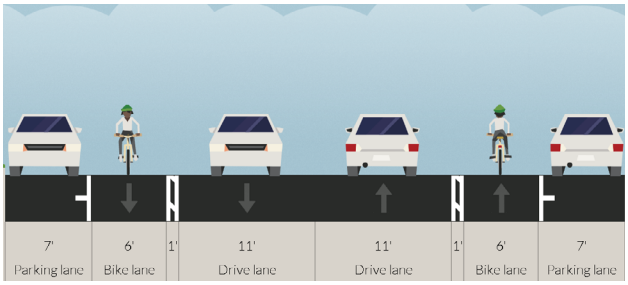


Figure 39. Jackson St. Proposed improvements.

Jackson Street

Jackson Street is a major north/south corridor that runs from downtown to the north side of Sioux City. The street has a variety of adjacent land uses, with more commercial uses near downtown and more residential land use to the north. Jackson Street's higher posted speeds are located towards the north end of the corridor and decrease as the corridor runs south. There are many transit stops located along Jackson Street. The corridor is a currently a designated bicycle route.

Bicycle Recommendations:

- Reduce lane width to 11 feet
- Remove parking on East side of Jackson Street
- Install buffered bicycle lanes on Jackson Street (Figure 39)
- Bicycle lane width and buffer width will vary based on road width

The primary change being proposed is the addition of two bicycle lanes to the road. This will create one northbound and southbound bicycle lane along the length of Jackson Street. At the wider portions of the road, these bicycle lanes will have buffers between the bicycle lane and the vehicle lane. At the narrower portions of the road, there would be no bicycle lane buffers and parking on one side of the street would be removed to accommodate the additional infrastructure.

Alternative Bicycle Recommendations:

- Install sharrows on southbound approach
- Install bicycle lane on northbound approach

If removing parking is proven to be an infeasible option, then the downhill (southbound) side of Jackson Street should be given a sharrow and the uphill (northbound) side should have a bicycle lane. This would provide enough room to keep current parking.

Pedestrian Recommendations:

- Bring intersections up to ADA compliance
- Install high visibility crosswalks at key intersections
- Implement pedestrian signal phasing at key locations
- Install bus shelters at high-volume stop locations

There are many areas where crosswalks markings are non-existent. Also, many curbs do not slope at street intersections to allow for pedestrians with mobility challenges to have sidewalk access. Some inter-

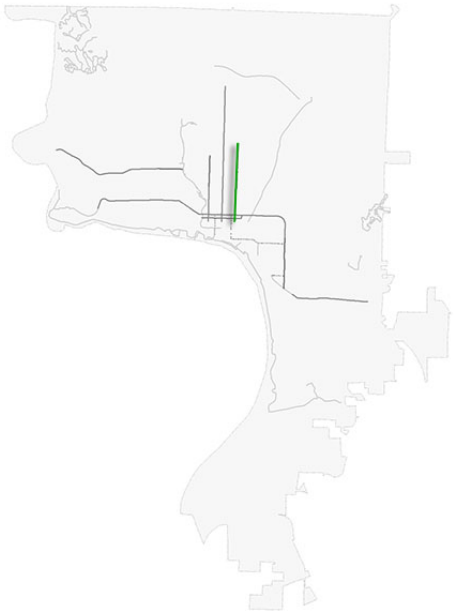
Jackson St.

sections do not have pedestrian crossing signals. Crosswalk markings should be installed, curb-cuts created with truncated dome pads, and signalized intersections should have pedestrian buttons if pedestrian phasing is not already included in the signal timing. The sidewalks along this corridor should be brought to full ADA compliance. In addition, bus stop shelters should be installed in high-use locations to more effectively integrate transit with pedestrian and bicyclist activity. Some of the proposed recommendations are represented in Figure 41.

Figure 40. Jackson Street: Existing conditions

Figure 41. Jackson Street: Proposed buffered bike lanes

Court St.



Court Street

Court Street is a north/south corridor with a mix of land uses, primarily commercial and residential. An existing transit route allows potential for integrating bicycling and walking in the area with transit service.

Bicycle Recommendations:

- Install bicycle lane on northbound traffic lane
- Install sharrows on southbound traffic lane

Court Street should have a bicycle lane in the northbound direction and a sharrow in the southbound direction. The sharrow would be on the southbound direction since that direction is downhill. Bicyclists riding downhill are better able to match the speed of a moving vehicle than bicyclists riding uphill. For this reason, the uphill direction will have a bicycle lane so that slower moving bicyclists can be separated from the faster moving traffic. The current conditions and the recommendations are shown in Figure 42 & Figure 43.

Pedestrian Recommendations:

- All sidewalks along the corridor should meet ADA compliance
- Implement pedestrian signal phasing at key locations
- Install crosswalks at high traffic intersections

The pedestrian conditions along the corridor are inconsistent. Some portions of the corridor have crosswalks and curb cuts while others do not. The crosswalk, sidewalk, and curb cut conditions along the corridor should be brought up to ADA compliance. Consistent compliance with these standards should be pursued for the entire length of the corridor. Improving these conditions will make the corridor more accessible and safe for pedestrians. Furthermore, signalized intersections do not have pedestrian intervals to show pedestrians when it is safe to cross. Currently, there are only signals for vehicles. Signalized intersections should add pedestrian crossing lights to provide a safer crossing for pedestrians. A sample intersection treatment located on Court Street can be seen in Figure 47.

The intersection of Court Street and 11th Street has stop signs as well as an overhead traffic signal. We recommend evaluating the removal of one of these stop controls.

Length	Width	Number of lanes	Posted speed	AADT (2011)
1.75 miles	35 to 53 feet	2	20 to 30 MPH	4,100 to 5,600

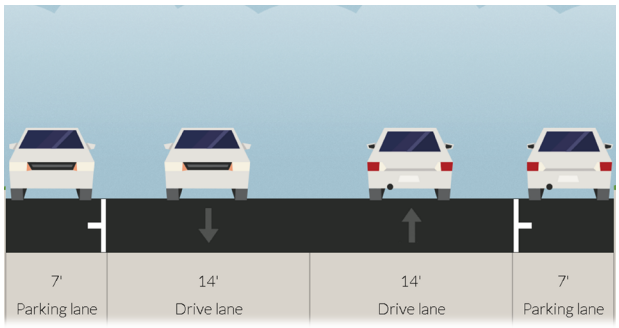


Figure 42. Court St.: Existing condition

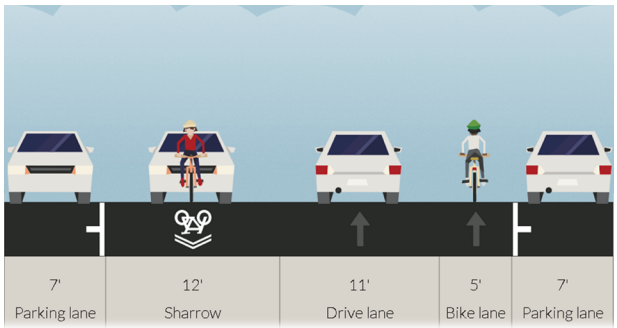


Figure 43. Court St.: Proposed Improvements.

Court St.

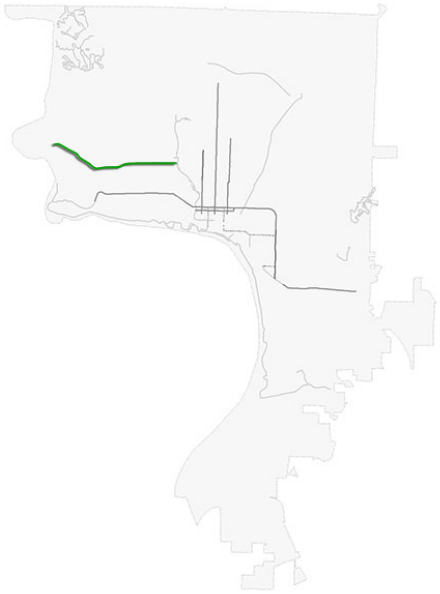
Figure 44. Court Street: Existing conditions

Figure 45. Court Street: Proposed bike lane and sharrows

Figure 46. Intersection of Court Street & 13th St.: Existing conditions

Figure 47. Intersection of Court Street & 13th St.: Proposed improvements

W. 19th St.



West 19th Street

West 19th Street is an east/west corridor that connects the Riverside neighborhood to the Perry Creek trail and downtown. This is a minor arterial, a designated shared roadway, and a bus corridor (Council Oaks and Riverside routes). From West Street to the east, a parking lane is present on the north side. Speed limits are relatively high, varying from 30 to 35 MPH. Actual traveling speed may be higher due to the wide travel lanes (18 feet). Land use along the corridor ranges from churches, schools, and commercial areas to residential areas.

A sidewalk is present on the north side of most part of the corridor. Sidewalks are not well-maintained in some segments. There are some worn-out grass strips along the street showing the demand for sidewalk where one is not present. Most of the intersections are not ADA compliant (either lack of curb ramps or truncated domes, or both). Signs are placed along the corridors indicating school areas and indicating the designated bike route.

West 19th Street has many intersections with small side roads and alleys. Two-way stop signs are the major type of traffic control along this corridor. There are signal controls at major intersections such as Harris Street (near three schools), Casselman Street, Center Street, Hamilton Boulevard, and near Liberty Elementary School.

Length	Width	Number of lanes	Posted speed	AADT (2011)
3.06 miles	36 feet	2 to 4	30 to 35 MPH	2,840 to 11,130

Within the past 10 years, there have been 11 crashes along the corridor, near West High and Middle schools and at intersections of Rebecca Street, Myrtle Street, Hamilton Boulevard. Some pedestrian crashes happened at midblock locations near bus stops, suggesting that bus users might have crossed the street unsafely. These areas should be considered for pedestrian treatment to enhance safety.

Bicycle Recommendations

- Reduce drive lanes to 11 feet and install buffered bike lanes on W. 19th Street from Riverside to West Street (Figure 51)
- Install sharrows on W. 19th Street from West Street to the east (Figure 53)
- Install bicycle boxes at signalized intersections
- Improve access from W. 19th Street to Perry Creek trail at Perry Creek bridge by removing the curb edge separating the drive lane with the curb side
- Place warning signs to alert motorists to the presence of bicyclists sharing the road

W. 19th St.

- Avoid potential conflict between bus and bicycle at bus loading areas by using well-designed signs and pavement markings

Pedestrian Recommendations

- Install sidewalks on the south side of W. 19th Street at appropriate locations, such as areas near West High and Middle School and Loess Hills Elementary School, near bus stops, and at locations that have worn out grass strips (Figure 51)
- All sidewalks along the corridor should be improved to meet ADA compliance
- Install high visibility crosswalks at intersections and appropriate midblock locations, especially near schools, bus stops, and other high traffic destinations (Figure 53)
- Implement pedestrian signal phasing at signalized intersections and use count down timing at appropriate locations to increase pedestrian and motorist compliance
- Extend pedestrian green time if needed to allow enough time for pedestrians to cross the street, especially for older adults, children, and adults with strollers
- Install suitable traffic calming devices at locations with high pedestrian traffic, such as near schools and commercial areas
- Install warning signs to alert motorists to pedestrians crossing

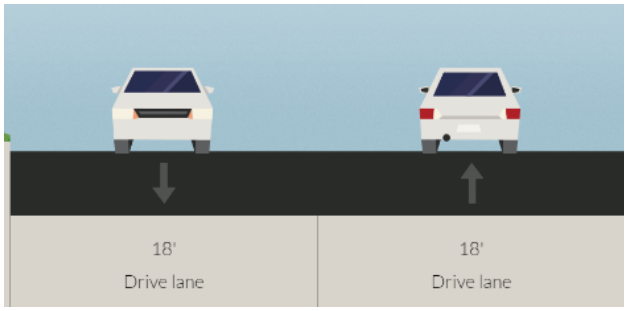


Figure 48. West 19th St: Existing condition (from Riverside to West Street)

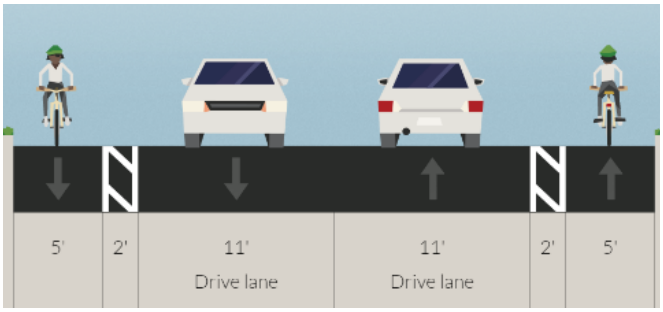


Figure 49. West 19th St.: Proposed Improvements. (from Riverside to West Street)

W. 19th St.

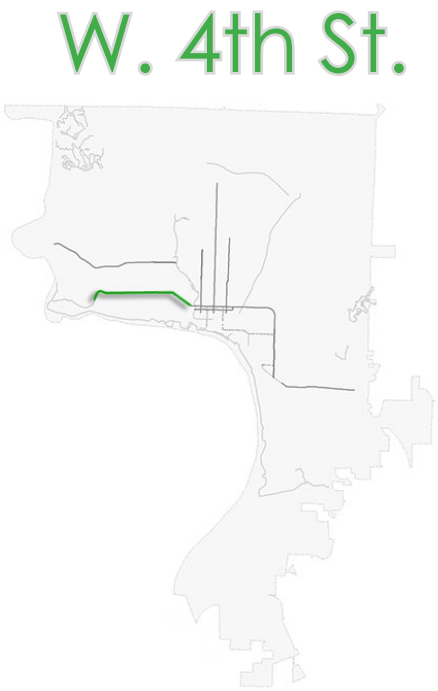
Figure 50. West 19th Street: Exsiting conditions (from Riverside to West Street)

Figure 51. West 19th Street: Proposed buffered bike lanes (from Riverside to West Street)

Figure 52. W19th and Center Street intersection: Exisisting conditions

Figure 53. W19th and Center Street intersection: Proposed pedestrian improvements

West 4th Street



The corridor of West 4th Street from Wesley Parkway to Grove Street is a two-way two-lane road with intermittent areas of on-street parking. This street is important for all mode types because it provides a direct link between downtown and western neighborhoods with relatively few hills. The land use is predominately residential with some commercial near major intersections. Sidewalks are present along the length of the corridor with one gap between Leonard Street and Prescott Street, but ADA compliance is inconsistent. Many of the homes located on this street are multi-family units. Due to this arrangement, it is likely that despite most homes having alley access, street parking is highly valued.

Length	Width	Number of lanes	Posted speed	AADT (2011)
1.92 miles	32 to 57 feet	2 to 4	30 to 35 MPH	6,100 to 7,800

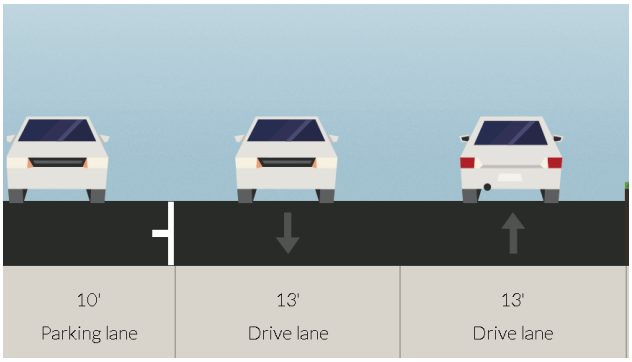


Figure 54. W. 4th St.: Existing conditions

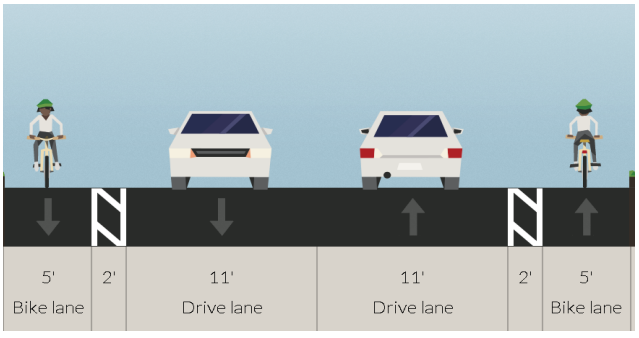


Figure 55. W. 4th St.: Proposed Improvements

Bicycle Recommendations

- Conduct a study to determine use of on-street parking and the impact of its removal
- Reduce vehicle lane width to 11 feet
- Install buffered bicycle lanes if on-street parking is removed (Figure 57). Buffered bicycle lanes will provide added separation from car traffic and the street has adequate width to accommodate this infrastructure
- Widen the sidewalk on the west side of Wesley Parkway between W. 4th Street and W. 3rd Street to trail-width to provide a connection to the downtown bicycle network at 5th Street

Pedestrian Recommendations

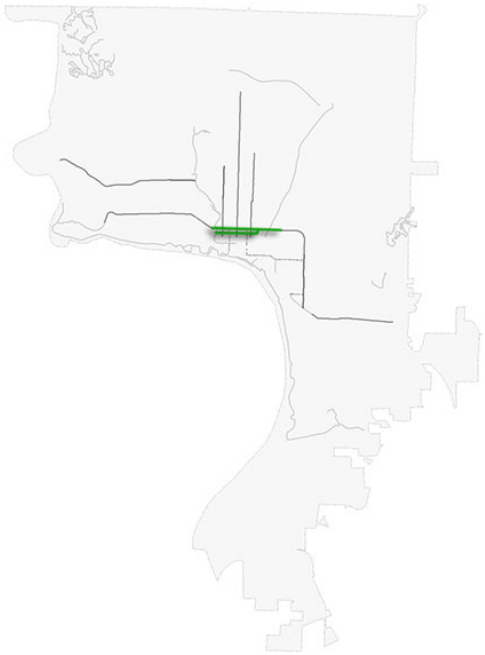
- Close sidewalk gap between Leonard Street and Prescott Street
- All sidewalks along the corridor should be improved to meet ADA compliance
- Crosswalks should be installed where intersections are signalized

W. 4th St.

Figure 56. West 4th St.: Existing Condition

Figure 57. West 4th St.: Proposed buffered bike lane.

