HASTINGS
WALKABILITY + CONNECTIVITY STUDY

in partnership with TOOLE DESIGN

EXISTING TRAIL IN HEARTWELL PARK

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PROFILE

EXISTING TRAIL AT 12TH STREET + ELM AVENUE

PLANNING APPROACH

The development of the walkability and pedestrian plan started with the background and data collection phase to develop a “picture” with both images and data about the status of pedestrian access in the city. This picture is the foundation to move the city forward and establish a baseline to measure successes (PROFILE). A sidewalk inventory was conducted along with a demographic review of the community emphasizing age of residents, commuting patterns, and household income. A Latent Demand Analysis was also conducted as part of this review to highlight priority areas for new or enhanced bicycle and pedestrian infrastructure through land use patterns.

The ENVISION phase relied on local leader participation to gain an understanding of the opportunities, challenges, and needs of the pedestrians in the city. Much of this input was received during a stakeholder focus group meeting held in October, 2018, with staff from various city departments and representatives of local advocacy agencies.

Main themes reviewed were:

- Business district access
- Access to schools
- Recreation vs transportation routes
- How trails can enhance the city
- Impact and compliance with the city’s Quiet Zone Plan
- Typical sections, including pedestrian facilities needed improvements for ADA walkway locations

The ACHIEVE section is focused on the Prioritization Trail Planning Process utilizing field observations of sidewalk segments and curb ramps to identify the highest need for improvements. The resulting prioritization maps help form the basis for the final trails projects.

Lastly, the IMPLEMENTATION section incorporates the wants, needs, and desires of the city, as determined through this planning process, into an updated walkability plan. A discussion on the proposed trail route projects and how they could be funded is included in this section to provide the public with assurance Hastings’s local funds will be utilized as effectively and efficiently as possible. The importance of wayfinding and recommended applications are included in this chapter as well.

BACKGROUND + PURPOSE

Most of us are pedestrians at one time or another during the course of a day. Whether it's a walk to school or the bus stop, a few steps to our car, or a leisurely stroll around Lake Hastings we walk to get places and to get exercise. Supporting a walkable city that’s safe, vibrant, equitable, and healthy is key to our collective quality of life.

Hastings' recent passage of Complete Streets Policy as well as a general interest in enhancing the community's trail network created the opportunity to develop the Hastings Walkability and Connectivity Study. The resulting implementation plan focuses investments on streets near schools, public parks, and other community amenities. Not only does the study focus on improving access and safety for people walking, it also establishes strategies and actions that prioritize vibrant public spaces and complete streets to make walking and biking a more comfortable and enjoyable experience.

With significant gaps in Hastings' pedestrian network, this implementation plan describes the work that the city will undertake to implement a more walkable community over the next 10 years.

This plan should be reviewed annually to:

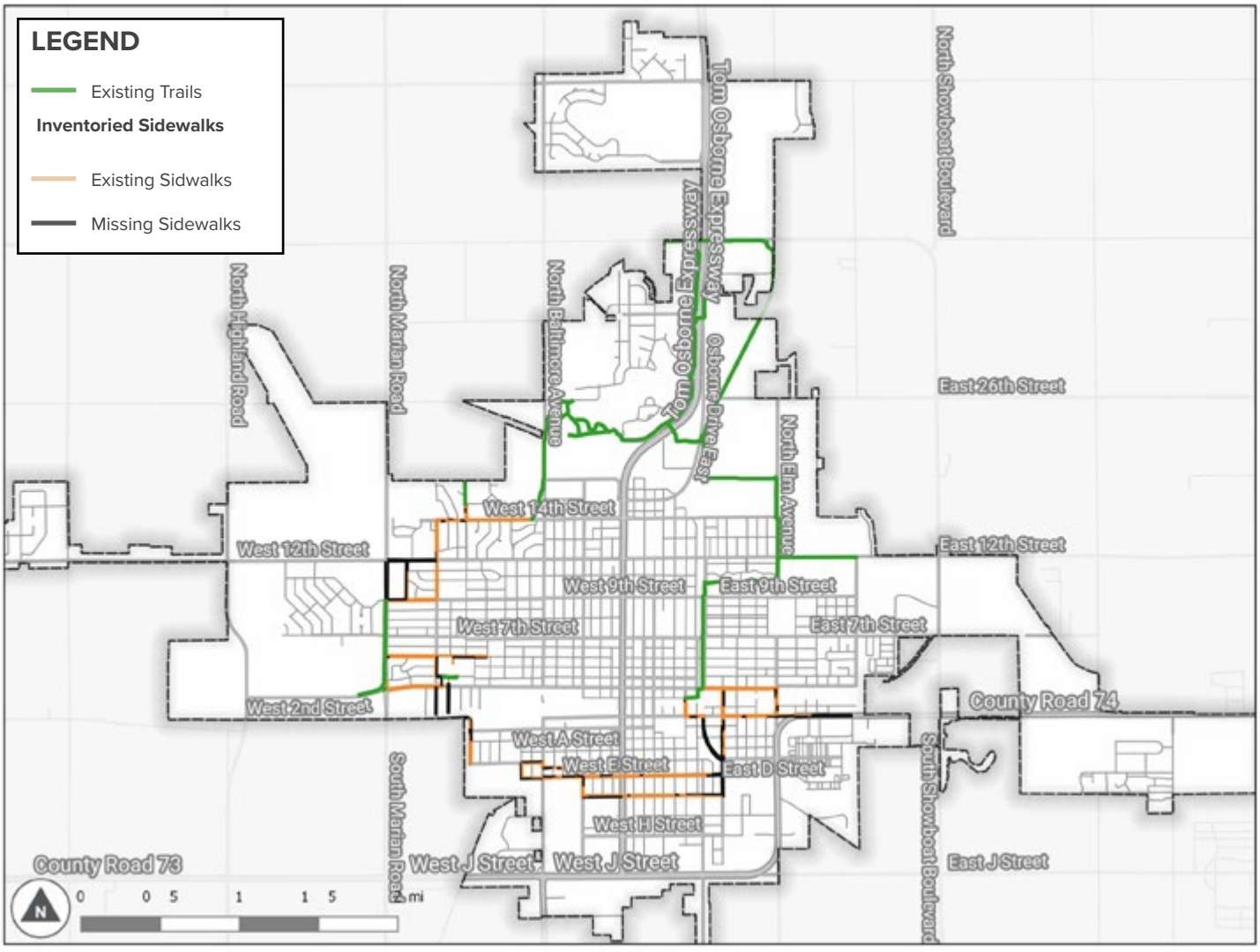
- Reprioritize projects to build;
- Serve as an accountability and reporting tool; and
- Guide future budget requests.

MARIAN ROAD, LOOKING NORTH TOWARDS 2ND STREET

EXISTING INFRASTRUCTURE

Many people walk and bike in Hastings, whether for recreation or to get where they need to go. Hastings' trail system is popular with people that like to walk, jog, or bike for fun and exercise. There are approximately 10 miles of trails in the area, all of which are part of the city's Pioneer Spirit Trail. Sidewalks are also an important component of the network providing additional connectivity. Based on the sidewalk inventory the project team completed in fall 2018 for 100 blocks in Hastings, 64% of inventoried roadways have sidewalks. However, there are important areas that are lacking sidewalks, or the sidewalks that are present are inaccessible for community members using mobility devices. For instance, North Laird Avenue, between West 2nd Street and West South Street is missing sidewalks on either side of the road. The railroad tracks also cross North Laird Avenue in this area, which makes it very challenging for pedestrians to safely cross the tracks, because there are no sidewalks. Figure 1 shows the existing trails that are part of the Pioneer Spirit Trail, and existing and missing sidewalks that were part of the fall 2018 sidewalk inventory.

Figure 1. Inventoried Network Segments: Existing Trails + Sidewalks



RELEVANT PLANNING INITIATIVES

IMAGINE HASTINGS | COMPREHENSIVE PLAN (2009)

The current comprehensive plan for Hastings highlights the need for greater pedestrian mobility:

> *A system of sidewalks runs throughout Hastings along some of the arterial roads. However, many of these pedestrian routes are disconnected and are in need of repair. Collector and local streets throughout Hastings often do not have a pedestrian route. Where sidewalks exist, there are often obstructions such as trees and utility poles that limit the width of the walkway.*

Goal PR. 2 further states the need for a trail network:

> *Create a comprehensive recreational trail network that connects the community through the parks, open and recreational spaces as well as the civic uses.*

Goal PR. 4 expands trails beyond recreational use and notes the need for greater pedestrian mobility:

> *Create an integrated pedestrian network of sidewalks, trails and parks within the community.*

CITY OF HASTINGS COMPLETE STREETS POLICY (2013)

A Complete Street is designed to be a transportation corridor for all users: pedestrians, cyclists, transit users, and motorists. Complete streets are designed and operated to enable safe continuous travel networks for all users, pedestrians, bicyclists, and motorists of all ages and abilities are able to safely move from destination to destination along and across a network of complete streets. Elements of Complete Streets include street and sidewalk lighting, pedestrian and bicycle safety, access to streets and sidewalk, street trees and landscaping, drainage, parking and street amenities. The vision of the City of Hastings is to provide a safe and efficient motorized and non-motorized transportation system that creates access to businesses, schools, parks and neighborhoods, promotes health and mobility, and takes into consideration all citizens and all modes of transportation.

The purpose of this policy is to provide a network of interconnected local and collector streets that supports walking and bicycling for all citizens of Hastings, Nebraska. This will be accomplished because all street projects–including design, planning, reconstruction, rehabilitation maintenance, or operations–shall be executed in a way that takes into consideration ways to accommodate and encourage travel by bicyclists and pedestrians of all ages and abilities.

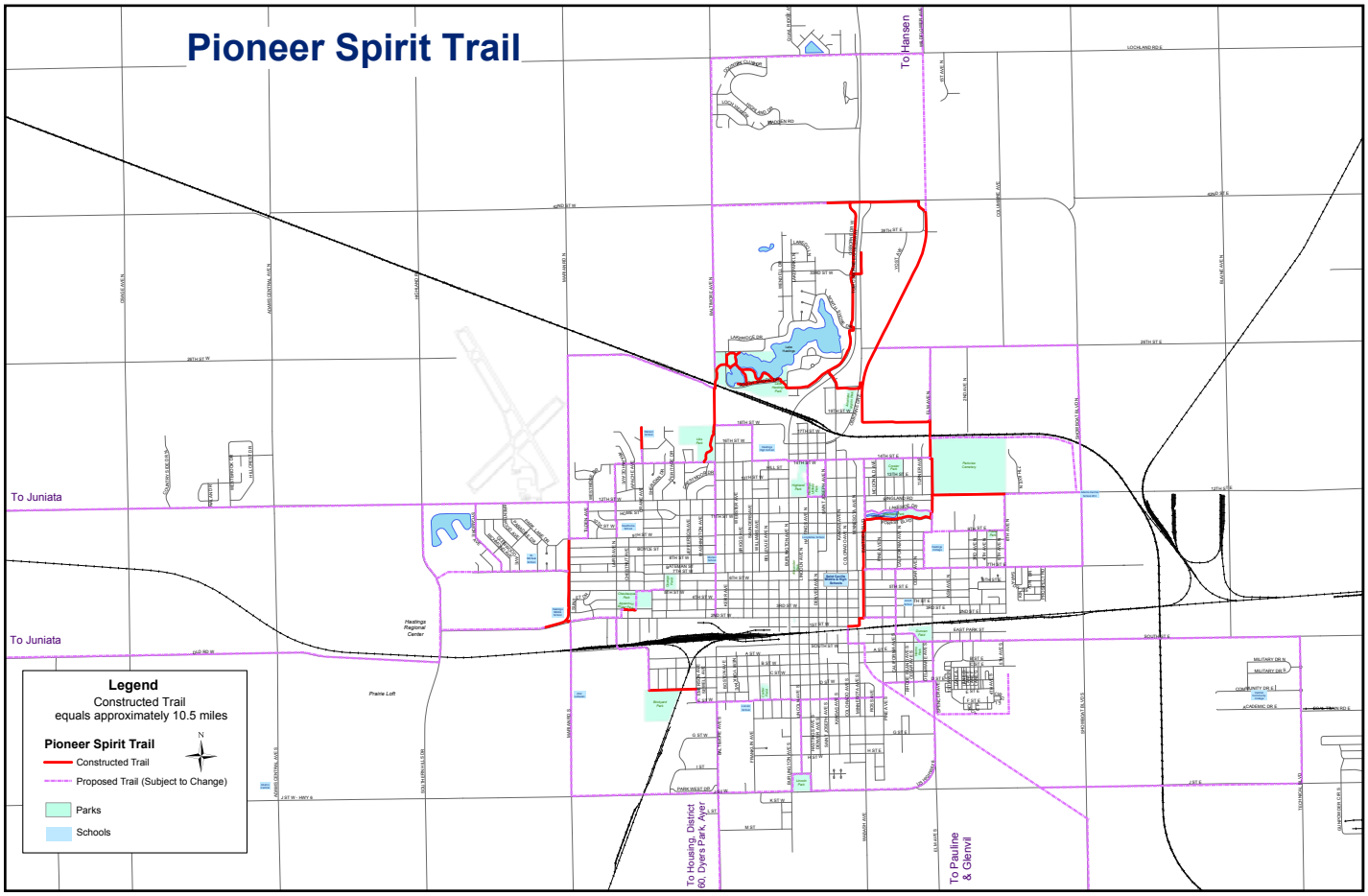
PIONEER SPIRIT TRAIL

Hastings, along with other communities across the nation, has recognized the need for an intermodal pedestrian transportation network in the city.

The purpose of the Pioneer Spirit Trail is to provide for a pedestrian, bike, and an exercise route between major recreational centers such as Libs Park, Heartwell Park, Lake Hastings, Hastings College, and the Downtown Central Business District. The latest additions connected to the Prairie Ridge Park facility and major shopping centers along North Highway 281 (see Figure 2).

The trail has been predominantly funded by federal funds with local match. As funds are available, extensions will be made in accordance with the Trail Master Plan.

Figure 2. Pioneer Spirit Trail: Existing + Future Trail Segments



Source: City of Hastings Engineering

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DEMOGRAPHIC REVIEW

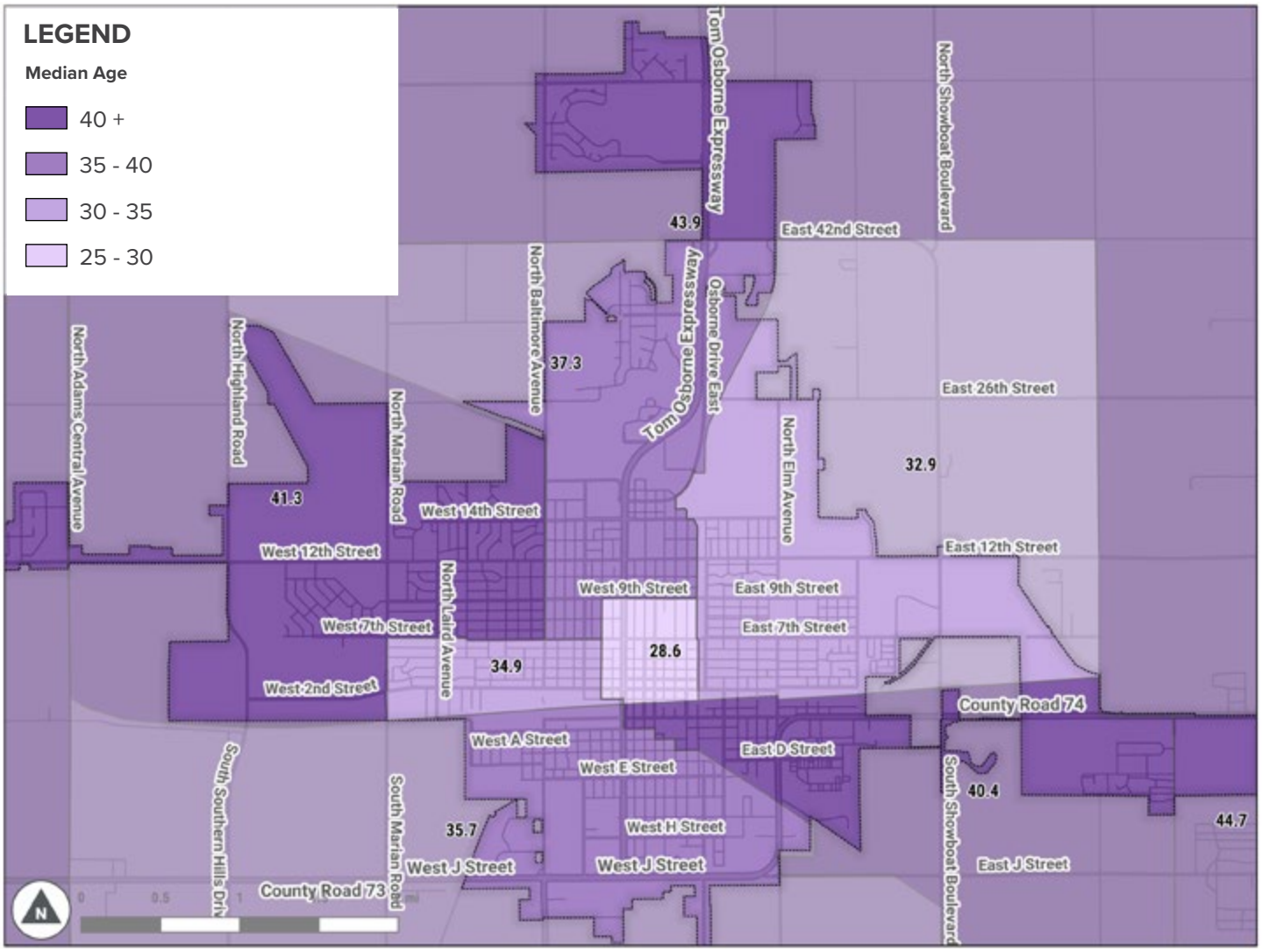
To better understand the community, Census demographics were reviewed for median age, poverty, commute mode and vehicle ownership. All data reviewed was from the 2017 American Community Survey, 5-year estimates.

While some characteristics might not be surprising, there are certain locations in Hastings that have unique characteristics, such as southern Hastings.

MEDIAN AGE

Many areas in Hastings have median ages representative of young families and older adults (Figure 3). The median age of adults living in Hastings is about 36 years old and 20% of Hastings residents are under the age of 14 years. A young median adult age and an overall large percentage of children and adolescents implies that Hastings is home to families.

Figure 3. Median Adult Age In Hastings, Nebraska

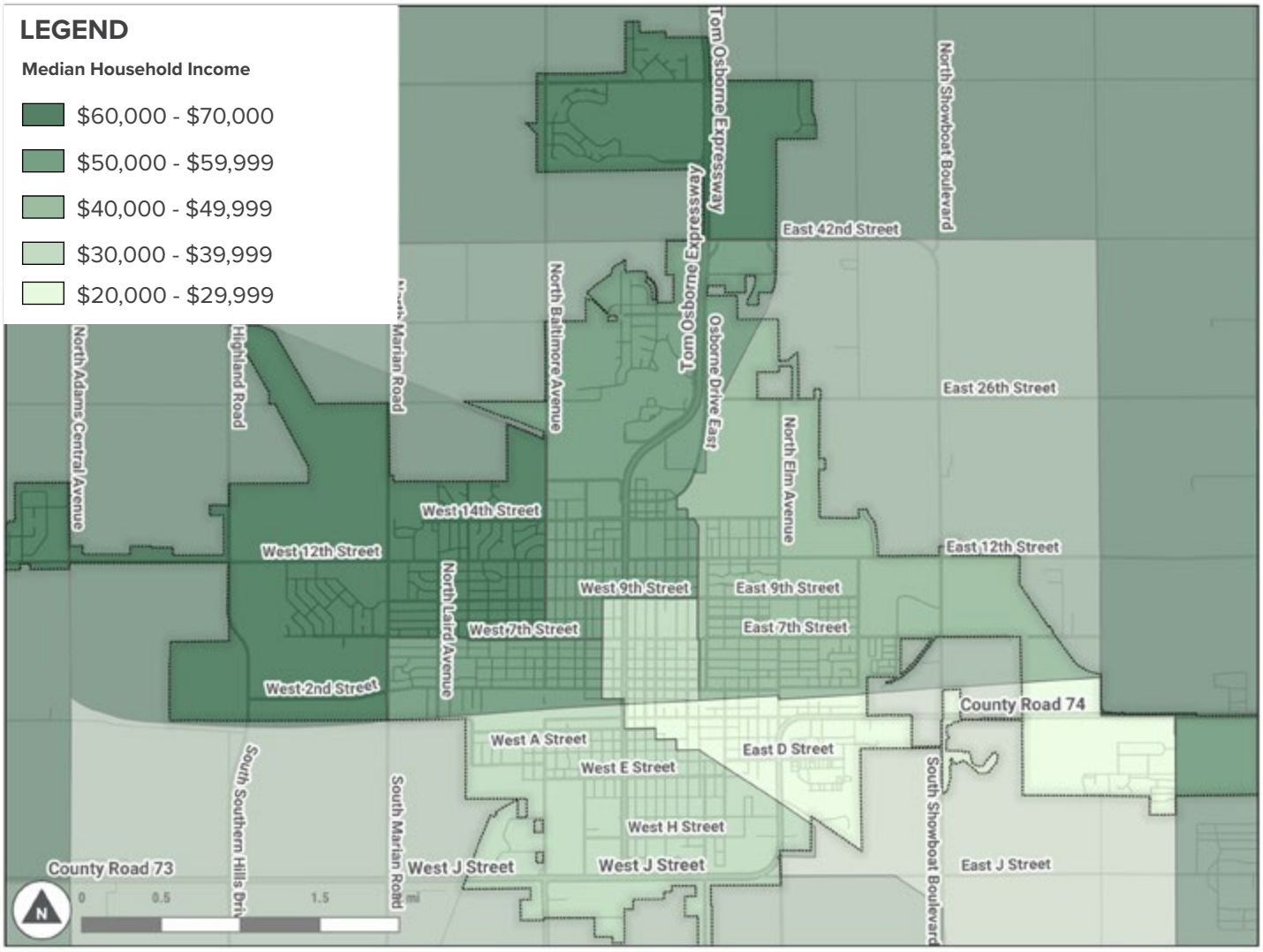


There is a concentration of residents over the age of 50 in southeast Hastings in and around the Good Samaritan retirement village. This is a key area where bicycling and pedestrian recommendations should ensure that older adults can comfortably access destinations, regardless of any mobility limitations. Residents below the median age typically reside nearer to downtown and areas adjacent to Hastings College and Central Community College in eastern Hastings. When planning bicycle and walking facilities, the facilities will need to be planned for all age groups and all abilities, so that young children to older adults can feel comfortable and confident bicycling and walking in Hastings.

HOUSEHOLD INCOME

Research has indicated that individuals' economic characteristics greatly influence mode choice, and more solo driving can be expected from those with higher incomes.[1] Median household incomes vary across Hastings (Figure 4). Southern Hastings and downtown Hastings have lower median household incomes when compared to the rest of the city. These areas also have a higher percentage of households living below the poverty line, and as such, these households have a higher likelihood of depending on transit, walking, or bicycling to get around.[2]

Figure 4. Median Household Income in Hastings, Nebraska



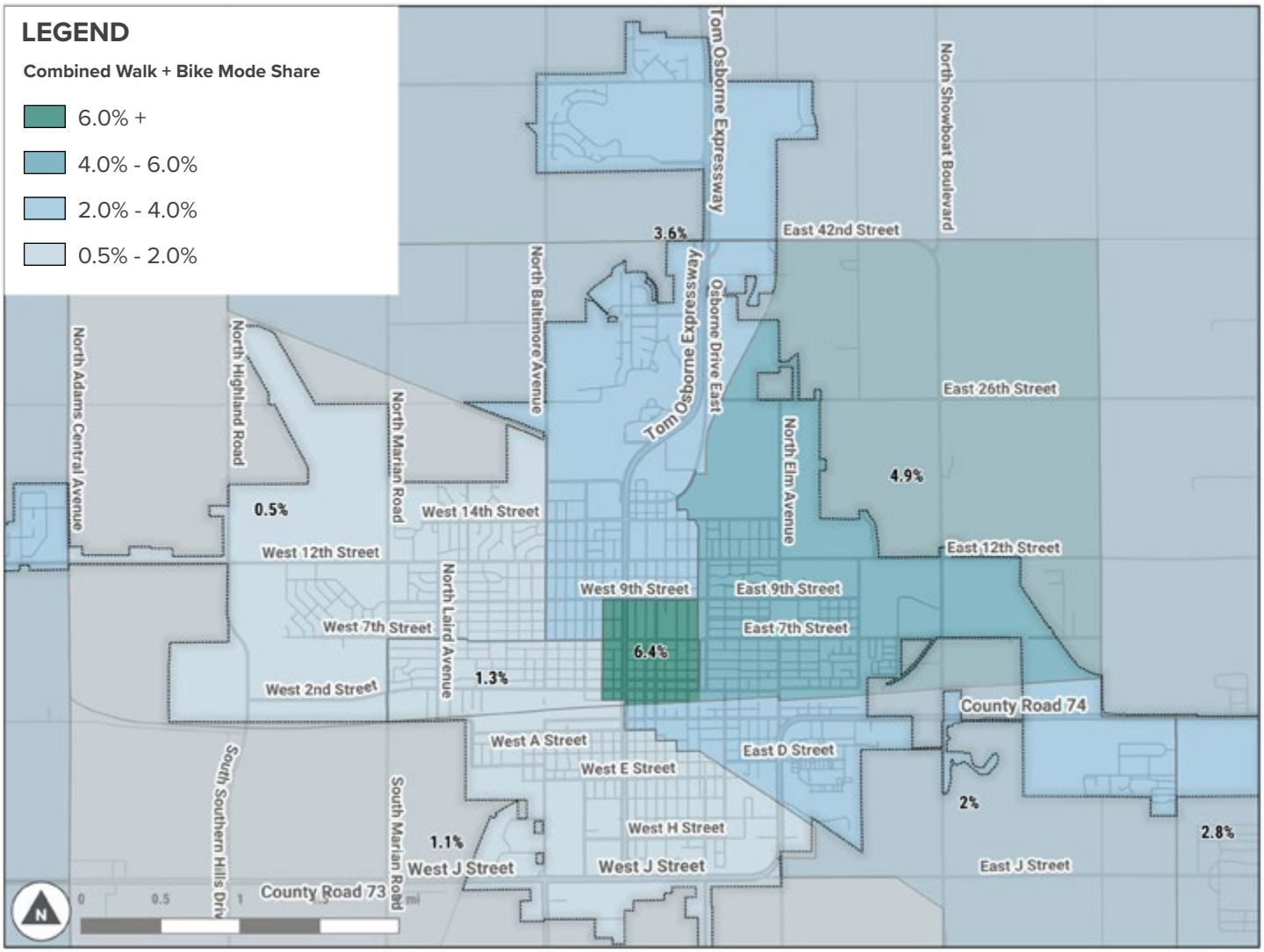
1 The Next Generation of Travel: Research Analysis and Scenario Development. E Interrante - Federal Highway Administration, U.S. Department of Transportation. https://www.fhwa.dot.gov/policy/otps/nextgen_stats/index.cfm#toc.

2 Predicting Transit Ridership at the Stop Level: The Role of Service and Urban Form. J Dill, M Schlossberg, L Ma, C Meyer - 92nd Annual Meeting of the Transportation Research Board, 2013.

