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TRAILS FOR RED CLOUD








ACTIVE TRANSPORTATION FOR AN HISTORIC COMMUNITY

RDg...
PLANNING ● DESIGN

ACKNOWLEDGMENTS

The project team is grateful to the Discover Red Cloud, the National Willa Cather Center, the Red Cloud Community Foundation, and the City of Red Cloud, and Advisory Committee members for their assistance throughout the development of this plan and their advocacy for the treasures of this historic city. We are especially grateful for the leadership of Jarrod McCartney for his appreciation of the value of trails for Red Cloud and assembling the team and moving this important project forward

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STATE
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Chapter One:
Introduction

INTRODUCTION

On a summer day in 2023, two middle-aged women were sitting on a bench in the center of Deshler, Nebraska. The Bicycle Ride Across Nebraska was passing through Deshler on the way to Hebron, about 9 miles to the east, and several riders ventured into the center of town. One of the riders engaged in a conversation with the women, who it turned out were from the east coast and were on a cross-country driving trip to explore America. They asked the rider where he had started, and he told them Red Cloud, 45 miles to the west. He talked about the significance of Red Cloud and its deep association with Willa Cather. Their eyes widened and it turned out that they were huge fans of Willa Cather. However, they had not heard of Red Cloud and since they were now traveling eastbound, they may have missed their chance. But the story drives home the point of Red Cloud's continued potential as a visitor destination, especially for people interested in American literature and pioneer history and life.

In Red Cloud, trail planning – and in this plan, the word "trails" also includes sidewalks and street crossings – addresses two different but related audiences: the citizens and businesses of Red Cloud and visitors to the town. For residents, trails have two functions – access to community destinations and recreation. Access to destinations includes safe ways to get to school and parks, child care, sports events, public facilities, and other community resources. Recreation encompasses the need for people to get outside for exercise, social interaction, and physical and mental health.

For visitors, trails are ways to interact with the community and its history, to learn, to be guided to places of interest, and to have an experience that causes them to come back and tell their friends. They are assets the combine physical activity with learning, and create a richer experience in the

combination. So for Red Cloud, trails are both a quality of life and an economic development asset.

Why Active Transportation?

For both residents and visitors, active transportation is a good thing for the community. How we move is important to how well we live, and affects our health and the health of our communities and environment. Most of us have been blessed with the capacity to travel under our own power, while also thinking and taking delight in the beauty of our towns and natural environment. The bicycle and other wheeled, human-powered vehicles expand our range farther. New technologies and innovative products, such as pedal-assisted e-bikes and recumbent tricycles, bring pedal-powered self transportation within the capability of more people. And other low-impact means of travel, such as scooters and power-assisted wheelchairs, bring greater mobility to those of us with disabilities. In a compact town like Red Cloud, the majority of purpose-related trips are shorter than two miles, and Red Cloud's generally level topography makes routine, human-powered travel easy.

Trails for Red Cloud is dedicated to expanding the routine use of these healthy and efficient methods of travel within Red Cloud for both residents and visitors. This plan will propose a program that considers needs and opportunities throughout the community. The plan's recommendations strive to be efficient, incremental, and able to deliver benefits worth the cost.

WHY THIS PLAN?

The support for this planning effort originally grew from a strong interest in capitalizing on Red Cloud's historical tourism assets and improving the visitor experience. But equally important was also enhancing the experience of living and working in

Red Cloud. The city's current comprehensive plan, prepared by RDG in 1999, introduced the concept of a Willa Cather Walk, linking historical resources that related to the life of that renowned American author. In 2021, the community developed the "Red Cloud Health and Recreation Walking Path," with the goal of improving the wellness of Red Cloud's citizens. It incorporated some of the ideas of the 1999 plan and added two innovations:

- A perimeter loop providing a continuous path around the city with connections into the center.
- Extension of a path south to the Republican River for recreational purposes.

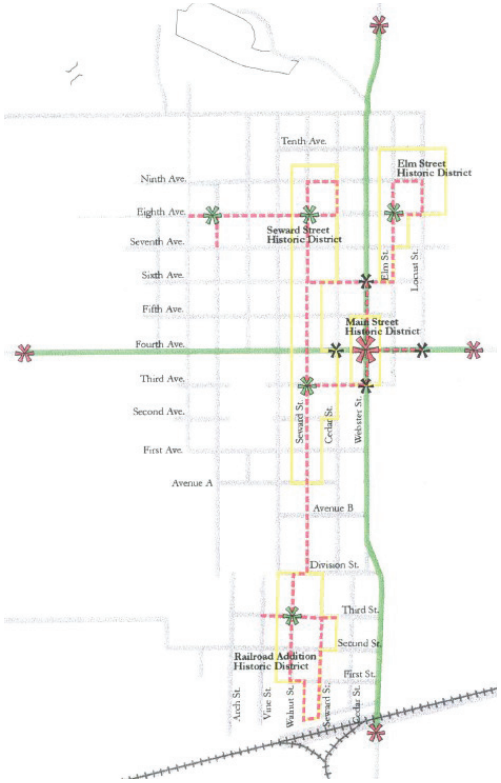
This plan builds on these concepts but will add several important elements:

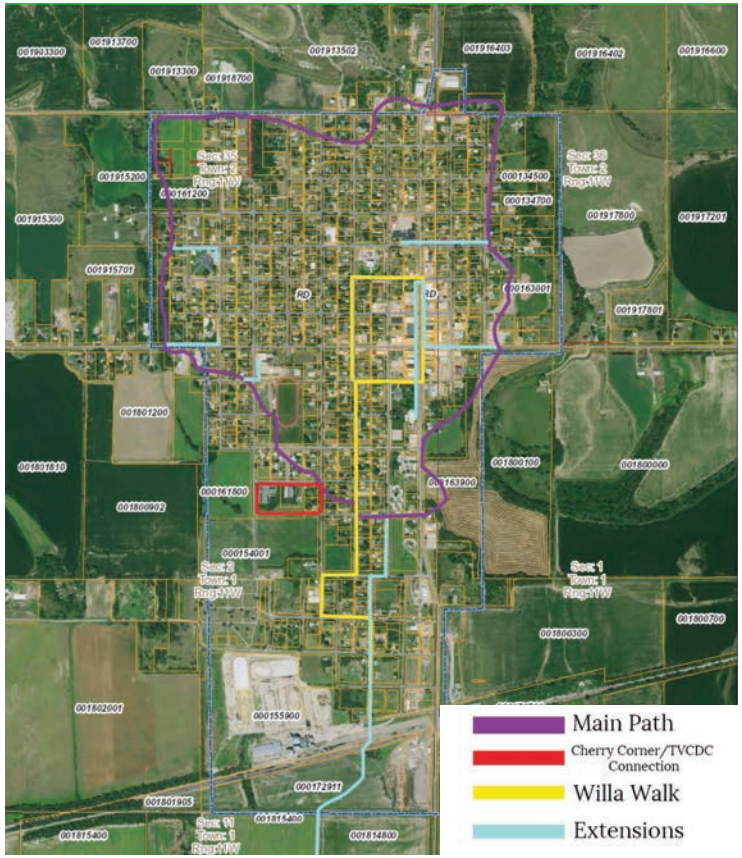
- An increased emphasis on "utilitarian" active transportation – creating safe paths and routes to important community destinations.
- Greater details on the design of facilities and addressing different types of infrastructure.
- Increased guidance on implementation, including calculating planning-level cost opinions, priority setting, and sequencing.

So Why is This Important?

We are all pedestrians. At some point in each of our days, we navigate the world on foot and this is a time when we should feel safe, slow, and at peace. As such, the physical environment should be designed to encourage people to experience their community on foot regardless of their age, mobility, or destination.

People are easier on infrastructure than cars. Our society has established the automobile as an essential part of normal behavior, even for short trips in walkable areas. While a car is important to regional transportation, using walking or biking on short local trips extends the life of the city's streets (and through health benefits, extending our own lives in the bargain).





Above: Willa Cather Walk from the 1999 Red Cloud comprehensive plan. **Right: Red Cloud Walking Trail Concept,** 2021

Community happens outside of a car. We tend to isolate ourselves in our cars, never encountering our neighbors on our way as we drive to our destinations. While community cohesion is not a problem in Red Cloud, focusing on pedestrian and bicycle friendliness will also increase people friendliness – definitely a good thing in these times.

Pedestrians and bicyclists are good for business. Red Cloud's history and scenic environment draw tourists, especially those with special interests in Willa Cather, American literature, and early American history. These assets, combined with the high quality lodging offered by the Hotel Garber, can encourage multi-day visits, and good pedestrian and bicycle transportation throughout the town can contribute to that experience. Active transportation is an economic development strategy that can benefit neighborhoods and strengthen its town center.

WHY PROMOTE ACTIVE TRANSPORTATION?

People in Red Cloud appreciate the wellness, community building benefits, and economic development benefits of active transportation, and the importance of individual choice and mobility within the town. This is evidenced by previous trail planning efforts and participation in this study .

This plan will build on this interest by helping the city, community organizations, and residents to achieve the following goals:

GOAL ONE:

INCREASE THE NUMBER OF PEOPLE WHO WALK OR BIKE FOR BASIC TRANSPORTATION AND RECREATION. Red Cloud's gentle topography and short travel distances are well suited to active transportation. A measurement of success will be a significant increase in trips taken on foot or by bicycle for a variety of purposes. A current obstacle is lack or poor condition of sidewalks on key routes and the difficulty of crossing the town's main travel corridors – 4th Avenue (US 136) and Webster Street (US 281)

GOAL TWO:

IMPROVE ACCESS TO KEY DESTINATIONS FOR PEDESTRIANS, BICYCLISTS, AND OTHER LOW-IMPACT MODES. To be successful, a bicycle and pedestrian transportation system should get people comfortably and safely to where they want to go. In Red Cloud, these major destinations include the Elementary and High Schools, Webster County Community Hospital, Valley Child Development Center, Webster County Courthouse, City Hall, Downtown, Illian Field, City Park, and retail and service providers outside of the center of town. A successful system will connect these primary destinations with a seamless network of trails, sidewalks, and on-street pathways. Facilities will also serve the needs of people who use scooters, motorized wheelchairs, and other technologies that provide independence and mobility to people with some level of disability.