5th St. & 6th St.



	Length	Width	Number of Lanes	Posted Speed	AADT (2011)
5th Street	0.97 miles	49 to 53 feet	2 to 3	20 to 25 MPH	n/a
6th Street	1.66 miles	32 to 64 feet	3 to 5	20 to 35 MPH	3,410 to 8,300

5th Street & 6th Street

5th and 6th Streets are paired one-way east/west streets through downtown Sioux City. They provide a critical link across the city for all transportation mode types. East of Iowa Street, 6th Street becomes two-way with two lanes in each direction and uses a bridge to cross over the Floyd River and industrial area. 6th Street then extends further east until it turns south and transitions into Fairmount Street.

The primary land use is downtown commercial development. From Iowa Street east, there is no on-street parking. The challenges presented are primarily in the potential loss of on-street parking and the lack of adequate pedestrian and bicycle accommodations on the bridge between Iowa Street and Hoeven Drive. Current proposals to convert 5th and 6th Streets to two-way have been considered and the recommendations below will accommodate either scenario.

Bicycle Recommendations

- Narrow vehicle travel lanes to 11 feet on all of 5th and 6th Streets.
- Remove on-street parking on the north-side of 6th Street and south-side of 5th Street
- Install buffered bicycle lanes on the north-side of 6th Street for west-bound and south-side of 5th Street for east-bound (Figure 61)
- Install bicycle lanes on Iowa Street to connect 5th Street to 6th Street
- Install bicycle boxes at signalized intersections to allow bicyclists to safely move to the left turn lane especially at 6th Street and Hoeven Drive to allow for east-bound bicyclists to use the left turn signal to access to the Floyd River Trail
- Narrow travel lanes to 10 feet on 6th Street east of Iowa Street to accommodate bicycle lanes in both directions

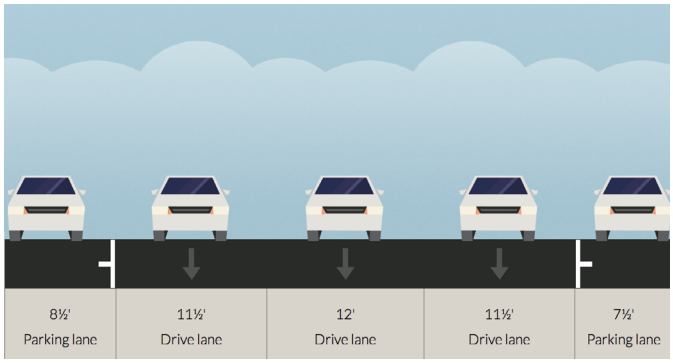


Figure 58. 6th St.: Existing conditions

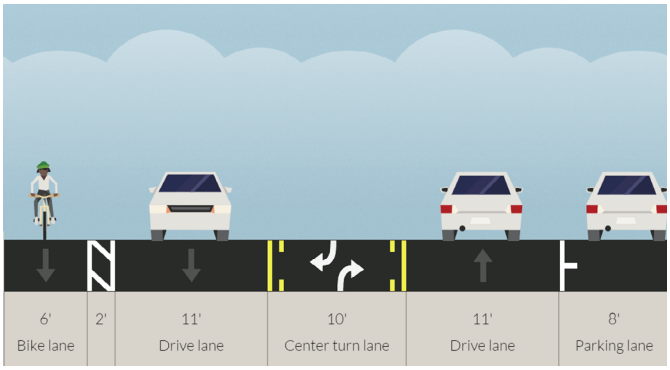


Figure 59. 6th St.: Proposed Improvements

5th St. & 6th St.

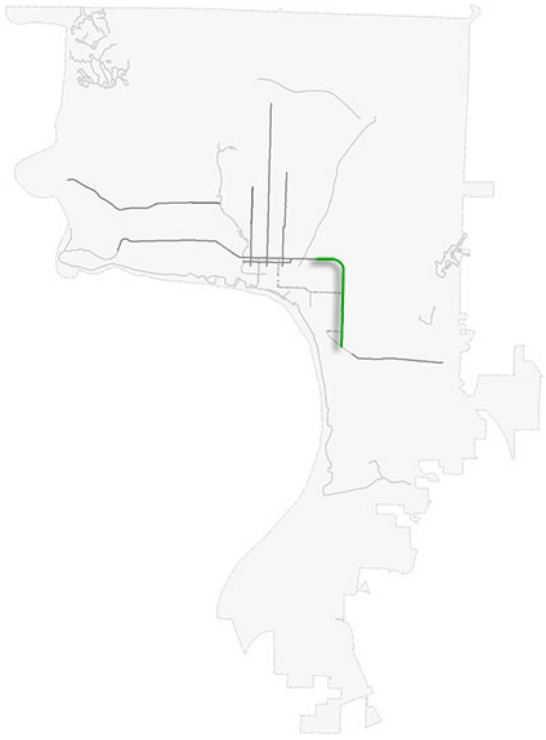
Pedestrian recommendations

- Recommendations are discussed in the Downtown Pedestrian Zone section.
- Install wider sidewalks, crosswalks and pedestrian actuated crossing signals at the intersection of 6th Street and Hoeven Drive to connect the downtown with the Floyd River Trail and eastern developments

Figure 60. 6th St.: Existing conditions

Figure 61. 6th St.: Proposed buffered bicycle lane

Fairmount St.



Length	Width	Number of lanes	Posted speed	AADT (2011)
1.75 miles	24 to 69 feet	2 to 6	25 to 35	700 to 10,900

Fairmount Street

Despite its rolling hills, Fairmount Street is a necessary connection which will link the Morningside neighborhood to downtown, trails, and the rest of Sioux City. Starting as a collector street in a residential area in the south, it gradually grows into a minor arterial as the adjacent land use transitions into commercial and industrial zones with wider lanes and heavier traffic closer to the downtown area. Providing enhanced pedestrian and bicycle facilities on Fairmount Street will allow non-motorists to utilize the same connectivity as vehicles.

Sidewalk connectivity is good, but occasionally absent on one side of the road. Compliance with ADA standards is also reasonably good and should continue to be enforced as pedestrian facilities are installed.

Bicycle recommendations:

- Install sharrow on Faimount Street between Transit Avenue and Gordon Drive
- Reduce lane width from Gordon Drive to Lewis Boulevard to 11 feet
- Install bicycle lanes on Fairmount Street between Gordon Drive and Lewis Boulevard

Bicycle alternative:

- Install sharrows on Faimount Street between Transit Avenue and Gordon Drive
- Remove center median from north leg of Faimount Street
- Restripe pavement to accommodate 6 foot bicycle lanes with 2 foot buffers, four 11 foot travel lanes, and one 10 foot center two-way left turn lane on Faimount Street between Lewis Boulevard and Gordon Drive

While not normally optimal for most streets, Fairmount requires two types of infrastructure to adequately accommodate on-street bicyclists. On the south end where traffic volumes are low and lanes are narrower, sharrows are an excellent way to indicate to motorists that bicyclists are present without having to remove parking or restripe the road. Placing sharrow markings near the center of the street helps to mitigate wear over time, thereby reducing maintenance costs. However, the sharrows should transition into a bicycle lane or buffered bicycle lane on the north leg closer to downtown as the street widens, posted speed rises, and vehicle volume increases. Bicycle lanes help improve safety for all users on the road ways by separating vehicle and bicycle traffic and reducing vehicle speeds by narrowing travel lanes.

Fairmount St.

Pedestrian recommendations:

- Evaluate signal timing at signalized intersections to determine average pedestrian delay
- Complete sidewalk network on the north leg of Fairmount Street

The existing sidewalk network terminates at 4th Street and should be completed through Lewis Boulevard. This would give residents and students in the Morningside area direct pedestrian access to downtown.

Figure 62. Fairmount - North leg: Existing condition

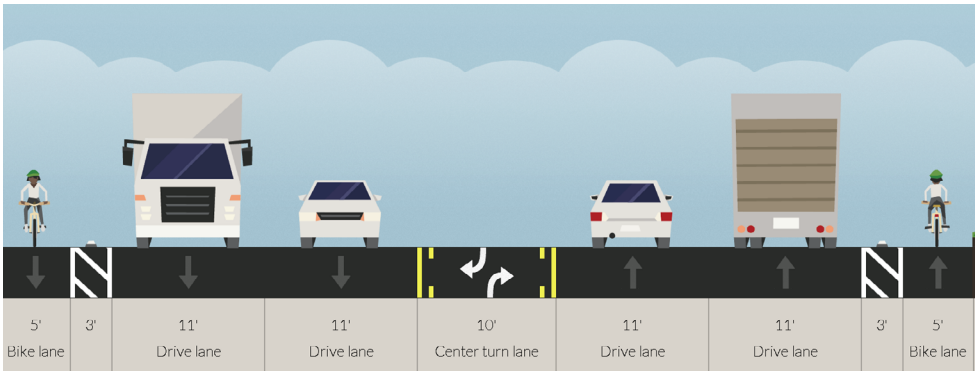


Figure 63. Fairmount - North leg: Proposed

Figure 64. Fairmount - South leg: Existing conditions

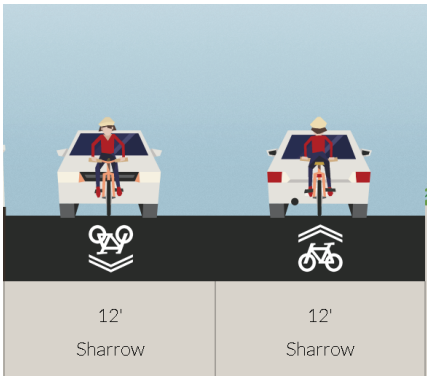
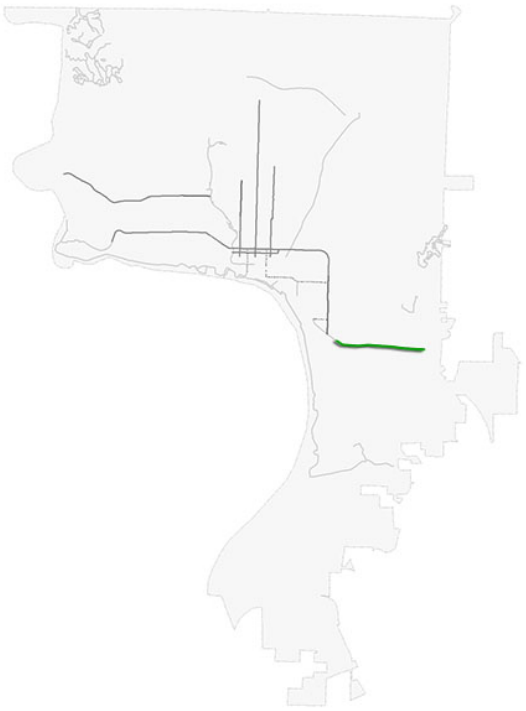


Figure 65. Fairmount - South leg: Proposed

Morningside & Transit Ave.



Length	Width	Number of lanes	Posted Speed	AADT (2011)
2.32 miles	40 to 70 feet	2 to 5	30 to 35 MPH	4,670 to 11,500

Morningside and Transit Avenue

Morningside Avenue and Transit Avenue are minor arterial streets which serve as the major east-west corridor for the Morningside neighborhood. Adjacent land use on the corridor is primarily residential with a commercial area between S. Lakeport Street and Transit Avenue. Traffic volumes peak near the intersection of Transit Avenue and Morningside Avenue, in a commercial area.

The corridor is an existing shared roadway, but improving bicycle and pedestrian infrastructure on this corridor will address some safety issues at key locations and will help enhance connectivity in the neighborhood for all road users. Sidewalks are present on both sides throughout the corridor, including a trail-width sidewalk on the south side of a portion of Transit Avenue. ADA compliance is good but some intersections could be improved, particularly on the intersections of the small local roads on the eastern side of the corridor.

While the length of the corridor is only 2.32 miles, the block lengths are relatively short. There are 35 intersections in the study area. Short blocks lend to walkability, but also present more conflict points for pedestrians and other road users. Between 2004 and 2014, 7 pedestrians and 11 bicyclists were involved in collisions along this corridor. Of these, 9 collisions occurred on Morningside Avenue between Transit Avenue and S. Patterson Street. This area is primarily commercial, and therefore would attract many pedestrians, bicyclists, and vehicles, but accommodations for non-motorists are lacking. The intersection of Morningside Avenue and Transit Avenue provides the closest safe crossing for pedestrians. The next closest safe crossing to the east is S. Lakeport Street, nearly half a mile away. Therefore, it is important to slow traffic, provide pedestrian refuge while crossing, and install high visibility midblock crosswalks in this area in an effort to reduce pedestrian-involved collisions occurring between Transit Avenue and S. Lakeport Street.

Bicycle recommendations:

- Remove on-street parking on the north side of Morningside/Transit in residential areas
- Reduce through lane width to 11 feet
- Reduce turning lane width to 10 feet
- Install buffered bicycle lanes on the eastbound and westbound approaches
- Install bicycle boxes at all signalized intersections
- Install SHARE THE ROAD and bicycle awareness assemblies

Morningside & Transit Ave.

(MUTCD W11-1/W16-1) every half mile along the corridor

- Install wayfinding signage at the trailhead on Transit Avenue and advance warning signage 300 feet to the east to assist on-street bicyclists who may want to use the trail

Pedestrian recommendations:

- Bring all intersections up to ADA compliance
- Install high visibility crosswalks on Morningside Avenue at the intersections of Patterson Street and Hennepin Street
- Install pedestrian refuge islands at the Morningside Avenue / Transit Avenue intersection and the Morningside Avenue / S. Lakeport Street intersection.
- Evaluate corridor-wide signal timing optimization with leading pedestrian intervals and split signal phasing.

Other recommendations:

- Evaluate as candidate for corridor-wide traffic calming with corridor-wide street redesign. Potential treatments may include curb extensions, speed humps, gateway treatments, or chicanes

Figure 66. Morningside Ave.: Existing conditions

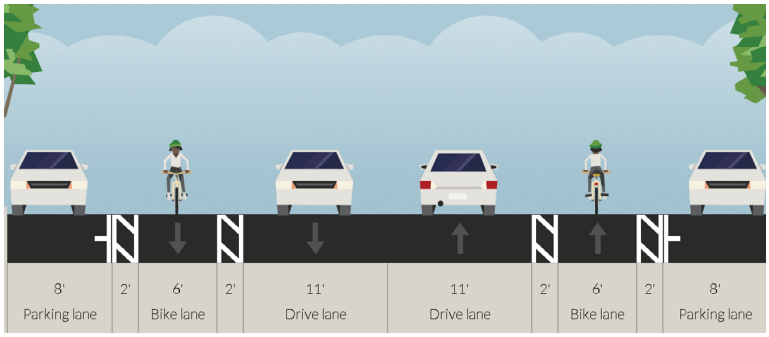


Figure 67. Morningside Ave.: Proposed improvements

Figure 68. Morningside Ave.: Existing conditions

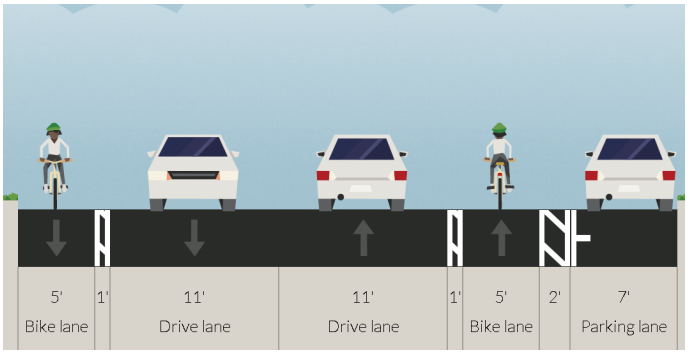


Figure 69. Morningside Ave.: Proposed improvements

Morningside & Transit Ave.

Figure 70. Morningside Ave.: Existing conditions

Figure 71. Morningside Ave.: Proposed buffered bike lane.

Downtown Pedestrian Zone

Downtown Pedestrian Zone

Some residents indicated that the pedestrian environment in Sioux City can be hazardous. The crash information corroborates this perception. The recommendations below are intended to create a safer, more pleasurable walking environment in the downtown area. Since multiple modes converge in the downtown area, pedestrian enhancements for downtown are prioritized separately from the corridors which will compose the active transportation network. However, these recommendations can also be applied to other roadways and intersections throughout the city.

Sioux City's downtown area has good pedestrian infrastructure, but improvements can be made to enhance safety and accessibility. The density of intersections – especially signalized intersections – in the downtown area, coupled with the high number of crashes led us to develop a site-specific set of recommendations for pedestrian infrastructure. These recommendations can be easily integrated with the other elements of this plan.

The area designated as the downtown pedestrian improvement zone is bounded by 11th Street to the north, 3rd Street to the south, Wesley Parkway to the west, and Floyd Boulevard to the east, although the city can choose to expand the area for improvement as needed (Figure 72). A 15 year phasing horizon was used to prioritize projects over time.