MODE SHARE

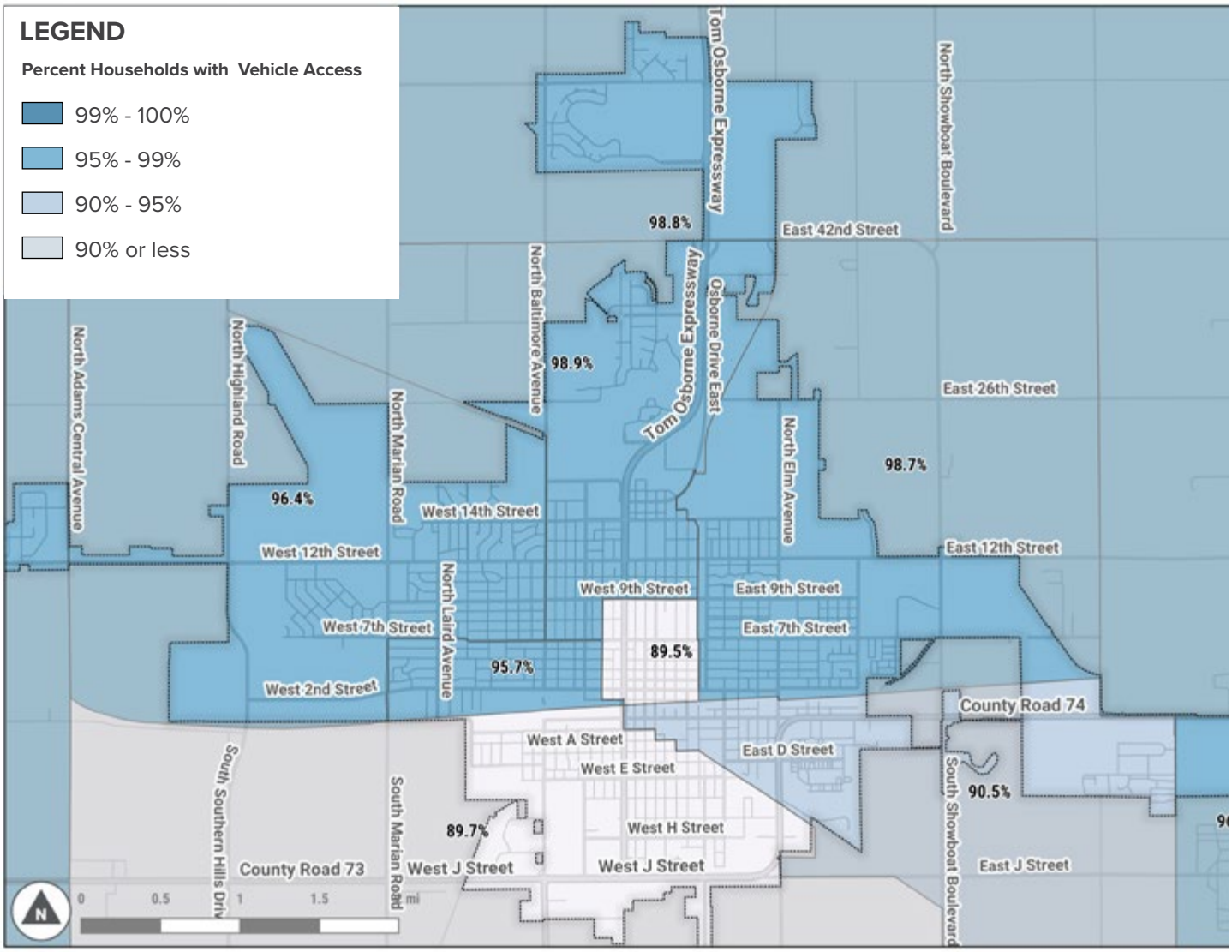
Nearly 83% of Hastings residents drive alone for their commute and less than 4% walk, bike, or use transit (Figure 5). When not driving alone, most residents commute via carpool, with walking being the third most common commute mode. Downtown Hastings and northeast Hastings have the highest percentage of people who commute via walking or bicycling. In addition to addressing bicycling and walking infrastructure, the Hastings Walkability and Connectivity Study should provide guidance on how to shift commuting norms and encourage bicycling and walking.

Figure 5. Combined Walk + Bike Mode Share



Even though a sizable percentage of Hastings residents commute by car, there are still households in Hastings that do not own a car. Most of these households are in the central and southern portions of Hastings, with the highest concentration near downtown (Figure 6). These households may find it difficult to access certain parts of Hastings without a car and would likely benefit from improved bicycle and pedestrian connections.

Figure 6. Household Access to Vehicles



LATENT DEMAND ANALYSIS

The Latent Demand Analysis illustrates where people are—or would be most likely to—bike or walk, based on development patterns and social and economic characteristics. In doing so, it highlights priority areas for adding or enhancing bicycle and pedestrian infrastructure and allows Hastings to prioritize funding for sidewalks or bikeways in locations that have the greatest potential to increase walking and biking.

EXPLANATION OF LATENT DEMAND FACTORS

This section describes the rational for using each Latent Demand Analysis factor.

INTERSECTION DENSITY

Research into travel mode choice has shown that intersection density is highly correlated with increased bicycling.[1] Areas with a high number of intersections with three or more legs tend to have better connectivity and high densities and diversities of utilitarian destinations and are therefore locations in which utilitarian trips are more likely to occur.

POPULATION DENSITY

Population density is another major determinant for both recreational and utilitarian trips. In short, the more people are in an area, the more people will be walking or biking

EMPLOYMENT DENSITY

Walking and bicycling is sometimes used as a means to get to work. The higher the number of jobs per area, the higher the potential for a larger number of employees to get to work by bicycling or walking.

PERCENT OF HOUSEHOLDS BELOW THE POVERTY LINE

Research indicates that people living in households below the poverty line are more likely to depend on transit, walking, or biking to get around.[2] The households-in-poverty data is only available for Census block groups, which are larger geographic areas composed of multiple Census blocks.

PERCENT OF OLDER ADULTS

Livable neighborhoods that are safe, vibrant, and accessible by walking and biking are crucial to ensuring Hastings residents can remain active community members throughout their lives. Creation of livable communities is advocated by AARP. Percent of older adults by Census block was used to identify areas with a higher population of older adults.

PARKS + SCHOOLS

Heard clearly through the fall 2018 Stakeholder Focus Group, stakeholders view parks and schools as destinations for people who bike or walk. Safe access to these amenities are important for healthy communities. Parks provide safe places for physical activity and walking or biking to school instills healthy active transportation habits at a young age.

EXISTING TRAILS

Trails are part of the active transportation network, but they can also be destinations themselves.

1 Built Environment Influences on Healthy Transportation Choices: Bicycling Versus Driving. M Winters, M Brauer, E Setton, K Teschke – Journal of Urban Health, 2010.

2 Predicting Transit Ridership at the Stop Level: The Role of Service and Urban Form. J Dill, M Schlossberg, L Ma, C Meyer - 92nd Annual Meeting of the Transportation Research Board, 2013.

METHODS

Intersection density, certain demographic factors, and certain land uses are highly correlated with walking and biking for utilitarian trips and casual recreation. Utilitarian trips are ones made for basic transportation needs, such as going to school, restaurants, or shopping. Casual trips are focused on sociability or physical exercise and do not involve a fixed destination.

Table 1. Latent Demand Analysis Criteria + Weighting

Criteria	Weighting
Weighting Intersection density	11
Percent of households in poverty	10
Percent of older adults	10
Proximity to parks	12
Proximity to schools or colleges	23
Proximity to existing paths	10
Population density	14
Employment density	10
Total possible points 100	100

Each Census block in Hastings was scored according to these factors. Census blocks are used because, even though they can be uneven sizes and shapes, they generally display a fine level of detail in urban areas and can be linked with Census population, employment, and household income data. The table below shows the factors and weights used to determine the demand score in the map. The total demand score for each Census block is an aggregate of the individual factor scores. The consultant team worked with city staff to fine-tune the weighting and identify areas with potential for walking and bicycling trips that were not identified from the GIS data.

FINDINGS

Areas with higher scores indicate areas with greater demand. When mapped, these places show up as dark purple areas, or “hot spots” (Figure 7). Among the many hot spots in the City of Hastings are:

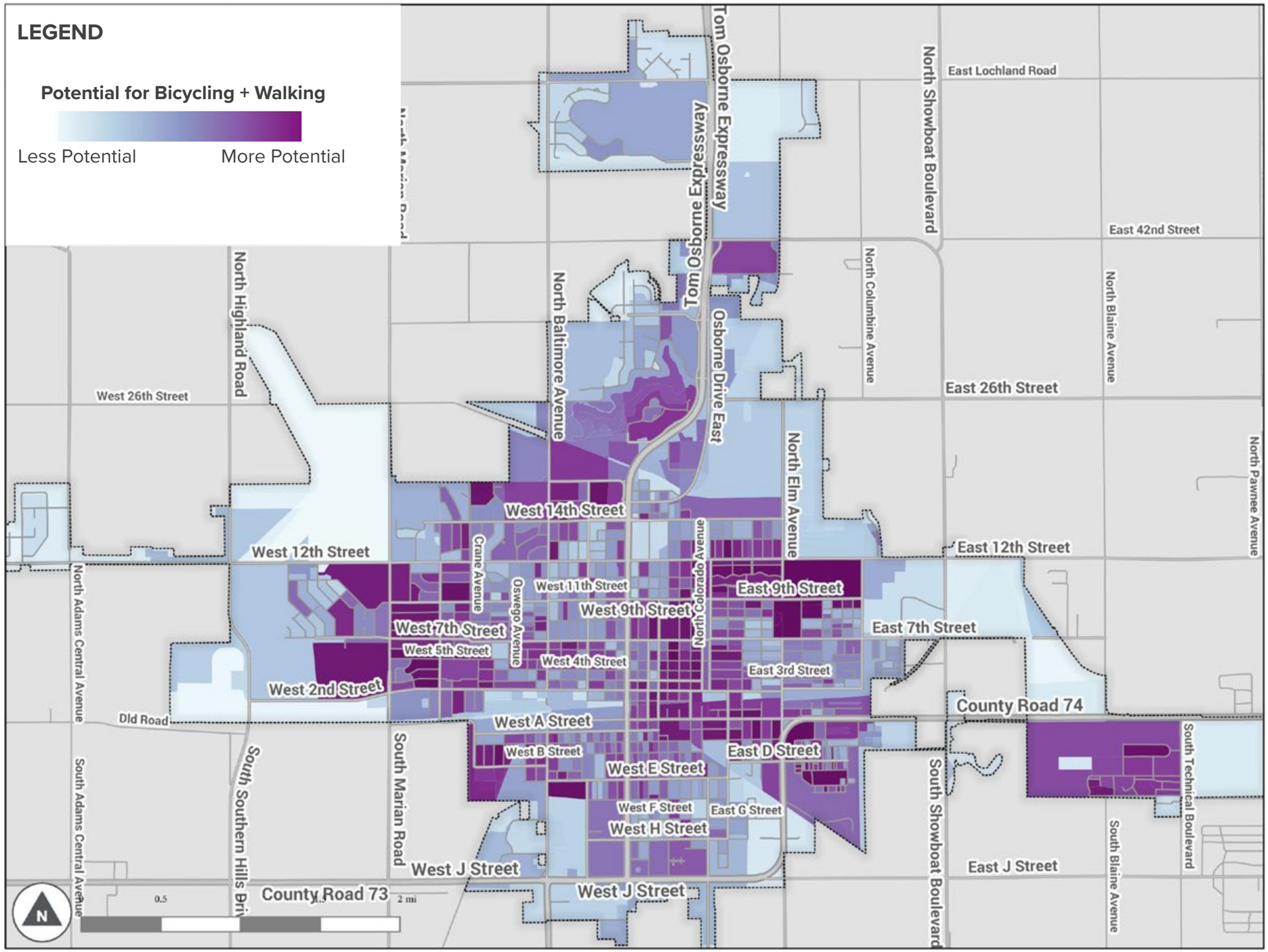
- Hastings College
- Central Community College
- Good Samaritan Village
- Hastings Public Schools
- Downtown Hastings
- Parks

Some residential neighborhoods turn up as darker purple compared to others. This might be due to the percent of older adults or percent of households in poverty within each Census block.

It’s important to note that this analysis is not exhaustive of all potential demand indicators, and as such may not highlight all areas with greater demand. Throughout discussions with the city and at the fall 2018 Stakeholder Focus Group, there were several areas that were identified as areas with the potential for high pedestrian movement that were not identified by the GIS model, and should be considered as projects get formulated:

- Hastings Cemetery
- West of Osborne Drive West near West Lochland Road
- North of North Shore Drive to North of Loredo Lane
- Westbrook to Hillcrest Drive
- Between West 2nd Street and West South Street/A Street
- 12th Street

Figure 7. Latent Demand Analysis Results



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EXISTING TRAIL AT LAKE HASTINGS PARK

ENVISION

STAKEHOLDER FOCUS GROUP

At the fall 2018 Stakeholder Focus Group, stakeholders representing Hastings city departments and advocacy agencies were asked to record the three words that describe walking and bicycling in Hastings today. Most participants described biking and walking as disconnected or difficult to navigate due to gaps in the network or uncomfortable crossing locations. Other concerns voiced by stakeholders include that the network is underutilized, non-existent, and lacks east/west routes.

However, stakeholders were also quick to highlight the positive aspects of walking and bicycling in Hastings. Some participants described walking and biking in Hastings as “relaxing and peaceful” while others described these facilities as “utilized” and “safe.” Some stakeholders had a positive perspective of walking and bicycling today in Hastings, and others see room for improvement. The proposed walking and bicycling network aims to alleviate safety and connectivity issues, and further enhance the positive aspects that make walking and bicycling in Hastings enjoyable.

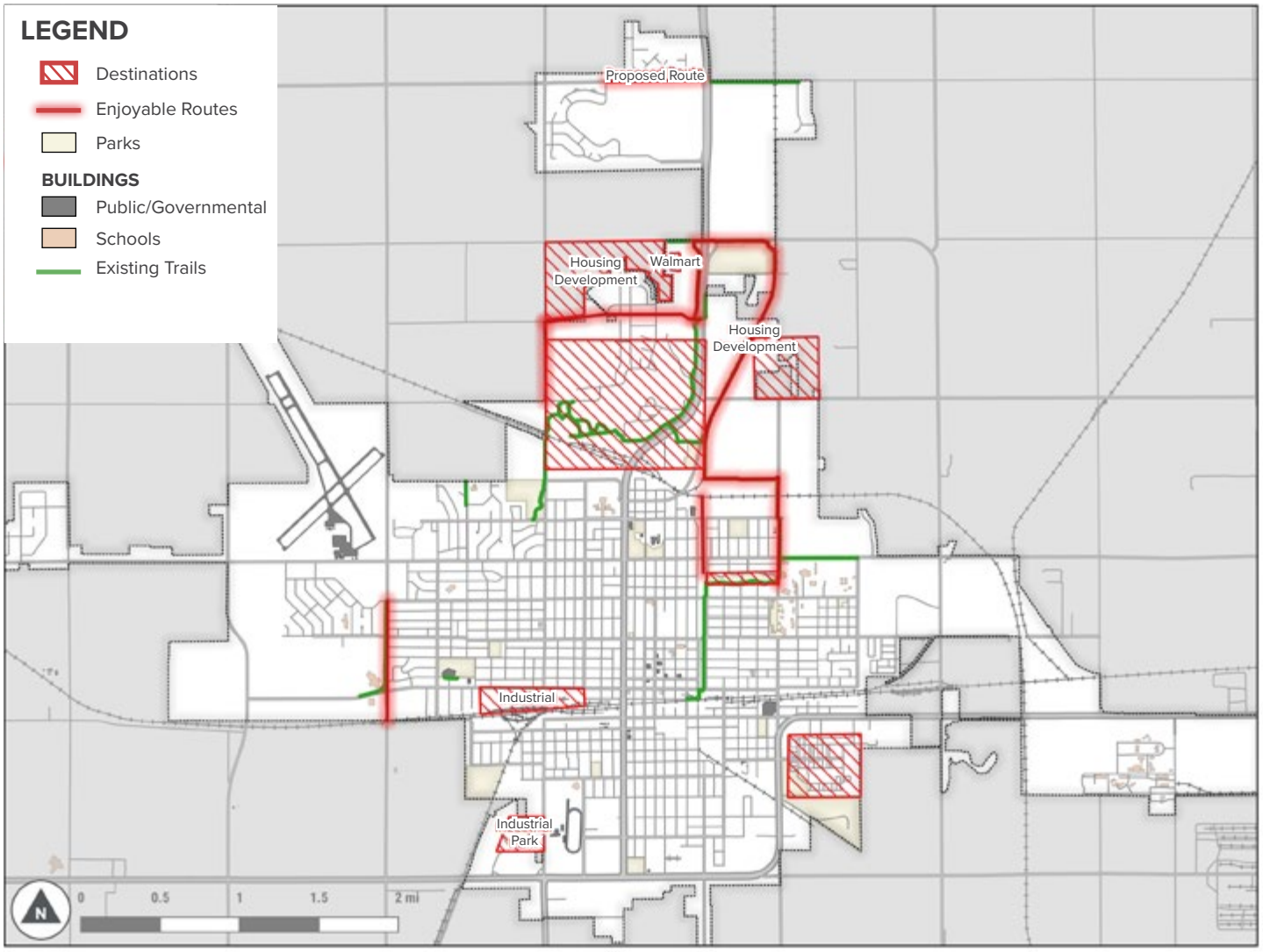
COMFORTABLE ROUTES + DESTINATIONS

At the Hastings fall 2018 Stakeholder Focus Group, attendees identified key destinations in Hastings and bicycling and walking routes that are currently enjoyable. The project team made some additions and modifications to these routes (Figure 8). In addition, stakeholders identified the following as important destinations:

- Lake Hastings Park and Heartwell Park
- Good Samaritan Village
- The industrial park in southwest Hastings, a large employment center

The enjoyable routes that stakeholders identified are scattered across Hastings. The Pioneer Spirit Trail, from Heartwell Park to 33rd Avenue is an enjoyable route that comfortably connects between multiple parks and the Walmart off Tom Osborne Expressway. Stakeholders also enjoy North Marian Avenue from West 19th Street to West South Street because it is a less congested route that feels safe. Stakeholders often see people walking along West Lochland Road, which has Sunset Memorial Gardens and Lochland Country Club located along it. The route along West 33rd Avenue to North Baltimore Avenue was identified as an area that, when North 33rd Street is complete, could easily accommodate a bicycle lane on either side of the road and could connect new development near Lake Hastings Park.

Figure 8. Stakeholders' Destinations + Enjoyable Routes



UNCOMFORTABLE ROUTES

At the fall 2018 Hastings Stakeholder Focus Group, participants also noted roadways and roadway segments across town that are uncomfortable for pedestrians and/or bicyclists (Figure 9).

For those routes identified as uncomfortable, common characteristics were identified that might impact why these streets are perceived as uncomfortable. Table 2 displays the characteristics for uncomfortable routes. Generally, conditions that may make a street more uncomfortable for people walking and biking are: wider streets with numerous lanes, a small or non-existent shoulder, high speeds, and non-existent or poorly maintained sidewalks. In some cases, on-street parking can make a street feel more comfortable for bicyclists and pedestrians. Most of these streets are where destinations such as stores, schools, and services are located along and provide efficient east/west access for vehicular traffic. This highlights the need for the Hastings Walkability and Connectivity Study to increase bicycle and pedestrian access to destinations that are centrally located. It also suggests that for these routes with more vehicular traffic, that enhanced pedestrian and bicycle facilities are needed to provide a comfortable experience.

Figure 9. Stakeholders' Uncomfortable Routes

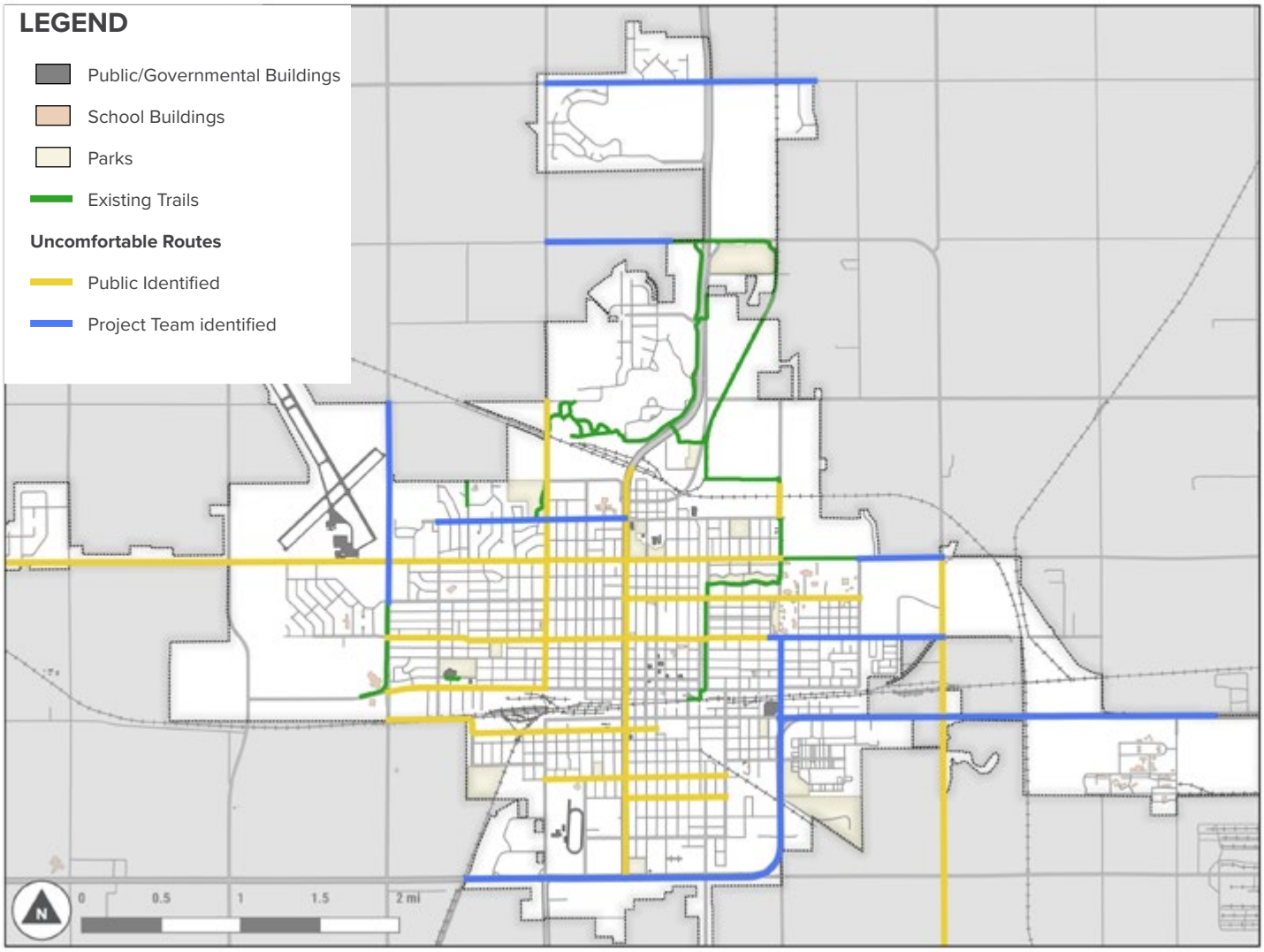
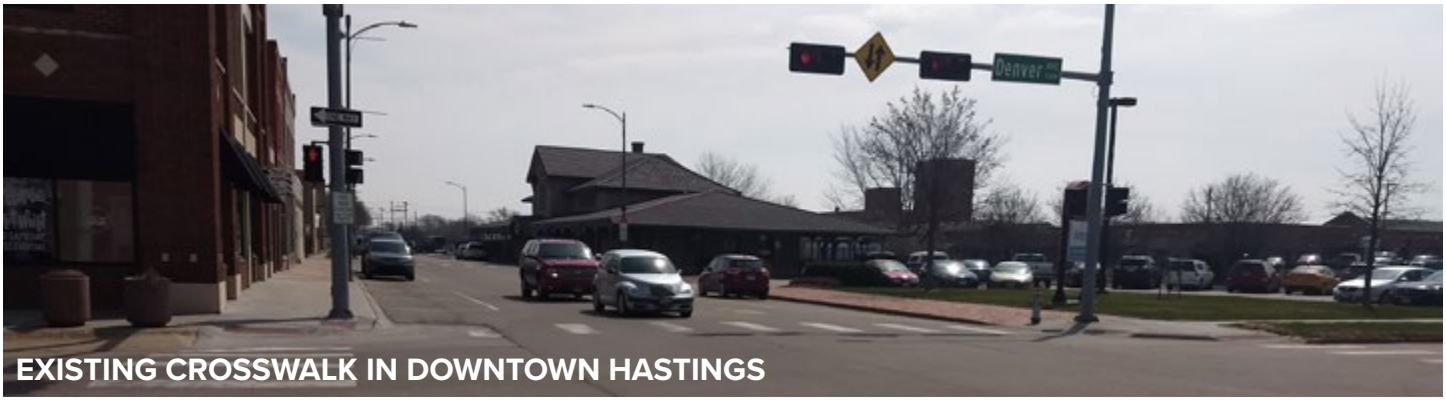


Table 2. Uncomfortable Routes Characteristics

ROUTE NAME	NUMBER OF TRAVEL LANES	SHOULDER	SPEED	SIDEWALKS PRESENT	ON-STREET PARKING	OTHER NOTES
Showboat Boulevard	2 lanes	Small shoulder	50	No	No on-street parking	
Burlington Avenue	4-5 lanes (occasional center turn lane)	No	30	Sidewalks on both sides	No on-street parking	
2nd Street	4-5 lanes (occasional center turn lane) west of downtown; 2 lanes in downtown	No	30-35	Sidewalks on both sides	On-street parking near downtown	
12th Street	2-3 lanes, some sections have a center turn lane	No	30	Sidewalks present east of N. Baltimore	Some on-street parking allowed	
E/W 7th Street	2-4 lanes, some areas have median/turn lanes; Much of the street west of Burlington has no pavement markings/ centerline	No	25	Sidewalks on both sides	No on-street parking	
A Street/South Street	No pavement markings/ centerline	No	25	Sidewalk on south side along most of street	Off-street parking (adjacent to street), especially near Burlington; no on-street parking	South street portion (western part of barrier) has no shoulder, sidewalk, or on-street parking, with 2 lanes marked with centerline
E Street	No pavement markings/ centerline	No	25	Sidewalks continuous along south side of W E St and partially continuous along north	On-street parking restricted to one side of the street on some portions	

...Table 2 continued.

ROUTE NAME	NUMBER OF TRAVEL LANES	SHOULDER	SPEED	SIDEWALKS PRESENT	ON-STREET PARKING	OTHER NOTES
E 9th Street	No pavement markings/ centerline	No	25	Continuous sidewalks	On-street parking allowed on both sides	
Baltimore Avenue	No pavement markings/ centerline	No	25	Pioneer Spirit Trail runs parallel south of RR	On-street parking allowed on both sides	
F Street	West of Burlington: 3 lanes (includes center turn lane); East of Burlington, no pavement markings/ centerline	No	25	Some portions of sidewalks on both sides, some only one side	West of Burlington: no on-street parking; East of Burlington: on-street parking	
N Elm Avenue – Pioneer Spirit Trail	N/A	N/A	N/A	N/A	N/A	Participant comment: Intersection with rail; Trail bollard at 14th street – hard to navigate
Laird (at W South Street)	2 lanes	No	25	No	No	Centerline near railroad tracks
Lochland Road West	2 lanes	No	35	No	No	



EXISTING CROSSWALK IN DOWNTOWN HASTINGS

ACHIEVE

In order to create a trail system that provides accessibility for people of all abilities, a sidewalk segment and curb ramp rating analysis must be conducted. To complete this process approximately 100 blocks of trails and sidewalks were evaluated to determine the prevalence of existing curb ramps and determine whether they meet current standards of the Americans with Disabilities Act (ADA). The metrics used to rank these sidewalk segments is outlined on the following pages. Data was collected manually in the field by trained staff with the resulting scores ranked into eight categories. Table 3 on page 23 and Table 4 on page 25 contains the score ranges for each metric measured and the amount of points assigned to each curb ramp and sidewalk segment inventoried.