GOAL THREE:

USE AN INVESTMENT IN ACTIVE TRANSPORTATION TO REINFORCE THE SENSE OF COMMUNITY AND THE ECONOMIC VITALITY OF ITS DOWNTOWN. Downtown Red Cloud is a center of economic activity and provides a variety of resident and visitor services, including quality a grocery, pharmacy, hotel and restaurant, art studio and gallery, and the iconic bookstore and resource center of the Willa Cather Foundation. Webster Street itself presents a walkable environment, but streets leading to it are spottier. In addition, connections between the "main street" center and other complementary destinations are not well developed. An example is access from Downtown to Illian Field.

S. Cedar Street. A logical access route to the Burlington Depot, but is inaccessible to pedestrians.

GOAL FOUR:

INCREASE SAFETY ON THE ROAD FOR MOTORISTS, BICYCLISTS, AND PEDESTRIANS. Improved safety is a critical goal for any transportation improvement, and good infrastructure can reduce crashes and increase comfort for all users of the city's transportation network. A successful network will reduce traffic incidents involving vehicles, bicyclists, or pedestrians) despite higher use of active modes. The main safety focus for active transportation involves travel along and across the principal highway corridors. Motor traffic on most local streets is relatively light.

GOAL FIVE:

CONNECT RED CLOUD'S HISTORIC POINTS OF INTEREST TO CREATE A BETTER VISITOR EXPERIENCE. Historic tourism is already an important part of the local economy, and making discovery of the town's assets through active transportation will create a better recreational and educational experience for visitors. A case in point is access between Downtown and the historic Burlington Depot and Saint Juilana Falconer Catholic Church. These two important resources on the south side of town are difficult to find and harder to reach because of the lack of wayfinding and walking paths.

N. Franklin Street. A major potential pedestrian route to the hospital that lacks sidewalks.

GOAL SIX:

REALIZE THESE BENEFITS WITHIN A REASONABLE TIME PERIOD. Sometimes bicycle and pedestrian plans are overly expensive or ambitious, and can only be completed with considerable expense and time. Also, the current political climate is making the federal programs that we have come to rely on, such as the Transportation Alternative Program (TAP), less reliable sources of funding. It is important to achieve short term rewards, and create a good initial system that is within the means of the region. This involves being focused and strategic, and making maximum use of existing assets.

USING THE PLAN

An active transportation plan requires good execution, and the purpose of this plan is to make implementation as easy, efficient, and comprehensive as possible.

ORGANIZATION OF THE PLAN

CHAPTER 1: INTRODUCTION

This current chapter provides the case for active transportation and the goals and organization of the plan.

CHAPTER 2: RED CLOUD TODAY

The planning process included stakeholder and advisory committee presentations and open house sessions. Chapter 2 summarizes the community opinions and preferences that emerged this effort. It also explores the physical conditions that help define an active network for the town.

CHAPTER 3: SYSTEM CONCEPT AND FACILITIES

The central component of the plan is establishing the lines that connect the dots. This chapter recommends the routes that form the active transportation network and the type of facility (sidewalk, pedestrian path, trail, bike lane), proposed for each segment,

CHAPTER 4: IMPLEMENTATION & SEQUENCING

While the completed system concept seems ambitious, it will emerge over the course of several years and leverage a variety of funding opportunities and partnerships. Many of its recommendations are tactical improvements that produce the maximum benefits for the dollar of investment. This section investigates the structure and cost of a phased implementation program and considers potential funding sources.

Central district entrance. Approaching Downtown from Highway 281 South.

CHAPTER 5: SUPPORT PROGRAMS

An effective active transportation system should include supporting programs that keep people interested in using it. This chapter identifies local and regional initiatives that also help increase the number of people who travel to and within Red Cloud on foot, by bike, and by clean, low-speed vehicles. In the process, it can help make Red Cloud a better and more livable community.

APPENDIX: DESIGN GUIDELINES AND CONSIDERATIONS

The appendix provides additional supporting and technical information and guidance on the design of specific types of facilities proposed for the network.

GUIDING PRINCIPLES

A plan is only useful if the community has the resources to implement it. This capacity can be increased by a strategic implementation program that defines priority segments that address immediate needs. It provides a foundation for expansion by building partnerships and taking advantage of funding opportunities. Such a program should be:

Incremental. The system should be created through a series of incremental stages that will ultimately realize the entire active transportation system. While occasionally disconnected components may be built to take advantage of opportunities, each step in the process should add value to the community.

Priority-Based. The process of setting priorities should incorporate many factors including currently planned roadway improvements, engagement of community partners, contribution to fulfilling goals, and community input.

Efficient. The most direct path between two points is usually a straight line. As a transportation system, active routes should get users to their destinations efficiently with a minimum of wasted time. But sometimes a good experience compensates for a slightly indirect route, especially for visitors.

The design of any active transportation system should be guided by criteria that can be used to evaluate individual components and the effectiveness of the entire network. The Netherlands' Centre for Research and Contract Standardization in Civil and Traffic Engineering (C.R.O.W.), One of the world's leading authorities in the design of bicycle friendly infrastructure, has developed useful standards to help determine the design of bicycle and pedestrian systems. Adapting C.R.O.W.'s work in its venerable design manual, *Sign Up for the Bike*, an urban bicycle network should generally fulfill six basic requirements:

1. **Integrity.** An active network at all points in its phased development should connect starting points with destinations. It should be easy to understand and keep users oriented.

2. **Directness.** The active network should offer routes that are as direct as possible, with minimal detours or misdirections.

3. **Safety.** The network should maximize safety for all users and minimize or improve hazardous conditions and barriers. On the other hand, no transportation system is totally free of risk and can at best improve but not guarantee user safety.

4. **Comfort.** Most users should view the basic network as being within their capabilities and not impose unusual mental or physical stress. As the system grows, more types of users will find that it meets their needs comfortably.

5. **Experience.** The active network should offer its users a pleasant and positive experience that capitalizes on the community's built and natural environments.

6. **Feasibility.** The bicycle network should provide a high ratio of benefits to costs and should be viewed as a wise investment of resources. It is capable of being developed in phases and growing over time.

Chapter Two:
Red Cloud Today

INTRODUCTION

This chapter summarizes local input and preferences, explores physical and social conditions in Red Cloud that help determine the character of the town's future trail system.

A number of people contributed content to this plan through participation on the Plan Advisory Committee, stakeholder discussions, attendance at public workshops, public workshops, two walking tours, and a community survey. Community engagement is important for a number of reasons:

- **Familiarity with the Community.** It is best to learn from the people who know the community best - those who live it every day. Stakeholders help us understand barriers, opportunities, and their vision for the community as a whole.
- **Understanding Local Priorities.** Community input helps create a successful plan because the community will ultimately implement the plan. Stakeholders frame the plan by articulating its goals and focus, helping to define priorities, and identifying partners who will help execute the plan.
- **Understanding Local Issues.** Active transportation planning should not be a "one-size fits all model." Instead its recommendations are tailored to the preferences and characteristics of the community and its residents, including people of all ages and abilities. Major user groups include school children, families, seniors, and people with mobility disabilities.

TRAILS FOR RED CLOUD!

The City of Red Cloud is developing a new trail and sidewalk master plan to make our city safer and more connected. We need your ideas and help to create a plan that makes life better for us and for people who visit our city.

Come to our Kick-Off Workshop to learn about the project and share your thoughts about walking and rolling around the community.

WHERE:
Red Cloud Community Center, 142 West 3rd Ave
WHEN:
Tuesday, July 29, 2025
5:30 PM

Ride (or walk) with Marty.

RDG Planning & Design, in partnership with the City of Red Cloud and Red Cloud Heritage Tourism are developing a new Recreational Trails Master Plan for the city. As part of the project, we will be holding two events on Wednesday, August 20 to look at opportunities together and invite you to participate.

AUGUST 20, 5:30-6:30:
A BEFORE DINNER COMMUNITY BIKE RIDE
Bring your bikes for a slow, one-hour ride (about 6 miles at most) to look at ideas and opportunities on Red Cloud's streets and paths.

AUGUST 20, 7:15-8:00:
AN AFTER DINNER EVENING STROLL
A comfortable walk Downtown and around the center of Red Coud to review connections and talk about how to make the city more comfortable for residents and visitors.

Both events will be led by Marty Shukert if RDG, who is leading the planning process. Both begin at Red Cloud's wonderful Hotel Garber.

BE PART OF THE PLAN

Visit the project website at:
www. engagerdg.com/redcloudtrails
Take the survey, make notes on the map, keep up with progress. The QR code on the left will take you there or Goodgle "Red Cloud Trails Plan" for the link

SUMMARY OF PUBLIC ENGAGEMENT

REPRESENTATIVE PLANNING ADVISORY COMMITTEE

A advisory committee worked with the consultant team throughout the process to guide the project, review draft content in detail, and lead the project into the implementation phase.

PUBLIC KICKOFF AND DESIGN WORKSHOP

In July, 2025, the planning team began the engagement process with an initial meeting of the Plan Advisory Committee and a public kickoff open house, both held at the Hotel Garber. About 15 members of the public attended the workshop to learn about the project and offer their ideas through conversation and by interacting with presentation materials.