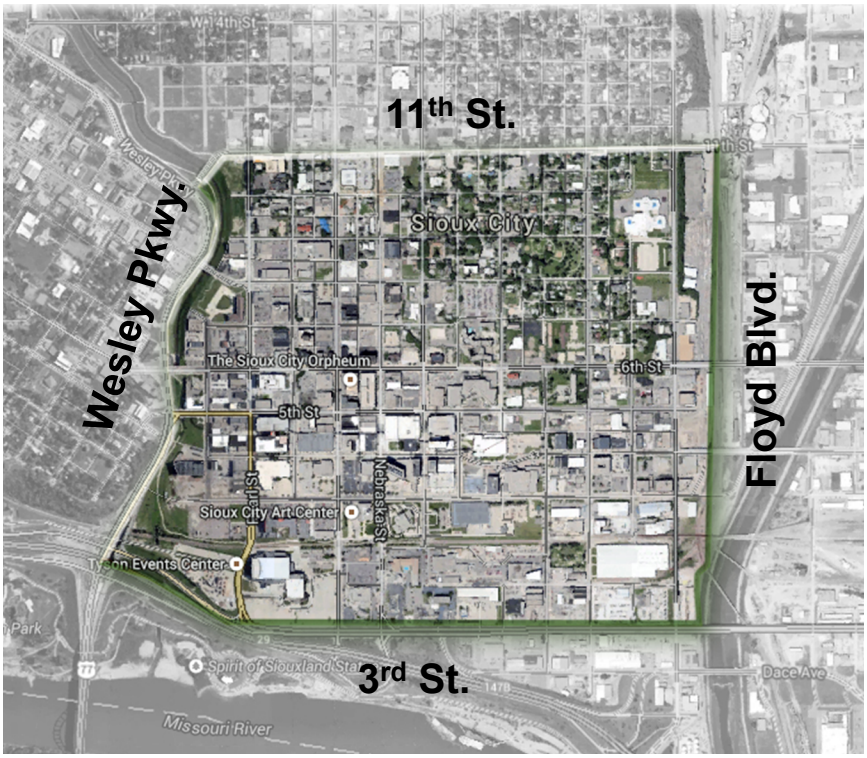


Figure 72. Downtown Pedestrian Zone

Downtown Pedestrian Zone

0 – 5 Years:

- Install pedestrian-oriented wayfinding signage throughout the downtown area that includes walk time and distance to key downtown locations.
- Develop easily recognizable and consistent signage indicating entrances to the skywalk network
- Implement pedestrian traffic signal prioritization
- Upgrade all intersections to high-visibility crosswalks
- Upgrade to pedestrian countdown signal timers at key locations
- Improve standards for pedestrian facilities in the Complete Streets Policy
- Perform spot enforcement at key intersections to ensure compliance by all users
- Consider adopting a form-based zoning code with NACTO pedestrian design standards on city streets
- Begin collecting data on pedestrian activity and crashes to evaluate the effectiveness of policy and engineering interventions

5 – 10 Years:

- Achieve ADA compliance at all intersections within the downtown zone
- Implement area-wide split signal phasing with leading pedestrian intervals using a 3.5 MPH pedestrian walk speed
- Encourage pedestrian-oriented storefronts through public-private matching funds
- Develop and expand Open Streets events through downtown districts
- Review data on crashes and compliance, making necessary improvements if needed

10 – 15 Years:

- Reduce the number of one-way streets through downtown
- Reduce posted speeds to 25 MPH or less through downtown, particularly around schools, public buildings, and civic centers such as museums
- Consider the adoption of a pedestrian master plan outlining projects for 2030 and beyond[1]

1 The Berkeley Pedestrian Master Plan is an excellent example

Wayfinding Signage

Wayfinding Signage

Wayfinding is a key element of the urban network and can be considered the "face" of the bicycle system.[1] Wayfinding can be a useful way to raise public awareness of the bicycle and pedestrian network, as well as to promote the use of the infrastructure. A good wayfinding system is helpful for residents who are new to bicycling, or new to the city, and will encourage residents to be more confident when bicycling, walking, or using transit.

The design of wayfinding signage should follow specific design standards to ensure ease of use and safety compliance on the network. They should also comply with the Manual on Uniform Traffic Control Devices (MUTCD) – Part 9: Traffic Control for Bicycle Facilities.

Wayfinding signage should be installed along the bicycle routes every quarter or half mile. The three types of wayfinding signage that should be installed are confirmation signs, turn signs, and decision signs.

Figure 73. Confirmation sign
Source: MUTCD 2009

Confirmation signs (Figure 73) inform bicyclists about the availability of designated bike routes. This sign type should be located at midblock locations or the far side of intersections. Destinations and distance can be included in this type of sign, but no arrow should be included.

Turn signs inform bicyclists to the turning direction, where going straight is not an option for bicycle travel. This sign type should be placed on near side of intersections. Destinations and arrows should be included.

Decision signs inform bicyclists and pedestrians the different directions at turning points on the street network. This sign type should be placed at decision points, such as the near side of intersections, or confusing locations where there are multiple directions for bicyclists and pedestrians to travel. Arrows and destinations should be included on these signs.

Destination wayfinding signs should deliver the following information:

- Direction
- Destination: nearby important destinations, such as schools, parks, museums, or recreational centers
- Distance in miles
- Time to get to each destination by bicycle or walking in minutes (optional)
- Symbology of pedestrian and/or bicyclist

1 APBP Webminar, *Wayfinding for Cyclists*. Retrieved from http://www.apbp.org/?webinar_archive

Wayfinding Signage

Destinations with distances of up to five miles, two miles, and one mile, should be organized into three following categories[2], respectively.

- Primary destinations (placed within 5 miles from destination): trails, downtown Sioux City, and regional parks
- Secondary destinations (placed within 2 miles from destination): universities and colleges, Martin Luther King Multimodal Center, and nearby cities
- Tertiary destinations (placed within 1 mile from destination): community schools, sports stadiums, the airport, and the on-street bicycle route

The order of destinations listed on a decision sign are through, left, then right. Destinations are shown from nearest to farthest. Straight and left direction arrows should be placed on the left side of a destination. Right direction arrows should be placed on the right side of a destination.

The signs should have a green background with white border, adequate levels of retroreflectivity, standard weight, and aluminum paneling. Any variation should be compliant with the MUTCD.

An example of recommended signage is shown in Figure 74.

Figure 74. Example of a decision sign
Source: http://twowheelsandalady.com/

2 City of Oakland (2012) Design Guidelines for Bicycle Wayfinding Signage. Retrieved from http://nacto.org/wp-content/uploads/2012/06/City-of-Oakland-2009.pdf

Transit Integration

Transit Integration

Transit integration with the pedestrian and bicycle networks are important since transit trips typically start and end with a bicycle or pedestrian trip. Therefore, every bus rider is also a pedestrian or a bicyclist. Furthermore, improving transit service can also encourage more people to walk and bicycle for a longer distance, and it may help these non-automotive commuters to overcome barriers, such as hills or rail road tracks, and gaps, such as a lack of direct connections, in the network. Additionally, by connecting transit to the bicycle network, more riders can be captured during off-peak times, as many bicycle trips are made for social or recreational purposes and occur during off-peak travel times[1].

Infrastructure and Amenities

Bus stop amenities are important to the perception of wait time and reliability for bus users. A friendly, accessible bus stop will enhance the comfort of the users and thus reduce the perceived out-of-vehicle wait time, which will in turn make bus use more attractive.

Figure 75. Example of bus shelter
Source: volokh.com

The City and SIMPCO staff should work with the transit agency to identify busy bus stops that can be prioritized for treatments such as lighting, streetscaping, and the installation of more amenities, such as benches and shelters (Figure 75). This can also be a place-making strategy that serves both bus users and non-bus users, as bus stops are usually located at important destinations that have high pedestrian traffic.

Bus stop flag signs are recommended to be redesigned to show necessary information such as the schedule or a contact for schedule, stop number, and bus route name.

Pedestrian and bicycle infrastructure, such as ADA compliant sidewalks, crosswalks, signal priority, and bike racks, should be provided within ¼ mile, or an equivalent of five minute walking access, around the bus stops. Signage should be placed near the bus loading areas along bicycle routes to inform bicyclists and vehicles to be aware of each other.

Although leaving a bicycle at a bus stop is less popular than taking a bicycle on the bus, this type of use should be considered for future need. It is recommended that secured bicycle parking be installed at high traffic stops to protect bicycles.

1 TCRP Synthesis 62: Integration of Bicycles and Transit http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_syn_62.pdf

Education

Educating the public on the health and safety aspects of active transportation is imperative for the success of this plan. It is very important that both drivers and active transportation users understand and are aware of their rights on the roadway and in the community. By emphasizing safety and awareness, Sioux City will become a safer place for all to travel.

Currently, there are many efforts being coordinated in Sioux City that focus on educating people on safety and awareness of active transportation. These efforts include the Walking School Bus program, driver education at Western Iowa Tech Community College, and larger events such as International Walk to School Day hosted by schools throughout the community.

Source: www.economicdrivingschool.com

The recommendations in this section are intended to complement and enhance the existing educational efforts being coordinated within Sioux City. It is important to realize that there should be educational efforts for both children and adults. Thus, the following recommendations are split into two categories, one focused on strategies to educate youth and young adults and another focused on reaching out to parents and adults within the community.

Youth

Safe Routes to School

Source: teastpdxnews.com

Safe Routes to School (SRTS) is a national movement to provide opportunities for children to reach school by walking or bicycling in safe and efficient ways. Safe Routes to School programs emphasize healthy living by actively engaging youth in physical activity which can help reverse trends in childhood obesity.[1] Cities across the nation and state have adopted SRTS programs that incorporate special events, such as Walking School Bus programs, Mileage Clubs, school route audits, and many other activities.[2] It is important that Sioux City capitalize on the strong efforts that already exist, such as the Walking School Bus program that many elementary schools have adopted. Building off the success of the Walking School Bus program, Sioux City should move forward and develop a district wide Safe Routes to School Plan to ensure children have a healthy and active way to get to school.

1 Safe Routes to School National Partnership, “What is Safe Routes to School?,” Retrieved from: http://saferoutespartnership.org/about/history/what-is-safe-routes-to-school

2 National Center For Safe Routes to School “How to Build and Sustain a Program,” Retrieved from: http://www.saferoutesinfo.org/program-tools/build-sustain-program

Annual, Large Events

Source: www.townpolice.net

In conjunction with a SRTS program many communities also hold large, annual events that get parents and students walking to school together. Many communities typically choose International Walk to School Day as a fun way to hold these large events and emphasize SRTS efforts. Those that participate will usually walk the same Walking School Bus routes to school during these large events and have a large celebration when participants reach the school. These large events are typically at the start of the school year (typically in October in conjunction with International Walk to School day) and are celebrated by both students and parents. Currently, in Sioux City, several elementary schools have participated in International Walk to School Day. Building off the success of these events, Sioux City should encourage more elementary and middle schools within the District to participate in annual, large events that encourage students to walk or bicycle to school.

Bicycle Rodeos

Some communities around the nation have also held smaller events that encourage and educate children and young adults about bicycle and pedestrian safety. Bicycle Rodeos are a fun way to educate children and young adults about bicycle safety and awareness. Bicycle Rodeos can vary in size and activities but in most cases they facilitate events that help young bicyclists practice and develop skills to become a safer bicyclist. There is usually an evaluator or instructor who will provide feedback to the participants on how they can improve and what they should be looking out for to remain safe. These types of events can be facilitated by schools, non-profits, bicycle shops, or the City.[3]

Within-School Curriculum

There is a great opportunity to incorporate lessons and curriculum that educates students on the importance of being active and safe. This is especially true for the seven schools within Sioux City that have joined the Blue Zones Project. These schools are Bryant Elementary, Clark Elementary, Hunt School, Irving Elementary, Mater Dei, Riverside Elementary, and Spalding Park Elementary. Classroom and physical education lessons can be on stand-alone basis or integrated in subjects and larger lesson plans. For example, an elementary math class could calculate the cumulative miles they had walked or bicycled over a month to see how far up Mount Everest they would be.[4]

3 Cornell University & New York State Governor's Traffic Safety Committee, "An Organizers Guide to Bicycle Rodeos," (2005), Retrieved from: http://www.saferoutesinfo.org/program-tools/organizers-guide-bicycle-rodeos

4 The SRTS Guide developed by the Pedestrian and Bicycle Information Center has many resources Strategies for Educating Children. Please see the following reference for more information. Safe Routes to School Guide, (2013), "Safe Rtoues to School Online Guide," Retrieved from: http://guide.saferoutesinfo.org/education/strategies_for_educating_children.cfm

Driver Education

Driver education courses should continue to emphasize teaching awareness of bicyclists or pedestrians who share the roadway. Currently, in Sioux City, all driver education in the area is organized through Western Iowa Tech Community College's Teen Drivers Education program.[5] Within this program, driver instructors spend time teaching new drivers how to be aware and cautious of people in or around the roadway. Compared to other cities across Iowa, Sioux City has more accidents involving active transportation users. With this in mind, it is important that driver education in the Sioux City area continue to offer opportunities for new drivers to learn about being aware and cautious of active users on or near the roadway.

Parents and Adults

Promotional Material

Reaching out to parents and adults can be a difficult task. To reach out to adults, strategies should appeal to many different groups and through many different media sources. One way of connecting with parents and adults about safety and awareness is through a promotional campaign that emphasizes driver safety. These campaigns should go further than just pamphlets at City offices. The most effective messages connect with people through commercials and social media. One very good example of this is a behavior change and awareness campaign in the Washington D.C. area called Streets Smart.[6] Since 2002 the Streets Smart campaign has emphasized education of motorists and pedestrians through mass media including radio, newspaper, transit advertising, public awareness efforts.[7] Using similar strategies, Sioux City should begin a promotional campaign that highlights safe driving habits and active user awareness.

Certified Instructors

There should be certified bicycling instructors in Sioux City. Currently, there are no instructors certified through the League of American Bicyclists. Certified instructors assume the role of educators for the whole community. The goal of these instructors is to ensure that people know how to operate a bicycle safely and legally.[8] To become an instructor through the League of American Bicyclists, one simply needs to sign up to become a member and then take a 2-day seminar training.

Source: League of American Bicyclists

5 Western Iowa Tech Community College, (2015) "Teen Drivers Ed) Retrieved from: https://www.witcc.edu/continuing_ed/driversEd.cfm

6 Street Smart, (2015), " About Street Smart," Retrieved From: http://bestreetsmart.net/index2.php

7 Street Smart, (2015), " About Street Smart," Retrieved From: http://bestreetsmart.net/index2.php

8 The League of American Bicyclists, (2015), "What's a League cycling Instructor?," Retrieved From: http://bicycleleague.org/content/become-instructor

Following their training, instructors are certified to teach smart cycling classes to both children and adults.[9] Having League of American Bicyclist instructors also helps communities achieve Bicycle Friendly Community status.

Integrating Efforts

Based on the above recommendations, there are many opportunities for parents and adults to learn and participate in active transportation education efforts. For example, many of the recommendations from the children and young adult section require parents and adults within the community to participate and volunteer. Specifically, larger events which involve coordination require parents to be engaged in the process. There are also opportunities for law enforcement officers to be involved in the process through educational opportunities like driver education courses, bicycle rodeos, or through encouragement events such as Open Streets events or competitions.

9 The League of American Bicyclists, (2015), "What's a League cycling Instructor?," Retrieved From: http://bicycleleague.org/content/become-instructor

Encouragement

Source: wslr.org

Encouragement strategies are important to the success of the Sioux City Active Transportation Plan. Switching from an auto-centric lifestyle to an active transportation lifestyle helps residents fit exercise into their daily schedule, thereby improving their personal health and quality of life. The events and activities of this section are designed to gather the community and develop support for further expansion and use of active transportation.

Sioux City's current encouragement events are hosted by a combination of public and private groups. Bike to Work week is organized by SIMPCO, Sioux City and several local groups and businesses. The Siouxland Cyclists, a local club, organizes weekly rides designed for recreational bicyclists and conditioning for RAGBRAI. The Siouxland Trails Foundation hosts the Tri-State Trails tour that uses the area trails to route bicyclists between Iowa, Nebraska, and South Dakota. The Sioux City Marathon was held yearly until 2008, when it was cancelled due to flood damage on the course.

Active Transportation Advisory Committee (ATAC)

We recommend that the City form a committee composed of staff, advocates, and residents that work to improve conditions for pedestrians and bicyclists in Sioux City. A president and vice-president should be elected to yearly terms with a one-year renewal. The composition of the committee should include: one police representative, one City or SIMPCO staff member, one Parks Department staff member, community organizations, and residents. There are several important roles this group would be expected to perform:

- Advise City staff and council on implementation of bicycle and pedestrian plans
- Evaluate performance in keeping with the phasing and timeline of the Active Transportation Plan
- Coordinate Encouragement, Education, Enforcement, and Evaluation activities
- Assist in the development and implementation of the Open Streets events

It is recommended that the committee meet monthly at a consistent, predetermined time. The ATAC should be chartered by either the City Council or Mayor's Office.

Open Streets

Open Streets are a popular event in many cities. These involve closing roads to vehicle traffic for a half or full day to allow for open pedestrian and bicycle use. These events are sometimes classified as mobile parks and can offer a wide range of activities and amenities depending on the size, organization, and funding available. Open Streets events provide opportunities for civic engagement, a unique experience, and could serve as a venue for data gathering through surveys and interviews or disseminate information to a wide audience.