The map figures starting on page 26 are graphic representations of the data collected, and rated indicating the inventoried sidewalks and curb ramps in relation to the current ADA standards. These maps help to highlight the opportunities and challenges in Hastings's current biking and walking network. These findings were then utilized to establish the final proposed trail projects outlined in the IMPLEMENTATION chapter.

CURB RATING + POINT SYSTEM

The Public Right-of-Way Accessibility Guidelines (PROWAG) were used to determine the acceptable range of curb ramp dimensions for ADA compliance. As published by the Nebraska Department of Transportation (NDOT), the NDOT Standard Plans were used as a guide to determine the specific type of curb ramp being inspected. ADA Accessibility Survey Instructions: Curb Ramps served to reference the correct way of taking curb ramp measurements.

The ranking scale for individual curb ramps (Table 3), based on field observations, was broken into 12 different groups. Each group had different points allotted to them based on prioritization.

Table 3 contains the ranges of the different measurements and the amount of points that were assigned to each inventoried ramp.

Longitudinal Ramp Slope	Slope of the ramp that is measured with the direction of travel or parallel to the ramp. Compliance with ADA standards states that longitudinal ramp slope should not exceed 8.3%
Ramp Cross Slope	Slope of the ramp that is measured perpendicular to the ramp or path of travel. Compliance with ADA standards states that ramp cross slope should not exceed 2.0%
Top Turning Space Slope	The top turning space is the square of pavement, located at the top of the ramp, that allows pedestrians in wheelchairs to turn. Compliance with ADA standards states that the turning space slopes should not exceed 2.0% in any direction.
Truncated Domes	Located at the foot of the ramp, also known as “Detectable Warning Panel.” ADA standards states that the truncated domes must be colored and be a different material than the concrete sidewalk.
Physical Obstruction	Any obstacle contained within a ramp (vegetation, manhole in center of ramp, etc.) forcing pedestrian to change course of travel.
Crack/Condition Deficient	Determine if ramp contains cracking on pavement or rising and dropping of slabs of pavement greater than half inch intervals.
Ramp Width	Compliance with ADA standards states that the ramp width be no less than 4’.
Turning Space Width	Compliance with ADA standards states that the turning space width be no less than 4’.
Turning Space length	Compliance with ADA standards states that the turning space length be no less than 4’.
Receiving Ramp	Adjacent ramp following path of travel while traversing a roadway from one ramp to the next. If a ramp did not contain a receiving ramp, max allowable points were assigned.
Existing Ramp	Determine if there is currently a ramp at the location.
School Proximity	Determine if sidewalk ramp is within ¼ mile of any school.

Table 3. Curb Ramp Rating + Point System

Description	Ranges	Points
Long Ramp Slope (%)	0-8.229	0
	8.3-11.9	5
	>12	10
Ramp Cross Slope (%)	0-1.999	0
	2-3.999	5
	>4	10
Top Turning Space Slope (%)	0-1.999	0
	2-3.999	5
	>4	10
Truncated Domes	Yes	0
	Stamped	2
	No	4
Physical Obstruction	No	0
	Yes	1
Crack/Condition Deficient	None	0
	Minor	2
	Moderate	4
	Major	6
Ramp Width <4’	No	0
	Yes	2
Turning Space Width <4’	No	0
	Yes	2
Turning Space Length <4’	No	0
	Yes	2
Receiving Ramps	Yes	0
	No	25
Existing Curb Ramp	Yes	0
	Sidewalk w/full Curb	15
	No	25
Within 0.25 mile of School	No	0
	Yes	1

SIDEWALK SEGMENT + POINT SYSTEM

The ranking scale for sidewalk segments shown on the following pages, based on field observations, was broken into eight different groups. Each group had different points allotted to them based on prioritization.

Table 4 contains the ranges of the different measurements and the amount of points that were assigned to each inventoried sidewalk.

Average Cross Slope	Slope of the side that is measured perpendicular to the path of travel. Compliance with ADA standards states that cross slope should not exceed 2.0%. Segments were measured at random locations.
Length Exceeding 2% Cross Slope	Determined length of sidewalk that did not meet the 2% cross slope standard.
Length Exceeding 8.3% Cross Slope	Slope of the sidewalk is measured parallel to the path of travel. Determined length of sidewalk that exceeded 8.3%. Compliance with ADA standards states running slope should not exceed 8.3%
Physical Obstruction	Any obstacle contained within a sidewalk (vegetation, manhole in center of ramp, etc.) forcing pedestrian to change course of travel.
Crack/Condition Deficient	Determine if the sidewalk contains cracking on pavement or rising and dropping of slabs of pavement greater at half inch intervals.
Average Width	Compliance with ADA standards states that the sidewalk width be no less than 4'.
Existing Material	Determine the existing material of sidewalk that is currently in place.
School Proximity	Determine if sidewalk ramp is within ¼ mile of any school.

Table 4. Sidewalk Segment Rating + Point System

Description	Ranges	Points
Average Cross Slope (%)	0-1.999	0
	2-3.999	5
	>4	10
Length Exceeding 2% Cross Slope	0-50	0
	50.001-100	5
	>100	10
Length Exceeding 8.3% Running Slope	0-5	0
	5.001-20	5
	>20	10
Physical Obstruction	No	0
	Yes	1
Crack/Condition Deficient	None	0
	Minor	2
	Moderate	4
	Major	6
Average Sidewalk Width <4’	No	0
	Yes	2
Existing Sidewalk Material	Concrete	0
	Asphalt	5
	Brick	10
	None	20
Within 0.25 mile of School	No	0
	Yes	1

Figure 10. Walkability Prioritization Map- Area 1

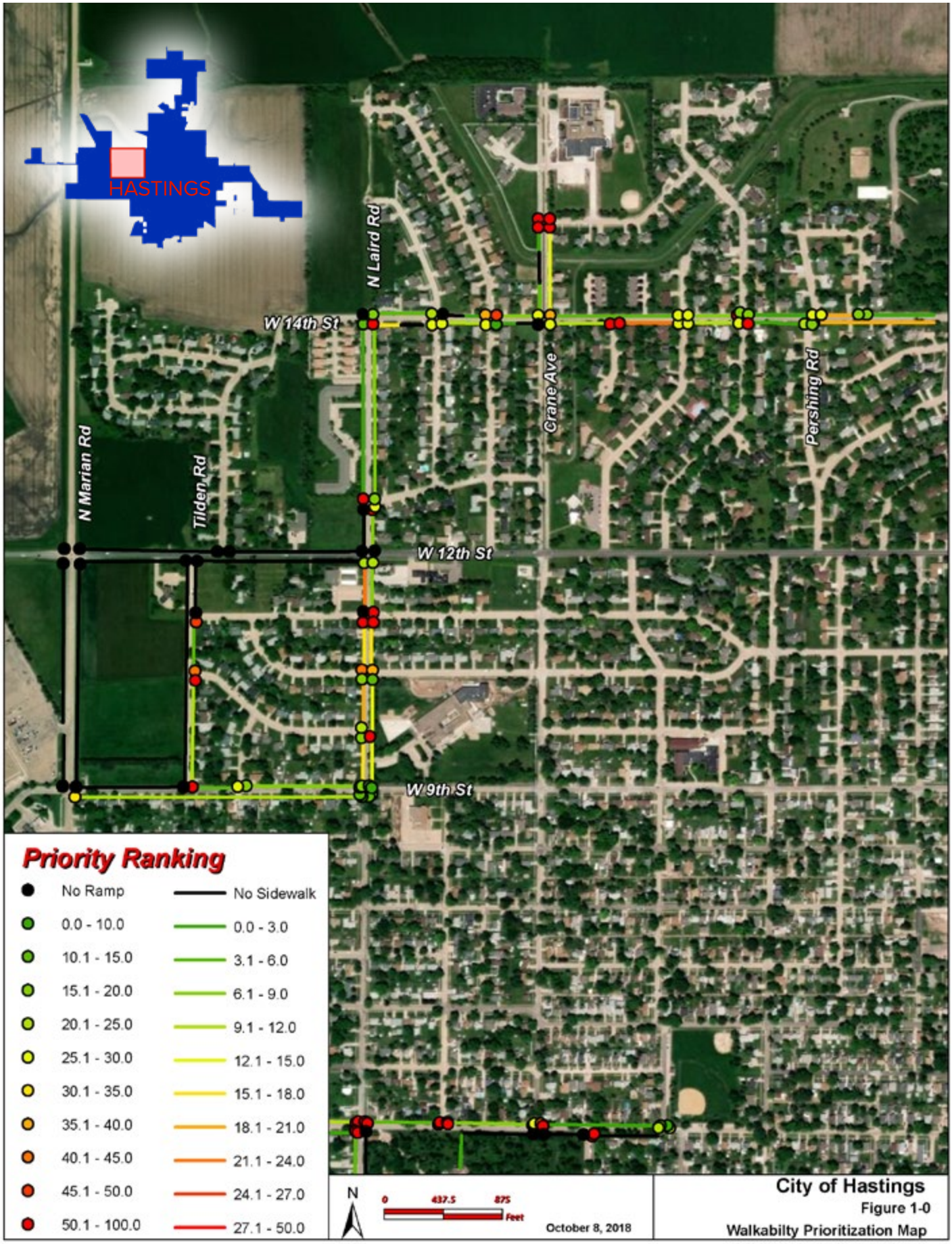


Figure 11. Walkability Prioritization Map- Area 2

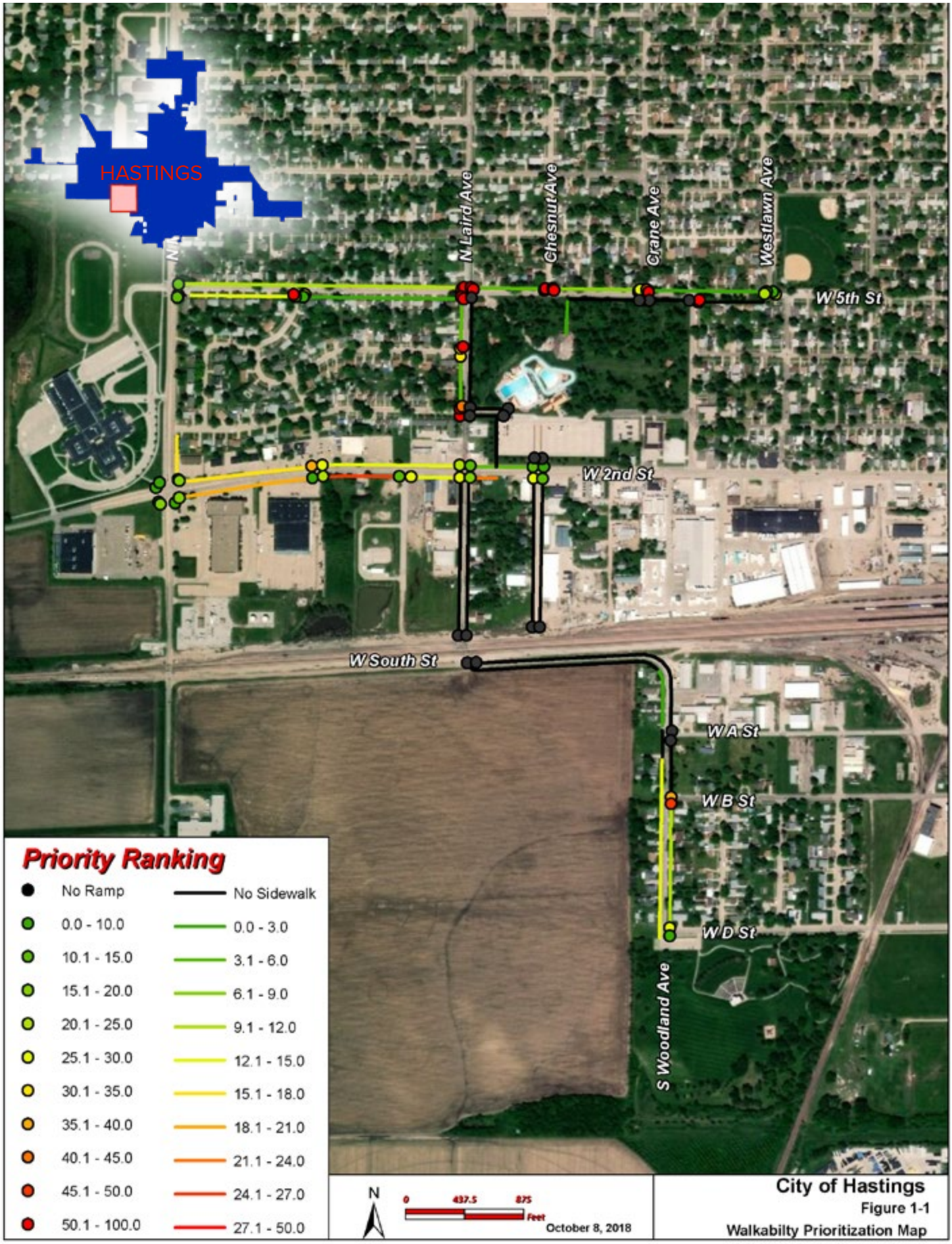


Figure 12. Walkability Prioritization Map- Area 3

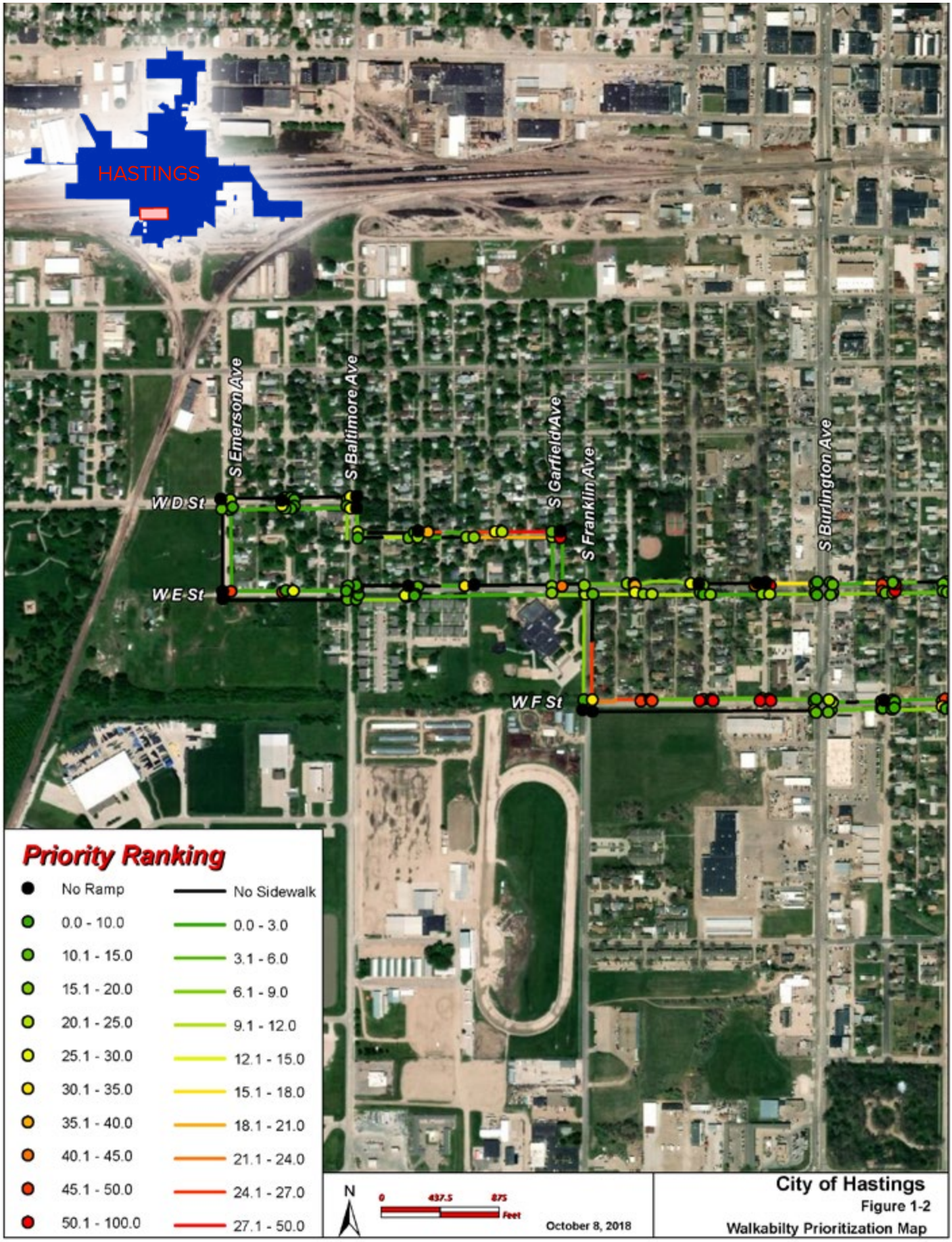


Figure 13. Walkability Prioritization Map- Area 4

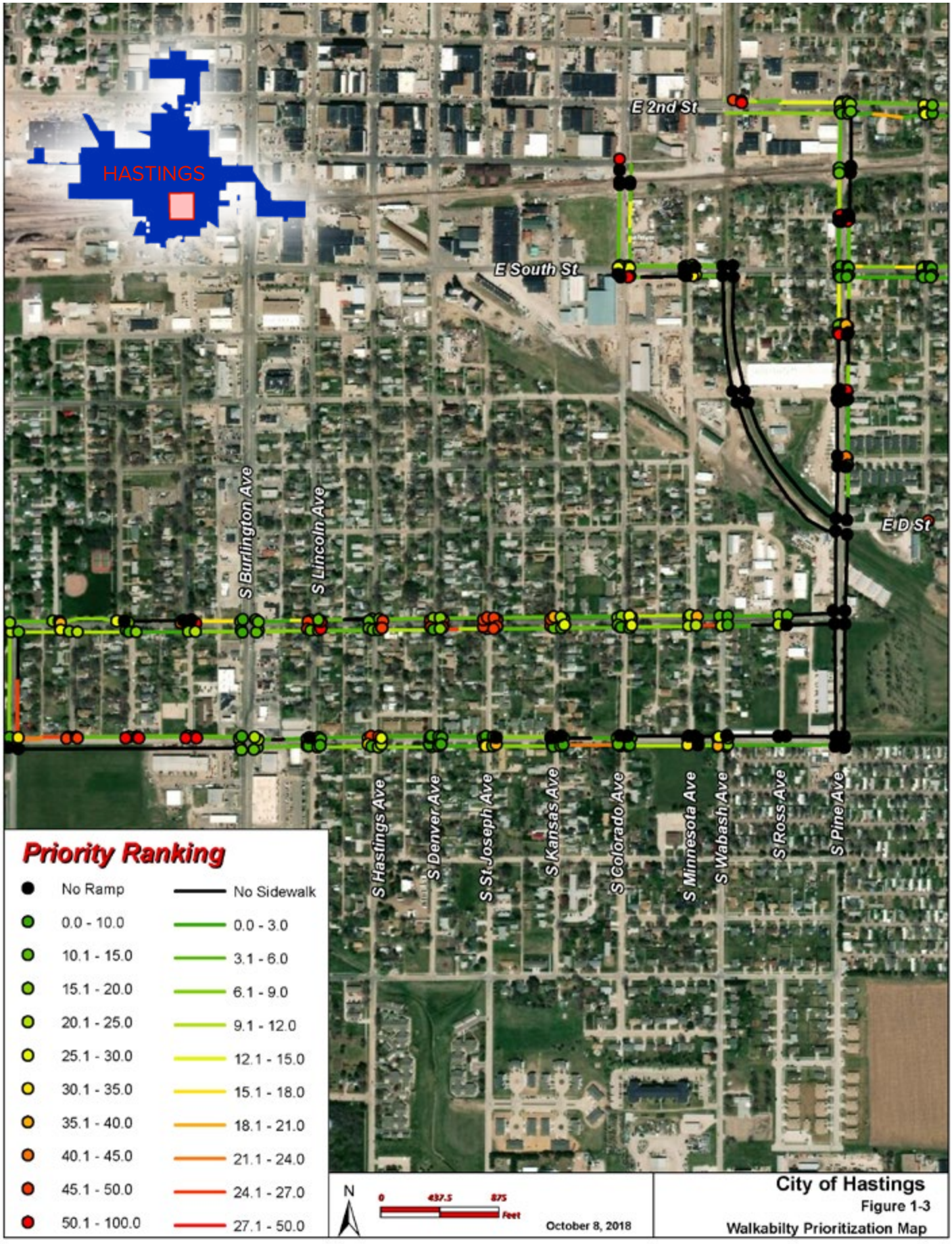
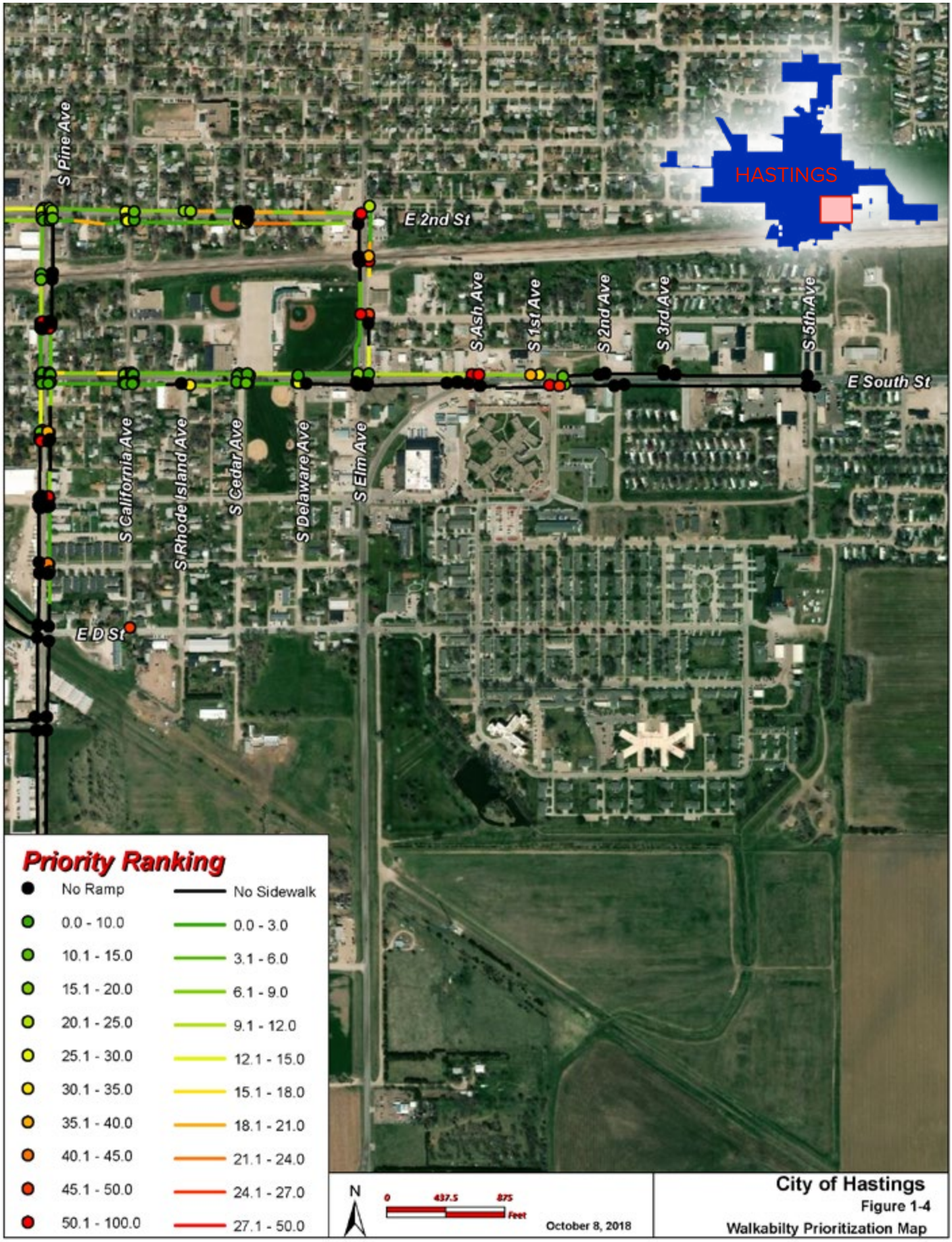


Figure 14. Walkability Prioritization Map- Area 5



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PROPOSED TRAIL ALONG CHATAQU PARK

IMPLEMENTATION

Local stakeholders were asked how they would like the future of walking and biking in Hastings to be described. Common themes that arose from that discussion were "greater connectivity" and "safety." Multiple participants would like walking and biking to be more utilized, accessible, signed, and scenic. Achieving these goals is possible, and many similar cities across the U.S. have improved walking and bicycling conditions and activity levels through a multi-pronged approach.

Enhancing bicycling and walking infrastructure in Hastings can help get community members to their destinations more safely. Additionally, the Hastings bicycle and walking infrastructure needs to represent the community character. It needs to cater to young families but also support older adults that are located in southeastern Hastings. Bicycling and walking infrastructure also needs to connect areas in town that have higher poverty and lower car ownership rates, such as the southern portion of Hastings.

This chapter will identify the proposed trails projects with prescribed bicycle facility types and phasing to create a more connected Hastings. Wayfinding improvements are also highlighted to better inform users of all modes of transportation–walking, biking, and driving- and provide a safer, pedestrian friendly community for all citizens.

Appendix A and B provide more information on wayfinding best practices and the various types of bicycle facilities. Appendix C provides alternative routing options for each proposed project with explanations of each alternative provided.

COMMON TERMINOLOGY

Below is a list of commonly used acronyms used throughout the descriptions of the proposed trail projects. Please refer to this list as necessary.

BNSF: BURLINGTON NORTHERN SANTA FE RAILWAY

UPRR: UNION PACIFIC RAILWAY

NDOT: NEBRASKA DEPARTMENT OF TRANSPORTATION

ROW: RIGHT-OF-WAY

HPS: HASTINGS PUBLIC SCHOOLS

HMS: HASTINGS MIDDLE SCHOOL

HHS: HASTINGS HIGH SCHOOL

EOC: ENGINEER'S OPINION OF COST

ADA: AMERICANS WITH DISABILITIES ACT

LF: LINEAR FEET

LS: LUMP SUM

SF: SQUARE FEET

SY: SQUARE YARD

PROPOSED PROJECTS

PROJECT 1 – SOUTHERN CROSSTOWN CONNECTION

Connects the trailhead in downtown at 1st Street and Colorado Avenue with the existing trail near Brickyard Park at D Street and Emerson Avenue.

- Total Project 1 Approximate Length: 11,400 Feet (2.16 miles)
- Total Project 1 EOC: $1,073,300

DESIGN CONSIDERATIONS

The route is proposed to cross the BNSF tracks near the existing Colorado Avenue at grade crossing. Coordination with BNSF will be necessary for the crossing to occur. Potential requirements may include:

- New crossing pads for the pedestrian/bike crossing (included in the EOC)
- New or relocated crossing gates for the pedestrian/bike crossing (not included in the EOC)
- If Quiet Zone improvements are made, additional considerations may be necessary

Much of the proposed corridor is developed with many driveways accessing residential properties. There may also need to be consideration for pedestrian crossing improvements for the intersection of F Street and Burlington Avenue/US Highway 34/US Highway 281 as there is currently no traffic signal. Lastly, this proposed route will have a large number of street crossings that require the installation of ADA ramps.