COMMUNITY SURVEY

A community survey was designed and shared with the public to better understand their priorities and preferences in terms of pedestrian and bicycle improvements. The survey also included an interactive map, inviting participants to make comments at specific locations. Unfortunately, despite posters, publicity, and radio notice, too few people responded to the survey to have any significance for the purpose of this plan.

COMMUNITY RIDE AND WALKS

The second public event, held in August, 2025, included community bicycle rides and walks. Both events actually became walking tours that covered a

TRAILS FOR RED CLOUD!

A COMMUNITY WORKSHOP

We've been talking and working with people and groups for several months now on the Red Cloud Trails Plan. The workshop is a time to review our ideas and add your own about walking and biking around town.

WHERE:
Hotel Garber
346 N. Webster St
WHEN:
Monday, October 13,
Drop-in anytime between
5:30-7:30 pm

BE PART OF THE PLAN

Take the survey, make notes on the map, keep up with progress. The QR code above will take you there or Google "Red Cloud Trails Plan" for the link

significant part of Red Cloud. The tours each covered about three miles and explored potential trail corridors and sidewalk issues and made valuable contributions to the design of the trail network.

FIELDWORK

Fieldwork by bicycle and on-foot covered the entire city and extended to the south bank of the Republican River. This method of understanding the city led to informal contacts and discussions with individual citizens.

OCTOBER OPEN HOUSE

The October open house included a presentation of the preliminary network concept followed by informal discussions and exchange of ideas. This was the last major public event and led directly to preparation of this document.

Community walk. Two late afternoon and early evening community walks explored sidewalks, potential routes and trail resources.

SYSTEM DETERMINANTS

This section examines the existing conditions that apply to bicycling and walking. It includes physical factors such as key destinations and existing bicycle and pedestrian facilities and local preferences. These factors–streets, sidewalks, destinations, and neighborhoods–determine the nature of the trail and active transportation system.

STREET SURFACE AND TYPICAL SECTION

Streets are a fundamental part of any community's active transportation system, but are especially important for wheeled vehicles like bicycles, scooters, and even golf carts. Paved or otherwise hard-surfaced streets (concrete, asphalt, or chip-sealed) are most accessible to the greatest number of users. These streets, already in place, can be used in Red Cloud's low traffic environment, with minimum capital investment. Most of the city's streets are hard surfaced, as illustrated in Figure 1, Gravel or other unpaved surfaces are concentrated in the northwest and south extremities of town.

The street section, the horizontal dimensions of the street, are also important. A wide right-of-way and narrow streets provides abundant space for sidepaths (multi-use paths above the curb but on public street right-of-way) without affecting the appearance or use of neighboring properties. Most of Red Cloud's local streets are 22 to 25 feet wide, with sidewalk setbacks (the distance between the curb and the leading edge of the sidewalk) ranging from a very wide 20 to 24 feet.

Figure 1: Street Surfaces

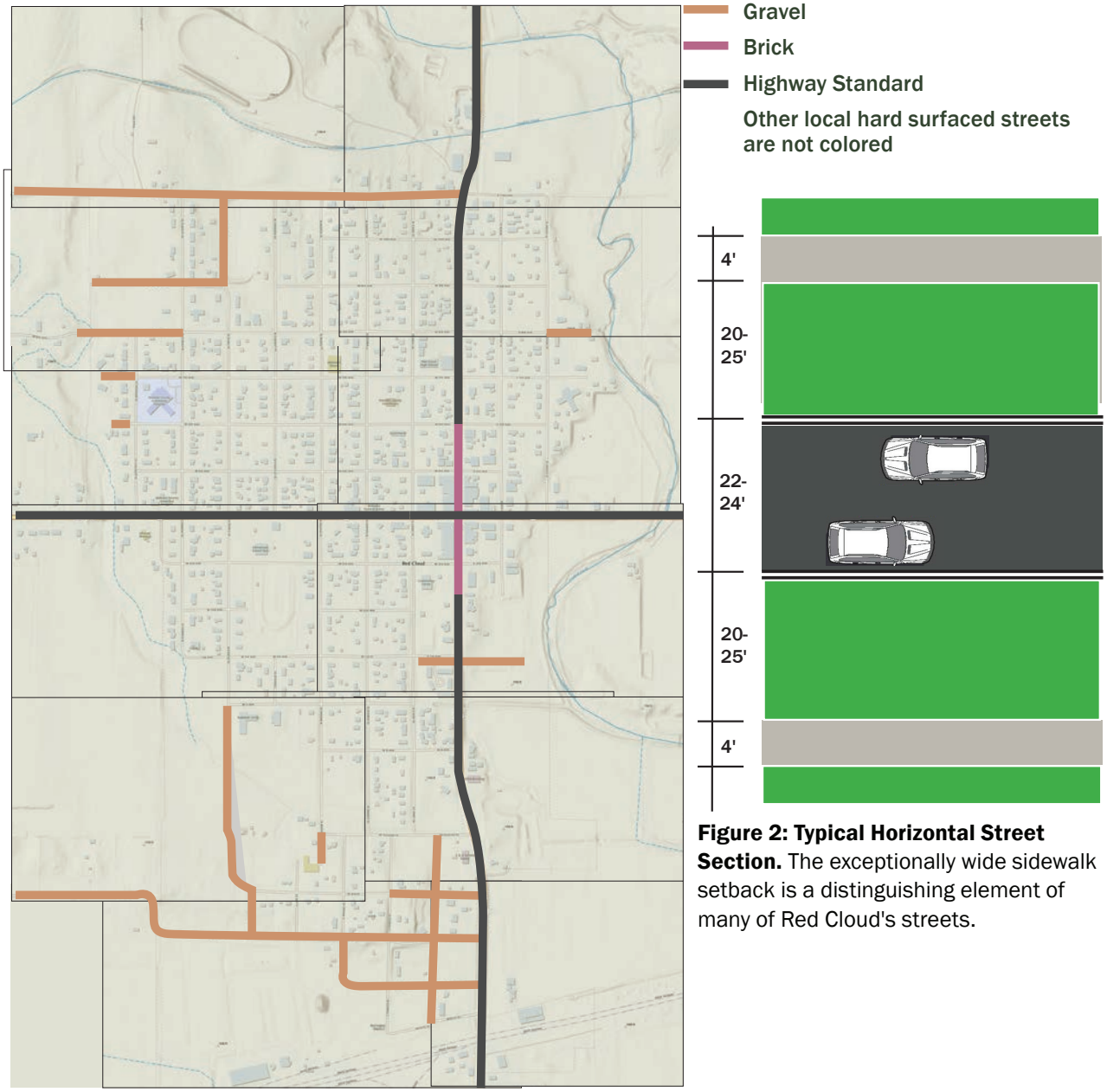


Figure 2: Typical Horizontal Street Section. The exceptionally wide sidewalk setback is a distinguishing element of many of Red Cloud's streets.

SIDEWALKS

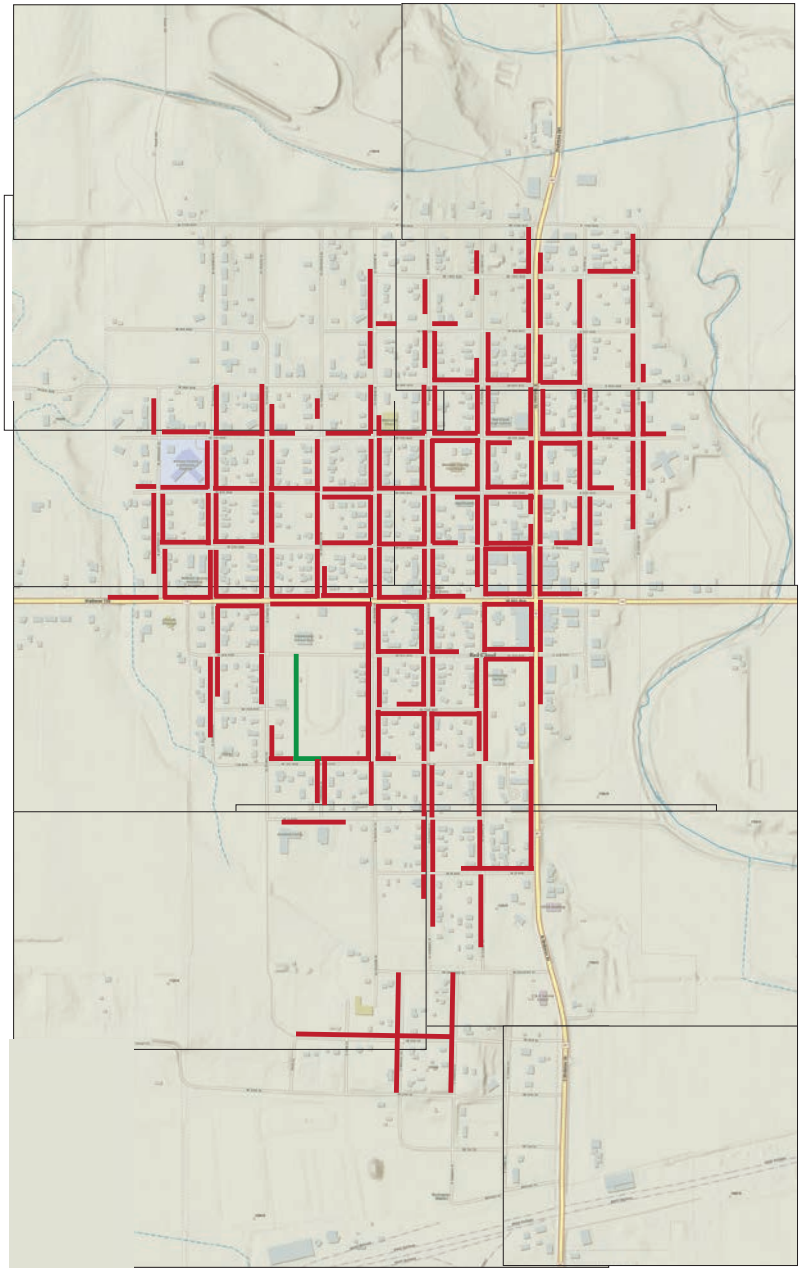
Sidewalks are the background of Red Cloud's pedestrian network and most streets in the center of town have sidewalks on at least one side. Sidewalk coverage is most complete in the between W. 8th Avenue on the north and W. 1st Avenue on the south between Webster and Cherry Streets. Sidewalks north and south of this central district are more intermittent, although separate segments are present.