Sioux City should host at least one event per year within the first five years with additional events as conditions allow. The Active Transportation Advisory Committee, working with the Parks Department and other applicable departments, should handle organization of this event. The organizing committee should use the Open Streets Guide[1] from the Alliance for Biking and Walking as a guide to implementation and evaluation. Downtown Sioux City is an ideal location for an Open Streets event. Other locations, such individual neighborhoods, could incorporate residential, commercial, and park areas. Members of the organizing committee are encouraged to visit regional examples of these events in Minneapolis, Des Moines, and Lincoln to experience first-hand and discuss issues with the hosts and organizing staff.

Hill Challenges

The hilly terrain surrounding downtown Sioux City presents challenges for pedestrians and bicyclists alike. However, hills also present unique opportunities for competition. The City of Sioux City should partner with local bicycling and running clubs to stage events, such as races, that use the hills as a feature. Burlington's Snake Alley Criterion and Davenport's Bix 7 provide examples of using a perceived inconvenience as an asset.

Reduced Price Helmets

In order to provide a safe and accessible environment for bicycling in Sioux City, the current free helmet program should be expanded. Hosted by the Parks and Recreation Department, this initiative would partner the City, a local healthcare partner, and SafeKids Woodbury County to provide bicycle helmets at a reduced cost. Modeled from a similar program in Johnson County, Iowa, helmets in all sizes would be available for purchase at the Parks and Recreation Department building at cost (approximately $12 each). This program would lower the barrier to all Sioux City residents safely biking on the streets and trails.

1 Alliance for Biking and Walking. http://www.bikewalkalliance.org/resources/reports/open-streets-guide

Bicycle Friendly Community

The formation of the ATAC is an important step in organizing the effort to produce a more bicycle friendly environment. To recognize this, the League of American Bicyclists (LAB) developed a community rating system. Presently, the nearby communities of South Sioux City and Sioux Falls are at a bronze-level. The ATAC, in partnership with the City and SIMPCO, should apply for a rating from the LAB. Regardless of the rating, the LAB will provide feedback on what is necessary to attain the next level.

Bicycle Friendly Business

This is a designation given to a business that provides accommodations for bicyclists as patrons and employees. The ATAC should identify Sioux City businesses that meet the criteria for Bicycle Frienfly Business, and identify improvements that can bring a business up to the standard. Bicycle shops, healthcare companies, and large employers are a natural fit for the criteria and Albrecht's Cycle Shop is a suggested starting point.

Walk Friendly Community

After adoption of this plan the ATAC should begin the application for designation as a Walk Friendly Community. This is a national program that recognizes and encourages communities to improve the pedestrian environment.

Walking Loops

Often, people not accustomed to walking will overestimate the time or effort required to cover a distance. It is recommended that employers work with employees to identify walking routes utilizing the pedestrian network around their location. This will provide exercise and help residents understand the time a one mile or longer walk can take. In the winter, skywalks can be utilized for this purpose.

Transit Encouragement Strategies

The City should work with the transit agency to allow folding bikes on the buses, and selectively allow non-folding bicycle on the bus when passenger loads allow. This could help bicyclists avoid having to wait for the next bus with an empty bicycle rack.

Bicycle rack information should be made available to bicyclists, especially through bicycle advocacy groups, websites, or by issuing educational videos, brochures, explanatory posters, individual training, or bringing a demonstration bus bicycle rack to public events and transit

stations (Figure 76). Also, the city could issue maps showing bicycle routes with terrain information and simplified bus routes, so that bicyclists could use buses for hilly routes.

Figure 76. Bike rack demonstration
Source: www.cumtd.com

Along with programs such as Bike to Work and Walk to Work Weeks, local employers could also encourage their employees to take the bus to work through incentives such as subsidized bus passes.

In addition, bus schedules and flyers should be translated into other languages to increase mobility for non-English speaking populations, along with the current transit marketing efforts. We recommend that the City works with developers to provide real-time information for users to track bus' arrival time.

Source: la.streetsblog.org

Enforcement

Source: buchheitconcrete.com

Enforcement is important for every plan. Enforcement helps ensure that the policies and procedure set forth by the plan are being implemented in the way that promotes the plan's goals and objectives. Enforcement is a means to improve compliance with policy and create a safer and more connected network. The following recommendations are ways to improve the practice of enforcement in Sioux City.

Sidewalks

Sidewalk repair requirements should be strictly enforced. It is the responsibility of property owners to pay for the repair of any deficient sidewalks on their property.[1] To enforce this, some form of sidewalk inventory should be established. Developing an inventory of the sidewalk network conditions around the city would allow for easy identification of areas in need of repair. Whenever a sidewalk is found to be deficient, the City should notify the property owner immediately.

A sidewalk repair hotline should also be established to help determine areas in need of repair. This hotline would allow residents to call and report sidewalks that are deficient and are in need of repair. The City would receive these resident reports and be able to notify property owners that repair is necessary.

There are several ways for property owners to pay for the sidewalk repair. Methods of payment include having the property owner pay a contractor for the repair, having the property owner pay the City to repair the sidewalk, paying the cost of repair to the City in monthly or yearly installments, and adding the cost of repair to the sales price of the home. For low-income property owners, paying small installment over time or adding the cost to the next sales price of the home may be the best option. The City may choose whichever payment policy it feels is most effective for the given situation.

Spot Enforcement

Spot enforcement consists of police officers watching specific areas, such as intersections, for non-compliant behavior from pedestrians, bicyclists, and motorists. This can include watching for improper pedestrian crossings or failures of motorists to yield to pedestrians or bicyclists. The specific areas chosen for spot enforcement should be identified based on crash data or history of non-compliant behaviors by pedestrians, bicyclists, or motorists. Locations with high crash rates would be a priority for spot enforcement. It will improve safety by ensuring compliance with rules and regulations across all user modes.

1 Property owners must pay to repair sidewalks in "Section 17.20.070 Repairing defective sidewalks"

Bicycle Police Presence

Having police officers on bicycles will help to improve enforcement at the bicycle and pedestrian level. This can help to monitor motorist behavior towards bicyclist and pedestrians in addition to monitoring the behaviors of bicyclist. Furthermore, the presence of officers on bicycles adds to the legitimacy of bicycling as an accepted mode of transportation within the community.

Positive Enforcement

Positive enforcement policies can be helpful in changing behavior. Positive enforcement is any strategy that encourages change towards positive behavior rather than punishing disapproved behaviors. For example, bicyclists that are found without the required nighttime lighting[2] may be able to have their ticket eliminated by providing a proof of purchase of the required light. Such a program was implemented within Johnson County, Iowa with great success. In this way, bicyclist will be encouraged to change their behavior to follow the regulations rather than feeling discouraged and choosing to no longer use a bicycle.

Bicycle Specific Areas

Enforcement should help maintain the proper zones for each mode of transportation. Vehicles or motorcycles should not drive into bicycle lanes unnecessarily or block the lane. Enforcing the exclusivity of bicycle lanes will help to improve safety for bicyclists.

E-bike Requirements

The current on-street ban on electric bicycles[3], also known as E-bikes, as well as the requirement for them to wear helmets in Sioux City[4] should be repealed. It is recommended that E-bikes be given the same rights as bicyclist on the road network. Altering these laws would allow for E-bikes to be treated the same as regular bicyclists. In general, E-bikes are almost identical to a regular bicycle except for the presence of a small electric motor that may be turned on to assist the rider. The E-bike ban should be lifted because E-bikes provide a way for people to overcome barriers to bicycling within the community, such as physical ability or the presence of hills. E-bikes provide a way for people with less physical ability overcome strenuous bicycling over long distances or rough terrain.

2 Lighting required in “Section 10.52.100 Lamps and other equipment on bicycles”
3 Electric bicycles banned from the road network in “Section 10.54.050 Places of operation”
4 Helmets required for all Sioux City E-bike riders in “Section 10.54.060 Equipment requirements”

Vehicle Lane Width Requirement

The minimum motor vehicle lane width requirement in Sioux City should be changed to 10 feet. This matches the recommendations set by NACTO[5], which is the national standard used for this plan. Narrower lane widths provide more space for on-street bicycle facilities and tend to cause less speeding by motorists, contributing to a safer transportation environment for everyone.

Complete Streets

The current complete streets policy adopted by the Sioux City represents a positive stride in the area of active transportation. However, it is recommended that the policy be strengthened. Currently, the policy calls for pedestrian and bicycle options, but lacks a true requirement in ensuring that options are actually provided. The policy can be improved by ensuring or requiring all future road projects promote pedestrian and bicyclist options. The following recommendations will strengthen the Complete Streets policy:

- Remove any mention of specific bicycle treatments and replace with reference to best practices used in a context sensitive manner. Either NACTO or AASHTO standards are appropriate.
- Apply the policy to all collector and arterial streets in Sioux City. The current limitation of the policy to the bicycle network will prove confusing as the bicycle network changes. In addition, the bicycle network may not cover areas where pedestrian improvements can be made.
- Exceptions to the Complete Streets policy should be reviewed by a committee composed of staff and possibly representatives from pedestrian, bicycle or health advocacy groups. This will allow for a wider range of perspectives and make the process more inclusive.
- The review committee will also keep track of Complete Streets project approvals, exceptions, and other measures that can be used to evaluate the policy. The committee will then be able to make recommendations on future amendments to provide added strength or clarity as needed. The strength of the policy should be measured by scoring according to the rubric provided by Smart Growth America.

5 NACTO. http://nacto.org/usdg/street-design-elements/lane-width/

Evaluation

In order to determine the progress achieved towards plan objectives, an evaluation process is necessary. The evaluation process will help to inform future actions based on the results of past policies. The evaluation process will involve community stakeholders examining the data on the measures of success at project milestones. This will help to ensure that the plan is meeting its expected goals. The information gathered from this process can provide feedback on which policies have or have not been effective over time. This information can be used to focus resources on the programs and projects that have proven most effective or strengthen underperforming projects.

Data Collection

To evaluate the projects implemented in the plan, it is important to collect data that is relevant to the policies proposed in this plan. Data on mode share, number of participants in education and encouragement events, miles of bicycle lanes created, number of crashes and fatalities, and amount of sidewalks repaired should all be collected. A sidewalk inventory of Sioux City should also be completed to provide comprehensive and accurate information on the sidewalks that have been repaired, constructed, and made ADA compliant.

Milestones

The evaluation process will take place at three major milestones. These milestones align with the recommended project phasing guidelines of this plan. This plan's goals have been divided into five year intervals. Therefore, the progress made toward plan goals should be evaluated at the five, ten, and fifteen year milestones after the acceptance of the plan.

The plan will be evaluated based on its progress towards the goals described at each planning interval. Ideally, the proposals for each time frame will be completed by the end of each five year period. However, it is possible that goals will not be met due to unforeseen circumstances or changes.

Measures

There are many different indicators of success that can be used to analyze the implementation of this plan. These measures of success include, but are not limited to, mode share, miles of bicycle lanes or sharrows, public health benefits, crash and fatality rates, and percent compliance with the Americans with Disabilities Act. It is recommended that information on all of these measures be continually gathered over time to assist in the evaluation process.

Table 6 is an illustrative way of understanding the evaluation process. Each of the recommendations of this plan follow the framework of the five E's. The table shows expected outcomes for our recommendations. For evaluation, the actual outcomes in these areas can be compared to the desired outcomes in order to determine the success of the implementation. If the actual outcome values are not at the desired levels, this table can be used to show which recommendation areas need to be reexamined as part of the evaluation process.

Stakeholders

To improve the evaluation process, many groups should be involved. Certain groups may have different perceptions about how successful the implementation has been. Involving Sioux City, SIMPCO, the previously recommended Active Transportation Advisory Committee, community stakeholders, and the general public in the evaluation process can help to ensure that the evaluation process considers the views of everyone that is affected by the plan's implementation. This can be done by reaching out to bicyclist groups or having a public forum to ask how conditions have or have not improved over time.

Table 6. Measures of evaluation for 5 E's.

Evaluation Plan Table				
	Inputs	**Activities**	**Outputs**	**Outcomes**
Engineering	Funds	Construction projects Identify crash areas	Bike lanes and Sharrows Accessible sidewalks Wayfinding	Bike and Pedestrian mode share increase Miles of bike lanes Reduced crash rates Percent ADA compliant
Education	Funds People	Create programs Police education Educate instructors	Participation in SRTS Driver awareness	Number of participants Number of programs Number of instructors Reduced crash rates
Encouragement	Funds People	Form committee Organize events	Increased bike and pedestrian use Event implementation	Bike and Pedestrian mode share increase
Enforcement	People Data	Police integration Sidewalk enforcement Spot enforcement	Police bike presence Sidewalk construction and repair	Number of intersections enforced Number of miles of sidewalk repaired
Evaluation	People Data	Collect data	Database creation Phased assessments of success Updated future plan	Number of evaluated projects Percent completion of infrastructure inventory

Chapter 6
Implementation

Implementation

Cost Estimation

To calculate the costs of the recommended infrastructure, we used the University of North Carolina's Highway Safety Research Center's *Costs for Pedestrian and Bicyclist Infrastructure Improvements* supplemental database.[1] Nearly 1,500 bid lettings from across the country for various pedestrian and bicycle infrastructure projects support the UNC center's research. The cost estimates include engineering, design, mobilization, furnishing, and installation costs, but not maintenance costs.

The database provided by the UNC Highway Safety Research Center provides several different estimates for active transportation infrastructure projects. We used only project estimates that had consistent per unit costs such as by per linear foot to ensure our estimates were reliable. In some cases there was a large enough sample of infrastructure bids. In these cases only bids from Iowa, Nebraska and Minnesota were used to ensure the best regional estimate was produced. All per unit costs were then adjusted to 2015 dollar values to capture inflation by using the Bureau of Labor Statistics' Consumer Price Index. Table 7 presents the adjusted per unit infrastructure costs.

For each corridor, the estimated cost of implementing the recommended infrastructure improvements was generated by measuring the length of the corridor and then calculating segment cost from the adjusted per unit cost. In calculating the cost, some further assumptions were made. First, if the segment called for a buffered bicycle lane, a restriping cost was added to the cost to represent the cost of adding more paint for the buffer. Second, if the improvements would require extensive restriping of the street (such as width reductions for multiple travel lanes), restriping cost was multiplied by three times and was added to the cost of the improvements to reflect the increased cost of restriping and narrowing the street. Third, based on NACTO standards, sharrows should be placed every 250 feet on lower volume streets and every 50-100 feet on higher volume streets. This was taken into consideration when calculating the cost of corridors with sharrows. Table 8 presents the cost breakdown for each corridor. In total, the cost for the proposed bicycle infrastructure is $1,971,418.

1 Bushell, Max A., Bryan W. Poole, Charles V. Zegeer, and Daniel A. Rodriguez, *Costs for Pedestrian and Bicyclist Infrastructure Improvements*, (2013).

Table 7. Estimated cost of bicyclist and pedestrian infrastructure

Type of Infrascture	Unit of measure	2012	Adjusted
Bike Lanes	linear foot	21.96	22.45
Sidewalks	Square Yard	24.76	25.31
Crosswalks	Linear foot	8.89	9.09
Restiping	linear foot	1.92	1.96
Sharrows	Each	161.47	165.08
Truncated dome pads	Square Foot	45.02	46.03
ADA Ramp	Square Foot	18.08	18.48

Table 8. Estimated cost for selected corridors

Projects				
Corridor	Sharrow (miles)	Bike lane (miles)	Buffered Bike lane (miles)	Cost
Fairmount	1.19		0.64	$ 86,377
Grandview	0.701			$ 2,444
Pearl***		0.31	0.44	$ 93,461
Court*	1.75	1.75		$ 170,832
W 19th	0.545		2.449	$ 325,140
Morningside ***			1.69	$ 217,821
6th***			1.62	$ 259,089
W 4th		2.5		$ 296,340
Jackson		1.68	0.93	$ 367,980
5th***			0.95	$ 151,935
Totals	**4.186**	**6.2362**	**8.7228**	**$ 1,971,418**

***These sections would require a bit more restriping because they are in the downtown area.
Calculation
Sharrows=(number of feet/250) * cost per sharrow for or slower roadways. For faster roadways (number of feet/50)*cost per sharrow.
Bike lanes=number of feet * cost per linear foot.
Buffered bike lanes= feet * cost perlinear foot
Buffered bike lanes plus restriping=number of feet* Cos per linear foot+(restriping cost * 3)

Funding

Table 9 outlines a variety of grant funding resources available through several agencies. The City can apply directly to each program with data collection assistance from SIMPCO.[2]

Traffic Safety Improvement Program (TSIP)

TSIP is administered through the Iowa DOT and funds construction and purchasing for traffic safety equipment and devices, but can also help fund traffic safety research. An associated cost-benefit form is provided by the Iowa DOT which is used to determine how the project might benefit traffic safety in relation to its cost.

The City may consider using any awarded TSIP funds to program specific safety projects recommended in this plan (notably, downtown and Morningside/Transit Avenue) or may choose to conduct research on site-specific applications of recommendations from this plan (for example, city-wide pedestrian counts by intersection). Application packages from previously funded projects are available through their website. Decisions for awarded projects are usually made by December with funding dispersed the following June.

Iowa Clean Air Attainment Program (ICAAP)

ICAAP funds projects which contribute to the betterment of air quality through the reduction of transportation-related emissions. Eligible streets must be a part of the current Federal Aid system (a list of these streets is maintained by SIMPCO and the Iowa DOT). The City and/or Sioux City Transit may apply directly to the program with assistance from SIMPCO. Funded projects require a 20 percent local match and must be at least $20,000 total. Transit projects must be a part of an approved five year Capital Improvement Program.