BENEFITS OF THIS ROUTE:

The proposed route connects the existing trail segments in located in the downtown area with the Brickyard Park segment. This route also provides trail access to Lincoln Elementary School opening up a safer passage for students. Furthermore, the route would provide greater ADA accessibility through new trail segments as well as improvements to existing sidewalk segments.

PHASE 1

This proposed trail alignment begins at the intersection of 1st Street and Colorado Avenue and runs to the intersection of Pine Street and D Street.

» Approximate Length: 2,800 Feet (0.53 miles)

» EOC: $276,600

Starting at the existing trail near 1st Street and Colorado Avenue, the proposed trail runs south across the BNSF railroad tracks on the east side of the street-crossing. Then the path crosses Colorado Avenue to the east side of the roadway to South Street, then crosses over to the west side of Colorado Avenue to South Street.

» This portion of the trail is proposed to be 8-foot-wide concrete trail located within existing ROW or city-owned property.

Then the trail continues down South Street along the abandoned UPRR ROW owned by the city to the south and east to Pine Street near the D Street intersection.

» This portion of the trail is proposed to be 10-foot-wide concrete trail located within existing ROW or city-owned property.

Table 5. Project 1 - Phase 1 - Southern Crosstown Connection

Item No.	DESCRIPTION	Unit	Quantity	Unit Price	Total
1.	Remove Curb and Gutter	LF	90	$10.00	$900
2.	Remove Concrete Sidewalk	SF	2,900	$2.00	$5,800
3.	Remove Pavement	SY	320	$5.00	$1,600
4.	Concrete Curb and Gutter (24"-36" wide)	LF	90	$30.00	$2,700
5.	6" Concrete Driveway	SY	320	$45.00	$14,400
6.	5" Concrete Sidewalk	SF	0	$7.00	$0
7.	6" Concrete Trail	SF	25,450	$6.00	$152,700
8.	On-Street Trail	LF	0	$20.00	$0
9.	Detectable Warning Panels	SF	150	$45.00	$6,750
10.	Railroad Crossing	LS	1	$20,000.00	$20,000
				Construction Subtotal: P1 Ph1	$204,850
				Contingency and Engineering: 35%	$71,698
				Total Opinion of Construction Cost	$276,548

PHASE 2

This proposed trail continues south along Pine Street near the D Street intersection and west along F Street to the Burlington Avenue/Highway 34 & 281 intersection.

» Approximate Length: 4,200 Feet (0.80 miles)

» EOC: $433,800

Starting where Phase 1 terminates near the intersection of D Street and Pine Street, this section runs south along the west side of Pine Street to F Street.

» This portion of the trail is proposed to be 10-foot-wide concrete trail located within existing ROW.

From the Pine Street and F Street intersection, the trail runs west to the intersection of Kansas Avenue and F Street on the north side of F Street. From the intersection of Kansas Avenue and F Street, the trail runs along the south side of the street running west to the Burlington Avenue/Highway 34 & 281 intersection.

» This portion of the trail is proposed to be 8-foot-wide concrete trail located within existing ROW.

Table 6. Project 1 - Phase 2 - Southern Crosstown Connection

Item No.	DESCRIPTION	Unit	Quantity	Unit Price	Total
1.	Remove Curb and Gutter	LF	290	$10.00	$2,900
2.	Remove Concrete Sidewalk	SF	6,200	$2.00	$12,400
3.	Remove Pavement	SY	1,440	$5.00	$7,200
4.	Concrete Curb and Gutter (24"-36" wide)	LF	290	$30.00	$8,700
5.	6" Concrete Driveway	SY	1,440	$45.00	$64,800
6.	5" Concrete Sidewalk	SF	0	$7.00	$0
7.	6" Concrete Trail	SF	35,220	$6.00	$211,320
8.	On-Street Trail	LF	0	$20.00	$0
9.	Detectable Warning Panels	SF	310	$45.00	$13,950
				Construction Subtotal: P1 Ph2	$321,270
				Contingency and Engineering: 35%	$112,445
				Total Opinion of Construction Cost	$433,715

PHASE 3

The third and final phase completes the connection to the existing trail near the intersection of D Street and Emerson Avenue.

» Approximate Length: 4,400 Feet (0.83 miles)

» EOC: $362,900

Starting at the intersection of F Street and Burlington Avenue/Highway 34 & 281, the trail runs west along the south side of F Street to the intersection of F Street and Franklin Avenue.

» This portion of the trail is proposed to be 8-foot-wide concrete trail located within existing ROW.

From the intersection of F Street and Franklin Avenue, the trail runs west along undeveloped F Street ROW along the north property line of the Adams County Fairgrounds, to Baltimore Avenue.

» This portion of the trail is proposed to be 10-foot-wide concrete trail located within existing ROW or city-owned property.

From the undeveloped F Street ROW and Baltimore Avenue, the trail runs north along the east side of Baltimore Avenue to the intersection of E Street and Baltimore Avenue:

» This portion of the trail is proposed to be 8-foot-wide concrete trail located within existing ROW.

From the intersection of E Street and Baltimore Avenue, the trail runs west along E Street to Emerson Avenue, then North along the west side of Emerson Avenue to the existing trail near the intersection of D Street and Emerson Avenue.

» This portion of the trail is proposed to be 10-foot-wide concrete trail located within existing ROW.

Table 7. Project 1 - Phase 3 - Southern Crosstown Connection

Item No.	DESCRIPTION	Unit	Quantity	Unit Price	Total
1.	Remove Curb and Gutter	LF	140	$10.00	$1,400
2.	Remove Concrete Sidewalk	SF	2,500	$2.00	$5,000
3.	Remove Pavement	SY	270	$5.00	$1,350
4.	Concrete Curb and Gutter (24"-36" wide)	LF	140	$30.00	$4,200
5.	6" Concrete Driveway	SY	270	$45.00	$12,150
6.	5" Concrete Sidewalk	SF	0	$7.00	$0
7.	6" Concrete Trail	SF	39,500	$6.00	$237,000
8.	On-Street Trail	LF	0	$20.00	$0
9.	Detectable Warning Panels	SF	170	$45.00	$7,650
				Construction Subtotal: P1 Ph3	$268,750
				Contingency and Engineering: 35%	$94,063
				Total Opinion of Construction Cost	$362,813

Figure 15. Project 1 – Southern Crosstown Connection

QUANTITIES - PHASE 1

ITEM	COLOR	LENGTH
PROPOSED 10' TRAIL		1600 FT
PROPOSED 8' TRAIL		1200 FT

QUANTITIES - PHASE 2

ITEM	COLOR	LENGTH
PROPOSED 10' TRAIL		1200 FT
PROPOSED 8' TRAIL		3000 FT

QUANTITIES - PHASE 3

ITEM	COLOR	LENGTH
PROPOSED 10' TRAIL		2500 FT
PROPOSED 8' TRAIL		1900 FT

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PROJECT 2 – WEST SOUTH STREET PATH

This proposed route connects Project 1 starting at Brickyard Park to Hastings Middle School.

- Approximate Length: 5,300 Feet (1.00 mile)
- EOC: $492,700
- All trail improvements are proposed to be 10 feet wide

The trail starts in the Southwest quadrant of 2nd Street and Marian Road, and crosses Marian Road at the existing pedestrian light to the east side of Marian Road. From there it progresses south within existing ROW south to the BNSF ROW and trackage crossing the tracks east of the current Marian Road at grade crossing. South of the BNSF tracks, a proposed easement to be acquired south of and parallel to the BNSF ROW/South Street to the rear lot lines of the homes facing Woodland Avenue. The trail is then proposed to run south within a proposed easement to be acquired, to the rear of the existing homes. Finally, the trail ends at the West D Street ROW terminating at Brickyard Park and connecting to Project 1 proposed trail.

DESIGN CONSIDERATIONS

The route is proposed to cross the BNSF tracks near the existing Marian Road at grade crossing. Coordination with BNSF will be necessary for the crossing to occur. Potential requirements may include:

- New crossing pads for the pedestrian/bike crossing (included in the EOC)
- New or relocated crossing gates for the pedestrian/bike crossing (not included in the EOC)
- If Quiet Zone improvements are made, additional considerations may be necessary

Easement acquisition is anticipated for the following sites along the proposed route:

- For the portion of the project that runs east from Marian Road south of the BNSF ROW
  - Drainage or culvert improvements with some grading is anticipated
- For the portion that runs south to the rear of the homes west of Woodland Avenue
- Both easements are proposed to be acquired from the field property, not from the residential properties
- ROW/Easement Acquisition is not included in the EOC

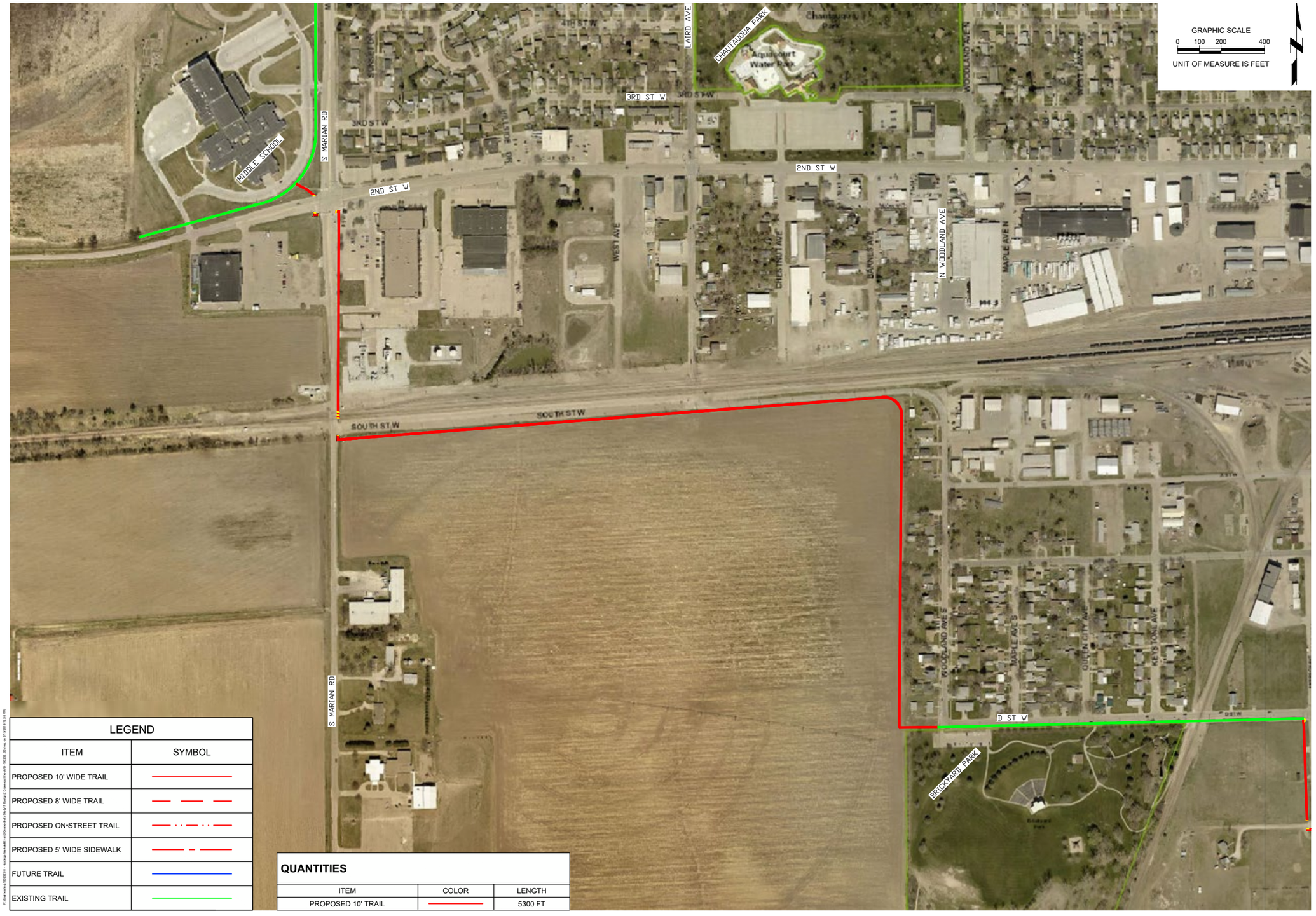
BENEFITS OF THIS ROUTE:

The greatest benefit of this route is its ability to connect Hastings Middle School with Brickyard Park, and the neighborhood south of the tracks while posing few or no impacts to existing residential properties and trees. Furthermore, the route provides sidewalks and greater pedestrian access in an area underserved by these amenities. This route also makes use of existing signalized pedestrian crosswalks at Marian Road and 2nd Street near Hastings Middle School providing cost savings to the project. Additional cost savings are realized with only minimal grading required along this chosen route resulting in less ground disturbance.

Table 8. Project 2 - West South Street Path (Brickyard Park)

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
1.	Remove Curb and Gutter	LF	105	$10.00	$1,050
2.	Remove Concrete Sidewalk	SF	100	$2.00	$200
3.	Remove Pavement	SY	385	$5.00	$1,925
4.	Concrete Curb and Gutter (24"-36" wide)	LF	105	$30.00	$3,150
5.	6" Concrete Driveway	SY	385	$45.00	$17,325
6.	5" Concrete Sidewalk	SF	0	$7.00	$0
7.	6" Concrete Trail	SF	52,500	$6.00	$315,000
8.	On-Street Trail	LF	0	$20.00	$0
9.	Detectable Warning Panels	SF	140	$45.00	$6,300
10.	Railroad Crossing	LS	1	$20,000.00	$20,000
				Construction Subtotal: P2	$364,950
				Contingency and Engineering: 35%	$127,733
				Total Opinion of Construction Cost	$492,683

Figure 16. Project 2 – West South Street Path



LEGEND	
ITEM	SYMBOL
PROPOSED 10' WIDE TRAIL	
PROPOSED 8' WIDE TRAIL	
PROPOSED ON-STREET TRAIL	
PROPOSED 5' WIDE SIDEWALK	
FUTURE TRAIL	
EXISTING TRAIL	

QUANTITIES

ITEM	COLOR	LENGTH
PROPOSED 10' TRAIL		5300 FT

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PROJECT 3 – NORTHERN CROSSTOWN CONNECTION

The proposed trail provides a connection between Libs Park, HHS, Hastings Museum, and the existing trails along East Side Boulevard and Hartwell Park.

- Total Project 3 Approximate Length: 8,900 Feet (2.16 miles)
- Total Project 3 EOC: $927,800
- All trail improvements are proposed to be 10-feet-wide, 6” concrete trail

DESIGN CONSIDERATIONS

While this route creates a pedestrian friendly connection from Libs Park to HHS, Hastings Museum and other community amenities, there are challenges to address. One of the challenges of the proposed route is several trees along 18th Street and Saunders Avenue may be impacted. Another challenge to consider is the segment along 13th Street may impact several driveways. Final Design should determine if the north side may be a better fit for the proposed trail. Lastly, the portion of the trail along the Hastings Museum, park and fire station properties may consider a more meandering route for aesthetic purposes where the city has available property.

BENEFITS OF THIS ROUTE

First and foremost, this proposed route connects several important recreational facilities within the community, existing neighborhoods and existing trails in Libs Park and near Hartwell park. In addition, much of the proposed route provides sidewalk access to areas where little or none currently exist. And while residential neighborhoods are accessible to the proposed trail, a relatively small segment of this trail has residential properties immediately adjacent to it. This is achieved through routing the trail through properties that are public entities or city-owned properties. Lastly, this route makes use of existing signalized pedestrian crosswalks at Burlington Avenue, Marian Road, and W 14th Street near the Hastings Museum providing cost savings to the project.

PHASE 1

This proposed trail alignment connects 18th Street and Baltimore Avenue to Hastings Avenue, near North Park Fire Station.

- » Approximate Length: 5,000 Feet (0.95 miles)
- » EOC: $411,000

The proposed route begins south of the Baltimore Avenue and 18th Street intersection connecting to the existing trail in Libs Park. The route turns east along the south side of 18th Street to Saunders Avenue, and then south along Saunders Avenue.

- » This portion of the trail is proposed to be 8-foot-wide concrete trail to be located within existing ROW

The trail then continues east along the 14th Street on the north side near HHS.

- » This portion of the trail is proposed to be 10-foot-wide concrete trail to be located within existing ROW

The trail crosses to the south side of 14th Street at the Burlington Avenue/Highway 34 & 281 traffic signal and continues east along 14th Street to Hastings Avenue. The propose route turns south along the west side of Hastings Avenue to the existing trail segment near the North Park Fire Station.

- » This portion of the trail is proposed to be 10-foot-wide concrete trail to be located within existing ROW

Table 9. Project 3 - Phase 1 - Northern Crosstown Connection

Item No.	DESCRIPTION	Unit	Quantity	Unit Price	Total
1.	Remove Curb and Gutter	LF	250	$10.00	$2,500
2.	Remove Concrete Sidewalk	SF	7,500	$2.00	$15,000
3.	Remove Pavement	SY	700	$5.00	$3,500
4.	Concrete Curb and Gutter (24"-36" wide)	LF	250	$30.00	$7,500
5.	6" Concrete Driveway	SY	140	$45.00	$6,300
6.	5" Concrete Sidewalk	SF	0	$7.00	$0
7.	6" Concrete Trail	SF	34,500	$6.00	$207,000
8.	On-Street Trail	LF	0	$20.00	$0
9.	Detectable Warning Panels	SF	280	$45.00	$12,600
10.	Bridge Structure	LS	1	$50,000.00	$50,000
				Construction Subtotal: P3 Ph1	$304,400
				Contingency and Engineering: 35%	$106,540
				Total Opinion of Construction Cost	$410,940

PHASE 2

This proposed trail alignment begins at the intersection of Hastings Avenue in Hastings Utilities Park and runs to the intersection of 9th Street and East Side Boulevard.

- Approximate Length: 3,900 Feet (0.74 miles)
- EOC: $516,800

The existing trail crosses Hastings Avenue south of the North Denver Station into Hastings Utilities Park. The proposed route would continue the trail east from the street crossing, then meander through the park east and north to the intersection of 13th Street and St. Joseph Avenue.

- This portion of the trail is proposed to be 10-foot-wide concrete trail to be located within existing city-owned property

The trail is then proposed to run along the south side of 13th Street to the intersection of Minnesota Avenue, then south along the west side of Minnesota Avenue to 12th Street. The trail would continue east along the north side of 12th Street to the East Side Boulevard intersection.

- This portion of the trail is proposed to be 8-foot-wide concrete trail to be located within existing ROW

The trail is then proposed to turn south along the abandoned UPRR ROW along the east side of the drainage ditch feeding into Lake Hartwell. The trail will then connect to the existing trail near 9th Street and East Side Boulevard.

- This portion of the trail is proposed to be 10-foot-wide concrete trail to be located within existing ROW or city-owned property

A connecting sidewalk is proposed on the east side of East Side Boulevard between 12th Street and Lakeside Drive as a connector between Hartwell Park and the proposed trail.

- The sidewalk is proposed to be 5-foot-wide concrete to be located within existing ROW

Table 10. Project 3 - Phase 2 - Northern Crosstown Connection

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
1.	Remove Curb and Gutter	LF	220	$10.00	$2,200
2.	Remove Concrete Sidewalk	SF	2,300	$2.00	$4,600
3.	Remove Pavement	SY	1,300	$5.00	$6,500
4.	Concrete Curb and Gutter (24"-36" wide)	LF	220	$30.00	$6,600
5.	6" Concrete Driveway	SY	1,300	$45.00	$58,500
6.	5" Concrete Sidewalk	SF	2,600	$7.00	$18,200
7.	6" Concrete Trail	SF	45,900	$6.00	$275,400
8.	On-Street Trail	LF	0	$20.00	$0
9.	Detectable Warning Panels	SF	240	$45.00	$10,800
				Construction Subtotal: P3 Ph2	$382,800
				Contingency and Engineering: 35%	$133,980
				Total Opinion of Construction Cost	$516,780

Figure 17. Project 3 – Northern Crosstown Connection

LEGEND	
ITEM	SYMBOL
PROPOSED 10' WIDE TRAIL	
PROPOSED 8' WIDE TRAIL	
PROPOSED ON-STREET TRAIL	
PROPOSED 5' WIDE SIDEWALK	
FUTURE TRAIL	
EXISTING TRAIL	

QUANTITIES - PHASE 1

ITEM	COLOR	LENGTH
PROPOSED 10' TRAIL		2500 FT
PROPOSED 8' TRAIL		2500 FT

QUANTITIES - PHASE 2

ITEM	COLOR	LENGTH
PROPOSED 10' TRAIL		2100 FT
PROPOSED 8' TRAIL		1800 FT
PROPOSED 5' TRAIL		500 FT

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PROJECT 4 – CHAUTAUQUA PARK CONNECTION

This proposed route connects HMS with Chautauqua Park/Hastings Aquacourt.

- » Approximate Length: 2,800 Feet (0.53 miles)
- » EOC: $284,400

The proposed trail starts at the traffic signal at 5th Street and Marian Road, and is proposed to run on the south side of 5th Street, within existing ROW to Laird Avenue. This portion of the trail is proposed to be 8-foot-wide concrete trail to minimize impacts to the yards, driveways, landscaping and other features of the adjoining properties. With that said, many driveways are anticipated to need partial reconstruction to accommodate ADA slopes for the proposed trail. The trail will continue from the intersection of Laird Avenue and 5th Street and run along the east side of Laird Avenue into Chautauqua Park. This final portion of the trail is proposed to be 10-foot-wide concrete to be located within existing ROW or city park property.

DESIGN CONSIDERATIONS

Of primary concern with this proposed route are the final grades and impacts to driveways, specifically on 5th Street. The south side of the street was selected as the preferred route since it is anticipated to be less of an issue, but it is worth evaluating the north side during final design. There are also fewer impacts to trees and landscaping on the south side of the roadway at the time of the completion of this report.

BENEFITS OF THIS ROUTE:

One of the main benefits of this route is its ability to connect HMS with Chataqua Park. This could potentially permit the school to designate an alternate pick-up/drop-off location for students attending HMS. This route also makes use of existing signalized pedestrian crosswalks at Marian Road and 5th Street near Hastings Middle School providing cost savings to the project.

Table 11. Project 4 - Chautauqua Park Connection

Item No.	DESCRIPTION	Unit	Quantity	Unit Price	Total
1.	Remove Curb and Gutter	LF	150	$10.00	$1,500
2.	Remove Concrete Sidewalk	SF	6,250	$2.00	$12,500
3.	Remove Pavement	SY	725	$5.00	$3,625
4.	Concrete Curb and Gutter (24"-36" wide)	LF	150	$30.00	$4,500
5.	6" Concrete Driveway	SY	725	$45.00	$32,625
6.	5" Concrete Sidewalk	SF	0	$7.00	$0
7.	6" Concrete Trail	SF	24,550	$6.00	$147,300
8.	On-Street Trail	LF	0	$20.00	$0
9.	Detectable Warning Panels	SF	190	$45.00	$8,550
				Construction Subtotal: P4	$210,600
				Contingency and Engineering: 35%	$73,710
				Total Opinion of Construction Cost	$284,310

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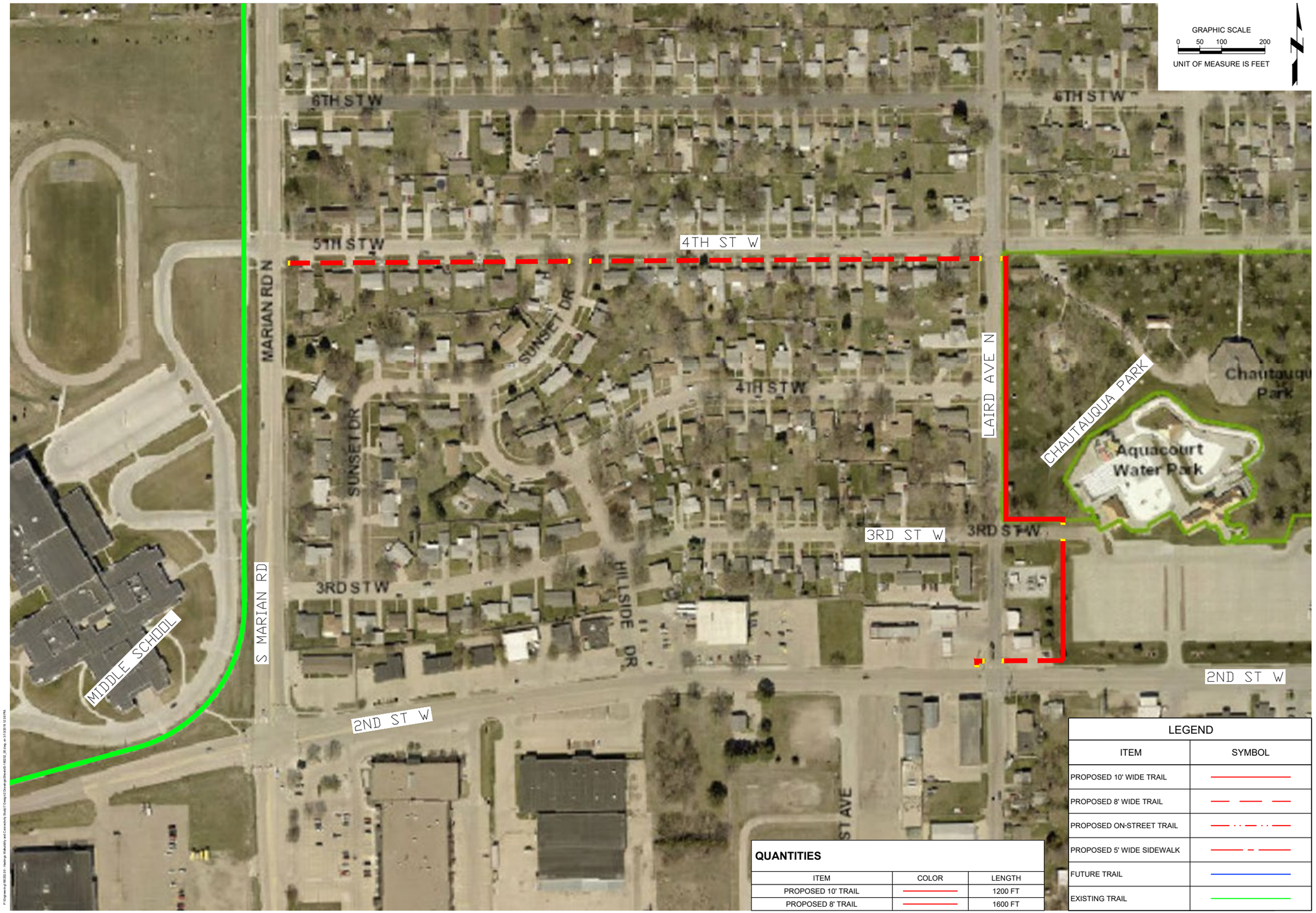
Figure 18. Project 4 – Chautauqua Park Connection



QUANTITIES

ITEM	COLOR	LENGTH
PROPOSED 10' TRAIL		1200 FT
PROPOSED 8' TRAIL		1600 FT

LEGEND	
ITEM	SYMBOL
PROPOSED 10' WIDE TRAIL	
PROPOSED 8' WIDE TRAIL	
PROPOSED ON-STREET TRAIL	
PROPOSED 5' WIDE SIDEWALK	
FUTURE TRAIL	
EXISTING TRAIL	

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PROJECT 5 – 14TH STREET LINK

The proposed route provides a much needed connection between the intersection of 9th Street and Marian Road and Libs's Park.