Typical sidewalk width is 4 feet, creating issues for people with accessibility needs. Five feet is a better minimum width in most cases. Additionally, many sidewalk sections are in poor condition. In some cases, tree roots have pushed sidewalk panels up. In other situations, sidewalks have simply deteriorated from age or neglect.

Despite past planning, the city has only one facility that approaches normal trail width standards – a path between 1st and Chestnut to the Elementary School. A short, narrow path on Nebraska Game and Parks Commission property connects to Indian Creek Pond to the property's parking lot off Highway 136.

Sidewalk discontinuity. Examples shows a case of a sidewalk that ends abruptly and has a deteriorated segment.

Figure 3: Sidewalk Coverage



Sidewalk

Shared Use Path

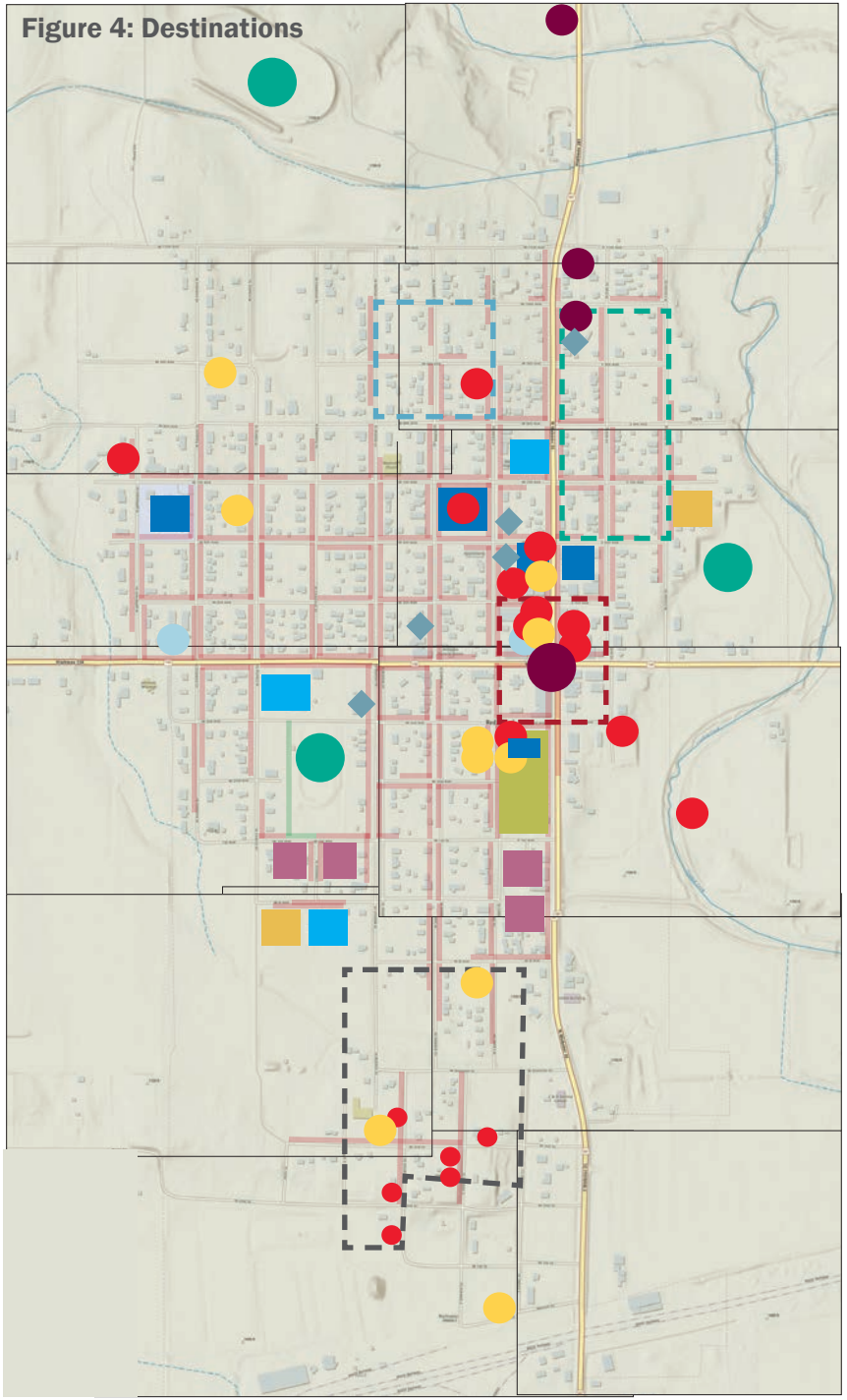
DESTINATIONS

A community active transportation system should get people where they want to go, Therefore community destinations help determine the design of the active transportation system. Red Cloud includes destinations that are very important to residents and primary interest to visitors. Resident destinations include schools, civic facilities, the hospital, library, parks, churches, and commercial and service centers, while visitor interest focuses on historic sites, museums, and visitor services. Red Cloud features an unusual trove of historic features and sites, both relating to the life of and influences on Willa Cather and general pioneer settlement. The city also has four historic districts listed on the National Register of Historic Places.

Figure 4 displays the distribution of destination in the city. It also relates the sidewalk network to destinations, helping to identify areas that are unserved. Some areas of note include:

- Commercial destinations on the north edge of town along Highway 281.
- Neighborhoods and historic features on the south edge. These are gaps in the system that can be remedied with a specific trail corridor.
- The Illian Field baseball complex.
- East-west 4th Avenue, a particular barrier because of traffic near the Elementary School.

Figure 4: Destinations



Outside of Mapped Area:
Republican River Bridge (NRHP)
Indian Creek Pond (Recreation)

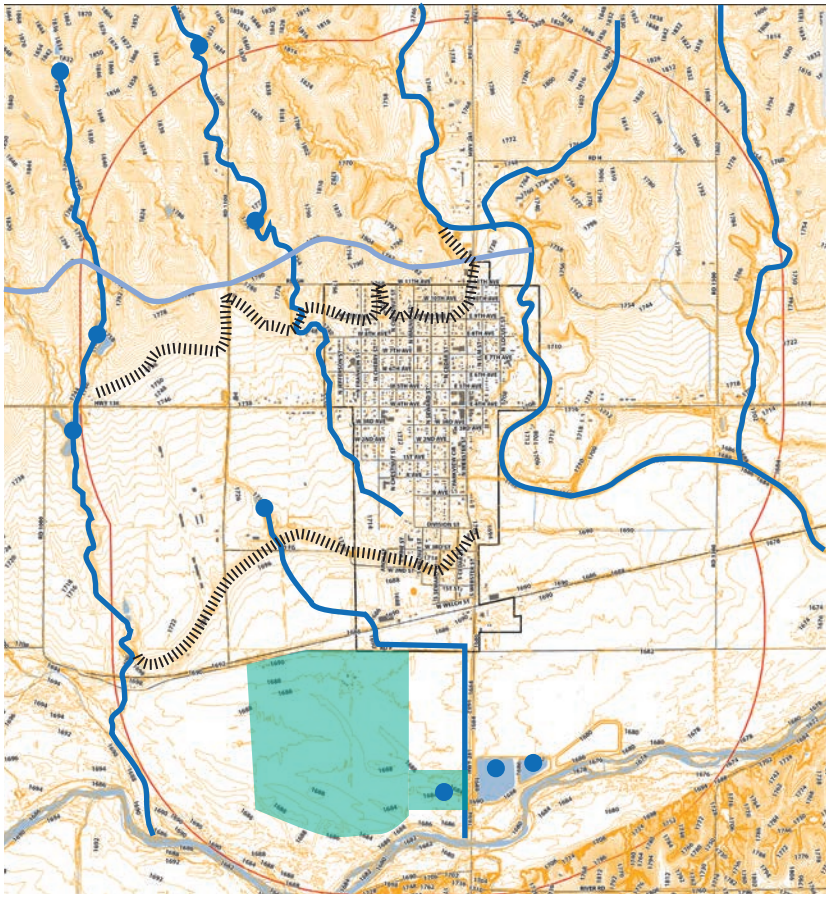


Figure 5: Regional Environmental Features

ENVIRONMENT

Environmental factors and topography can be important determinants of an active transportation system. Red Cloud sits in something of a topographic bowl formed by the Republican River and tributary creeks. The north side of the river slopes very gently with two slightly steeper steps -- one between West 2nd and 3rd Streets on the south side of town, the other north of West 9th Avenue. More significant than slopes are drainageways, including Crooked Creek to the east and a secondary drainage to the west. A drainage ditch north of 11th Street drains into Crooked Creek. These three features formed the basis of the previous Walking Trail concept. Other important environmental features are the state-owned Indian Creek Wildlife Management Area and Indian Creek Pond.