Potential projects from this plan which may be eligible for ICAAP benefits include improved transit stop amenities, and recommended improvements to all corridors with the exception of Grandview Boulevard (although Pearl Street is eligible).

2 Detailed descriptions of each program and their requirements can be found at http://www.iowadot.gov/pol_leg_services/Funding-Guide.pdf.

Federal Transportation Alternatives Program (TAP)

Federal TAP funds may help to program a variety of the recommendations made in this plan, including on-street bicycle facilities, sidewalks, crosswalks, and Safe Routes to School projects. These may also fund the planning and design of such projects. The City, Sioux City Transit, SIMPCO, and County are all eligible to apply.

A 20 percent local match is required, and the project must be on an existing or planned roadway. Please note that if these funds are requested through SIMPCO, deadlines may vary.

Pedestrian Curb Ramp Construction

This program assists with ADA compliance by providing funds to construct or retrofit ADA compliant facilities. The City must engineer and administer eligible projects. A local match of 45 percent is required, and no city may be awarded more than $250,000 per year. All ADA compliance recommendations in this plan are eligible.

Table 9. Proposed funding opportunities

Name	Funding Agency	Description	Deadline	Matching Requirements	Amount
Traffic Safety Improvement Program	Iowa Department of Transportation	Funds the research, design, purchase, and installation of materials to enhance safety at intersections with site-specific crash history	15-Aug	None	$500,000 maximum
Iowa Clean Air Attainment Program	Iowa Department of Transportation / Federal Highway Administration	Funds projects for every mode which help maintain clean air quality. Eligible street projects must be on the federal-aid system	1-Oct	20 percent	Project must cost $20,000 minimum
Federal Transportation Alternatives Program	Federal Highway Administration as delegated by the State of Iowa and Iowa Department of Transportation	Funds projects directly related to on- and off-road pedestrian and bicycle facilities, including Safe Routes to School projects and recreational trails projects	1-Oct	20 percent	Not specified
Pedestrian Curb Ramp Construction	Iowa Department of Transportation	Funds projects to achieve ADA compliance on newly constructed primary roads	Ongoing	45 percent	$250,000 maximum per city per year

See http://www.iowadot.gov/pol_leg_services/Funding-Guide.pdf for further information

Phasing

Phasing for this plan was developed while considering cost, safety benefits, and improvements to connectivity over time. While the majority of the engineering improvements are recommended to take place in the first 10 years of the plan's implementation, there are multiple funding sources which may help offset the costs of these projects (see Funding section above.

Three major milestones are used for plan implementation: the 5, 10, and 15 year marks from plan adoption. This timeline was established with the assistance of SIMPCO and is a common time period breakdown for plans of this size and scope. Later incarnations of this Active Transportation Plan may choose to use longer or shorter phasing timelines.

0-5 Years

Recommendations within the first five years focus on the establishment of engineering, educational, encouragement, and enforcement practices in an effort to improve safety and accessibility for bicyclists and pedestrians. Data collection is an important element of this timeline, as later projects will rely on accurate, site-specific data for evaluation. The establishment of an Active Transportation Advisory Committee will help to put that data to use in policy development and other recommendations.

0-10 Years

The first 10 years of plan implementation will see the completion of nearly all the engineering improvements recommended in this plan, as well as the development of site-specific standards based on data collected over time. Further data collection techniques and programs may be considered within this time. Performance of the Active Transportation network may be evaluated at this time.

10-15 Years

By the 15 year mark, all engineering recommendations should be complete. This should finish concurrently with the development of a new Active Transportation Plan, using the data collected through the plan's first iteration. At this time, the City may choose to expand the network, refine existing programs, or strengthen policy and outreach to further encourage participation in active transportation.

Figure 77 and Figure 78 describe the Engineering and Supportive Programming timelines.

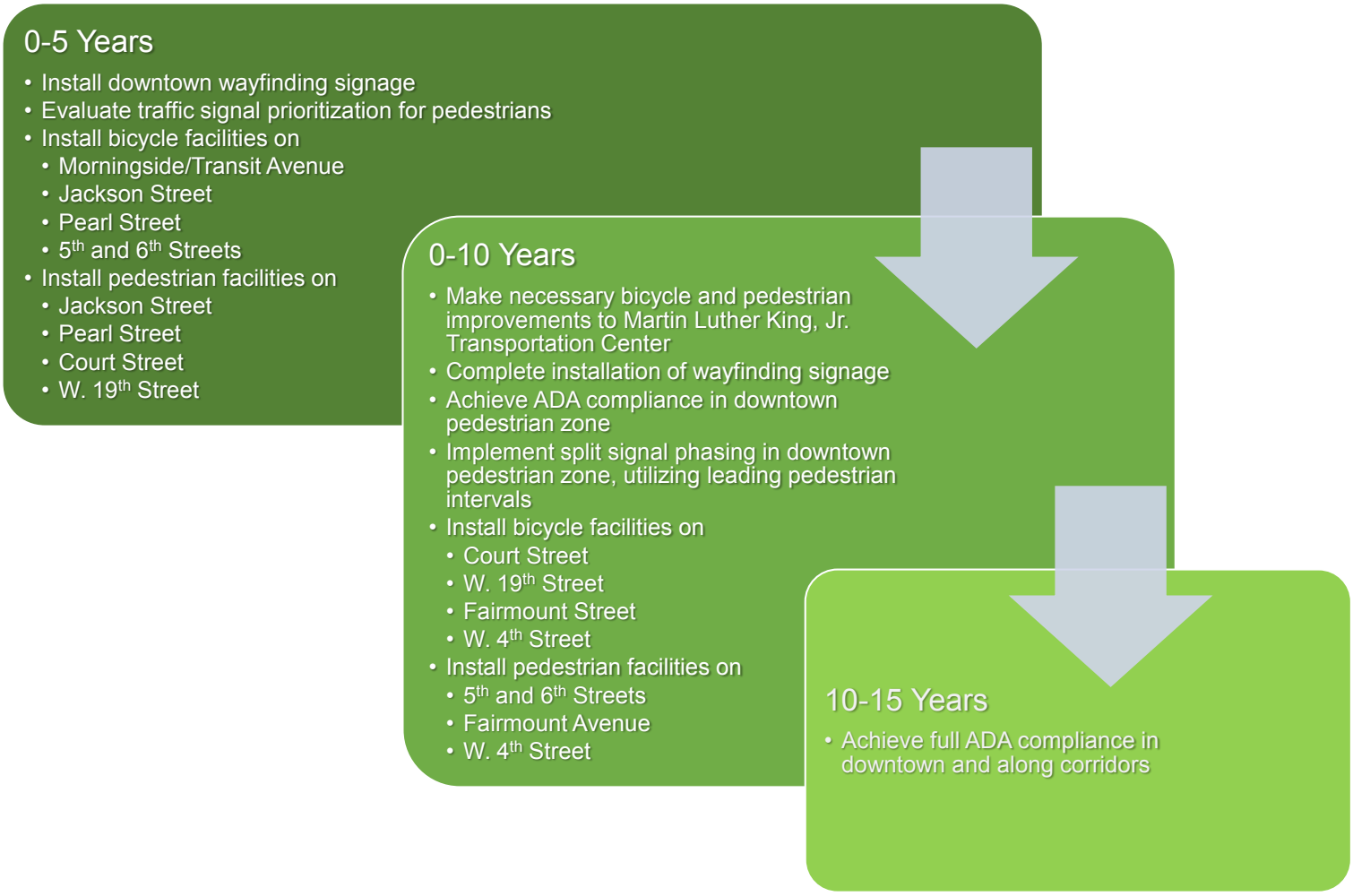


Figure 77. Phasing for proposed engineering projects

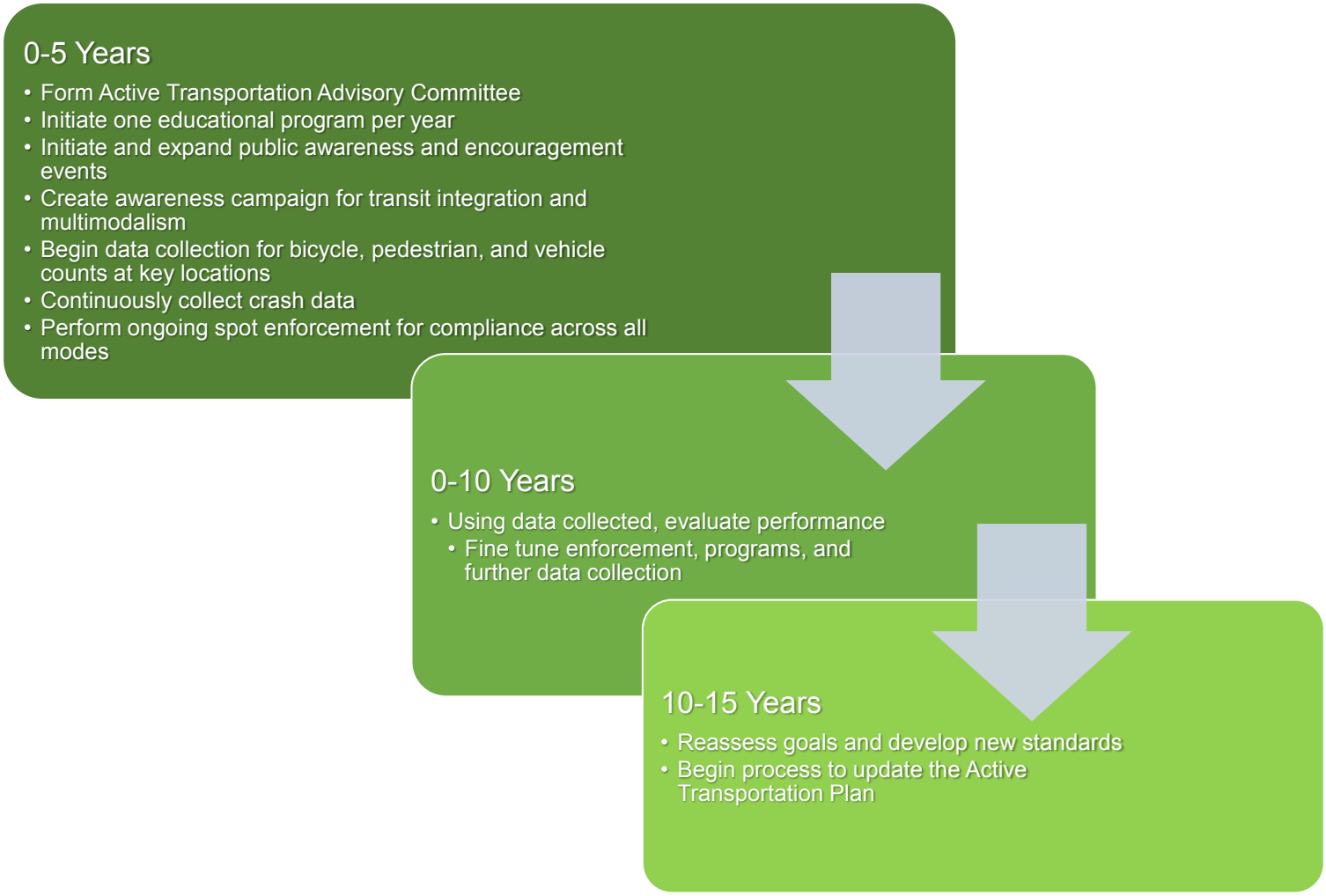


Figure 78. Phasing for propsed supportive programming

Appendix

Why This Plan?

Blue Zones

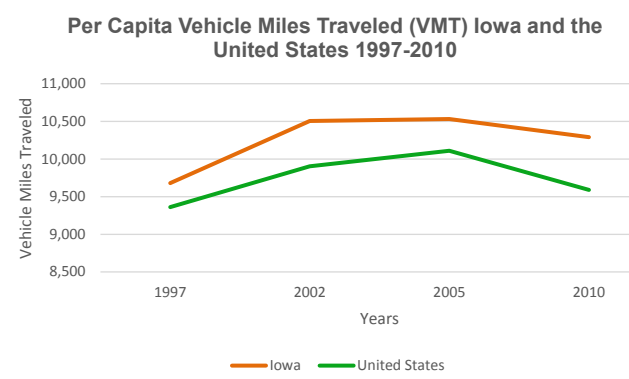
Blue Zones has made the adoption of Complete Streets policies as well as Bicycle and Pedestrian Master Plans an integral part of their designation process. This is due to the Blue Zones research identifying key factors for longevity and healthy living. Studies have shown that environments conducive to walking and biking encourage and reward the choice to walk and bike.[1]

There is a strong and well-documented link between physical activity and health and wellness. According to the 2008 Physical Activity Guidelines for Americans[2], physical activity can have multiple health benefits such as improving the chance of living a longer and healthier life; protecting against heart disease, strokes, high blood pressure, type-2 diabetes, and osteoporosis while preventing weight gain; and increasing heart-lung and muscle fitness. Physical activity may also relieve some symptoms of depression and anxiety while improving mood.

Studies[3] [4] show that as little as 15-20 minutes of physical activity a day is enough to see many of these benefits. Walking is the easiest and most cost-effective way to incorporate physical activity into a daily routine. This is one of the reasons Blue Zones has made Active Transportation one of their key goals. By increasing activity levels, people receive low-cost preventative health benefits. Since more than 1 in 3 adults are obese, increasing physical activity is important. Obesity contributes to heart disease, type-2 diabetes, and strokes, which are the leading causes of preventable death. This trend is also seen in children. Increased childhood obesity leads to diabetes and other medical issues usually seen only in adults.[5]

1 Centers for Disease Control and Prevention (CDC). Behavioral Risk Factor Surveillance System Survey Data. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2009.
2 U.S. Dept. of Health and Human Services. 2008 Physical Activity Guidelines for Americans. 2008.
3 Manson JE, Hu FB, Rich-Edwards JW, et al. A prospective study of walking as compared with vigorous exercise in the prevention of coronary heart disease in women. N Engl J Med. 1999; 341:650-8.
4 Tanasescu M, Leitzmann MF, Rimm EB, Willett WC, Stampfer MJ, Hu FB. Exercise type and intensity in relation to coronary heart disease in men. JAMA. 2002; 288:1994-2000.
5 Prevalence of Childhood and Adult Obesity in the United States, 2011-2012. http://jama.jamanetwork.com/article.aspx?articleid=1832542

National Trends



Vehicle miles traveled (VMT) is a common measurement of travel for roadway systems and is most regularly used in the United States as an indicator of miles traveled by vehicles within a specific region or over a duration of time. Strategies for reducing VMT are important for controlling congestion, reducing environmental impacts, and improving the overall reliance of personal vehicles. The United States reached its peak vehicle miles travelled (VMT) in 2007 at 3 trillion VMT.[6] The years before 2007 showed steady increase in VMT, but since then, VMT has leveled off. Figure 3 shows rural and urban VMT from 1980 to 2012.[7] As time passes it will be interesting to see if VMT keeps leveling off or starts to decrease. For now, it indicates that Americans have stagnated in terms of VMT and may be becoming less car dependent.

A recent study[8] has found that mode choice by individuals in the United States may vary more than in previous years, suggesting that Americans today may be less car dependent than in previous decades. The study found that "population density and access to public transportation are associated with greater likelihood of being multimodal (using more than one transportation mode)."[9]

American driving habits may be influenced by a number of reasons. The recent recession and other economic factors may contribute to a better understanding of the stagnation of VMT and decreased reliance of the personal automobile. Unemployment rates have only just begun to return to pre-recession levels. However at the end of 2007 when the recession began unemployment grew drastically as seen in Figure 4.[10] In addition to increasing unemployment, Americans faced decreased or stagnating incomes during the recession. Which means they simply had less buying power for transportation.[11] Gas prices have been increasing and have been at historic highs as can be seen in Figure 5.[12]

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6 Puentes, Robert. "Have Americans hit peak travel? A discussion of the changes in US driving habits." International Transport Forum Discussion Paper, 2012.

7 U.S. Department of Transportation, Federal Highway Administration, Highway Statistics. Highway Vehicle-miles Traveled Rural and Urban 1980-2012. http://www.rita.dot.gov/bts/

8 Buehler, Ralph, and Andrea Hamre. "The multimodal majority? Driving, walking, cycling, and public transportation use among American adults." Transportation (2014): 1-21.

9 Buehler, "The multimodal majority?", 1-21.

10 U.S. Department of Labor, Bureau of Labor Statistics, Unemployment Rate Percent of rate 16 years and over. Accessed Dec 8, 2014. http://data.bls.gov/pdq/SurveyOutputServlet

11 Aaron Cobet, High-income House spending and the Economic Recovery, United States Department of Labor, BHureau of Labor Statistics. http://www.bls.gov/spotlight/2014/high-income-spending-economic-recovery/home.htm

12 U.S. Energy Information Administration. Petroleum and other Liquids: U.S. All Grades All Formulations Retail Gasoline Prices. Accessed Dec 8, 2014. www.eia.gov

Combining these factors associated with economic recession including the reduced purchasing power of consumers, unemployment and high gas prices, may provide a better perceptive of recent trends in VMT and reduced reliance.

Transportation for Younger Populations

City leaders have recently expressed concern regarding attracting young professionals to the city. Understanding the driving habits and preferences of this population is important. First, although there continues to be an increasing number of licensed drivers, the percentage of licensed drivers has declined. Importantly, the percentage of young drivers has dropped significantly in the last 30 years.[13] Generally, young drivers are taking fewer and shorter trips than previous generations.