- Approximate Length: 10,200 Feet (1.93 miles)
- EOC: $474,200

The proposed trail starts at the existing traffic signal at 9th Street and Marian Road. It runs on the north side of 9th Street to Tilden Avenue, then north along the west side of Tilden Avenue to Home Street. At Home Street the trail is proposed to cross to the east side of Tilden Avenue and run north along the east side of Tilden to 12th Street where it crosses 12th Street.

- This portion of the trail is proposed to be 8-foot-wide concrete trail primarily located within existing ROW or on existing city-owned property

Then the route runs east along the north side of 12th Street to Laird Avenue.

- This portion of the trail is proposed to be 10-foot-wide concrete trail primarily located within existing ROW or on existing city-owned property

The route then turns north and continues on the west side of Laird Avenue to 14th Street.

- This portion of the trail is proposed to be 8-foot-wide concrete trail within existing ROW to minimize impacts to existing properties and landscaping

The trail then transitions into an on-street trail segment and runs east along 14th Street from Laird Avenue to the Pershing Road intersection.

- The on-street trail segment is proposed to be a 5-foot-wide bike lane on each side of the street with two 12-foot-wide lanes for motor vehicles
- No on-street parking is recommended on this portion of the trail to accommodate the on-street trail segment

From the Pershing Road intersection, the trail is proposed to go to the north side of the roadway to the existing trailhead in Libs Park west of the 14th Street and Kingsdale Road intersection.

- This portion of the trail is proposed to be 8-foot-wide concrete trail located within existing ROW

A connection is proposed from the Crane Avenue and 14th Street intersection north to the existing trail on the west side of Crane Avenue.

- This portion of the trail is proposed to be 8-foot-wide concrete trail located within existing ROW
- This portion of the trail may be considered for a curbside trail to minimize impacts to adjoining properties' landscaping and driveways

DESIGN CONSIDERATIONS

The city may choose to vary the final route alignment to create better aesthetics along 9th Street and Tilden Avenue where the city owns property. Another consideration is parking restrictions to accommodate the on-street portion of the proposed route. Lastly, the current traffic conditions meet guidelines for the recommended on-street crosssections along the proposed route. Should these traffic conditions change or demand increase, the improvements related to the on-street option may need to be evaluated and modified.

BENEFITS OF THIS ROUTE

One of the main benefits of this route is its ability to extend Pioneer Spirit Trail from it current western terminus in Libs Park. This route would also connect existing trails on Crane Avenue and Marian Road that link to HMS and Watson School. HMS. The on-street portion avoids some significant grade issues a traditional 8- or 10-foot-wide trail would have along this corridor resulting in overall cost savings to the project.

Table 12. Project 5 - 14th Street Link

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
1.	Remove Curb and Gutter	LF	140	$10.00	$1,400
2.	Remove Concrete Sidewalk	SF	5,600	$2.00	$11,200
3.	Remove Pavement	SY	400	$5.00	$2,000
4.	Concrete Curb and Gutter (24"-36" wide)	LF	140	$30.00	$4,200
5.	6" Concrete Driveway	SY	400	$45.00	$18,000
6.	5" Concrete Sidewalk	SF	0	$7.00	$0
7.	6" Concrete Trail	SF	43,900	$6.00	$263,400
8.	On-Street Trail	LF	2,550	$20.00	$51,000
9.	Detectable Warning Panels	SF	160	$45.00	$7,200
			Construction Subtotal:	P5	$351,200
			Contingency and Engineering:	35%	$122,920
				Total Opinion of Construction Cost	$474,120

Figure 19. Project 5 – 14th Street Link

QUANTITIES

ITEM	COLOR	LENGTH
PROPOSED 10' TRAIL		1900 FT
PROPOSED 8' TRAIL		3200 FT
PROPOSED ON-STREET TRAIL		5100 FT

LEGEND	
ITEM	SYMBOL
PROPOSED 10' WIDE TRAIL	
PROPOSED 8' WIDE TRAIL	
PROPOSED ON-STREET TRAIL	
PROPOSED 5' WIDE SIDEWALK	
FUTURE TRAIL	
EXISTING TRAIL	

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PROJECT 6 – PRAIRIE RIDGE PARK CONNECTION

The proposed route connects existing trails from north of 33rd Street and Osborne Drive East with a trail near the intersection of 42nd Street and Osborne Drive East. The trail runs from the existing trail north of 33rd Street along the east side of Osborne Drive East to the existing trail near the intersection of 42nd Street and Osborne Drive East. This portion of the trail is proposed to be 10-foot-wide concrete trail located within existing ROW or city-owned property.

- Approximate Length: 1,800 Feet (0.34 miles)
- EOC: $152,900

DESIGN CONSIDERATIONS

The primary design consideration for this project concerns the drainage along the softball fields from 39th Street East north to 42nd Street. This segment of the trail may be impacted by storm drainage issues and require storm sewer, culvert or additional grading to alleviate these concerns.

BENEFITS OF THIS ROUTE:

The proposed route provides a connection for two existing trail segments near a popular commercial area and a heavily used recreational area (Smith Softball Complex). Currently, there are no sidewalks or trails in this area.

Table 13. Project 6 - Prairie Ridge Park Connection

Item No.	DESCRIPTION	Unit	Quantity	Unit Price	Total
1.	Remove Curb and Gutter	LF	40	$10.00	$400
2.	Remove Concrete Sidewalk	SF	0	$2.00	$0
3.	Remove Pavement	SY	0	$5.00	$0
4.	Concrete Curb and Gutter (24"-36" wide)	LF	40	$30.00	$1,200
5.	6" Concrete Driveway	SY	0	$45.00	$0
6.	5" Concrete Sidewalk	SF	0	$7.00	$0
7.	6" Concrete Trail	SF	18,000	$6.00	$108,000
8.	On-Street Trail	LF	0	$20.00	$0
9.	Detectable Warning Panels	SF	80	$45.00	$3,600
10.	Railroad Crossing	LS	1	$0.00	$0
				Construction Subtotal: P6	$113,200
				Contingency and Engineering: 35%	$39,620
				Total Opinion of Construction Cost	$152,820

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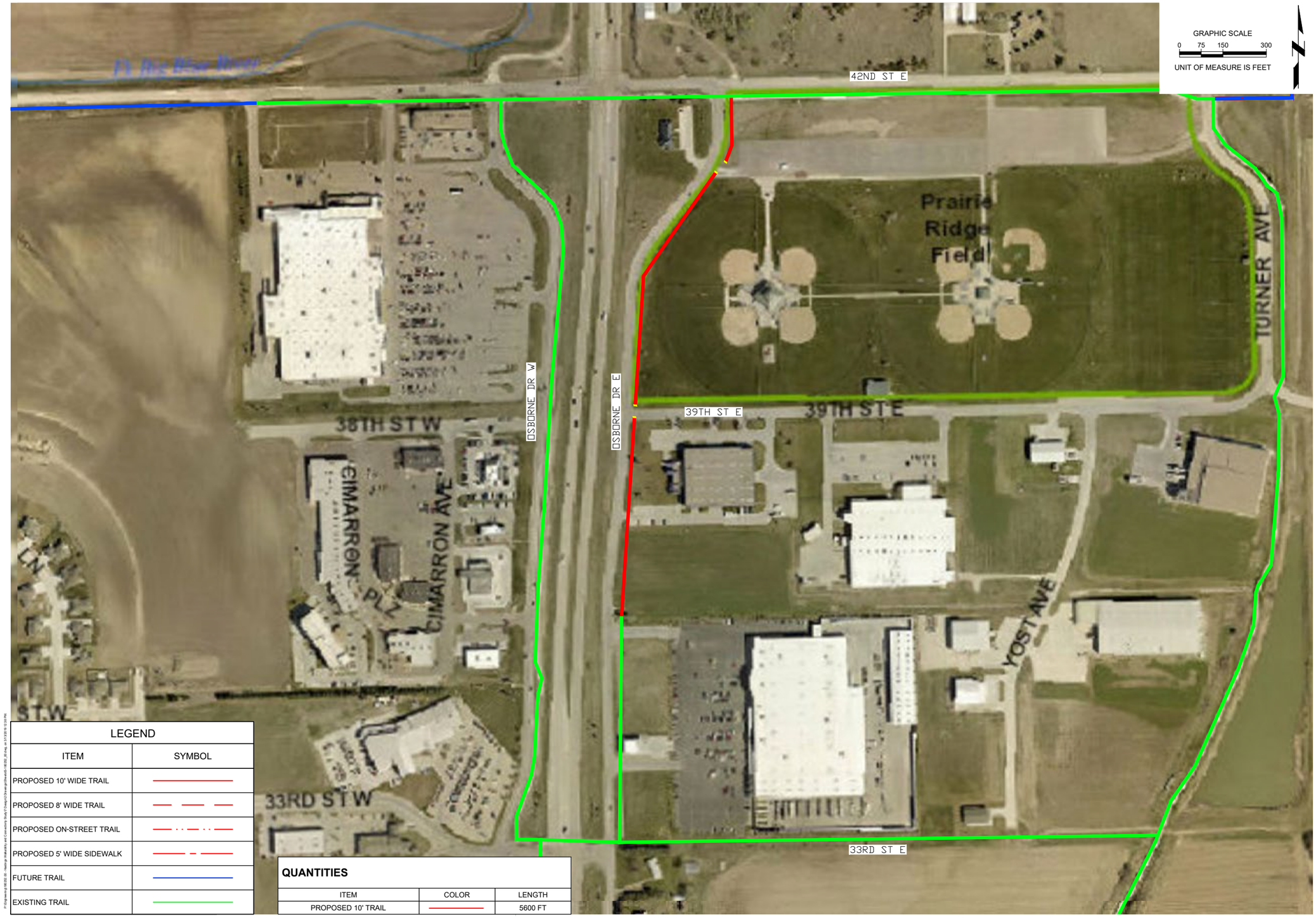
Figure 20. Project 6 – Prairie Ridge Park Connection



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PROJECTS SUMMARY

The table below provides a summary of all the proposed trails projects and their opinions of cost. Figure 21 and Figure 22 on the following pages show the existing trails (shown in green) and the entire system proposed by the walkability and connectivity study (shown in red). Implementing all these projects at once is cost prohibitive, but by following the proposed phasing these projects will begin to transform the city into a more bicycle and walk friendly community.

Table 14. All Projects with Opinion of Construction Cost

PROJECTS & PHASING	OPINION COST*
Project 1 - Southern Crosstown Connection	
Phase 1 - 1st St/Colorado Ave to Pine St/D St	$276,548.00
Phase 2 - Pine St/D St to F St/Burlington Ave	$433,715.00
Phase 3 - D St to Emerson Ave	$362,813.00
Project 2 - W South Street Path (Brickyard Park)	$492,683.00
Project 3 - Northern Crosstown Connection	
Phase 1 - 18th St/Baltimore Ave to Hastings Ave near Utilities Park	$410,940.00
Phase 2 - Hastings Ave near Utilities Park to 9th St/East Side Blvd	$516,780.00
Project 4 - Chautauqua Park Connection	$284,310.00
Project 5 - 14th Street Link	$474,120.00
Project 6 - Prairie Ridge Park Connection	$152,820.00
TOTAL PROJECTS COSTS	$3,404,729.00

** Opinion of Construction Cost include 35% contingency.*

FUTURE DEVELOPMENT ROUTES

The maps shown in Figure 21 and Figure 22 on the following pages also include future routes (shown in blue). These future routes have not be evaluated to the same level as the six prioritized projects outlined in this study. As the city grows and builds out into currently undeveloped areas, it is recommended future ROW be set aside by the city, adjoining property owners and developers to accommodate future trail routes that connect to the larger network. It is recommended that these future routes be designed as a 10 foot-wide off-street trail when and where possible.

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Figure 21. Existing, Proposed, + Future Trail Routes (South)

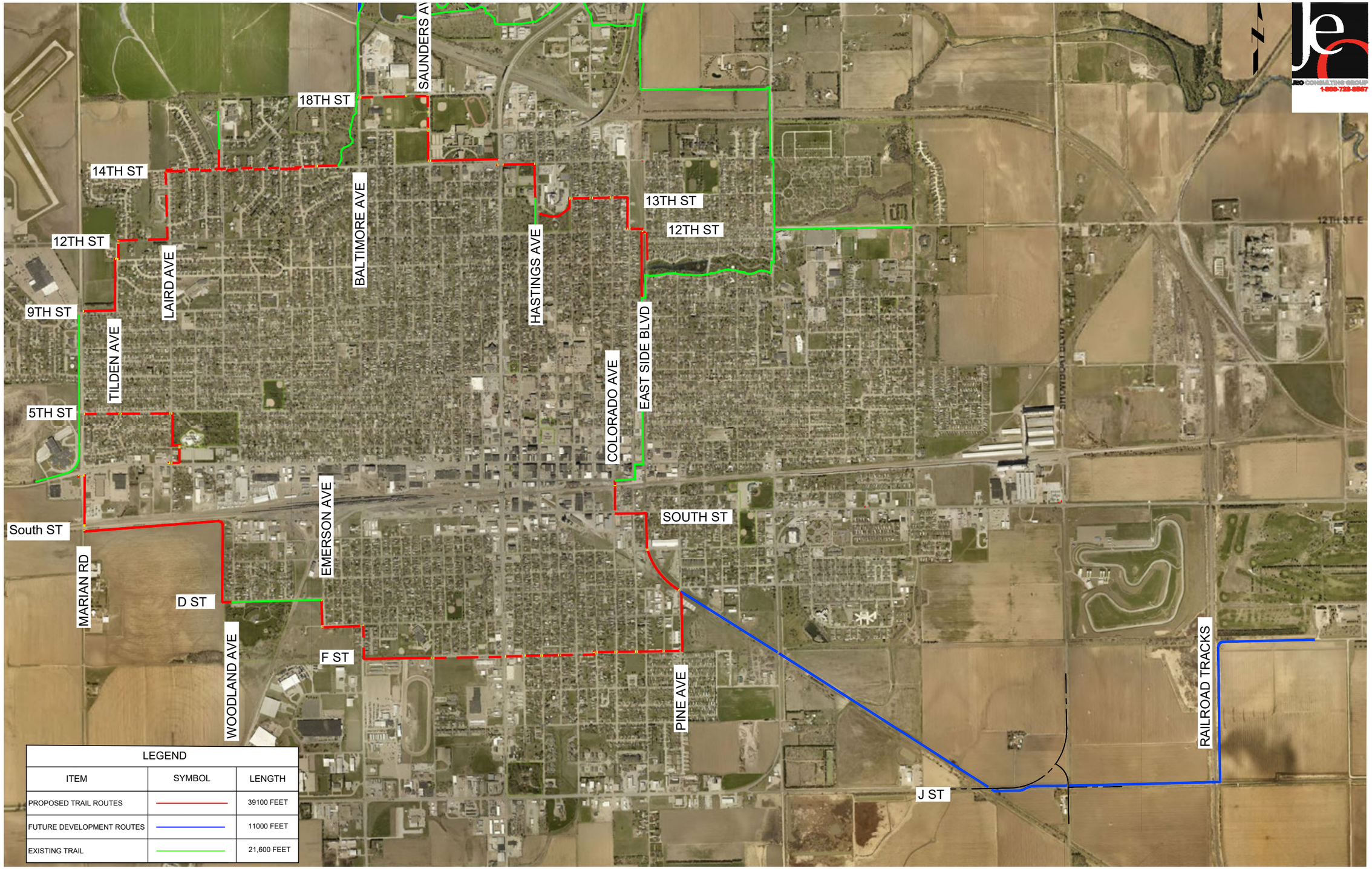

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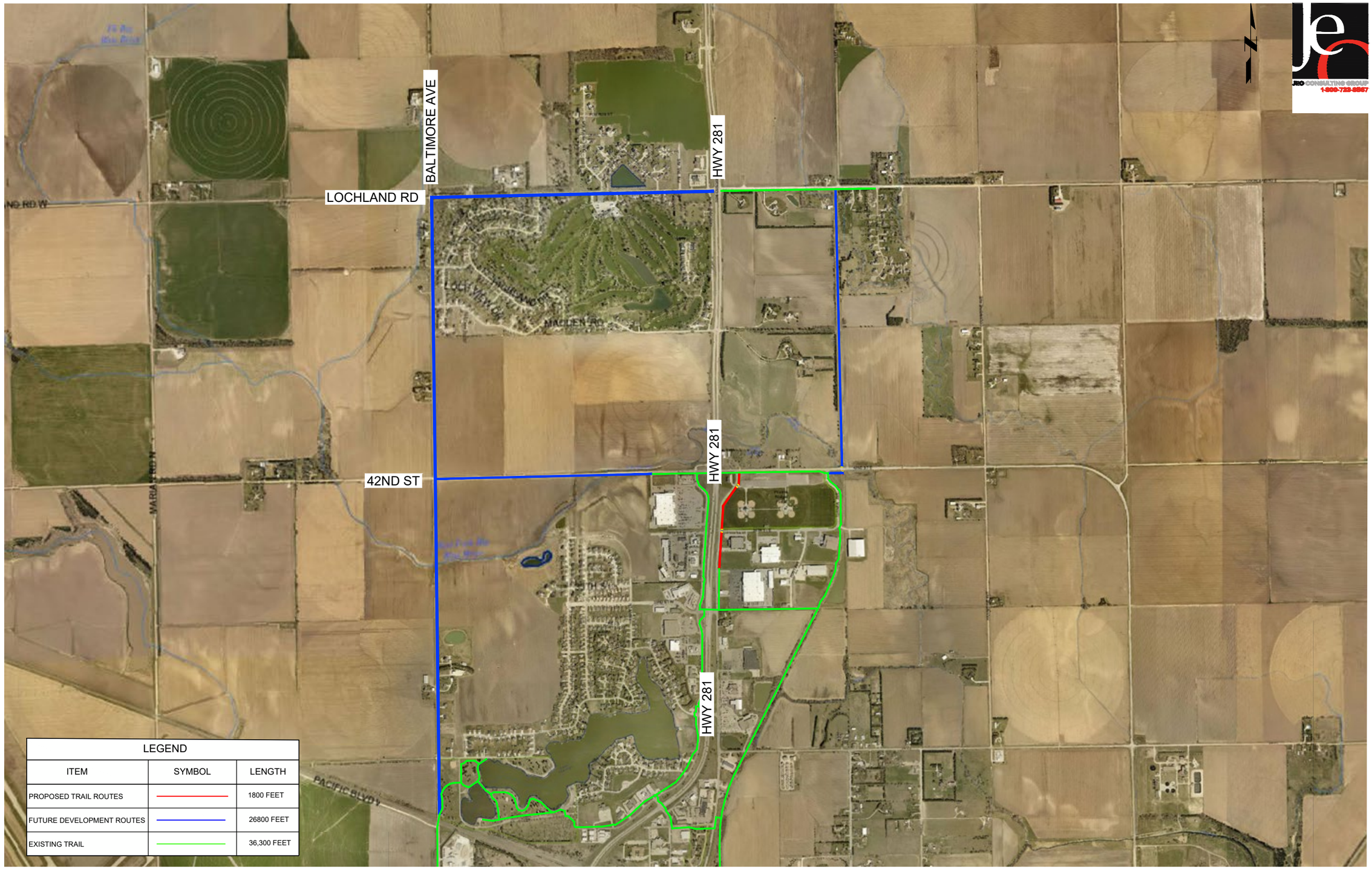
Figure 22. Existing, Proposed, + Future Trail Routes (North)



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WAYFINDING

The goal of this section is to provide the City of Hastings with a strategy to implement an effective wayfinding system. This guide will help planners and designers understand the intent of existing routes and develop a pedestrian and bicycle wayfinding network in Hastings as the city begins to implement the Hastings Walkability and Connectivity Study.

WAYFINDING NEEDS

As the city's on-street and off-street bicycle and pedestrian infrastructure grows, there will be a need to ensure all roadway users understand how to access comfortable routes and destinations by walking and bicycling. Signage may also attract more people to walk and bike.

The City of Hastings will implement the Hastings Walkability and Connectivity Study once it is adopted by City Council. Wayfinding is one element of the study and is intended to support existing and future Pioneer Trail alignments with clear routing and guidance. This will raise awareness of bicycle and walking routes and encourage people to consider bicycling or walking for transportation to key destinations across the city. Additionally, an easy to understand wayfinding system will make routes to school easier to identify.

EXAMPLE OF WAYFINDING

BENEFITS OF WAYFINDING

BICYCLE WAYFINDING SYSTEM BENEFITS

Wayfinding systems designed for bicyclists can enhance the value of an active transportation network by helping people identify and navigate desirable routes between destinations. Approaches to wayfinding vary considerably between communities and agencies. Some communities provide wayfinding for a smaller portion of the bicycle network, signing only low-stress routes that are comfortable for users of all skill and comfort levels. Others sign the entire bicycle and walking network and allow users to consider the relative comfort of the route. State departments of transportation frequently work with other state and national organizations to designate routes that have regional or statewide significance.

When the city moves forward with establishing their wayfinding program, planners should imagine a casual bicycle rider using the facilities and associated wayfinding. An experienced bicycle commuter or recreational rider often knows their favorite routes well and likely may not need a signed bicycle route system for that trip. However, a person who has just moved into a new neighborhood or who is exploring a path for the first time will appreciate the guidance provided by a well signed route.

PEDESTRIAN WAYFINDING SYSTEM BENEFITS

Pedestrian wayfinding systems are a low-cost solution to overcoming some of the barriers to walking. Pedestrian signage encourages walking by providing consistent and predictable environmental information that builds confidence in a pedestrian's understanding of their location and route options to important destinations. Good pedestrian signage will help a pedestrian gain a better understanding of their surroundings which in turn strengthens their knowledge of a city, its districts and landmarks.

OVERALL BICYCLE AND PEDESTRIAN WAYFINDING SYSTEM BENEFITS

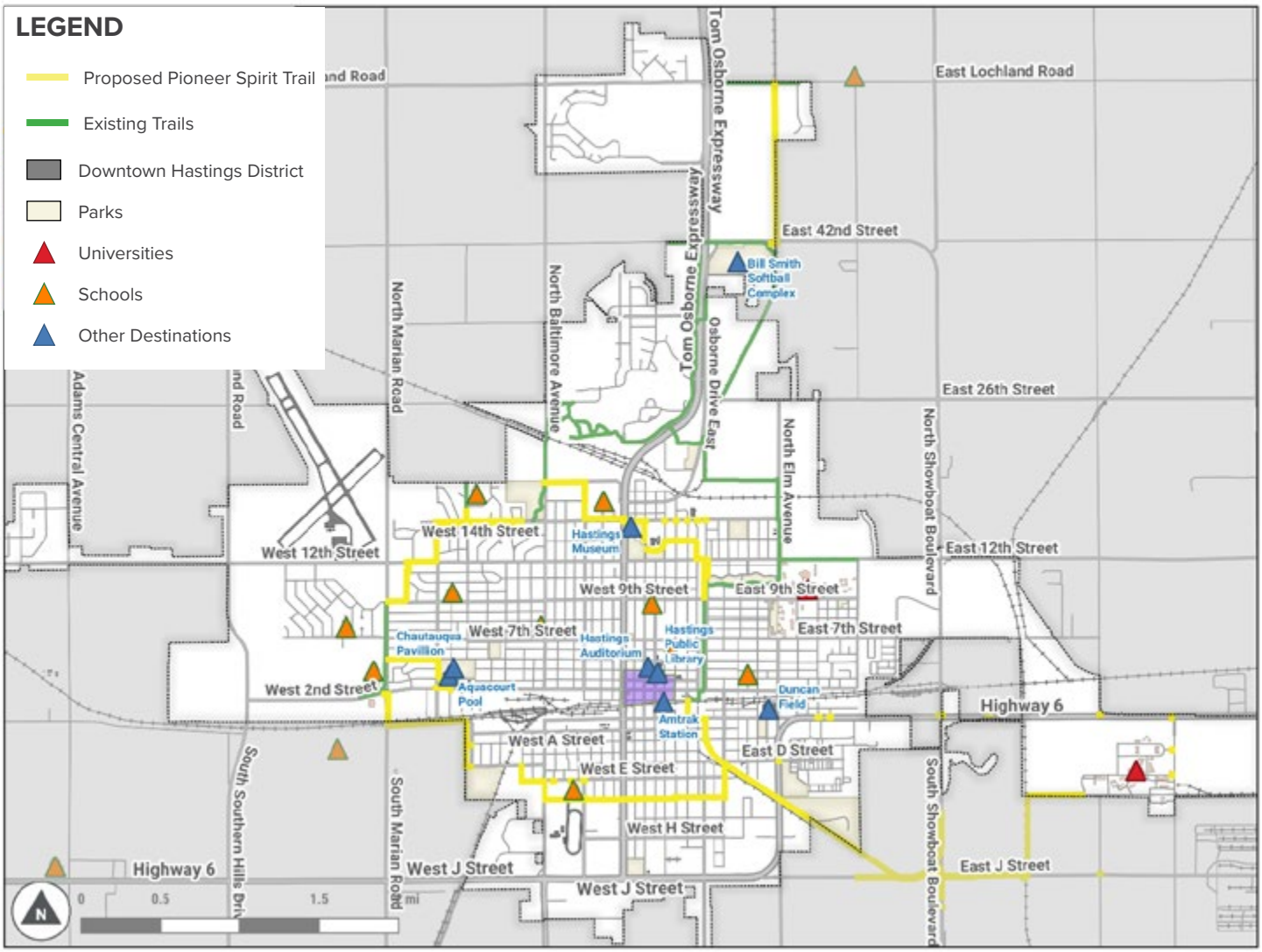
The benefits of establishing a bicycle and pedestrian wayfinding sign network include:

- Enhanced value of a bicycle and pedestrian network
- Helps people identify and navigate desirable routes between destinations
- Encouragement for Interested but Concerned Users
- Reminds drivers of bicyclists' and pedestrians' presence
- Promotes active travel
- Easy-to-implement
- Low-cost project

SIGNAGE RECOMMENDATIONS

For simplicity, MUTCD standard signage is recommended for bicycle wayfinding signs. For pedestrian wayfinding, there is no national standard comparable to MUTCD, so custom signage would need to be developed.

Figure 23. Map of Proposed Wayfinding Routes and Existing Destinations



BICYCLE WAYFINDING

In Hastings, destinations that may be considered for a wayfinding system include:

PRIMARY

- Downtown Hastings District
- Hastings Aquacourt Waterpark
- Hastings Museum
- Bill Smith Softball Complex
- Chautauqua Park and Pavilion
- Duncan Field
- Hastings City Auditorium
- Amtrak Station

SECONDARY

- Parks
- Schools and Colleges
- Hastings Public Library

In addition to the primary and secondary destinations highlighted above, several areas were identified as key destinations during public outreach. These destinations primarily include housing developments and centers of employment, which are not typically included in wayfinding systems.

Both route-based and destination-based wayfinding would be appropriate in Hastings and could be combined to maximize usefulness. While a route-based approach is most appropriate to direct users to or along the Pioneer Trail, these routes could be complemented by destination-based wayfinding along them that directs users to parks, business districts, and other notable destinations that the route passes. As shown in Figure 23, all of the identified primary destinations and many of the identified secondary destinations are near the Pioneer Trail.