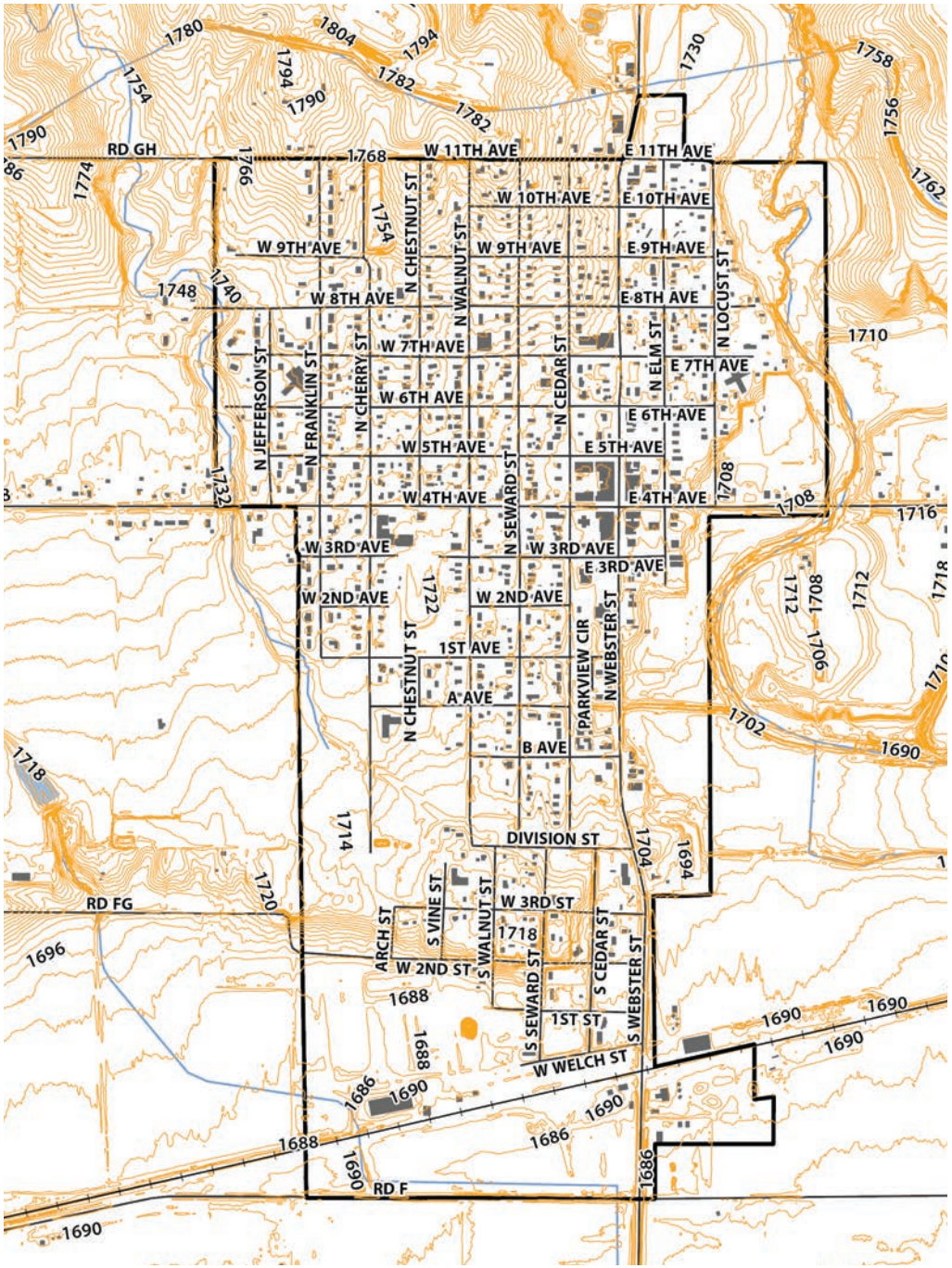


Figure 6: Central Red Cloud Topography

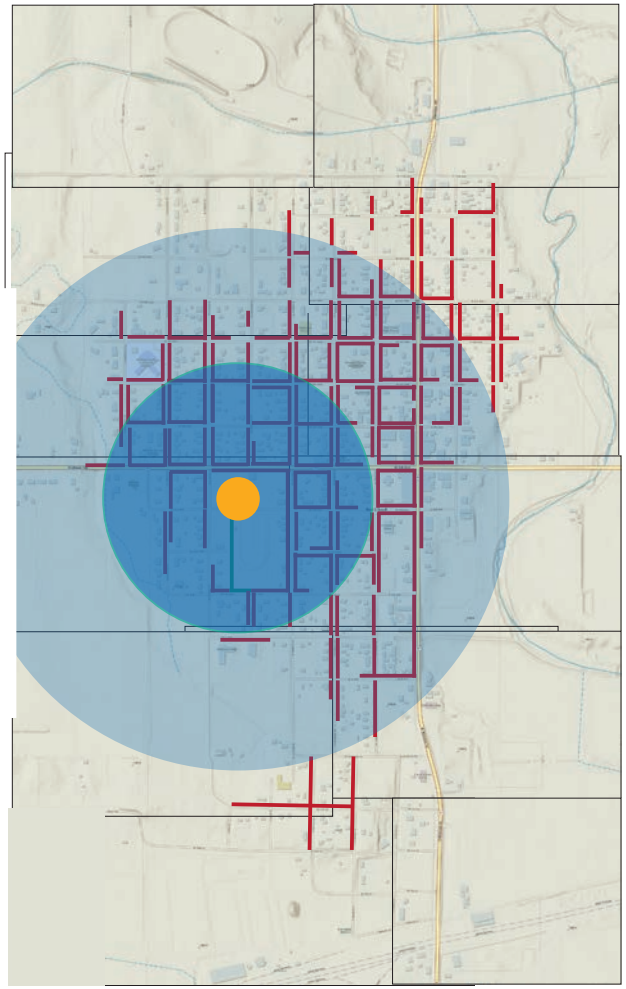


Figure 7: Elementary School Walking Radius

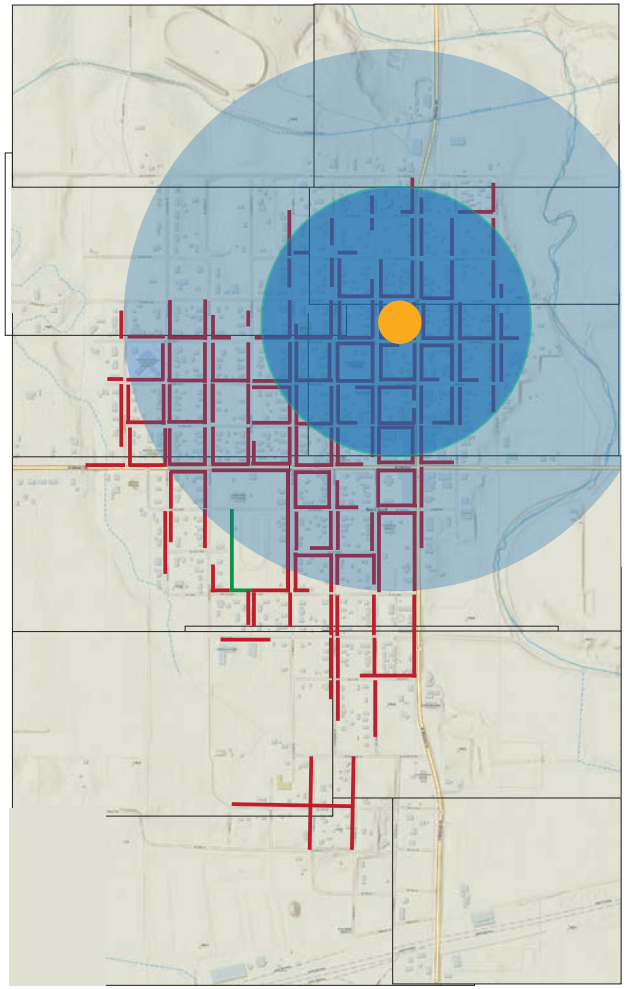


Figure 8: High School Walking Radius

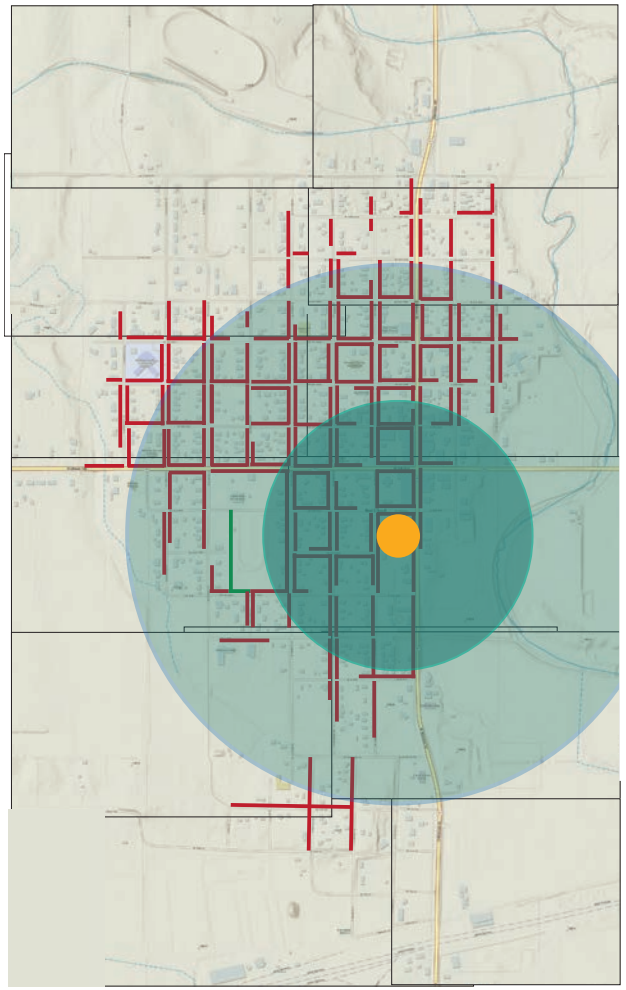


Figure 9: City Park Walking Radius

WALKING RADIUS FIELDS

Neighborhood or community parks and schools are arguably the most important pedestrian destinations in a community. Figures 5 through 7 display a 1/4 mile (5 minute) and 1/2 mile (10 minute) walking radius in Red Cloud to these important destinations. Bicycle access is less relevant because every destination is easily accessible by bike. Good sidewalk continuity should be provided within both of these "access fields."