The reasons fewer young adults are applying for driver's licenses are diverse. Those who are students or working part time are less likely to have a driver's license than those who have a full time job or those who live independently with children. Similarly, young adults are choosing to marry and have children later in their lives and thus are less dependent on a personal vehicle.[14] The expenses associated with owning and operating a personal vehicle contribute to falling numbers of licensed drivers. In addition, young people are reprioritizing their spending away from cars and towards other amenities, such as housing, food, and entertainment. [15]

Young adults increasingly value the accessibility of urban areas over the flexibility of personal vehicles. This trend is especially true for those without children who prefer to live in mixed use urban areas. Those who live in these areas are able to access and utilize public transit facilities, meaning owning a car or getting a driver's license is less important, but location is more important. Another reason young adults may not be applying for driver's licenses may be increased regulations. The introduction of graduated driver licensing (GDL) to improve road safety may pose a barrier to accessing licenses. GDL regulations typically require a number of hours of supervised driving, which may be problematic for young adults without access to a car.[16] This may result in young adults deciding to get a driver's license later in life or adopting other modes of transportation.

Several other factors may also be influencing young adults' decisions to forgo getting a driver's license. This may include the role of cellular or mobile technology, which gives young adults the ability to communicate and stay in contact with peers through phone calls, email, texting,

13 Puentes, "Have Americans hit peak travel? 2012.
14 Delbosc, Alexa, and Graham Currie. "Causes of youth licensing decline: A synthesis of evidence." Transport Reviews 33, no. 3 (2013): 271-290.
15 Delbosc, "Causes of youth licensing decline", 271-290.
16 Ibid.

or social media. [17] For young adults, the symbol of independence that a personal vehicle once had may not be as clear or pronounced for today's generation. Therefore, owning or having access to a vehicle may be less important. Finally, young adults may see other modes of transportation as a more environmentally friendly option than a personal vehicle. Thus, in order to be eco-friendly, they have adopted other options that are less degrading to the environment and are more sustainable.[18]

Transportation for Older Populations

Baby Boomers make up nearly 77 million people in the United States.[19] Planning for this generation and their transportation needs is becoming increasingly important as more transition into the 65 years and older age group. Although many will rely on personal vehicles as their primary mode of transportation, there is a growing trend of older adults choosing non-motorized transportation and public transit for more of their daily trips. In fact, walking is the second most popular means of travel for this group, followed by public transportation.

Transit use by older adults has "increased by 40% between 2001 and 2009."[20] This trend towards transit use may be influenced by the number of older, non-driving adults that has grown over the last decade by 1.1 million.[21] A recent AARP report highlighted that "to accommodate the mobility needs of an aging population, the focus of transportation planning and policy must shift from increasing road capacity to providing more multimodal solutions."[22] This will require concentrated efforts for planners and public officials to understand and adapt to this generation's needs.

Within Sioux City, the 65 years and older age group makes up 15.0% of the total population. There is also a large portion of the population that will transition into this age group within the next decade.[23] In Sioux City, this group tends to live far from the city center. As this group continues to grow, there will need to be more of an emphasis on how to accommodate their transportation needs. A recent AARP report found that, of those surveyed, 73% age 65 or older strongly agreed with the statement "What I'd really like to do is stay at my current residence

17 Ibid.
18 Delbosc, "Causes of youth licensing decline", 271-290.
19 DeGood, Kevin. "Aging in place, stuck without options: Fixing the mobility crisis threatening the baby boom generation." (2011).
20 DeGood, "Aging in place", (2011).
21 Lynott, Jana, and Carlos Figueiredo. "How the Travel Patterns of Older Adults Are Changing: Highlights from the 2009 National Household Travel Survey." No. Fact Sheet 218. 2011.
22 Lynott, "How the Travel Patterns of Older Adults", 2011.
23 U.S. Census Bureau; Census 2010, generated by Samuel Sturtz; using American FactFinder; <http://factfinder2.census.gov>; (11 November 2014).

for as long possible."[24] The same report also found that respondents over 65 value being near friends, family, church, and social organization. For Sioux City, these findings are important. This age group will most likely want to stay in their current residence, but also want to stay connected to their community[25]. As this population ages, they will rely less on personal vehicles and more on other modes of transportation. For Sioux City, this means finding ways to accommodate the changing needs for a large and growing portion of the population by increasing the facilities and programs that support walking and transit within the city.

What Does This Mean For Sioux City?

As stated above, it seems that Americans are driving less. For Sioux City, this means that transportation planning and policy should be directed towards finding a clearer balance between auto-dominated transportation systems and alternatives such as active transportation. In Sioux City, the increasing number of Baby Boomers who will enter the 65 years and older age group will also present unique challenges and opportunities for providing support for alternative modes of transportation. The city is also trying to draw in young professionals. To attract this group, it is important to consider their travel behaviors. Many may feel less inclined to use a personal vehicle and instead use other modes of transportation. Sioux City should develop the facilities and necessary infrastructure to allow its residents to choose the best mode of travel for themselves.

24 Keenan, Teresa. "Home and Community Preferences of the 45+ Population." (AARP). 2010.
25 Keenan, "home and community Preferences", 2010.

Existing Plans and Policies

Below are a series of plans and related documents which guide the development of transportation policies and infrastructure in Sioux City.

Comprehensive Plan

The primary planning document guiding development in Sioux City is the comprehensive plan, adopted in 2005. One of the many topics covered within the plan is transportation. Although the focus of the plan appears to be automotive travel, it clearly calls for a closer balance between automotive and other modes of transportation. Improving the quality of alternative modes of transportation is described as necessary for the people of Sioux City. Furthermore, the plan calls for action to reduce potentially fatal transportation accidents in all modes. This Active Transportation Plan is designed to elaborate on the existing comprehensive plan by providing more specific recommendations on how to promote safe bicycle and pedestrian transportation throughout Sioux City.

Long Range Transportation Plan

The Long Range Transportation Plan (LRTP), adopted in 2011, provides more detail in the area of transportation planning. This plan is developed and maintained by SIMPCO. This plan is currently being redeveloped by SIMPCO and is expected to be complete by January of 2016. The new LRTP will contain new chapters on bicycle and pedestrian transportation. These chapters will outline bicycle and pedestrian planning policy for the entire metropolitan region. The Active Transportation Plan is designed to coordinate with the new LRTP. Both plans will complement one another and ensure the alignment of City and regional planning in the area of bicycle and pedestrian transportation.

Complete Streets Policy

Sioux City adopted a Complete Streets Policy in July of 2014. This policy encourages Sioux City to implement practices that will spur the development of interconnected bicycle, pedestrian, and transit infrastructure throughout the city. This policy is expected to have a significant impact on the design of all future road construction projects. The Complete Streets Policy calls for added sidewalks, trails, and bicycle accommodations when conducting transportation-related construction projects, which will prove vital in assisting in the implementation of the Active Transportation Plan's recommendations.

Road Conversion Plan

Sioux City is considering the conversion of many of its one-way roads into two-way roads. An analysis was conducted by Olsson Associates to analyze the feasibility of these conversions. If the City moves forward with the road system conversion, it would provide an opportunity to implement many of the Complete Street Policy and Active Transportation Plan recommendations into the new infrastructure. Some roads under current consideration of conversion were analyzed for their potential as possible bicycle and pedestrian corridors so that new infrastructure could be implemented as part of any conversion.

Sioux City Design Guidelines

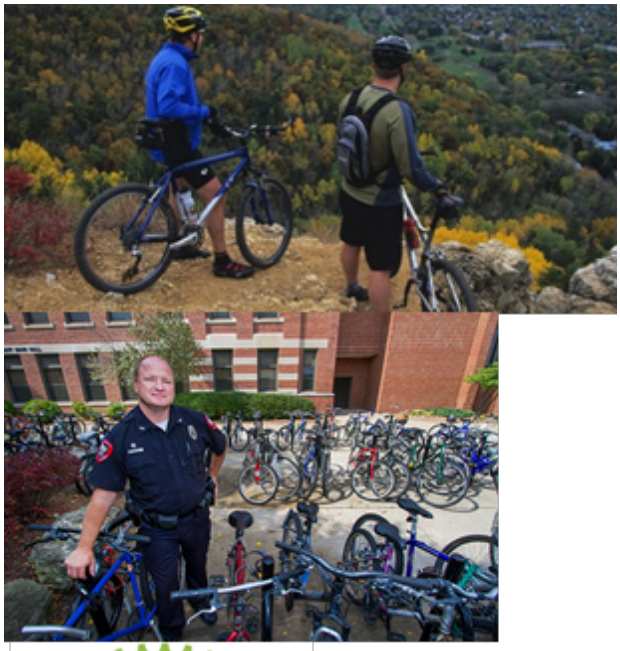
The Sioux City Design Guidelines describe the architectural, environmental, and engineering practices that are recommended for Sioux City. These guidelines outline a variety of topics, including trails, sidewalks, bicycle lanes, and complete streets. Many of the recommendations made in the Sioux City Design Guidelines describe adapting streets to accommodate bicycle and pedestrian traffic. These guidelines will prove valuable in the implementation of the recommendations made in this Active Transportation Plan.

Comparable and Aspirational Plans

Bicycle, pedestrian and active transportation plans from other cities were studied for insights on best practices, and to examine how certain challenges relevant to Sioux City, such as topography, Blue Zones requirements, trail and street integration, and goals were addressed. Four Midwestern cities were chosen on the basis of their location, Blue Zone status, award-winning recognition, and topography similar to Sioux City. Aspirational plans were examined due to their national recognition and how they addressed some of the challenges that face Sioux City while providing inspiration and best practices to strive toward. Key elements are identified that could be applied to Sioux City.

Comparable Plans

LaCrosse, WI



Source: LaCrosse, WI Bicycle and Pedestrian Master Plan.

City population: 52,553 (2013)

Plan: Bicycle and Pedestrian Master Plan (2012)

Ranking: Silver Bicycle Friendly Community

LaCrosse, like Sioux City, is located on a major river and has similar topography with a flat downtown near the river and hills that can prove challenging. The plan emphasized expanding and connecting the current infrastructure to promote the city as a regional center for active living. Goals included attaining Gold level designation for both Bicycle Friendly Community and Walk Friendly Community.

Key elements:

- Hiring a Bicycle and Pedestrian coordinator
- Identifying and improving critical pedestrian crossings
- Making connections between trails and on-street networks
- Transforming three streets into Bike Boulevards

Sioux Falls, SD

Source: Sioux Falls, SD Bicycle Master Plan

City population: 164,676 (2013)

Plan: Bicycle Master Plan (2007)

Ranking: Bronze Bicycle Friendly Community

The Sioux Falls Bicycle Master Plan, adopted in 2008, integrates the area MPO plans with city aspirations. On this level, it serves as a regional plan for making connections to neighboring communities. Sioux Falls has several existing trails that form a loop within the city. On-street facilities include designated routes that are ordered by experience level of the cyclist and street crossing points that have been upgraded for safety.

Key elements:

- Experiment with multiple types of infrastructure and seek public input on effectiveness.
- Wayfinding signs integrate trail and street information.
- Improving access and visibility to trails.

Source: Mason City, IA Activating Mason City

Mason City, IA

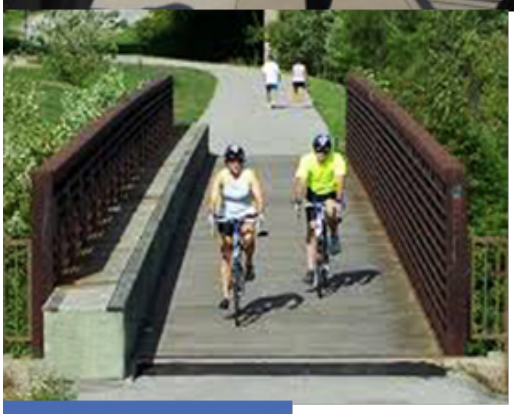
City population: 28,079 (2010)

Plan: Activating Mason City (2014)

After two years of policy implementation and preparation, Mason City was designated a Blue Zones community in 2014. The city adopted a Complete Streets policy and a Bicycle and Pedestrian Master Plan while also committing $1.8 million to fund the first five years of projects. Mason City moved quickly to extend trails and install bike lanes in preparation for the Register's Annual Great Bicycle Ride Across Iowa (RAGBRAI) in 2014. The Bicycle and Pedestrian Master Plan included an evaluation of the pedestrian network, addressed ADA issues, and identified gaps in the infrastructure.

Key elements:

- Using the Blue Zones organizational structure to 'Build the Market' for active transportation.
- Provide suggestions for committees and coordinator positions.
- Focus on encouragement activities to involve the community in active transportation events.
- Events include walking groups, bike challenge events, and organizing running races.



Source: Muscatine, IA Pedestrian & Bicycle Master Plan

Muscatine, IA

City population: 28,079 (2010)

Plan: Pedestrian & Bicycle Master Plan (not adopted)

Muscatine is another Blue Zone community that recently adopted a Complete Streets policy and a pending Bicycle and Pedestrian Master Plan. The city faces many of the same challenges as Sioux City and other Iowa cities including a declining population, a shift in traditional industries, and increased bicycling and walking among its residents.

The master plan follows a standard 5E (Engineering, Education, Encouragement, Evaluation, Enforcement) structure but also brings in a unique technological approach to prioritizing infrastructure improvements with a map visualization tool. Areas around the schools are considered most crucial to the multiple goals of the Pedestrian and Bicycle Master Plan and Safe Routes to School (SRTS).

Key elements:

- Two of the goals are to gain recognition as a Bike Friendly Community and Walk Friendly Community.
- Phasing priority includes schools and safety elements

Source: Cincinnati, Oh Cincinnati Bicycle Transportation Plan

Cincinnati, OH

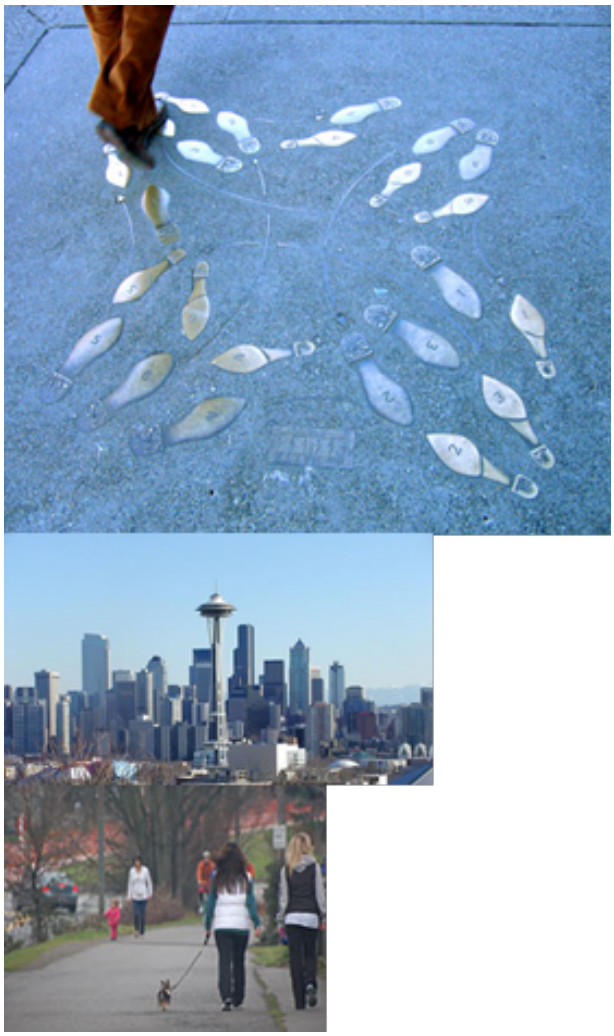
Population: 297,517 (2013)

Plan: Cincinnati Bicycle Transportation Plan (2010)

Cincinnati has a similar geography as Sioux City with hills around a flat, downtown riverfront. This plan was examined to specifically understand how challenges with topography were addressed. The best solution presented was the use of bike lanes on uphill travel lanes and sharrows on the downhill lanes. This solution protects the bicyclist when they are particularly vulnerable, while going uphill at a much slower speed than vehicles with no separated facilities. The full plan is ambitious, requesting 343 miles of bicycle facilities.

Key elements:

- Use of climbing lanes on hills.
- City with similar topography has found success with biking.