PEDESTRIAN WAYFINDING

Of the three types of pedestrian wayfinding discussed above, the district and transit area wayfinding approaches are both readily applicable to Hastings. Downtown Hastings offers a prime opportunity for a pedestrian wayfinding district. The area bounded by the Burlington Northern tracks on the south, 4th Street on the north, Lexington Avenue on the west and Kansas Avenue on the east includes a number of places of interest such as the Hastings Auditorium, the Hastings Public Library, an Amtrak station, the City of Hastings City Hall, multiple public parks, and a connection to the Pioneer Spirit Trail.

All three of the transit area pedestrian wayfinding components–including station identification signs, route markers, and neighborhood maps–could be implemented at Hastings's Amtrak Station to orient pedestrians as they approach and depart from the station. In addition to providing clear identification of the station, signage can provide orientation to the neighborhood and nearby destinations. This transit area signage could complement a Downtown Hastings pedestrian wayfinding district.

See Appendix A for a more extensive discussion on developing wayfinding systems.

ADDITIONAL RESOURCES AND INFORMATION

- ***National Association for City Transportation Officials (NACTO), Urban Bikeway Design Guide***: This guide has a chapter on bicycle wayfinding sign types, pavement markings, and design guidelines. A summary of the chapter is available online.
- ***American Association for State Highway and Transportation Officials (AASHTO), Guide for the Design of Bicycle Facilities***: The guide has a section on bicycle wayfinding systems and emphasizes design and placement. The section also deemphasizes bike routes, since bike routes are not a facility type.
- ***Federal Highways Administration (FHWA), Manual on Uniform Traffic Control (MUTCD):*** This manual has a section for standard bicycle signs and details such as sign and font size.

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FUNDING

The City of Hastings currently utilizes local, state, and federal funding for transportation projects. The city has also set aside approximately $200,000 annually in Local Option Sales Tax (LOST) funds for the next nine years to help implement this study. To further advance the implementation of the projects proposed in the Hastings Walkability and Connectivity Study, the City of Hastings will need to look beyond its traditional funding sources. While the LOST funds will not be enough to fully implement the plan on its own, these funds can be leveraged to apply for grants and other funding resources as described below.

LOCAL OPTION SALES TAX

Any Nebraska county or incorporated municipality may impose a local sales and use tax upon approval by a majority of their voters in a regular election. The local tax applies to the identical transactions subject to the state sales and use tax, with the exception of direct-to-home satellite programming. Local option taxes of 0.5¢, 1¢, and 1.5¢ may be approved by city or county voters. The tax is collected and remitted to the state and is then allocated back to the municipalities after deducting the amount of refunds made and a three percent (3.5%) administrative fee.

Effective July 19, 2012 and pursuant to LB357, municipalities may, with voter approval, impose a sales and use tax equal to 1.75¢ to 2.0¢. The proceeds from the rate in excess of 1.5¢ shall be used for public infrastructure projects or voter-approved infrastructure related to an economic development program as defined in section 18-2705. Public infrastructure project means and includes, but is not limited to, any of the following projects, or any combination thereof: Public highways and bridges and municipal roads, streets, bridges, and sidewalks; solid waste management facilities; wastewater, storm water, and water treatment works and systems, water distribution facilities, and water resources projects, including, but not limited to, pumping stations, transmission lines, and mains and their appurtenances; hazardous waste disposal systems; resource recovery systems; airports; port facilities; buildings and capital equipment used in the operation of municipal government; convention and tourism facilities; redevelopment projects as defined in section 18-2103; mass transit and other transportation systems, including parking facilities; and equipment necessary for the provision of municipal services.

No municipal sales and use tax shall be imposed at a rate greater than one and one-half percent (1.5%) or increased to a rate greater than one and one-half percent unless the municipality is a party to an interlocal agreement pursuant to the Interlocal Cooperation Act or a joint public agency agreement pursuant to the Joint Public Agency Act with a political subdivision within the municipality or the county in which the municipality is located creating a separate legal or administrative entity relating to a public infrastructure project.

Hastings currently has a 1.5¢ voter enacted local option sales tax.

For more information: http://law.justia.com/codes/nebraska/2017/chapter-77/statute-77-27-142/

GENERAL OBLIGATION BONDS

General Obligation (GO) bonds are backed by property taxes, and are issued by the city for a wide array of community betterment projects.

For more information: http://law.justia.com/codes/nebraska/2017/chapter-18/statute-18-501/

COMMUNITY DEVELOPMENT ASSISTANCE ACT

The Community Development Assistance Act (CDAA) was created in 1985 by the Nebraska Legislature to encourage financial support by businesses to community betterment organizations in their efforts to implement community service and development projects in chronic economically distressed areas.

CDAA empowers the Department of Economic Development to distribute a 40% state tax credit to businesses, corporations, insurance firms or financial institutions or individuals that make eligible contributions of cash, services, or materials to approved community betterment projects.

Five types of projects may qualify through the program. Eligible projects include, (1) employment training, (2) human and medical services, (3) physical facility and neighborhood development services, (4) recreational and educational activities, and (5) crime prevention.

Application deadline: None.
Maximum award: $25,000 in tax credits (generates $62,500 in private donations)

For more information:
https://opportunity.nebraska.gov/program/community-development-assistance-act/

LAND + WATER CONSERVATION FUND

The Land and Water Conservation Fund (LWCF) Act of 1965 seeks to provide outdoor recreation opportunities for all Americans. Funding is made available through royalty revenues from offshore leasing contracts with mineral extracting companies. Nebraska appropriates 60% of the fund for local subdivision recreation projects and retains 40% of the fund for statewide projects within the State Park System. As required by Congress, proposed recreation projects must be in accordance with the State Comprehensive Outdoor Recreation Plan (SCORP). The reimbursable program provides grants for up to 50% of project costs. Local governments/ political subdivisions must assure the Nebraska Game and Parks Commission that they have the financial resources to complete and maintain projects in desired operations and settings. Examples of eligible projects include playgrounds, ball fields, soccer fields, picnicking facilities, camping facilities, golf courses, tennis courts, shelters, acquisition and development, and related support facilities.

Maximum grant: None specified.
Match requirement: 50% non-federal
Application deadline: Early September

For more information:
http://outdoornebraska.gov/wp-content/uploads/2018/05/LWCF_Application_Guide_FY2018.pdf

TRANSPORTATION ALTERNATIVES PROGRAM

FEDERAL (TE + SAFE ROUTES TO SCHOOL)

MAP--21 combines previous biking and walking funding programs–Transportation Enhancements (TE), Safe Routes to School and Recreational Trails–into one program: Transportation Alternatives. Funding for the Recreational Trails Program is taken off the top, then remaining TA funding is divided up into two equal pots: 50% will be distributed by the state DOT through a competitive grant process and 50% will be distributed according to the share of population with the state. MPOs with populations greater than 200,000 will administer their own grant process; the other communities will be funded through the state DOT's grant process.

The Transportation Alternatives (TA) Program is currently full through Fiscal Year 2021, so NDOT will not be conducting a competitive selection process until 2018 or 2019.

For more information: http://roads.nebraska.gov/business-center/lpa/projects/programs/tap/

PRIVATE/CHARITABLE FOUNDATION

Private/charitable foundations are legal entities set up by an individual, a family, or a group of individuals, for a purpose such as philanthropy. The Hastings Community Foundation, is an example of such a foundation.

RECREATIONAL TRAILS PROGRAM

The Nebraska Game and Parks Commission administers the Recreational Trails Program (RTP) on behalf of the Federal Highway Administration. This fund uses refunds of fuel taxes paid by off-road recreational vehicles. 30% of the funding is dedicated to motorized trails, 30% of the funding is dedicated to non-motorized trails and the remaining 40% of the funding is dedicated to diversified use trails. Examples of eligible projects include construction of recreational trails, acquisition of land for trails, bridges for trails, support facilities such as trailheads, parking, and restrooms.

Grant range: $50,000 - $250,000
Match requirement: 20% non-federal
Deadline: September 1st

For more information:
http://outdoornebraska.gov/wp-content/uploads/2017/02/2017-RTP-Grant-Application.pdf

SPECIAL ASSESSMENT DISTRICTS

Certain improvements, such as parking lots and sidewalk improvements can be financed by special assessments. This method of financing is a tax upon a property owner for a portion of the costs incurred by the city for a particular improvement.

Second Class Cities: See Section 17-507 – 17-541, 17-703 of the Nebraska Revised Statues.

For more information: http://law.justia.com/codes/nebraska/2017/chapter-17/

TAX INCREMENT FINANCING

Tax Increment Financing (TIF) is a tool that encourages private development in areas experiencing blight and disinvestments, typically areas in or near downtown. A TIF program provides a method for financing public costs associated with a private development project by using the projected increase in property tax revenue resulting from the private development. TIF bonds allow the developer to retire the "public costs" over a period of 15 years. During the time the bonds are outstanding, each taxing jurisdiction receives its original share of tax revenue or "pre-TIF project tax revenues." The advantage of TIF is that it enables a local government to borrow against future tax revenues generated by a redevelopment project. See Section 18-2101 through 18-2154 of the Nebraska Revised Statutes.

For more information:
http://law.justia.com/codes/nebraska/2017/chapter-18/statute-18-2101/

LITTLE BLUE NATURAL RESOURCES DISTRICT

The Little Blue Natural Resources District has an Urban Conservation Program that helps citizens groups and governmental agencies in their efforts to reduce and prevent soil erosion, flooding and related resource problems and trails development in urbanized areas. The District will provide technical and financial assistance on eligible projects sponsored by citizen groups, private organization or governmental agencies. Contact the Little Blue Natural Resources District to discuss individual projects.

For more information: https://littlebluenrd.org/

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Appendix A:
Wayfinding Best Practices

BICYCLE WAYFINDING

TYPES OF BICYCLE WAYFINDING SIGNAGE

There are two main approaches to bicycle route signing and wayfinding: signing for recreational routes and destination-based wayfinding. The Manual of Uniform Traffic Control Devices (MUTCD) provides guidance for the design and placement of signs for both approaches. The most appropriate wayfinding approach will depend on the goal of the system—if the goal is to point bicyclists to destinations along the most comfortable, direct route possible, a destination-based system is most appropriate. If the goal is to help bicyclists follow a particular route that may not be direct, a route-based system may be more appropriate. While the two approaches can be combined, they can sometimes be incompatible: recreational routes are often circular or will deviate from the shortest path in order to take in a beautiful scenic view, follow a river, or go up a challenging hill. Destination-based wayfinding routes usually take a more direct—but still safe—route and will avoid steep hills. Both approaches should guide bicyclists along low-stress conditions.

Table 1 highlights different approaches and examples of each, as well as some examples where they have been combined.

Table 1. Types of Wayfinding Systems

	Destination-Based Wayfinding	Route-Based Wayfinding	Combination of Route-Based and Destination-Based
Primary use	Transportation	Recreation	Transportation and recreation
Type of travel and route	Routes are mostly direct and less hilly	Routes may be circular, may follow waterbodies or scenic views	Routes are mostly direct. May be urban escape routes or popular shared-use paths
Type of information on signs	Destinations, direction, and distance (optional).	Route name (or route number), direction, and optionally, distance. Routes may be color-coded	Route name (or route number), direction, and distance (optional). Routes may be color-coded
Examples	 Pittsburgh, PA  Arlington, VA	 Wausau, WI  Madison, WI	 Rockville, MA  Madison, WI (proposed)

DESTINATION-BASED

`DESTINATIONS AND ROUTE SELECTION

Destination-based wayfinding systems connect places along a route and are useful for users bicycling for transportation purposes. Typically, when designing a destination-based system, destination selection comes prior to route selection, as the places bicyclists are trying to go will ultimately inform their desired route.

HIERARCHY OF DESTINATIONS

Defining a hierarchy of destinations is useful to help planners determine which destinations are included on wayfinding signs—the hierarchy determines how far from the destination references to it will appear on wayfinding sign panels. Potential destinations can be assigned as either Primary or Secondary. Primary destinations should include the most well-known destinations and the venues that attract the most visitors (especially ones that arrive by bicycle). Primary destinations include major destinations and landmarks, districts, neighborhoods, parks, and shopping districts, and can be signed from up to two miles away. Private businesses are often not included in destinations.

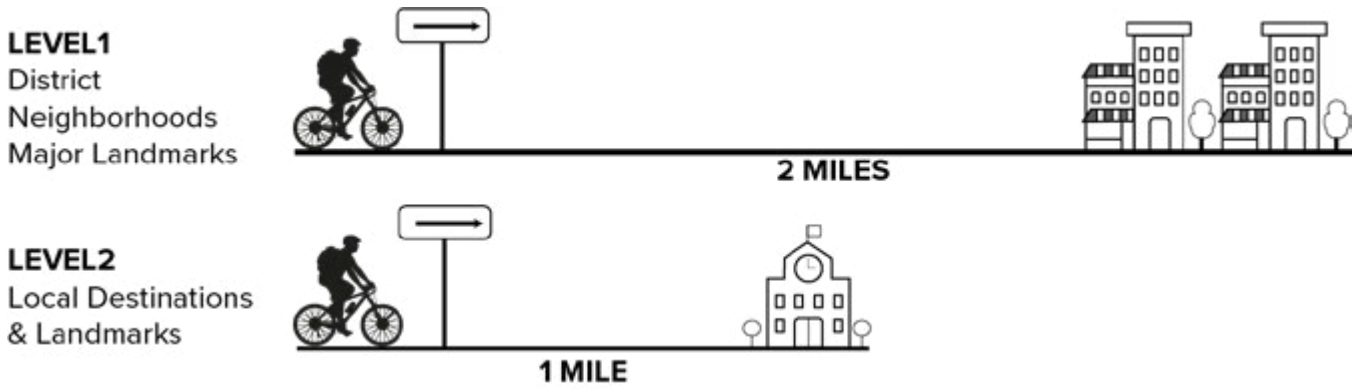
STANDARDS FOR MEASURING DISTANCE TO DESTINATIONS

A core principle of wayfinding sign design is progressively disclosing information by not overwhelming the bicyclist at any one decision point or sign assembly. Knowing when to introduce a new destination depends largely on its importance and distance from the sign.

Distance to Destination

In many cases, sign designers will have more possible destinations that could be included in a wayfinding assembly than space available for them. The destination hierarchy should guide the designer when deciding at what distance destinations should be included on wayfinding signs. Suggested distance guidelines for the urban/suburban and rural destination hierarchy are displayed in the figure below. In practice, however, the distance at which each destination appears on wayfinding signs will require the judgment of the person or committee who is planning the wayfinding along the bikeway. Additionally, time to destinations can be added to wayfinding signs by using the distance to each destination and average commuter cyclist speed (9.6 miles per hour).

Figure 1. Route-based Wayfinding Examples



Measure-To Points
If the destination is a neighborhood, municipality, or a large park, designers will have to establish a measure-to point.

- » For large parks or facilities, it may make sense to measure distance to the main entrance.
- » The distance to a city, district or neighborhood should be measured to the area's center point, as is the practice in highway wayfinding; Google Maps' bicycle navigation feature also measures distance to the city's center point.

ROUTE-BASED

Route-based wayfinding is geared towards users bicycling for recreation and may be less useful for those commuting or bicycling strictly for transportation purposes. Typically, route-based systems do not specify a destination, so they may be less useful absent a corresponding map. Often, different routes have unique features such as a number, letter, shape, color, logo, or name so that the route is easily identifiable.

Examples of route-based wayfinding are illustrated in the table below.

Table 2. Route-based Wayfinding Examples

Modeled on MUTCD M1-8 Sign	Modeled on MUTCD D11-1c Sign	Flexible interpretation of MUTCD guidance
 	 	 

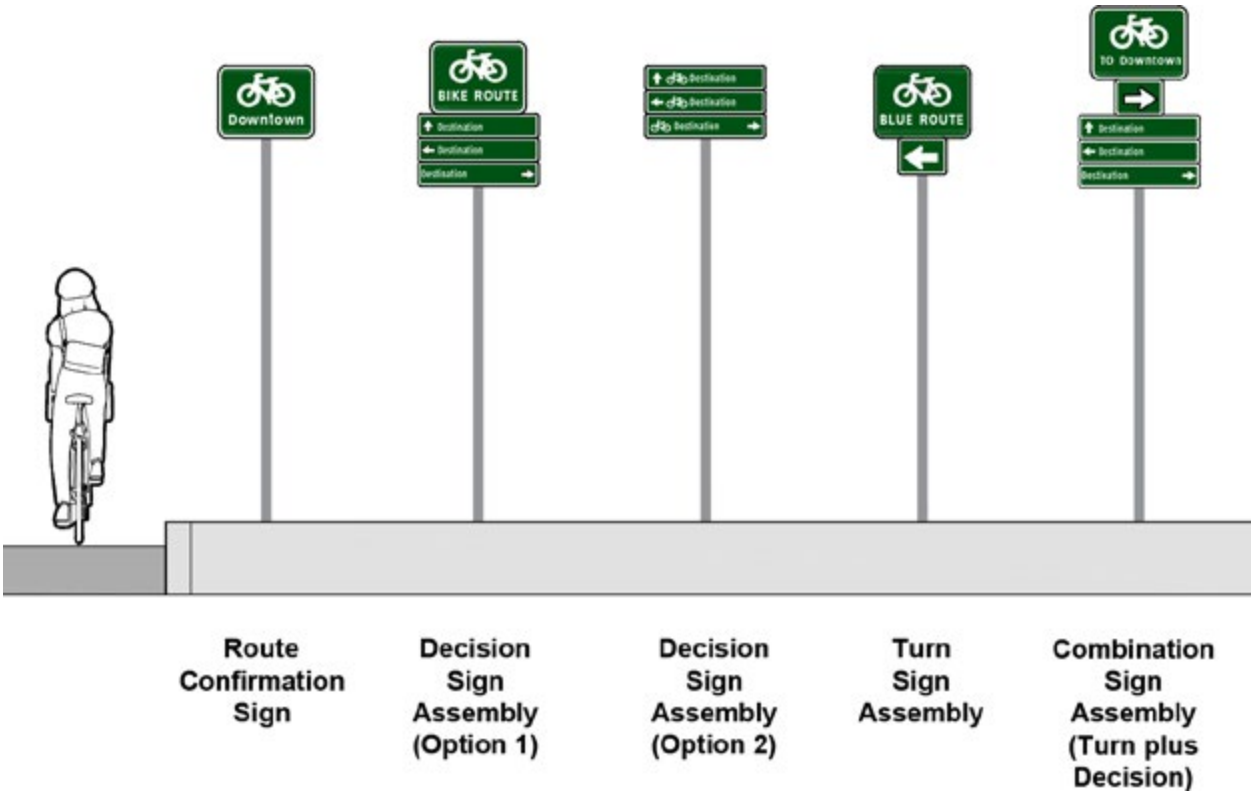
RECOMMENDED BICYCLE WAYFINDING SIGNAGE

To provide a custom feel for the City of Hastings, staff preferred the route-based wayfinding signs that use a flexible interpretation of MUTCD guidance such as the examples provided in column three of Table 2. While these signs have a standard size and assembly due to the single panel design, they should be used on the city's primary bicycle and pedestrian routes. However, standard MUTCD D11-1c signs can be used on future secondary bicycle and pedestrians to guide users to major routes. This layered approach provides greater flexibility and allows users to know they are on cross-town major routes.

SIGN ASSEMBLIES AND TYPOLOGIES

The fundamental family of sign assemblies used as part of bicycle and pedestrian wayfinding systems include route confirmation, decision, turn, combination, and supplemental information signs. The function, content, and placement of each are described below:

Figure 2. Wayfinding Signage Typologies



CONFIRMATION SIGN

Route confirmation sign assemblies let bicyclists know they are on a designated bikeway and alert motorists to the likely presence of bicyclists. They are placed after a turn or intersection to reassure cyclists that they are on the correct route. For urban or suburban environments where a bicycle route continues straight along a roadway or shared use path without any turns or decisions, it is recommended that a confirmation sign be placed every quarter to half mile or every three to four blocks to reassure bicyclists they are still on the designated bikeway. For rural routes, route confirmation signs should be spaced every one to two miles and more frequently where there are more intersections.

DECISION SIGN
A decision sign assembly is used to inform bicyclists of route choices at a junction. Decision sign assemblies are often used where two or more bicycle routes cross. To maintain simplicity, decision sign assemblies signs should not display more than three destinations. To improve user comprehension, through-destinations should be placed at the top of the sign assembly, followed by destinations that require the bicyclist to make a turn (left turns are typically displayed above right turns).

TURN SIGN
Turn signs are used to indicate a change in route or path direction when the main spine of a route turns. These assemblies usually include the main route confirmation plaque as well as a 6" arrow plaque.

COMBINATION SIGN
A combination sign typically includes elements of the other three sign types. These are more complex, and typically used at intersections warranting more information. Turn signs should be placed at points prior to the turn to give advance notice of a change in route direction.

MAP KIOSKS
Of the various wayfinding devices, maps provide the most information to the user. They can show all possible routes and destinations in Hastings and provide a snapshot understanding of the area. Map kiosks should be located at trailheads, parks, and other gathering areas.

GENERAL GUIDANCE

- Typically, bicycle and pedestrian wayfinding signs are placed on the right side of the street. For left hand turns, decision, turn, and combination signs should be placed a minimum of 25 ft. in advance of the intersection to allow adequate notice.
- Arrows on an assembly should not point to a minor side street, alley or driveway that could be mistaken for the intended turn.
- Care should be taken to place signs in locations where they will not be blocked from view by tree limbs, vegetation, other signs, parked vehicles (especially large vehicles and trucks), and buses at bus stops.
- Signs should be placed a minimum of two feet and no more than 12 feet from the edge of roadway or shared-use path.

MOUNTING HEIGHT
Wayfinding guide sign mounting height and vertical clearance requirements vary by location. The minimum height is measured vertically from the bottom of the lowest sign on the assembly to the near edge of pavement or top of curb. These minimum heights are as follows:

- Urban Areas or where pedestrian traffic/parking likely– 7 ft minimum
- Shared-Use Path – 4 ft minimum

Sign placement and mounting height must meet pedestrian accessibility requirements. This is particularly important in areas where multiple sign panels are mounted on the same post and may be in close proximity to pedestrian clear zones. See the proposed PROWAG and MUTCD Section 2A.18 for more information.

PEDESTRIAN WAYFINDING

PEDESTRIAN WAYFINDING BEST PRACTICES

In contrast to people biking, pedestrians are able to approach a sign more closely and take more time to read it. Because of this, pedestrian wayfinding signs can contain more information than bicycle wayfinding signs. Pedestrian signage and wayfinding is typically used in three contexts, which are outlined in this section.

Recreational walking routes:

Designating recreational walking routes is a popular way to promote and encourage walking in a community. Generally, pedestrians enjoy recreational routes that are quiet, have natural scenery and are convenient and safe. These can be on trails, loop routes and along quieter streets. They are generally named routes that can form loops or be linear in nature. Providing guidance along these routes to ensure pedestrians that they are on the correct pathway is important to the comfort and enjoyment of the walking route.

Districts:

Districts and neighborhoods that have a network of on-street and separated pathway pedestrian routes, and that cross at intersections require wayfinding that orients pedestrians at decision points. These can include arrival points such as transit stops and parking lots, public spaces and buildings, and other places of interest.

Transit Areas:

Providing pedestrian wayfinding within transit stop or station areas helps to facilitate the mode shift from walking to transit and vice versa. Pedestrian wayfinding near transit can be integrated with station wayfinding or neighborhood wayfinding if additional guidance is needed. These signage systems are required to follow ADA guidelines for sign placement and legibility. Components of a transit area wayfinding system are:

1. Station identification signs that mark the entrances to stations and that are visible from a distance during the daytime and at night.
2. Route markers that lead pedestrians to and from stations along direct walking routes. Implement route markers when the routes to and from transit are not clear or intuitive. For example, provide route markers to a bridge that must be crossed to access the station.
3. Maps of the neighborhood to help those arriving on transit to get oriented at the exit of the station and walk to nearby destinations within ¼ to ½ mile of the station or stop.

The best practice examples shown in Figure 3 highlight different strategies for pedestrian wayfinding along recreational walking routes, in districts, and in transit areas.

Figure 3. Pedestrian Wayfinding Examples

Recreational Walking Routes		
Agency	**Description**	**Wayfinding Tools**
Kirkland, Washington	The City of Kirkland, Washington, has implemented recreational walking routes throughout the city. Some of the routes have been marked with small 3.5-inch diameter signs with the name of the route and an arrow indicating turns in the route. In addition, the city has developed printable neighborhood walking maps that are available on the city website.	
Districts		
Agency	**Description**	**Wayfinding Tools**
Seattle Washington	These finger signs in Seattle are located at key decision points, (e.g. intersections, plazas) and provide direction and destination information. The signs direct pedestrians to major destinations such as transit stations, shopping districts, museums and public institutions. These signs can work in unison with maps to provide guidance, as pedestrians get closer to major destinations. The sign blades can be manufactured by the city's sign shop and the sign post is city standard issue that has been painted red. The sign assembly is installed by city crews, lowering the cost of the wayfinding system significantly.	
Transit Areas		
Agency	**Description**	**Wayfinding Tools**
Washington D.C.	The Metro Rail uses signs to point pedestrians toward rail stations.	

PEDESTRIAN SIGN SYSTEM COMPONENTS

SIGNS AND MAPS

Finger signs: Finger signs provide information for pedestrians at decision points. Generally, finger signs include direction, destination, and distance information. Finger signs are oriented around a central post and point in the direction of travel. Finger signs can help pedestrians determine which way to travel as they proceed to a location through various turns. Finger signs work well in districts with many destinations such as a downtown or business district or at intersections of trails and pathways. Finger signs help pedestrians navigate a network of intersecting pedestrian routes.

Pathway markers: Markers help pedestrians follow a specific pathway. These work well on trails and other popular recreational walking routes where there are few intersecting routes but many turns or jogs in the pathway that require wayfinding guidance. Pathway markers can be fairly small and unobtrusive in the right-of-way because they should be designed for the pedestrian scale.

Map kiosks: Of the various wayfinding devices, maps provide the most information to the user. They can show all possible routes and destinations in a prescribed area and provide a snapshot understanding of the area. Maps can also be spaced fairly far apart and thus do not create as much street clutter as finger blades. Maps generally cover ¼ to ½ mile area and provide a variety of elements relevant to pedestrian travel in the area. Determining the level of detail on maps is crucial to the function of the map for users. Kiosks made of durable materials and designed so that information can be swapped out for updated maps or content will reduce costs by not having to remanufacture the whole sign.

FUNDING

FUNDING OPPORTUNITIES

Hastings may choose to pursue supplemental funding sources to expedite planning and implementing a bicycle and pedestrian wayfinding system and to reserve funding already allocated to bikeway improvements for implementing bicycle facilities, such as bike lanes, separated bike lanes, and neighborhood bikeways. Implementation of bicycle route signage are eligible for funding through the following United States Department of Transportation programs:

- Better Utilizing Investments to Leverage Development Transportation Discretionary Grants (BUILD)
- Transportation Infrastructure Finance and Innovation Act (TIFIA)
- Federal Transit Administration (FTA) Capital Funds
- Associated Transit Improvement (ATI)
- Congestion Mitigation and Air Quality Improvement Program (CMAQ)
- National Highway Performance Program (NHPP)
- Surface Transportation Block Grant Program (STBG)
- Transportation Alternatives Set-Aside (TA)
- Safe Routes to School (SRTS)

The city can also enter into partnerships with private organizations, businesses, and neighborhood organizations to help fund the installation and maintenance of wayfinding signs. For example, the city of Hastings could create an “Adopt-A-Street” program that emulates the existing Adopt-A-Park/Trail program, partnering with individuals and organizations to help maintain signs along bicycle and pedestrian wayfinding routes. Crowdfunding campaigns and private donations can also bolster the funding available to the city for installing new signs and maintaining existing ones.