As indicated on other parts of this discussion of existing conditions, the primary connectivity issues within these areas are:

- Gaps in sidewalk coverage, partially within the central part of Red Cloud but more typically areas that fall within these fields north of 8th Avenue and from 1st Avenue south.
- Condition of sidewalks throughout.
- 4th Avenue (US 136), especially west of Downtown and near the Elementary School.

1/4 mile walking radius

1/2 mile walking radius

Destination


150

Chapter Three:
Concept and Facilities

AN ACTIVE TRANSPORTATION SYSTEM

Red Cloud should offer its residents and visitors comfort and safety as they travel around the community to reach destinations and attractions on foot, by bike, or by using other low-power personal mobility devices. With strategic planning and maximizing use of available facilities, it can achieve this goal in a relatively short time. This chapter presents an active transportation system that identifies components, types of infrastructure, and support systems to encourage people to walk, bike, or roll through the community. It includes:

System Principles. These are the guiding principles that provide the performance criteria that are used in selecting routes and developing the overall network. These principles were identified in Chapter One but are repeated here.

The Network Diagram. The active network diagram presents the interconnected system of streets, paths, and trails that link different parts of town together and leads to important destinations. The network considers the location of destinations, the condition and character of streets, and the presence or future needs for sidewalks or other paths to provide connectivity. It follows the guiding principles presented in the next section. The network diagram also illustrates the types of infrastructure that should be used for each of the routes or segments of the network.

Infrastructure Types. This section describes the types of facilities and general guidelines for their design that are envisioned in the network diagram.

Details. While some features of the network, such as sidewalks, are relatively generic and will generally follow designated streets, other routes and components require a greater level of specific detail or illustration of alignments. Others are specifically suited to special conditions and opportunities in Red Cloud. This section illustrates these special conditions.

SYSTEM PRINCIPLES

Performance principles guide how we select routes to create an overall community network. To review, the guiding principles of an effective active transportation system are:

1. **Integrity.** The network should link starting points continuously to destinations, and be easily and clearly understood by users.
2. **Directness.** The network should serve users and destinations with direct routes that avoid sending users on indirect routes or on long distances out of their way to reach destinations comfortably.
3. **Safety.** The network should minimize hazards and improve safety for users of all transportation modes.
4. **Comfort.** The network should respect the capacities of users and avoid mental or physical stress on users.
5. **Experience.** The network should offer its users a pleasant and positive experience.
6. **Feasibility.** The plan should maximize benefits and minimize costs, including financial cost, inconvenience, and potential opposition.

An effective active transportation system takes its users to their destinations with minimal discomfort and inconvenience. The overall system is made up of access points, pathways, and interventions to increase comfort and safety when the system must cross a busy roadway.

In fulfilling these performance principles, Red Cloud's active transportation network will be guided by several specific attributes:

It will provide direct routes to specific community destinations. The active network will provide direct, safe, and comfortable access from most parts of town to community destinations. The key

View of the Highway 281 Bridge from pond area

destinations that define and are served by the system include:

- Elementary School
- High School
- Downtown
- City Park
- Illian Field
- Webster County Courthouse
- Valley Child Development Center
- Heritage sites, including those linked to the story and works of Willa Cather
- Important commercial businesses outside of Downtown

It will serve as a tool for economic development. Red Cloud and its organizations, including the Willa Cather Center, Community Foundation, and Chamber of Commerce, have made significant investments of time and funds in features that strengthen the city's economy. The Hotel Garber is the latest of these major initiatives. An active transportation system that makes historic assets more accessible and meaningful to visitors will make the visitor experience even better. Additionally, It also will provide a quality of life feature that can increase the community's appeal to prospective residents.

Indian Creek Pond

It can open new parks and recreational features. Possible opportunities are the underused Indian Creek Pond area, the Republican River corridor, and the US 281 bridge, preserved and converted into a unique park over the water. Linkage of this city to these potential resources could open new outdoor recreational possibilities.

THE NETWORK DIAGRAM

Figure 10 illustrates the recommended active transportation network, defining the routes that most effectively meet community connectivity needs. The following discussion will also recommend appropriate facility types for each segment and a phasing plan for the network.

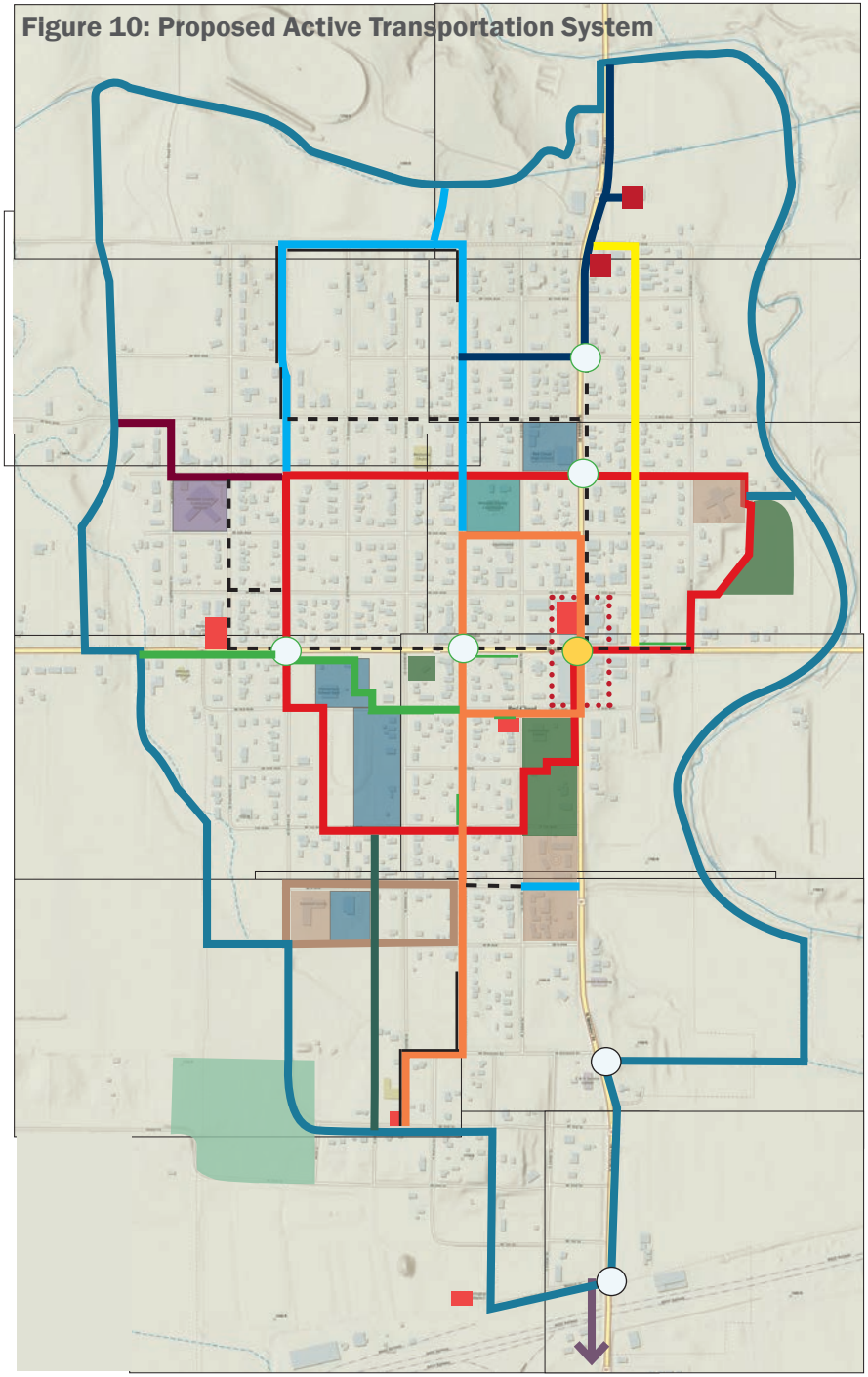
System Components

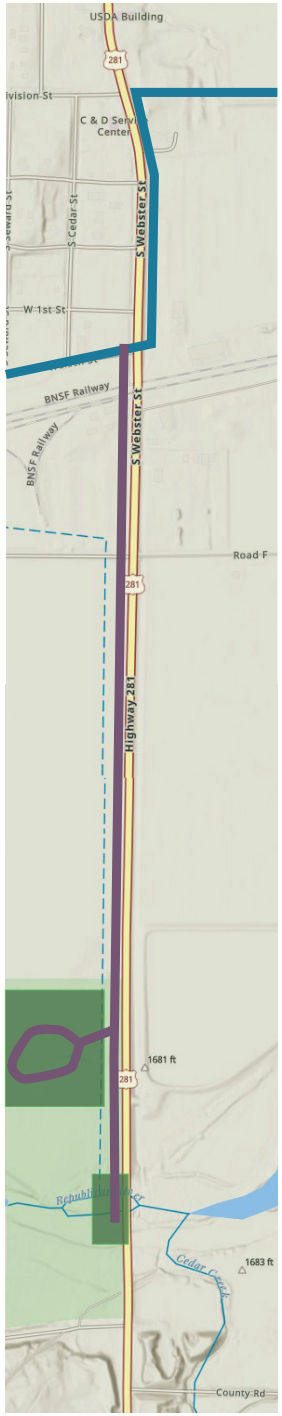
The system includes both major and minor facilities. Major facilities include trails, shared use facilities like sidepaths, and protected or separated bicycle lanes. Minor facilities include sidewalks and other pedestrian paths and bike routes using low-volume local streets.