Source: Seattle, Wa Seattle Pedestrian Master Plan

Seattle, WA

Population: 652,405 (2013)

Plans:

Seattle Pedestrian Master Plan (2008)

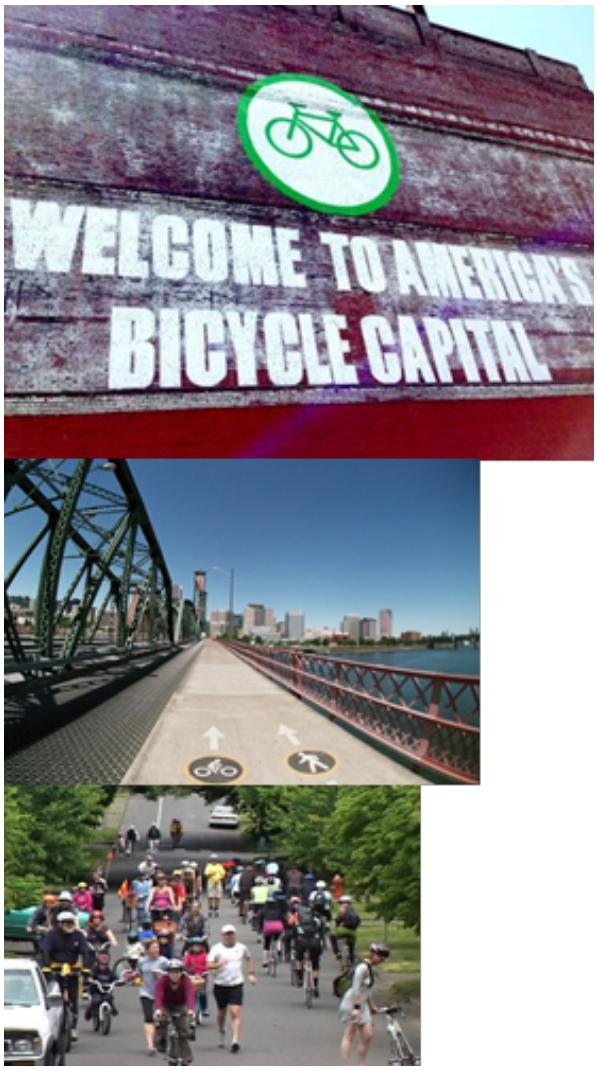
Seattle Bicycle Master Plan (2014)

Seattle is one of the more decorated cities in the United States with a Platinum rating from Walk Friendly Community and Gold rating for Bicycle Friendly Community. With the many hills in the metro area, the bicycle plan was also examined for clues on overcoming this barrier. While hills were acknowledged in the plan, no specific solution was given other than selecting an alternate route or using an e-bike.

The pedestrian plan focuses on improving the infrastructure and safety for all residents while improving the coordination between the various city departments and advocacy groups. A current extension of the plan examines improving lighting at key areas around the city to create a safer pedestrian environment. The city has also sought to increase funding for pedestrian projects through dedicated funds in the capital budget.

Key elements:

- Improving pedestrian infrastructure for all residents.
- Improve coordination between city departments and advocacy groups.
- Dedicated capital improvement funds for pedestrian projects.



Source: Protland, Or Portland Bicycle Plan for 2030

Portland, OR

Population: 609,456 (2013)

Plan: Portland Bicycle Plan for 2030 (2010)

Portland is often considered an aspirational standard for all cities. It is recognized as a Platinum-level Bicycle Friendly Community. The city has found ways to create safe routes for bicyclists, advance policy, and help foster community involvement. This involvement has occurred at the advocacy and policy level. Furthermore, there has been an effective public encouragement effort. For example, the city hosts five Sunday Parkways where large loops of streets are closed to car traffic and open to bicyclist and pedestrians. These events also include street art and other activities.

One of the unique types of infrastructure found in Portland are the Bicycle Boulevards. These are streets that have been optimized as bicycle routes due to their low car traffic. This creates a low cost network of routes that feed the bike lanes on major streets.

Key elements:

- Engage public in active transportation through open streets events.
- Use of Bicycle Boulevards to create a low-cost, low-stress network.

Questionnaire

1. What would support walking and biking within Sioux City? What hinders it?

2. Is it important to you to walk and bike more? Why?

3. If you could walk or bike more, what trips would you replace? Where would you go?

Age	Gender	Race	Neighborhood	Children

Questions for Focus Groups

1. Do you walk, bike, or use transit?

2. What barriers prevent you from biking or walking on your trips?

3. What would influence you to make more trips on bike or by walking?

4. Do you feel safe walking, cycling, bussing?

5. Do you use the skywalks? When?

6. Is there one vehicle trip per week that could you could replace with biking or walking?

Infrastructure

1. Do you know if there are bike trails/lanes, bus routes that run through your neighborhood?

2. What barriers prevent you from walking/cycling/riding the bus? (traffic volume, steep slopes, absence of sidewalk/bike lane/bike trail/ bus route…).

3. Do you feel the existing sidewalks, trails, and on-street bike routes are adequate?

4. How does availability/cost of parking influence your transportation decision?

5. Is there enough parking (free/paid) downtown or at locations you frequent? Would you reduce parking for an alternative mode of transportation?

6. Is sidewalk infrastructure adequate for walking? For using a stroller? Wheelchair? (ADA-compliance sidewalks and curb cuts)

Awareness

1. Do you know any events on bicycling in Sioux City? If yes, did you participate? If no, would you participate if you have more information?

Behavior

1. What would influence you to make more trips on bike or by walking?

2. Do you use the trails? Where do you go/which routes do you take?

3. Do you walk or bike for recreation or exercise in the evenings or during the weekend? Do you know anyone who does?

4. (If yes to above) How would you rate experience level?

5. (If yes to above?) What are the most important reasons for you to bike/walk? (health concerns, environmental protection, affordability, etc.)

6. Do you feel safe walking and cycling during the day/night?

    In your neighborhood

    On the trails

    Downtown

    In parks

7. What kind of/which trips could you replace by walking or biking in a given week? (Or maybe a hypothetical: if the bank/store you use is down the street, would you walk or bike there rather than drive? Why or why not?)

8. Do you use the skywalk? When or why not?

Activities

1. Are you aware of any organized biking or hiking events in Sioux City?

2. If yes, do you participate? If no, would you if you had more information?

3. Would you and your family be more likely to incorporate biking and walking for trip purposes or exercise/recreation?

    Any reasons for this preference?

Connections

1. Can you name some specific barriers to biking and walking in Sioux City?

Which are more of a problem for each mode?

Which destinations are important to you? Would you be more likely to bike or walk to these places if trails/sidewalks/bike lanes existed?

Would you walk or bike to a transit stop for any of your trips?

Knowing you can bring your bike on the bus, would you rather take the bus or bike to trailheads?

Informational - specific to bike group?

1. How would you rate your experience with biking?

Fearless

Enthusiastic

Interested

Uninterested/Unlikely to become interested

2. How is the culture of biking/walking/bussing in Sioux City changing, or has it remained the same since you can remember?

3. Among those who do bike/walk/use transit, would you say it's because they value

Health

Time

Saving money

Building a sense of community/culture

They have no choice

Informational-Specific to running group?

1. What are the dominate issues with being a pedestrian (runner) in the Sioux city area? Barriers?

2. What is running like in Sioux City? Is there a culture?

3. What are the most important reasons for you to run?

4. As a pedestrian or runner what destinations or places would attract you the most in the Sioux City area?

5. What could make Sioux City a better place to run/pedestrian? Opportunities?

6. What would encourage more people to use Active Transportation in Sioux City?

Informational-Safe Routes to School

1. What are the most successful aspects of the current Safe Routes to School program?

2. What has been the experience with the program so far? Are parents enthusiastically embracing it?

3. What discourages students from actively getting to school? Barriers?

4. What are limiting factors for the program?

5. What could encourage more people to participate in this program and actively get to school?

Other general thoughts

1. Would you describe the neighborhood where you live as mixed use?

2. Would you describe the neighborhood where you work as mixed use?

3. Would you walk/bike more if your neighborhood were more mixed use?

Table: What would support walking and cycling in Sioux City: Chi-squared test summary

	Neighborhood			Gender		
	Pearson Chi-squared	p	Significance level	Pearson Chi-squared	p	Significance level
Connectivity	3.7832	0.286		0.0563	0.812	
Bike lanes	1.1490	0.706		5.508	0.019	*
Maintenance	8.6918	0.034	*	0.5195	0.471	
Trails	1.8245	0.610		2.054	0.152	
Sidewalks	3.0540	0.383		0.4156	0.519	
Bike racks	1.9800	0.577		1.2351	0.266	
Destinations	2.7085	0.439		2.7039	0.1	.
	Age Group			Live with children		
	Pearson Chi-squared	p	Significance level	Pearson Chi-squared	p	Significance level
Connectivity	5.3199	0.236		1.9062	0.167	
Bike lanes	5.4137	0.28		0.0373	0.847	
Maintenance	1.754	0.777		1.3229	0.25	
Trails	8.5151	0.037	*	0.6595	0.417	
Sidewalks	4.9082	0.205		3.396	0.065	.
Bike racks	6.394	0.191		0.4043	0.525	
Destinations	5.9097	0.19		1.2842	0.257	

Significant level: (*) 0.05; (.) 0.1

Table: What hinders walking and cycling in Sioux City: Chi-squared test summary

	Neighborhood			Gender		
	Pearson Chi-squared	p	Significance level	Pearson Chi-squared	p	Significance level
Trails	1.1318	0.769		0.0369	0.848	
Sidewalks	1.3166	0.725		0.0022	0.963	
Bike lanes	1.1874	0.756		4.5932	0.032	*
Motorists' behaviors	2.1983	0.532		0.4774	0.49	
Safety: collisions	3.0596	0.383		0.0085	0.927	
Safety: lighting	1.9072	0.592		0.1888	0.664	
Signage	3.3440	0.342		2.3699	0.124	
Hills	2.4407	0.486		1.7594	0.185	
Physical ability	3.8015	0.284		3.5838	0.058	.
Connectivity	2.7255	0.436		2.7039	0.1	.

	Age Group			Live with children		
	Pearson Chi-squared	p	Significance level	Pearson Chi-squared	p	Significance level
Trails	2.2855	0.683		0.5333	0.465	
Sidewalks	3.7145	0.446		2.2741	0.132	
Bike lanes	1.6446	0.801		0.005	0.944	
Motorists' behaviors	4.2471	0.374		1.789	0.181	
Safety: collisions	8.7678	0.067	.	0.2722	0.602	
Safety: lighting	1.5152	0.824		0.005	0.944	
Signage	6.5901	0.159		1.3229	0.25	
Hills	4.8946	0.298		0.4289	0.513	
Physical ability	3.4344	0.488		-	-	
Connectivity	2.948	0.567		0.0406	0.84	

Weighted Accessibility Score

Weighted accessibility score for destination

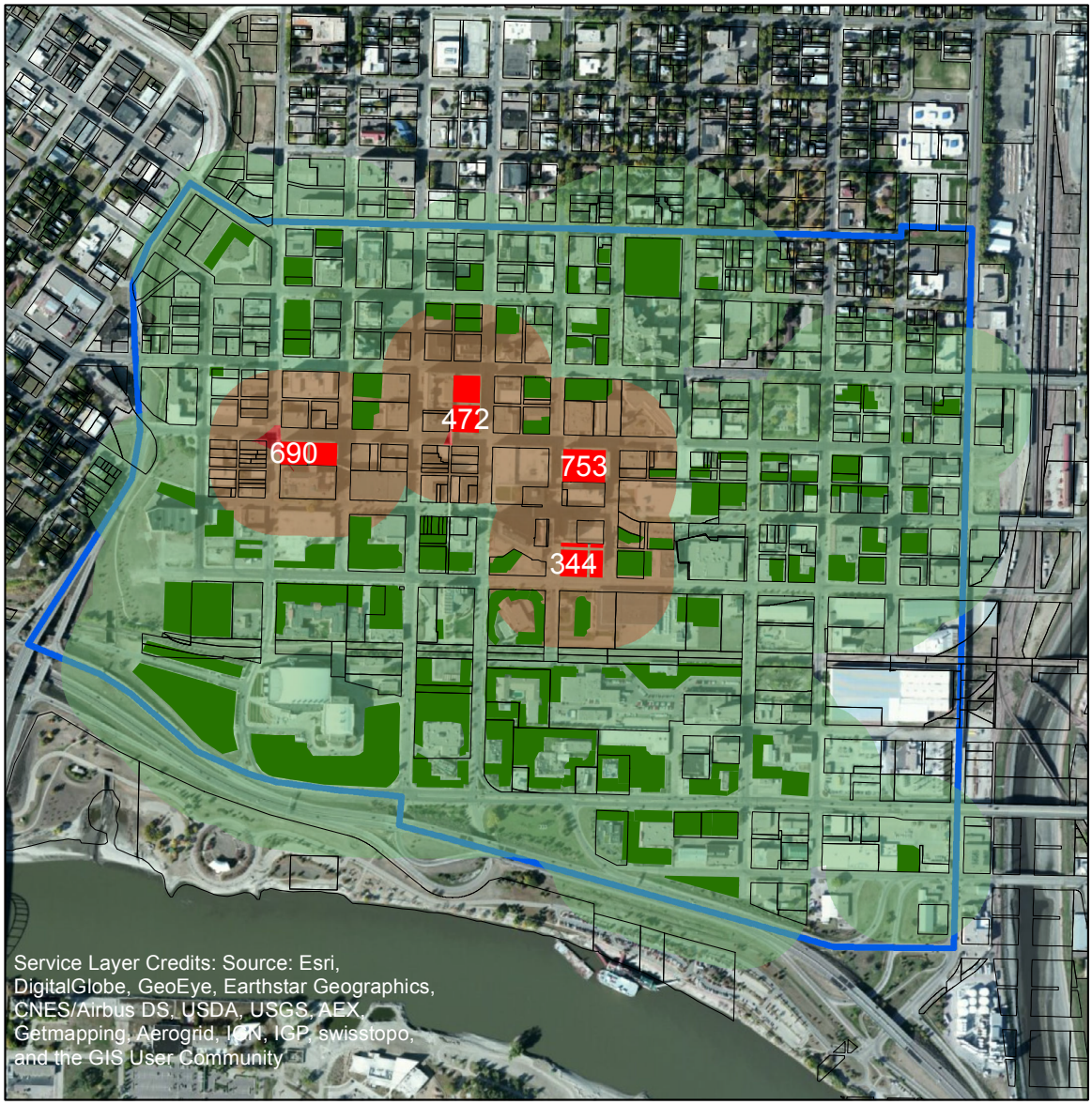
Destination	Base score
School	8
Retail, bank	7
Park, recreation, entertainment	6
Office	6
Daycare center	6
Other lower density employment centers	3
Industrial zone and very low density employment centers	2
Church	2

Note: These scores are assigned based on the importance of destinations with the reference from other plans, including Philadelphia Active Transportation Plan.

Parking Analysis

A parking analysis was conducted in order to determine the necessity of downtown, on-street parking. The GIS map shows the portions of downtown Sioux City with surface, commercial parking lots as well as parking structures. In total, the Discovery, Heritage, Martin Luther King Jr., and Rivers Landing parking structures contain 2,259 parking spaces. There are also 1,298 metered, on-street, downtown parking spaces. A buffer of 400 feet was added around each of the surface lots and parking structures in the downtown area, because 400 feet is the approximate length of one city block. As the map shows, almost the entire downtown area falls within one of these walking buffers. This shows that even without any on-street, downtown parking, people will be able to park on surface lots or in parking structures and be able to comfortably walk to their destination. Therefore, the removal of some on-street, downtown parking is not expected to limit people's ability to park within a short walking distance of their destination.