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Appendix B:

Bicycle Facility Types

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BICYCLE FACILITY TYPES

SHARED-USE PATHS

OFF-STREET SHARED USE PATH

Shared-use paths are typically located in rights-of-way separate from roadways, or adjacent to high-speed roads with very few roadway crossings of the path. They are preferred by less experienced cyclists and pedestrian because of their separation from traffic. More experienced cyclists may avoid them if pedestrians and slower cyclists are present. Snow removal and sweeping of these paths may require specialized equipment. Additionally, tree roots growing under the pavement may require periodic maintenance to preserve a comfortably smooth pathway surface.

Shared-use paths should have a minimum width of 10’ and a minimum 2’ shoulder on each side of the path (see Figure 1 below). In constrained right-of-way locations, the path width may reduce to a minimum of 8’ and should maintain 2’ shoulders. Shoulder width and clear space requirements may have an alternative minimum of 3’ depending on some Nebraska funding sources. However, a 5’ shoulder is desirable for paths adjacent to hazards, such as a body of water, fencing, or steep slopes. Figure 2 and Figure 3 on page 4 provide dimensions for minimum standards of a shared-use path. For a more detailed guidance on recommended path widths and shoulder widths, see the *AASHTO Guide for the Development of Bicycle Facilities*.

Figure 1. Shared-Use Path

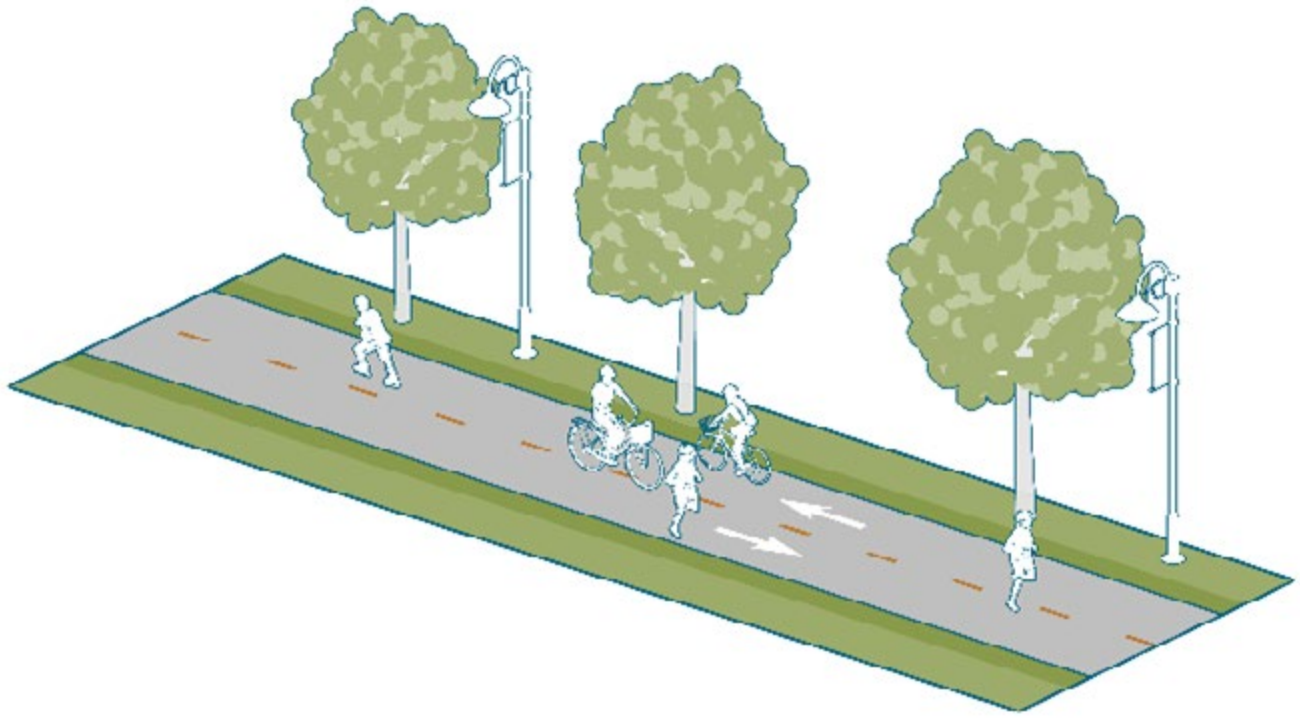
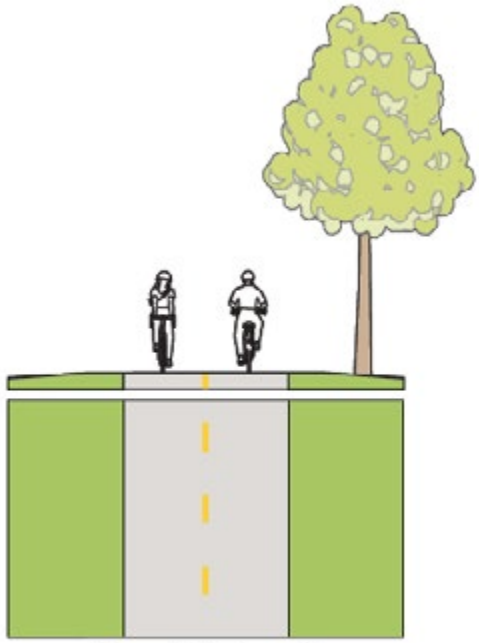
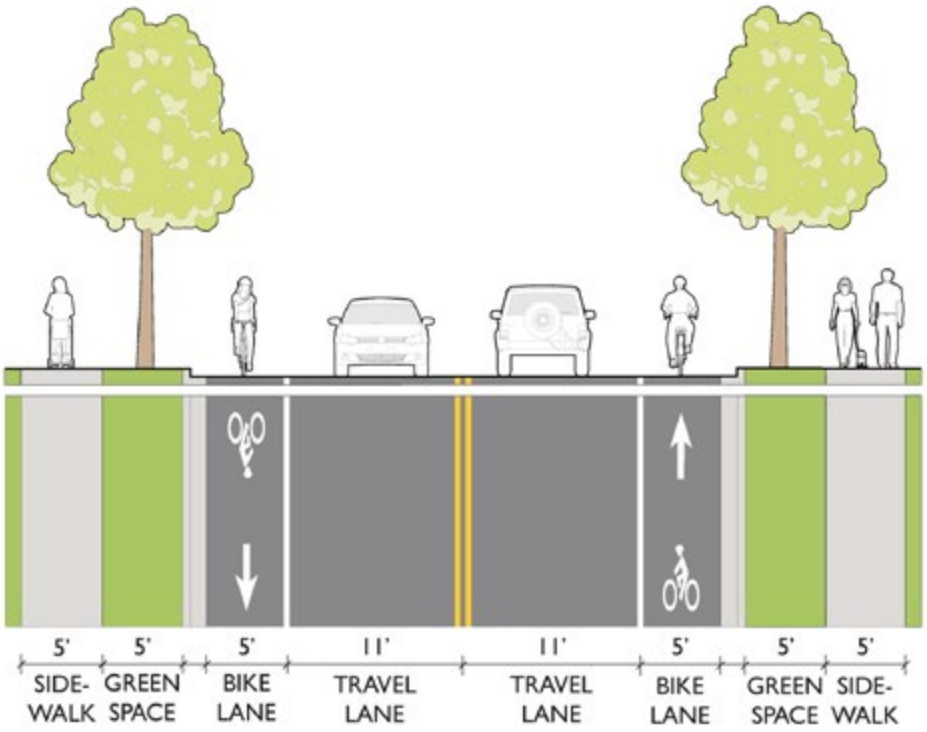


Figure 2. Shared-Use Path Recommended Minimum Dimensions



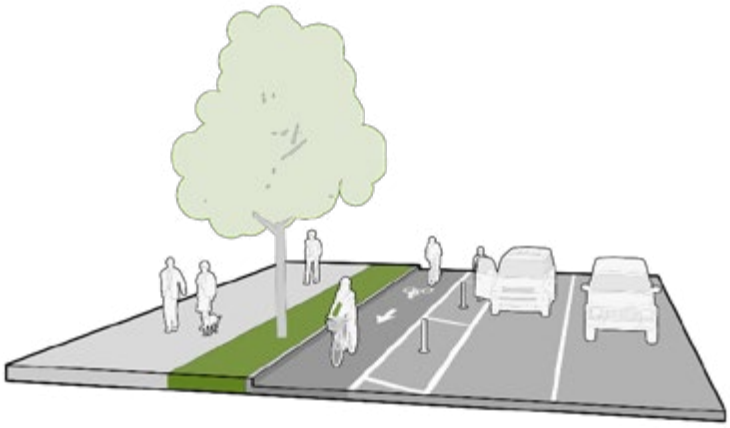
SHARED USE PATH - PAVED
(WITH 2' SHOULDER)

Figure 3. Shared-Use Path–Recommended Minimum Sidepath Dimensions



SEPARATED BIKE LANES

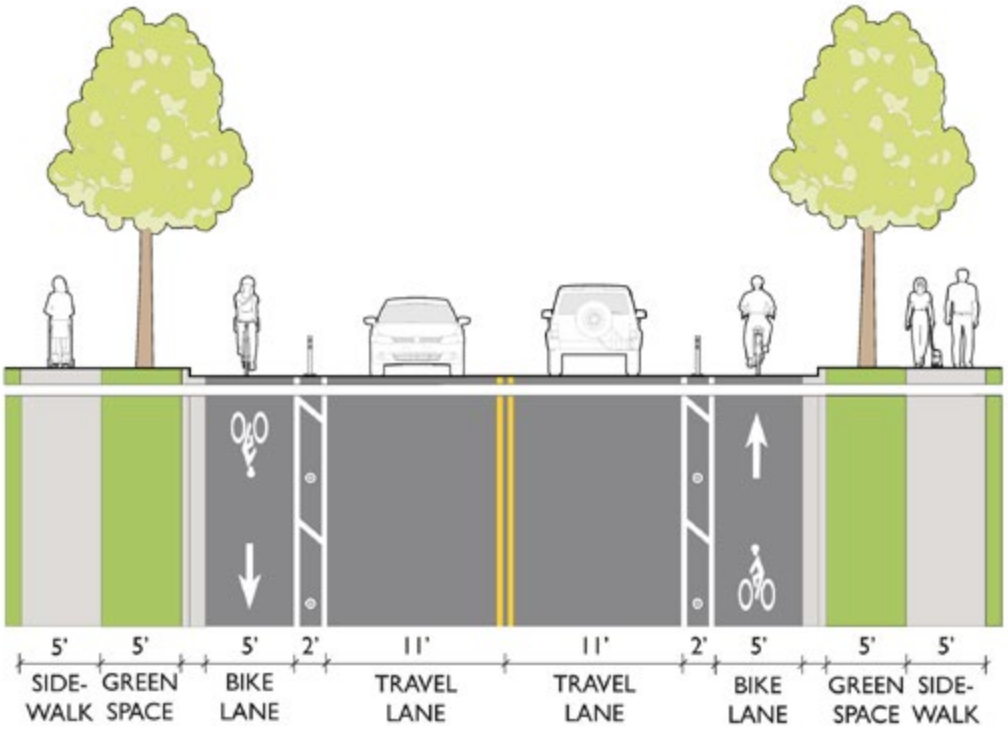
Figure 4. Separated Bike Lanes with Parking



This bikeway type combines the user experience of a separated path with the on-street infrastructure of bike lanes (see Figure 4). They may be one-way or two-way, level with the travel lane or raised above the level of the adjacent travel lane. Separation from traffic should be achieved with vertical separation using physical elements such as a lane of parallel parking, planters, cement curb, or flexposts. Protected bike lanes have added design considerations at driveways, transit stops, and intersections (especially for two-way protected bike lanes) to manage conflicts with turning vehicles and crossing pedestrians. Protected bike lanes may require bicycle-specific signals or phasing. Colored pavement or other visual treatments may be used to enhance visibility and raise awareness of the bike lane, especially at conflict areas like driveways and intersections. Stormwater runoff is one consideration that needs to be carefully evaluated when installing some types of protection such as new concrete curbs. This may be mitigated by installing pre-cast concrete blocks with drainage sleeves which allows storm water to access existing gutter and storm drain systems. Figure 5 below provides dimensions for minimum standards of a separated bike lane.

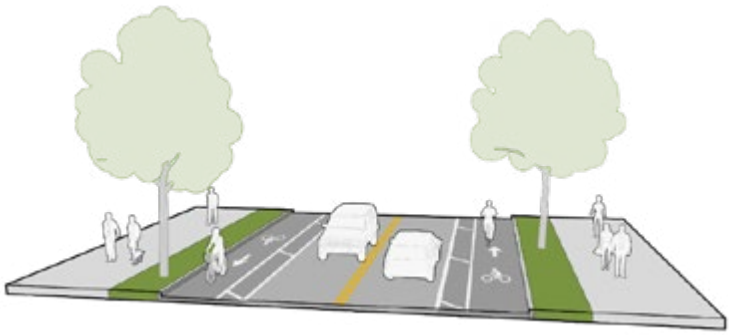
Note: Curb and gutter areas should not be calculated as part available bicycle travel ways. Curb and gutter should be a minimum of 2' feet wide.

Figure 5. Separated Bike Lanes Minimum Dimensions



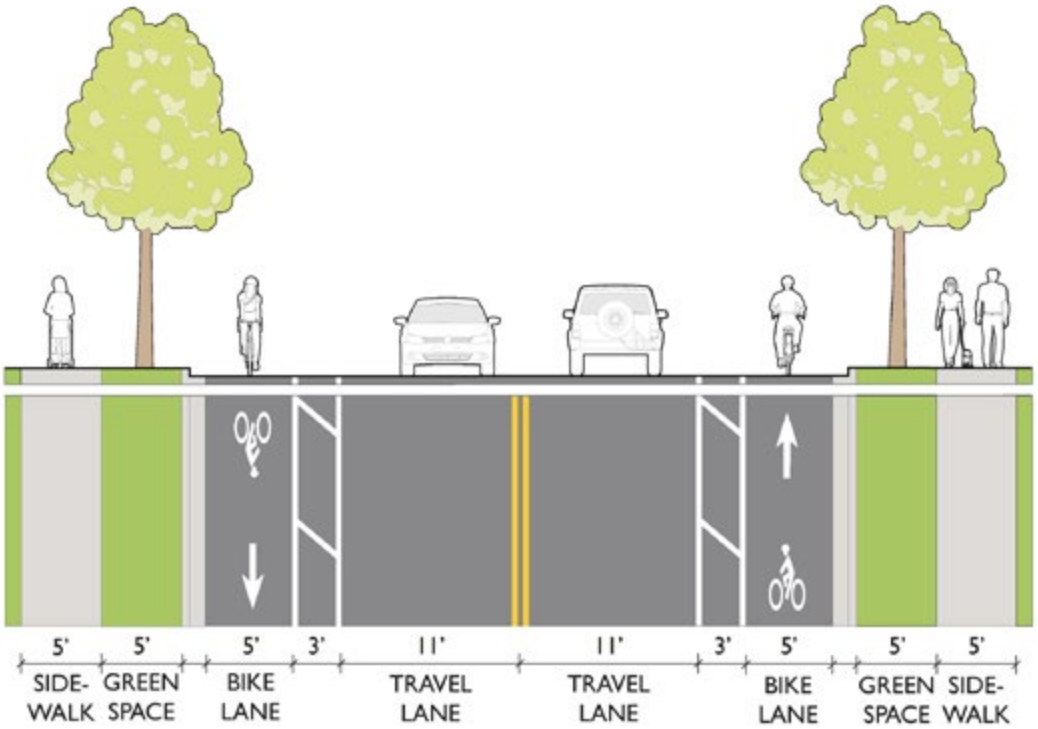
BUFFERED BIKE LANES

Figure 6. Buffered Bike Lanes



Buffered bike lanes, shown in Figure 6, provide a greater sense of comfort for bicyclists than conventional bike lanes by way of a lateral painted buffer between the bike lane and either the travel lane or parked cars (or both). The buffer is demarcated with two longitudinal strips and diagonal pavement (i.e., gore) striping. A raised profile stripe or rumble strip may also deter motor vehicles from encroaching into the bike lane while being more compatible with snow plows, but would make access to and from the buffered lanes more difficult for bicyclists. Maintenance considerations are similar to regular bike lanes except that buffered lanes have more striping that needs to be refreshed. Figure 7 below provides dimensions for minimum standards of a buffered bike lane.

Figure 7. Buffered Bike Lanes Minimum Dimensions



CONVENTIONAL BIKE LANES

This bikeway type uses signage and striping to allocate dedicated roadway space to bicyclists, shown in Figure 8 below. Bike lanes encourage predictable movements by bicyclists and motorists. Care must be taken to properly design bike lanes to meet or exceed minimum standards, particularly for operating space, and to properly restrict cars from parking in them. Substandard bike lanes may attract few cyclists, may be perceived as a waste of public funds, and could be hazardous. It is also important that bike lane treatments be carried up to and through intersections to provide continuity and guidance for bicyclists where the potential for conflicts is highest.

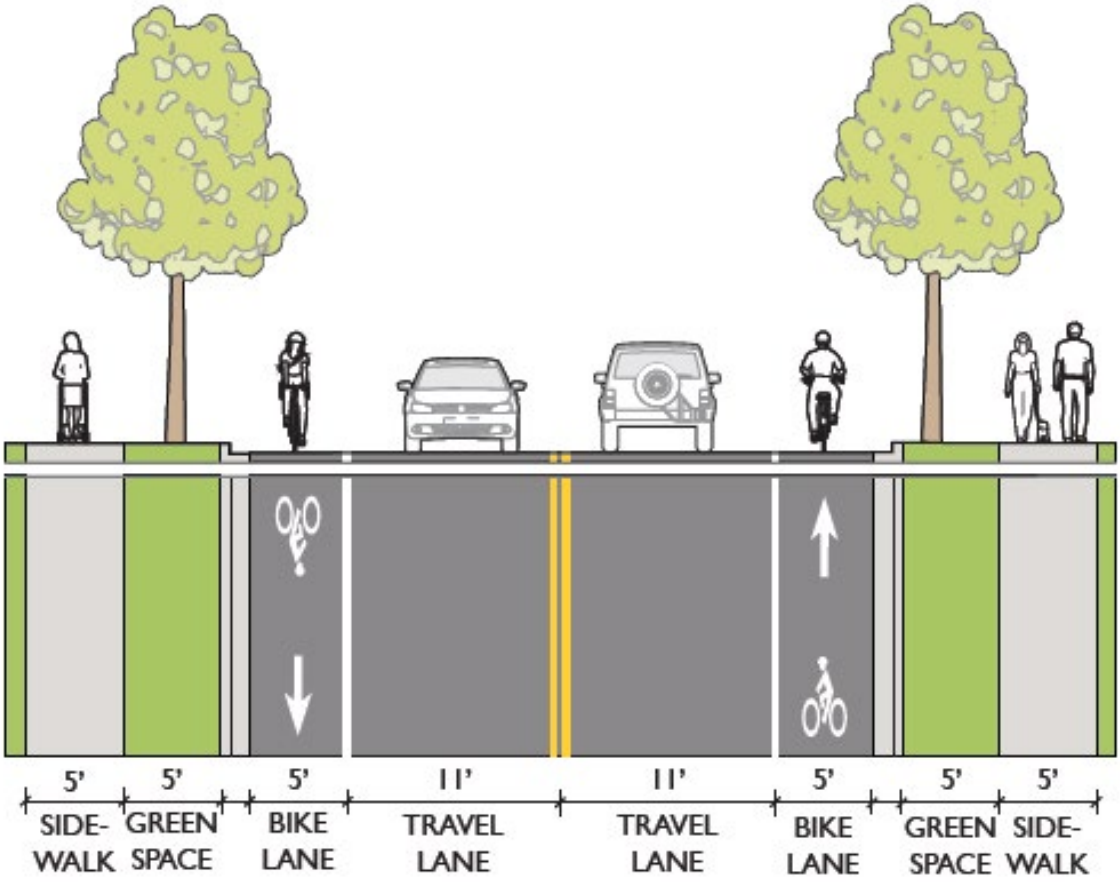
Where bike lanes must end due to space constrictions or must transition to another facility type, advance warning and/or wayfinding signage for an alternative route should be provided to instruct bicyclists how to proceed. Bike lanes generally need to be swept periodically to keep debris from accumulating in them, especially if they are located adjacent to a curb.

Figure 8. Conventional Bike Lanes

DESIGN TEMPLATE

The figure below illustrates what a normal typical cross section for a conventional bicycle lane in Hastings, NE, might look like. Figure 9 shows the minimum widths for pedestrian, bicycle and vehicle facilities. This design is applicable for streets that have heavier traffic than residential streets but are not quite as busy as large arterials. An example location for where this condition might make sense (and dependent on final proposed trail alignment) is 14th St W, between North Baltimore Avenue and Crane Avenue. This type of facility can be applied to moderately low volume streets, with speeds at or above 25 mph. Figure 9 on the following page provides dimensions for minimum standards of a conventional bike lane.

Figure 9. Conventional Bike Lanes Recommended Minimum Dimensions



NEIGHBORHOOD BICYCLE BOULEVARDS

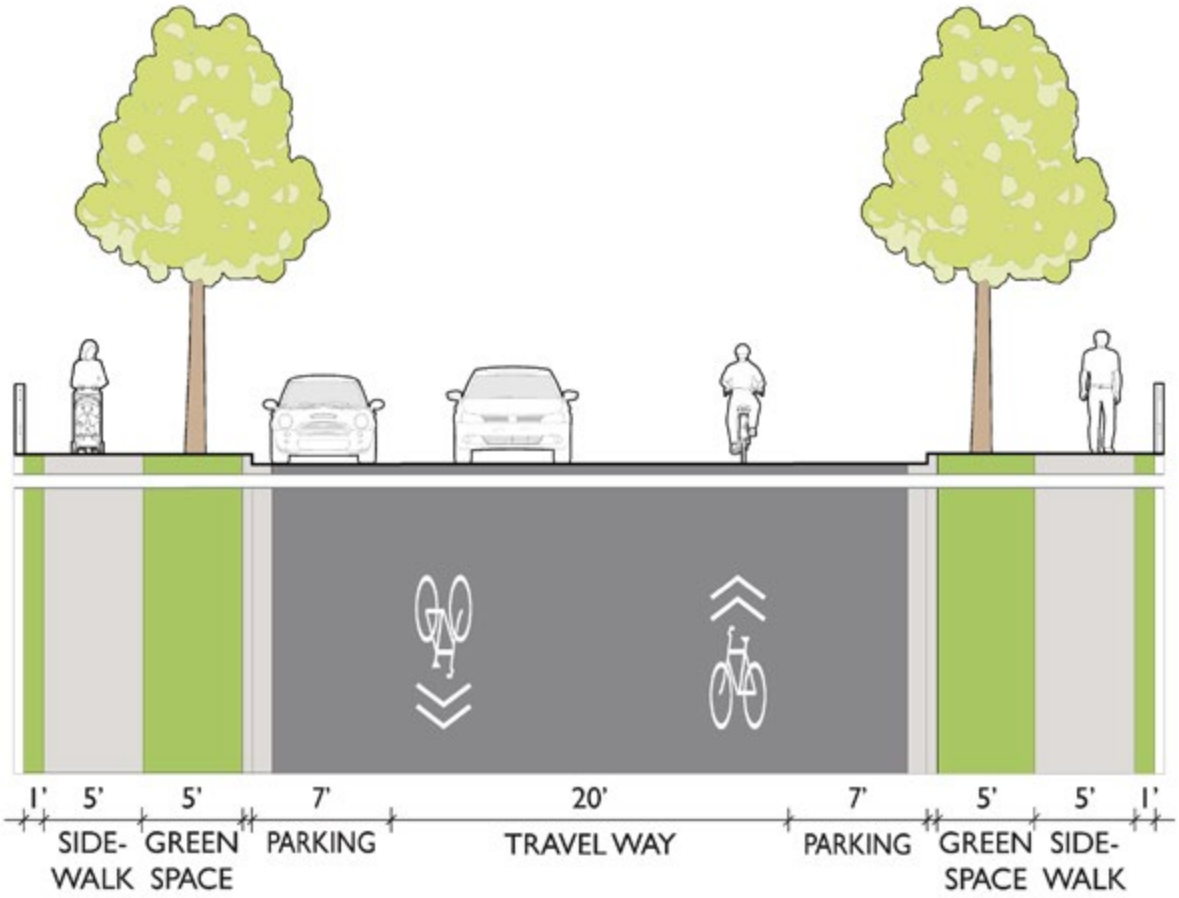
Neighborhood greenways (also referred to as bicycle boulevards or neighborhood byways) are low-speed, low-volume shared roadways that create a high comfort bicycling environment, shown in Figure 10 below. Traffic calming or diversion treatments are sometimes used to promote speed and volume reductions but they are not required. Shared lane markings and wayfinding signs are often used to help the user navigate the route and raise awareness that bicyclists are present. Neighborhood greenways also feature enhanced treatments at arterial/collector street intersections to provide safe and convenient crossings. Maintenance requirements are generally low because cars shared the same space and assist with sweeping of debris from the travel path, although traffic calming elements would add some upkeep needs if they are installed.

Figure 10. Neighborhood Bicycle Boulevard

DESIGN TEMPLATE

Hastings has many local residential streets that provide access to single and multifamily homes and are not intended to be used for vehicle regional or cross-town commuting. Figure 11 shows the minimum widths for pedestrian, bicycle, and vehicle facilities. These streets have slow speeds and low vehicular volumes with general priority given to pedestrians. The figure also illustrates what a typical cross section for a bicycle boulevard in Hastings, Nebraska, might look like. An example location for where this condition might make sense (and dependent on final proposed trail alignment) is Westridge Blvd. The pavement markings, or sharrows, make it clear to drivers to share the road with bicyclists, and, if this road is part of the trail system, it might have higher bicycle volume. This type of treatment can be applied to residential streets that are important connectors for the planned trails and meet the criteria discussed in the ‘Bikeway Selection’ section. Figure 11 on the following page provides dimensions for minimum standards of a neighborhood bicycle boulevard.

Figure 11. Neighborhood Bicycle Boulevard Recommended Minimum Dimensions



BICYCLE FACILITY SELECTION

This section presents a method for selecting particular bicycle facility types for a wide range of contexts. Roadway speeds, volumes, right-of-way width, presence of parking, adjacent land uses, and expected bicycle user types are all critical elements of selecting the right facility. Studies find that the most significant factors influencing bicycle use are motor vehicle traffic volumes and speeds. Additionally, most people prefer “high comfort” facilities separated from motor vehicle traffic (e.g., shared use paths, protected bike lanes) or local neighborhood roads with low motor vehicle traffic speeds and volumes (e.g., neighborhood byways).

Conformance with standard bikeway designs allows users to anticipate whether they would feel comfortable riding on a particular bikeway and plan their trips accordingly. A process consisting of the following four steps can help determine the appropriate bikeway type and intersection/crossing treatment to provide:

- Identify Design User
- Consider Traffic Speed and Volume
- Select a Bikeway Type
- Select Intersection/Crossing Treatment

STEP 1: IDENTIFY DESIGN USER

One of the most important factors to consider during bikeway design is the type of person the facility is meant to attract. User preferences vary by bicyclist skill level, trip purpose, and individual characteristics. As the level of separation increases, a facility becomes more attractive to a wider range of bicycle users, thereby making bicycling a more viable and preferred transportation mode.