The system proposes the following major elements:

- **The Outer Loop.** This component envisions a 4.75 mile trail loop around the perimeter of Red Cloud. The concept is based on the previous Red Cloud Walking Trail. Modifications of the previous concept generally were mode to follow property ownership lines. The eastern and northern legs of the loop follow Crooked Creek and the drainage corridor south of the raceway. The west leg follows a drainage corridor or adjacent property lines south to B Avenue and follows Cherry, 3rd, and Seward Streets through Red Cloud Cemetery and to the Burlington Depot, continuing north along Highway 281 east along minor drainages to complete the loop at Crooked Creek. The trail loop could be either paved for multiple users or granulated stone and can be developed in phases. Short trail spurs would provide access to significant destinations near the route, including Illian Field and the hospital. The primary issue for implementation is right-of-way or easement acquisition.
- **The Inner Loop.** The Inner Loop is a 2.1 facility connecting many of Red Cloud's key destinations, including Downtown, Illian Field, both schools, the hospital, the Valley CDC, City Park, and several historic sites. A trail spur would connect to loop to southside features from West 1st Avenue. It uses city streets, largely capitalizing on the wide sidewalk setback to provide space for shared use paths. Full implementation would replace the existing sidewalk on one side of the street with a continuous, fully accessible shared use path. Main challenges with the design of the Inner Loop will be wayfinding and intersection crossings.
- **Willa Cather Walk.** This route is primarily a walking route with wayfinding signage and on-street bicycle adaptation, principally along Seward Street. It picks up primary Cather-

Figure 10: Proposed Active Transportation System





- Outer Loop
- Inner Loop
- Willa Cather Tour
- Alley Trail
- Hospital Link
- 11th Avenue Loop
- VCDC Loop
- Bridge Trail
- Elm St Activeway
- Northside Link
- Park to School Path
- Added Sidewalk Routes
- Existing Signal
- Proposed protected crossings

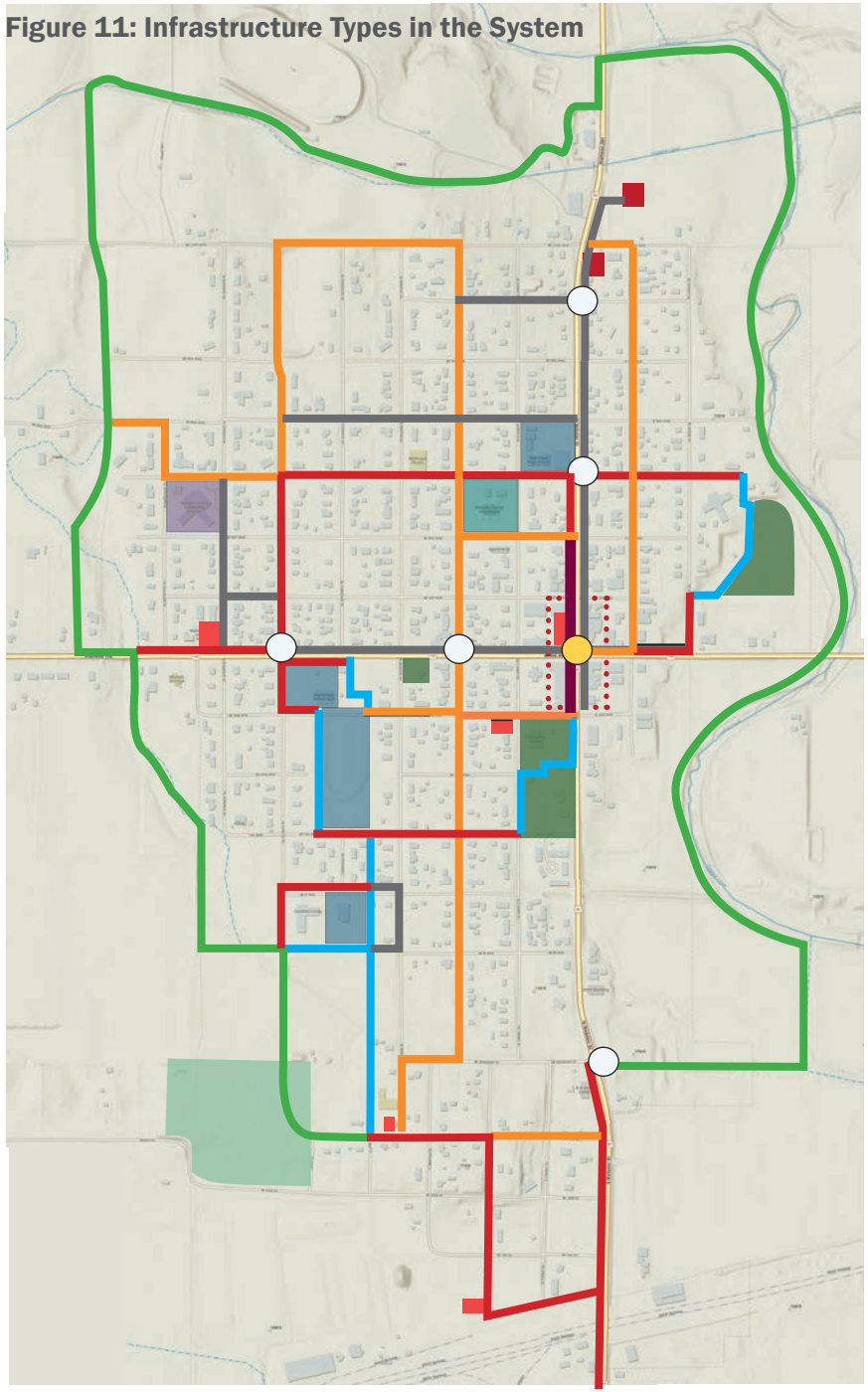
- Schools/VCDC
- Parks/Recreation
- Courthouse
- Hospital
- Commercial
- Historic Sites
- Cemetery
- Senior Living or Apartments

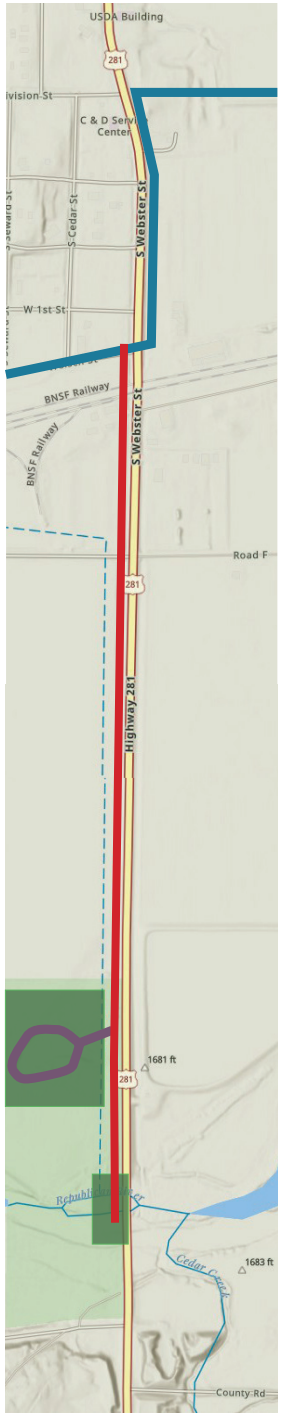
related sites, including Downtown and the Cather Center, the Cather home, City park, and the Burlington Depot. Principal capital projects include improved, continuous sidewalks along Seward and associated streets from City Park to the Depot, high-visibility crosswalks, and bicycle on-street wayfinding.

- **Alley Trail.** This trail would connect the Inner Loop at 1st Avenue to 3rd Street, using one block of existing public alley between 1st Avenue and A Avenue, and an undeveloped alley right-of-way south to the Outer Loop at 3rd Street. Its 0.44 mile length would be paved, a continuation of the Inner Loop, Combined with the Inner Loop and other connections , it provides a continuous north-south route linking the north and south legs of the Outer Loop.
- **Hospital Link.** This 0.30 on-street and sidewalk and on-street link connecting the Inner and Outer Loops by way of the County Community Hospital. It includes repair or replacement where necessary of existing sidewalks and a block of new walkway on West 8th Avenue between Jefferson Street and the Outer Loop trail.
- **11th Street Loop.** This approximately one-mile sidewalk and on-street facility serves residential areas north of 7th Avenue and connects to the Outer Loop. Together with the Inner Loop, it provides a continuous safe route to the Elementary School and track. It includes repair or replacement where necessary of existing sidewalks, bike route signage, and and about 400 feet of new path between 11th Street and the Outer Loop.
- **Valley Child Development Center (VCDC) Loop.** This short (0.5 miles) trail along with the Alley Trail surrounds the VCDC and Cherry Corner Estates block tying these buildings, B Avenue, the Alley Trail, the Cather Walk and Outer Loop together. The streets that make up part of this route have poor sidewalk coverage. Infrastructure would include a 8-foot new trail on the north, south, and west legs of the loop. sidewalk on all legs and bicycle wayfinding signage.
- **Bridge Trail.** This one-mile long trail is a sidepath along US Highway 281 between the Outer Loop (and Burlington Depot) to the Republican River Bridge. This trail, envisioned as a conventional paved shared use path, would probably be on the west side of the road, connect to Indian Creek Pond and lead to the historic Republican River bridge. This bridge will be replaced by a new structure and would become available as a "park" over the water – a unique attraction for this area. This reuse of a bridge has a number of precedents, including the Harmony Bridge in Bixby, Oklahoma and the Meridian Bridge in Yankton, South Dakota.