Downtown Sioux City Parking Analysis

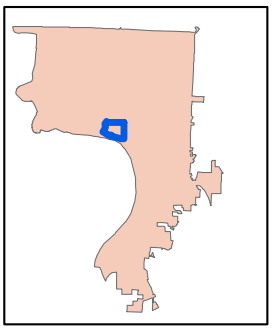


0 0.125 0.25 0.5 0.75 1 Miles

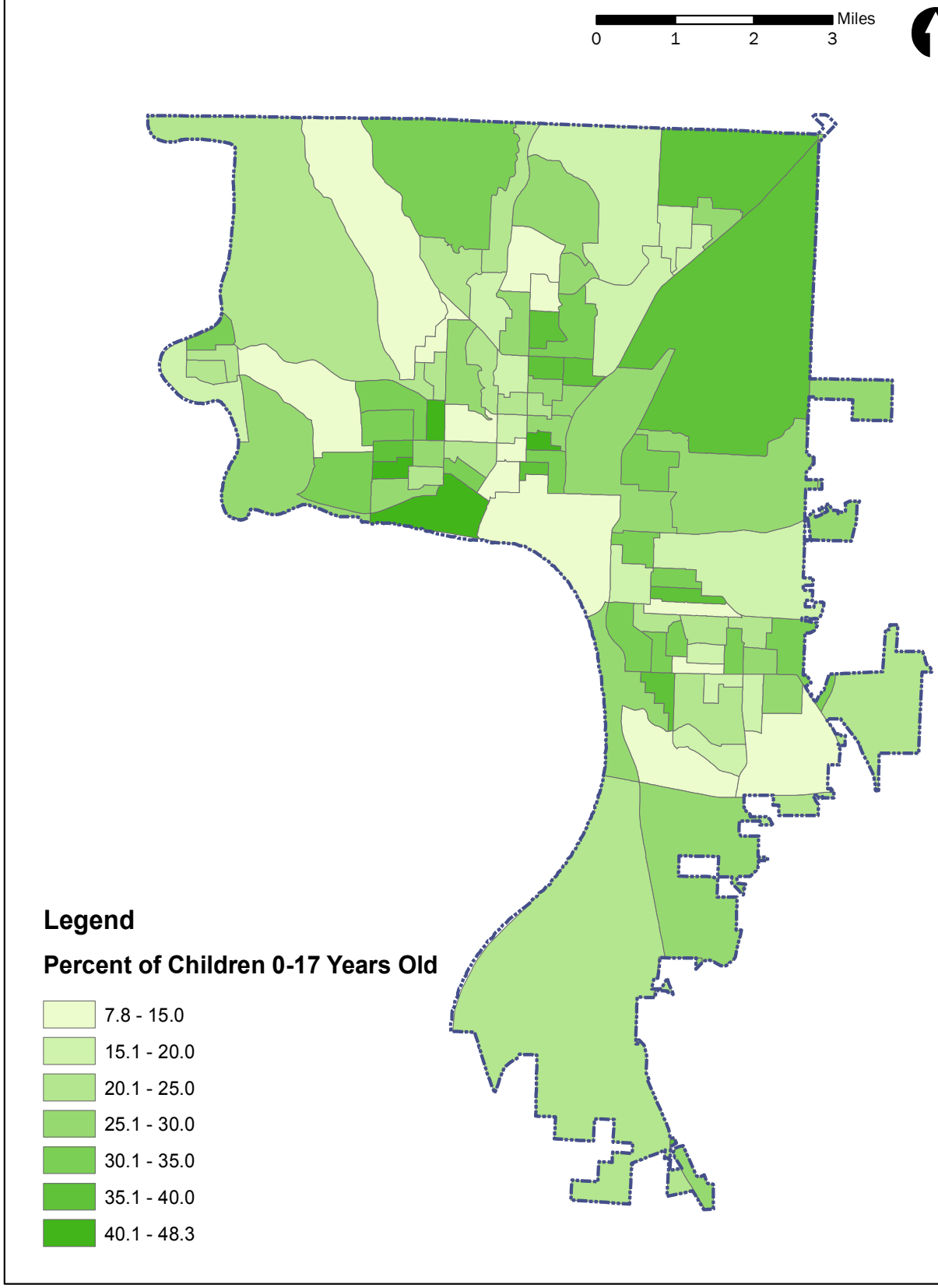
N

Legend

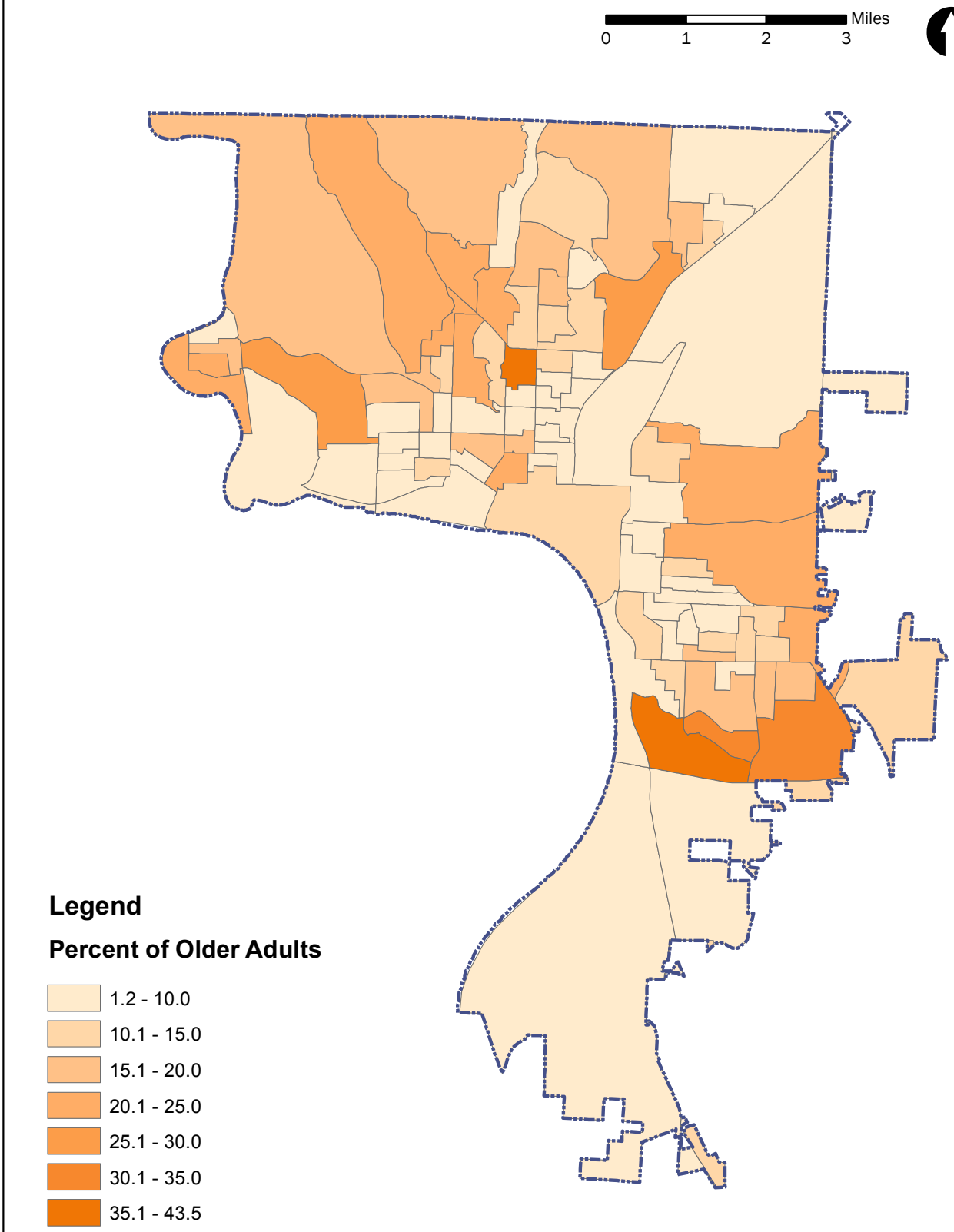
- Downtown
- Parking Structures
- Walk from Structure
- Surface Parking
- Walk from Surface



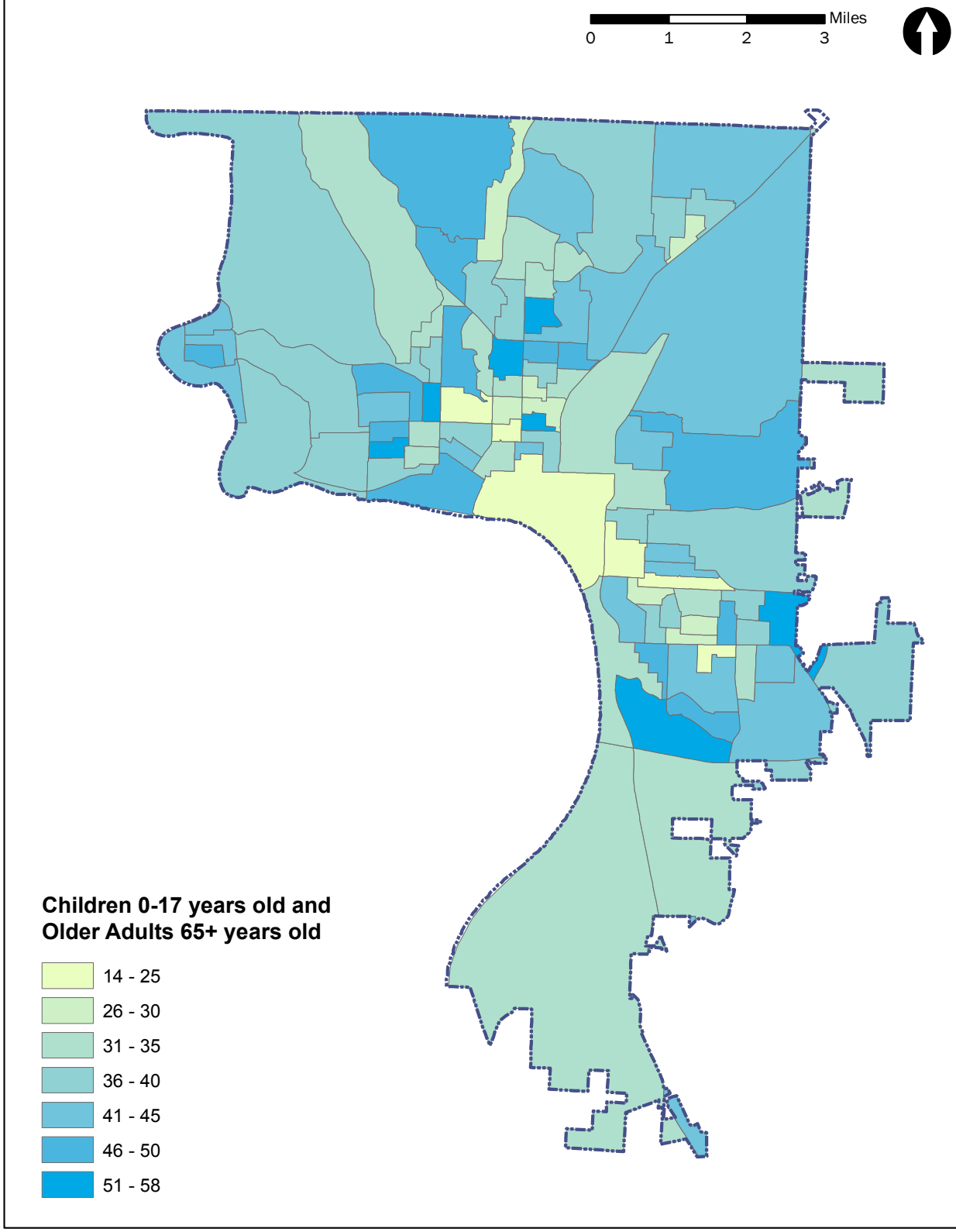
Percent of Children 0-17 Years of Age



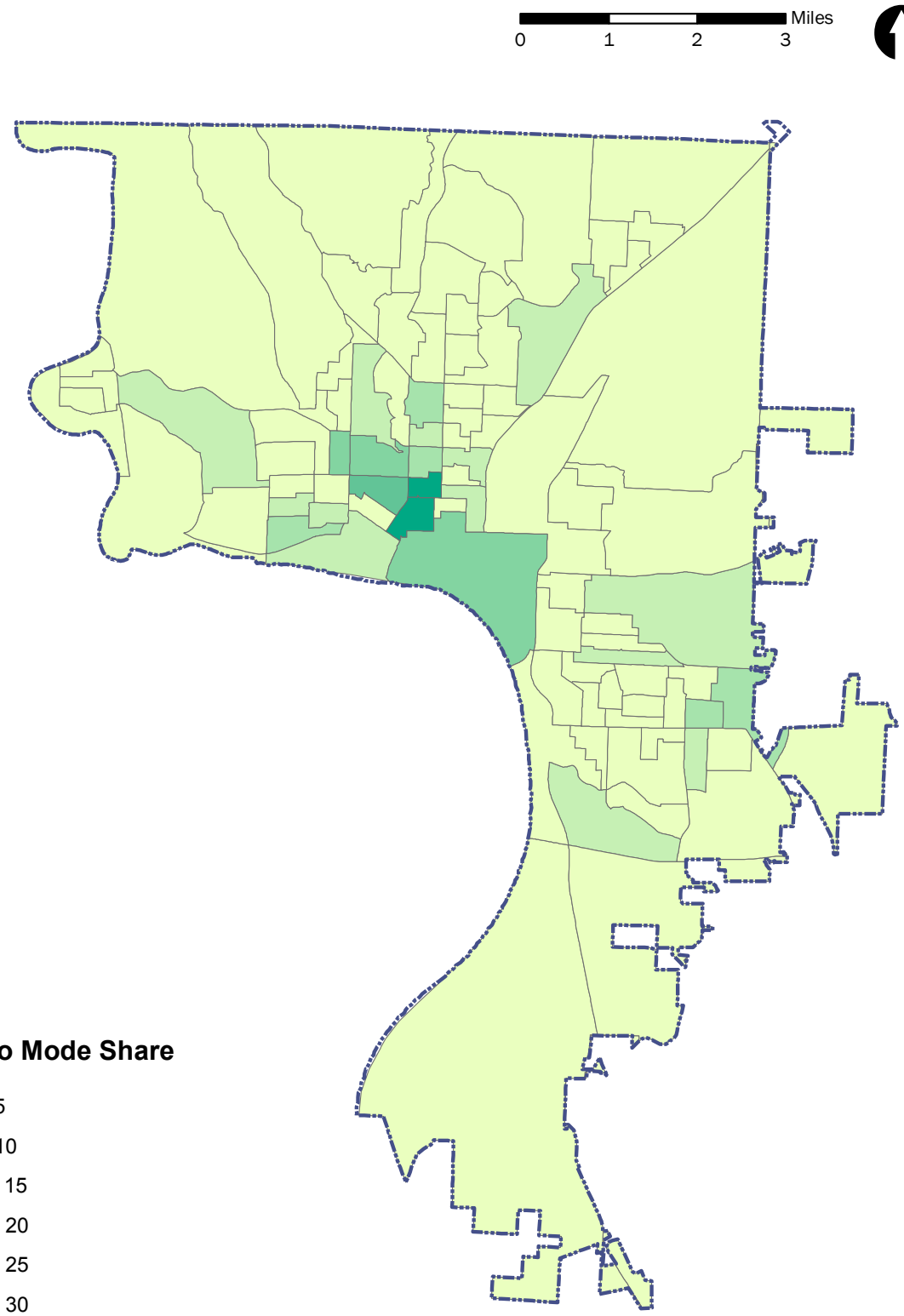
Percent of Adults 65 Years of Age or Older



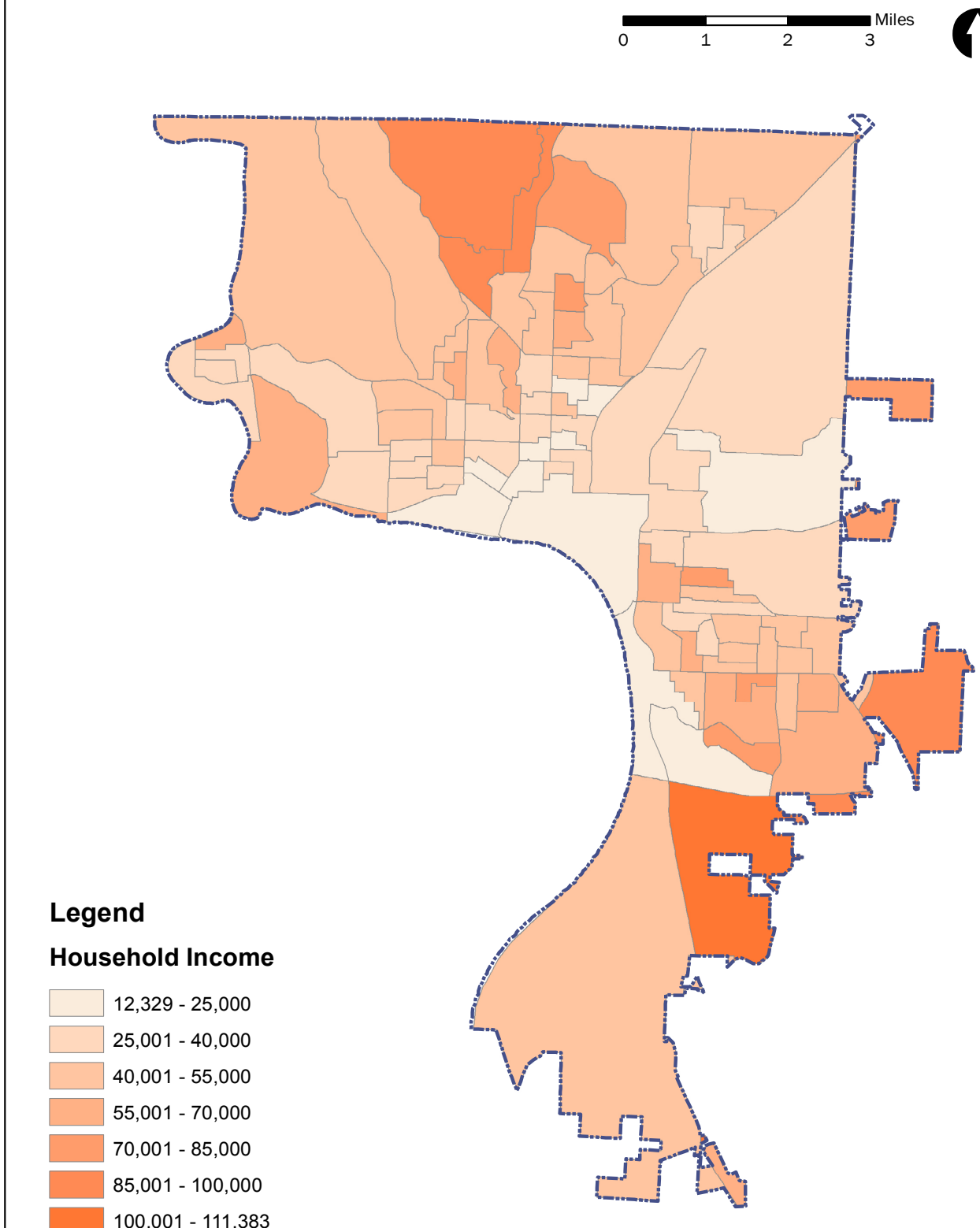
Percent of Children and Older Adults



Percent of Non-Auto Mode Share



Median Household Income



Glossary Picture Sources

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Bicyclist: http://www.planetizen.com/files/u405/Intermediate_Bicyclist.jpg

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Split Signal Phasing: http://ops.fhwa.dot.gov/publications/fhwahop08024/chapter4.htm#4.3

Leading Pedestrian Walk Interval: http://nacto.org/usdg/intersection-design-elements/traffic-signals/leading-pedestrian-interval/

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Crosswalk: http://carfreedallas.com/wp-content/uploads/2015/02/ladot.jpg

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Buffered Bicycle Lane: http://nacto.org/wp-content/gallery/2012_bufferedbikelane/bufferedbikelane_austin04.jpg

Wide Sidewalk: http://www.fhwa.dot.gov/publications/research/safety/pedbike/05085/images/les9fig2.jpg

Bicycle Box: http://nacto.org/wp-content/gallery/2012_bikebox/bikebox_austin01.jpg

Bicycle Route Wayfinding: http://bikemichiana.wp.ibsinternet.com/wp-content/uploads/2012/03/2012-03-06wayfindingsign11.jpg