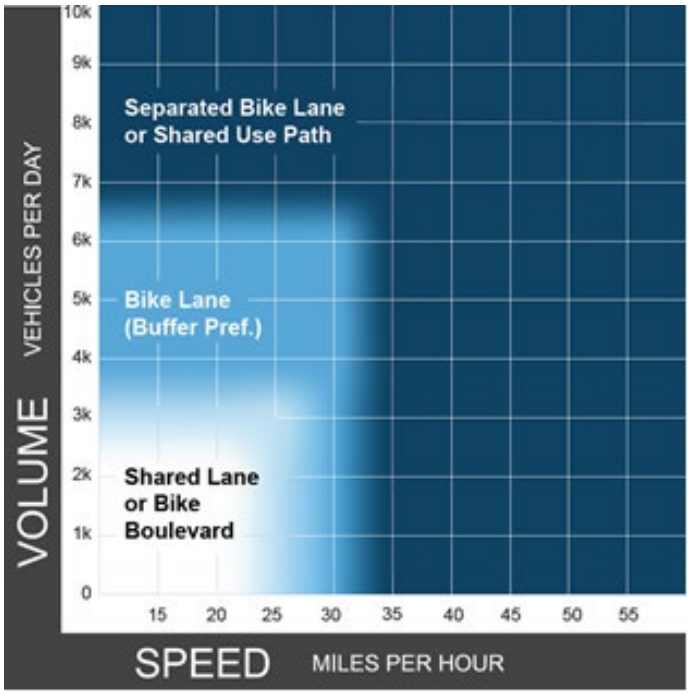
During the planning phase of a particular bikeway, the expected user group should be determined based on factors such as land use (e.g. proximity to schools, parks, and commercial areas), connections to transit, and agency goals. If it is determined a facility should be design for users of all skill and comfort level, than the recommendations provided in Step 2 (below) should be followed using the AASHTO Bicycle Facility Selection Chart.

STEP 2: CONSIDER TRAFFIC SPEED AND VOLUME

Bicyclists' comfort levels generally decrease as motor vehicle volumes and the speed of adjacent vehicular traffic increase. As a result, both traffic volume and speed are important considerations when choosing an appropriate bicycle facility type for a given location. In general, as both volume and speed increase, so does the need for greater separation of the bikeway from traffic in order to appeal to a wider cross-section of people. Wider bikeways (i.e., more than the standard five feet) also help to mitigate the effects of volume and speed, albeit to a lesser extent than increasing facility separation with painted buffers or physical barriers.

Figure 12 combines both speed and volume into a single chart to help identify an appropriate treatment for a given roadway if the facility is meant to accommodate users of all skill and comfort levels. Multiple facility types are recommended for each threshold of speed and volume. Context of the community, available right of way, feasibility, and budget can help determine which is the right facility type.

Figure 12. AASHTO Bicycle Facility Selection Chart



- **Separated Bike Lane or Shared Use Path**: Recommended when ADT is greater than/equal to 6,500 or speed is greater than/equal to 30 mph.
- **Buffered Bike Lane or Bike Lane:** Recommended when speed is greater than/equal to 25 and less than 30 mph or ADT is greater than/equal to 3,000, but less than 6,500.
- **Shared Lane or Bike Boulevard:** Recommended when speed is less than 25 mph and ADT is less than 3,000.

STEP 3: SELECT A BIKEWAY TYPE

This step begins with a determination of whether the preferred bikeway type resulting from Step 2 can be accommodated within the right-of-way, which may entail reallocating existing space and considering budgetary constraints. If the facility identified in Step 2 can be accommodated effectively, the bikeway selection process is over. If a determination is made that it cannot be accommodated within the right-of-way or there that there are budget concerns, then other options should be explored to serve the design user. Options may include:

- Selecting a parallel – yet proximate – route (often a maximum of one to two blocks over),
- Managing motor vehicle speeds so that a bicycle facility with less separation can be installed while still maintaining a relatively high level of comfort, or
- Diverting traffic to prioritized motor vehicle routes.

A critical consideration in selecting a bikeway type is return on investment. A conventional bike lane may be easy to implement and provide enhancements to connectivity, but it may not attract much use. While a buffered bike lane or separated bike lane may be more difficult to implement (e.g., require parking removal, lane reduction, etc.), it will likely attract a higher ridership and serve a wider cross-section of the population.

STEP 4: SELECT APPROPRIATE INTERSECTION/CROSSING TREATMENT

Maintaining a comfortable bicycle experience at street crossings and intersections is critical to providing a consistent network that attracts less confident bicyclists. While best available research is focused on operational safety, the guidance provided in Table 1 also considers comfort (i.e., perceived safety) for crossings.

This guidance provides rules of thumb that are to be considered during the planning phase. More detailed analysis may be required to determine the most appropriate crossing treatment. Even though it will be ideal to provide high-comfort crossing treatments like hybrid beacons and traffic signals at all bikeway crossings that meet the guidance provided in the table, it may be cost prohibitive to do so as there is likely to be many roadways that meet the criteria. Hence, for practical purposes, the high-comfort crossing treatments may be prioritized on bikeway networks that provide regional connections or high potential for increasing bicycle mode share by connecting destinations such as shopping districts, major institutions/employers, and transit stations. Furthermore, existing traffic signals may also be modified to provide Leading Bicycle Internal (LBI) with bicycle signal heads that allow bicyclists to establish themselves at the intersection before the concurrent vehicle phase gets green. This treatment greatly increases the visibility of the bicyclists and improves safety at the intersection.

It should also be noted that, depending on the location, available right-of-way and project budget, additional geometric improvements should also be considered. These include:

- Grade separation
- Traffic circle
- Protected intersection
- Curb extensions
- No-Parking at intersection, especially on side-street approaches to improve intersection sight distance

Table 1. Bicycle Intersection/Crossing Treatment Criteria

AADT	< 3,000		>3,000-9,000			>9,000-12,000			>12,000-15,000			>15,000		
# of Lanes	**2**	**3**	**2**	**3**	**4 to 5**	**2**	**3**	**4 to 5**	**2**	**3**	**4 to 5**	**3**	**4 to 5**	**6+**
≤ 25 mph	1	1	1	2	2	3	3	3	3	3	3	4	4	4
30 mph	1	2	2	2	2	3	3	3	3	3	3	4	4	4
35 mph	1	2	2	3	3	3	3	3	4	4	4	4	4	4
40 mph	2	2	3	3	3	4	4	4	4	4	4	4	4	4
45+ mph	2	2	4	4	4	4	4	4	4	4	4	4	4	4

Treatment 1: No crossing treatment needed*

Treatment 2: Median Crossing Island (install on any roadway with three lanes or more)

Treatment 3: Rectangular Rapid Flashing Beacons (RRFBs); include crossing island if roadway is three lanes or more

Treatment 4: Pedestrian Hybrid Beacon OR TOUCAN OR Ped Signal is recommended. Roadway with three or more lanes should include crossing island. The decision of whether to install a hybrid beacon or traffic signal is location specific and volume warrants should be considered.

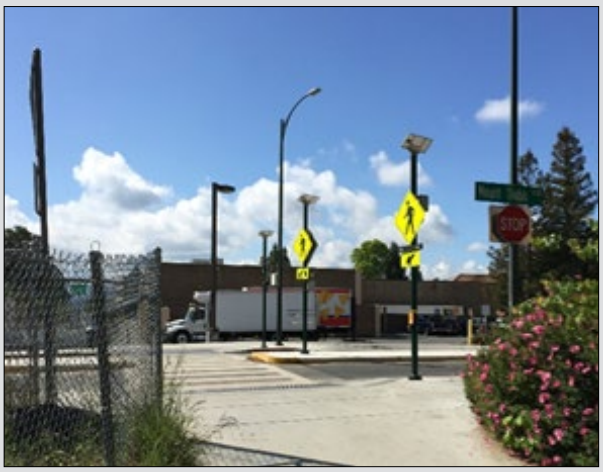
See examples of each treatment on pages 15 and 16.

Notes: **Bicycle crossing markings should be installed in combination with all treatments. High-visibility crossing warning signs assumed at all unsignalized crossings. RRFB may not be appropriate in locations where there is a combination of high traffic volumes and high ped/bike volumes, or on some multi-lane roads. On roadways where speeds exceed 40 MPH, efforts should be made to lower speeds before installing an unsignalized at-grade crossing. Grade separation may be appropriate in locations where vehicle speeds and volumes are high, there are multiple lanes in each direction, and the installation of a traffic signal or high comfort intersection treatments are infeasible. However, the bridge or underpass must be conveniently accessed and designed for people of all ages and abilities in order to maximize compliance and safety.*

Treatment 1: Examples of Uncontrolled Trail Crossing and Uncontrolled Bicycle Boulevard Crossings

Treatment 2: Examples of Uncontrolled Trail Crossings with Median Crossing Islands

Treatment 3: Examples of Trail Crossings with Rectangular Rapid Flashing Beacons (RRFBs)



Treatment 4: Examples of Pedestrian Signals, Pedestrian Hybrid Beacons, and Toucan Crossings

Appendix C:
Alternate Route Options

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ALTERNATE ROUTE OPTIONS

The following alternates were evaluated by the Complete Streets Committee and presented at the fall 2018 Public Involvement Meeting. The preferred routes were selected based on a number of criteria including public feedback, available ROW, potential impacts to properties, construction feasibility, safety and potential costs. The following discussion is to provide a basis for why these alternative routes are less desirable than the preferred options. In many cases, the options presented here may be viable options, for example, if adjoining properties develop further between the completion of this report and the construction of the proposed routes in this study. The following discussions may also be beneficial in providing additional information when outside funding is being pursued, explaining that alternate routes have been evaluated and why the preferred route is being pursued.

PROJECT 1 – SOUTHERN CROSSTOWN CONNECTION

PHASE 1 ALTERNATE

An alternate route is to extend the 8-foot wide trail south along Colorado Avenue to B Street, then a 10-foot wide trail segment southeast along the abandoned railway ROW to Pine Avenue near D Street.

- This route passes through an industrial zone with no current sidewalks or roadway pavement, making it aesthetically less desirable than the recommended route.

PHASE 3 ALTERNATE

On-street trail along F Street from Burlington Avenue/Highway 34 & 281 to Franklin Avenue.

- The roadway is currently a three-lane roadway with a shared centerline marked.
- To accommodate this segment, pavement markings would need to be revised.
- This is a relatively short on street segment, and it may create confusion if this is the only on-street bike lanes in this portion of the community.
- The property to the south of the roadway (preferred option) does not currently have sidewalk, and is relatively undeveloped, leading to relatively easy off-street trail development.

Off-street north along Franklin Avenue from F Street to E Street, (8-foot wide), and west along E Street along the south side to Baltimore Avenue.

- This route would require reconstruction of sidewalk along the F Street portion.
- This segment would also impact several driveways along Franklin Avenue.

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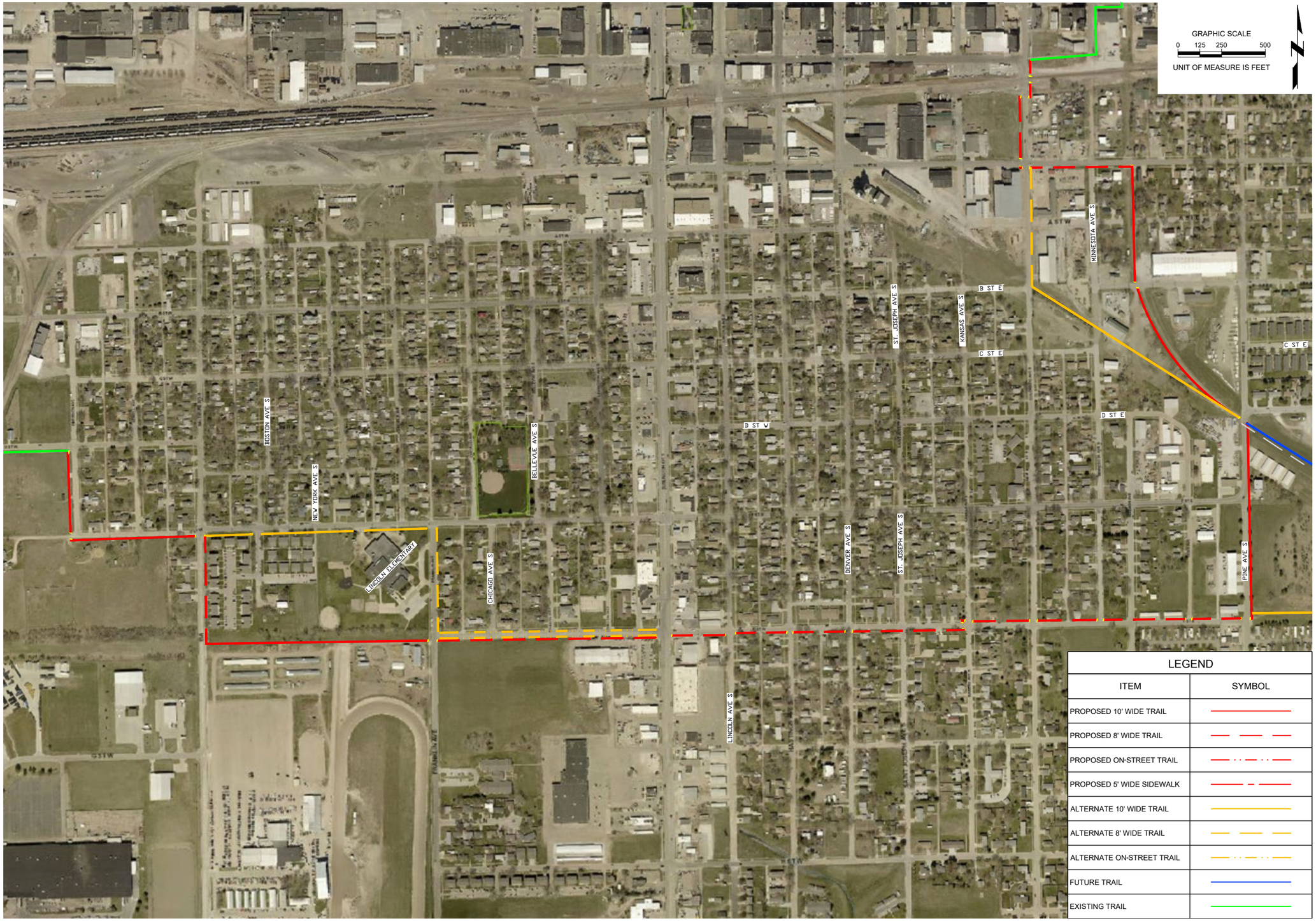
Figure 1. Project 1 – Southern Crosstown Connection



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PROJECT 2 – WEST SOUTH STREET PATH

ORANGE OPTION: FUTURE B STREET ROW EXTENSION:

This alternate would extend a 10-foot wide trail south along Marian Road to the future intersection of Marian Road and West B Street, the an 8-foot wide segment along Woodland Avenue south to Brickyard Park.

- This segment would require ROW/Easement acquisition along the what would be the westward extension of B Street.
- Currently the city has no plans to extend West B Street to Marian Road from Woodland Avenue.
- This is a potential roadway improvement if the city were to move forward with a viaduct over the BNSF railway as proposed in the city's Quiet Zone Study.
- The proposed route and easement or ROW would impact the farming operations including the current center pivot irrigation system.
- The portion along Woodland would impact many driveways, and the corridor has limited ROW, and may require easements to build a trail off of the street.

DARK BLUE OPTION: PEDESTRIAN OVERPASS OF BNSF RAILWAY AT CHESTNUT:

This alternate would run along Chestnut Street from 2nd Street to near the intersection/curve of South Street and Woodland Avenue.

- The overpass is currently estimated to cost approximately $3.0 million dollars.
  - This cost does not include easement or ROW acquisition, utility relocation, or connect trails north or south of the ramp approaches.
  - This does assume a single-span structure across the railway trackage.
- The overpass would require the relocation or reconstruction of powerlines both north and south of the BNSF Railway tracks and ROW.
- The overpass was identified in this location in the city's Quiet Zone Study as a potential pedestrian overpass.
- Significant grading would be needed on the south side to accommodate appropriate bike trail and ADA grades.
- The trail would be a direct connection between Chautauqua Park/Aquacourt and Brickyard Park.
- The concept has not been submitted to the BNSF Railway for consideration. Their review, approval and permitting process would need to be considered before advancing this concept to final design or construction.

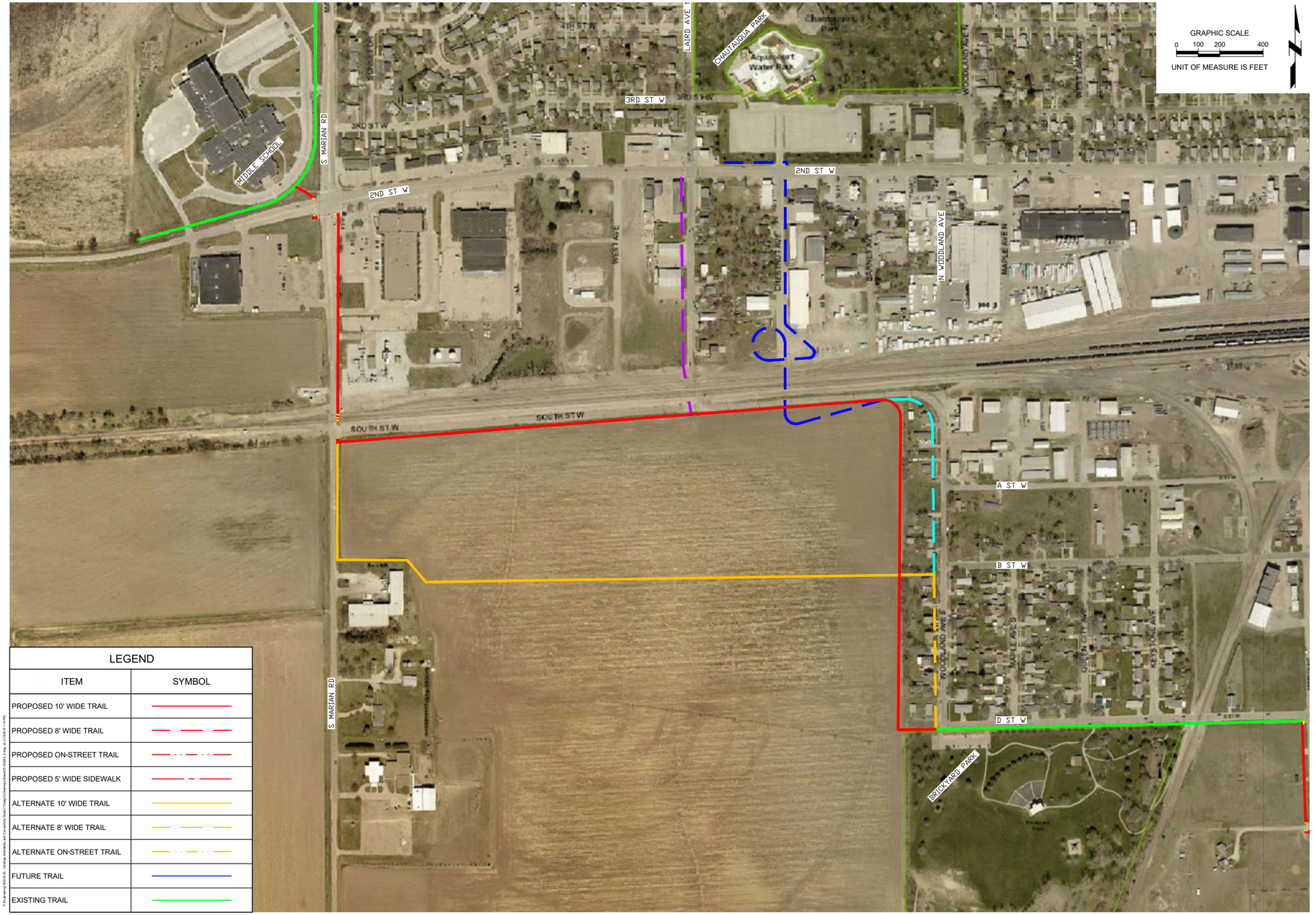
VIOLET OPTION: LAIRD AVENUE BETWEEN 2ND STREET AND SOUTH STREET.
An 8-foot wide trail was evaluated on the west side of Laird Avenue.

- This segment would include crossing the BNSF tracks at Laird Avenue, where there are five separate tracks to cross. These tracks are used by BNSF as a part of the switch yard operations to the east, and frequently are blocked at times, or have locomotives or rail cars parked close to the roadway crossing.
- Crossing pads would be needed at each track, and the elevation differences between tracks would make it difficult to navigate on a bike or for those with mobility issues.
- The nature of the development along this corridor is restrictive with numerous driveways for businesses and utility poles on the east side.

CYAN/LIGHT BLUE: SOUTH STREET TO WOODLAND AVENUE

- This segment along Woodland would impact many driveways, and the corridor has limited ROW, and may require easements to build a trail off the street.

Figure 2. Project 2 – West South Street Path



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PROJECT 3 – NORTHERN CROSSTOWN CONNECTION

PHASE 2 ALONG 14TH STREET AND EAST SIDE BOULEVARD

The route proposes an 8-foot wide trail along the south side of 14th Street from Hastings Avenue to East Side Boulevard, then a 10-foot wide trail along the west side of East Side Boulevard from 14th Street to 12th Street.

- This route may be difficult to build with the grades behind the curb along 14th and the number of driveways entering 14th Street.
- The portion of the trail along East Side Boulevard is proposed within city-owned ROW or abandoned railroad ROW.

A second alternate segment is proposed along the west side of East Side Boulevard, east of the drainage feeding into Hartwell Park, from 12th Street to the existing trail at Forrest Boulevard.

- This segment of Trail is proposed as a 10-foot wide trail.
- This trail is proposed within existing city ROW and city-owned abandoned railroad ROW.
- The trail here would likely require bank stabilization and railing to protect the trail and users from the drainage way.
- This segment of trail would also require a bridge or a widening of the current roadway bridge across the drainage feeding into Hartwell Lake.
- The preferred route corresponds to trail plan the city has considered in the past for future development and has fewer concerns and impacts on the drainage way.

PROJECT 4 – CHAUTAUQUA PARK CONNECTION

NO VIABLE ALTERNATES WERE IDENTIFIED OR EVALUATED.

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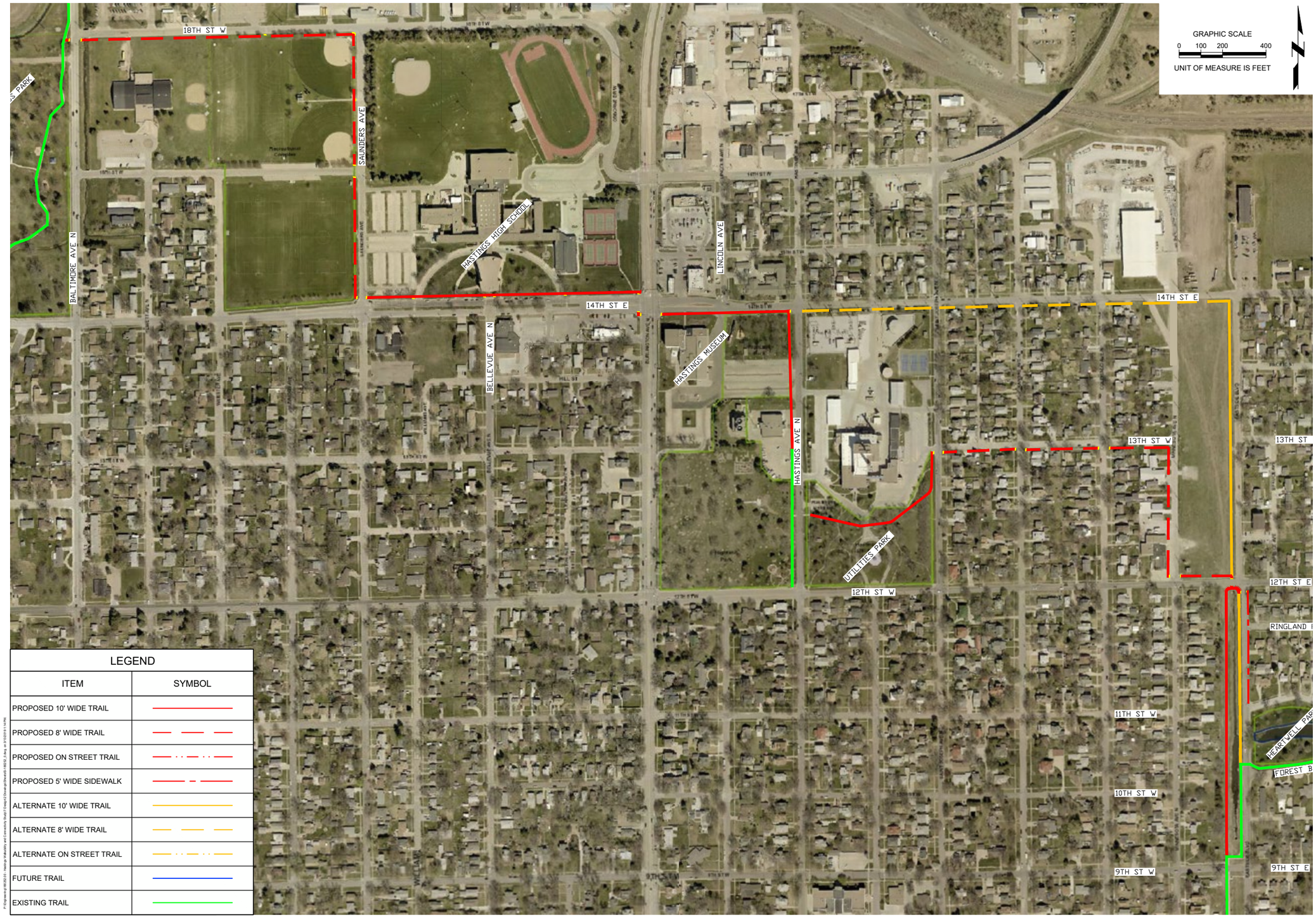
Figure 3. Project 3 – Northern Crosstown Connection



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PROJECT 5 – 14TH STREET LINK

ALONG THE WEST SIDE OF TILDEN AVENUE, BETWEEN HOME STREET AND 12TH STREET

- The trail segment along this segment would be proposed as a 10-foot wide trail.
- The current development along the west side has some grade issues at the commercial driveways and between the building and street that may require retaining walls or other efforts to develop a trail here.
- The east side of this segment (preferred route) currently does not have buildings or driveways adjacent to it, and therefore has fewer physical challenges to design around.

WESTRIDGE DRIVE AND 14TH STREET FROM 12TH STREET TO LAIRD AVENUE:

- This segment would be proposed as a shared roadway, with painted chevron/bike pavement markings so that motor vehicles would be aware they are sharing the driving lanes with bicyclists.
- The route has many homes that utilize the on-street parking, and many driveways, and many mailboxes in the existing sidewalk. The development of the corridor makes it difficult to implement an off-street bike trail.

14TH STREET BETWEEN LAIRD AVENUE AND PERSHING ROAD:

- The preferred route is an on-street bike lanes for this segment. It is a reasonably long stretch to provide consistency.
- The off-street option, a proposed 8-foot wide trail, has many physical challenges including:
  - Existing sidewalk
  - Grades in the existing sidewalk that require steps
  - Grades to adjoining properties that would likely require retaining walls to accommodate a bike trail off street.
  - Utility poles and mailboxes behind curb presenting obstructions to existing sidewalks and a proposed off-street trail.

PROJECT 6 – PRAIRIE RIDGE PARK CONNECTION

NO VIABLE ALTERNATES WERE IDENTIFIED OR EVALUATED.

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Figure 4. Project 5 – 14th Street Link

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