Harmony Bridge, Bixby, OK. This historic bridge with a parallel new highway bridge has been converted into a community park with a shared use path and themes around music and art.

Figure 11: Infrastructure Types in the System





- Separated Trail (paved or unpaved)
- Separated Trail (paved)
- Sidepath
- Bike Lane/Cycle Track
- Bike Route + Sidewalk
- Sidewalk Only
- Existing Signal
- Proposed protected crossings

Existing path along the track. This path, connecting the elementary school to the VCDC is incorporated into the Inner Trail.

Cemetery Road, part of the proposed Outer Loop.

Along the Inner Loop. Concept for a new shared use path replacing existing sidewalk. The concept uses the current wide area between the street and sidewalk, increasing the size of residential front yards.

- **Elm Street Activeway.** This 0.54 segment between 4th Avenue and 11th Avenue at Webster Street will serve the Elm Street National Register District. It includes a replaced or rehabilitated continuous sidewalk on at least one side of the street, bicycle wayfinding signage, and historic interpretation.
- **Northside Link.** This sidewalk link would connect neighborhood routes and sidewalks to Webster Street and extend the Webster Street sidewalk north to significant retail destinations on North Webster. This was cited by the committee as an important priority for pedestrian safety.
- **Park to School.** This on-street route connects City Park to the Elementary School, with a connection to the Outer Loop. This is an east-west route that also connects to the Historical Museum.

INFRASTRUCTURE TYPES

The Red Cloud active network described above is designed to connect parts all parts of the city to key community destinations. This section describes the types of walking and bicycling facilities that would be applied to these specific routes.

Overview of Facility Types

SHARED-USE PATH

Shared use paths accommodate all types of non-motorized users and, in Red Cloud, low-powered, low-speed devices such as motorized wheelchairs and scooters. They fall into two basic categories: 1) trails on their own right-of-way not adjacent to roads and 2) sidepaths, separated from but adjacent to roadways. A typical desirable minimum path width is 10 feet, although 8 feet may be used where space is limited or expected traffic is light. Ten feet is a desirable minimum for paths that serve low-powered vehicles as well as bicycles and pedestrians. Shared use paths are very popular because they separate users from motor vehicles.

Design Considerations

- Unlike exclusive bicycle facilities, shared-use paths must be designed in accordance with applicable Americans with Disabilities Act requirements.
- Sidepaths should not be immediately adjacent to roadways. A lawn, landscaped buffer, or other separation with a preferred minimum width of 6 feet is desirable. In constrained situations where a back of curb or pavement edge is required, a paved or painted buffer with a minimum 2 foot width is acceptable. Sidepaths on local streets such as the Inner Circle would be located in the deep sidewalk setback. This allows them to feel more trail-like and affords possibilities for enhancements like landscape, amenities like benches, public art, and historic interpretation.

Figure 12. Cycle track concept. Top: Example of path for bicycles and low-speed wheeled modes separate by an intermediate curb and parking. Bottom: Concept applied to Webster Street's dimensions.

Cycle track concept. Looking north on Webster Street.

- Intersection design for sidepaths is extremely important. Visible crosswalks and advisory signage at street crossings provides a higher level of safety on sidepaths. Roadways or road segments with limited driveway interruptions are also more suitable for sidepath development.
- Shared use paths may be hard-surfaced, normally using concrete or asphalt, or unpaved, using crushed or granulated stone. Paved facilities should be used with the city and along featured resident and visitor routes that should provide easy access to all users, including wheeled users. These facilities include the Inner Loop, Alley Trail, and key links of the Outer Loop. In addition, sidepaths should always be paved. While paving is preferable for its accessibility to all, peripheral or rural trails, Figure 11 distinguishes among paved and unpaved trails and paved sidepaths.

ON-STREET TREATMENTS

The very low traffic on most of Red Cloud's streets do not require separated on-street territory for bicycles and other low-speed wheeled vehicles like bike or mobility lanes. Additionally, most streets are too narrow for these dedicated bike lanes. The one exception is the Webster Street Cycle Track, a concept that accommodates bicycle/wheeled low-speed devices into the planned reconstruction of Webster Street through Downtown Red Cloud.

These designations do not include every street in the city or many streets where sidewalks are already present. A community of Red Cloud's size to fund all sidewalks in a short time. So instead, this plan focuses on streets that make up a basic trail/sidewalk system and can be used to set priorities on sidewalk replacement and reconstruction.

Different types of on-street facilities include:

- **Webster Street Cycle track.** This concept, essentially an on-street shared use path, provides a specific area for bicycles and wheeled vehicles like scooters off the sidewalk but separated from motor vehicles. It assumes that Red Cloud's downtown main street with its various retail features should provide a safe place for these modes – especially important for a highway environment with heavy truck traffic or on a main street with head-in diagonal parking. By providing a protected place for non- or limited-power vehicles, it reduces conflicts with traffic using the main roadway.

  Figure 12 is a diagram of a cycle track that could be developed for Webster Street between 3rd and 6th Avenues. The concept assumes our understanding of the current

reconstruction plan, which maintains the current curb line and uses new paver bricks to surface the travel lanes and concrete for the parking areas.

Elements of the concept include:

- Diagonal parking on one side of the street and converting the opposite side to parallel parking. This provides adequate space for a two-way path.
- Parallel parking on the opposite (probably west) side of the street with a painted buffer with vertical delineators or a free-standing curb th separate the parking from the path.

- An 8- to 10-foot two -way path between the buffer and the sidewalk curb.

Separated two-way bike lanes, such as this plan's recommendation for Webster Street, introduces a counterflow movement. Therefore, very good visibility of the facility at intersections must be provided by the facility design. Painted or raised bump-outs or curb extensions improve visibility and safety for all users at intersections and also benefit pedestrians crossing wide streets.

- **Bicycle (or mobility) routes with sidewalks.** These improvements will include bike route signage and wayfinding using the standard system described in Chapter Five, and other standard signage stating that bicycles may use the full lane. Pavement markings – specifically shared lane markings or "sharrows" may be used for wayfinding purposes, but have generally declined in use nationwide.

  These streets should also maintain continuous sidewalks in good repair on at least one side of the street. When the continuous sidewalk path changes sides of the street, a high visibility crosswalk and warning signage should be provided. Guidelines are provided in the Appendix.

Another useful safety measure can be stop controls favoring these routes. Most of the city's intersections are uncontrolled, lacking stop signs. Road rules give the right of way to the driver to the right when cars arrive at an intersection at the same time. This leads to ambiguity that increases for pedestrians and bicyclists, as many motorists in these conditions assume they always have right-of-way priority over active users. Stop signs that favor the preferred pedestrian/bicycle route by "stopping" the intersecting streets addresses this problem.

Desirable minimum width for residential sidewalks should be 5 feet. Clear width should never be less than 4 feet. Sidewalks should generally have a minimum 4 foot (more desirably 6 foot) separation from the back of curbs or pavement edge. When this is impossible because of an obstruction, the sidewalk may be closer to move around the obstruction. All sidewalks should be fully accessible with ramps at intersections.

- Priority Sidewalks outside of bicycle routes. These streets are not considered to be designated bicycle routes, although bicycles and similar wheeled vehicles are permitted), but should also provide a continuous a sidewalk path on at least one side of the street. All sidewalks should be fully accessible with ramps at intersections.

INTERSECTION IMPROVEMENTS

An active network is made up of more than linear segments. To be effective, these routes must also

St. Juliana Falconer Church

comfortably and safely cross barriers, which in Red Cloud are the two intersecting highways. The network concept includes five priority intersections in addition to the already signalized 4th and Webster intersection:

4th Avenue (US 136)

- Seward Street, the intersection with the Willa Cather Walk connecting Downtown to the south side of town and the St. Juliana Falconer and Burlington Depot historic sites.
- Cherry Street, connecting the north side to the Elementary School, football and track field, and the Inner Loop crossing.

Webster Street (US 218)

- Division Street, connecting the south side to the future Outer Loop Trail.
- 7th Avenue, the highway crossing of the Inner Loop and a primary link from north side areas to Illian Field and senior housing.
- 10th Avenue, connecting the north side safely to two primary commercial sites.

Countermeasures that increase safety and comfort for vulnerable users include:

- Pedestrian activated crossing beacons such as Rapid Rectangular Flashing Beacons (RRFB) or HAWK (hybrid actuated crosswalk beacons) signals, coupled with high visibility crosswalks. HAWKs include a red signal that stop traffic and are more suitable for higher of faster traffic settings than RRFBs. An RRFB type signal is currently installed at 4th Avenue and Cherry Street.
- Pedestrian refuge medians. These small medians provide a place for pedestrians to pause safely in the middle of a street, and wait for traffic in the opposing direction to clear.
- High visibility crosswalks, often using thermoplastic or reflective traffic paint and wide, "continental" striping.
- Curb extensions or bump-outs to increase the visibility of a pedestrian and decrease crossing distance.

Top priority intersections for upgrades in the Red Cloud network are 4th Avenue and Cherry Street and Webster Street and 7th Avenue, directly serving both school facilities.

Figure 13 lists these and other important intersections that require special attention in the proposed network.

General Design Considerations

- Crosswalks should be highly visible, well-maintained, and aligned with crosswalk ramps to allow for easy use by individuals with mobility issues.
- Intersections intended to serve as pedestrian and bicycle crossings should be designed to communicate this intention to automobile drivers.
  - » Signage should indicate that drivers should expect to see bicyclists, pavement marking should delineate where drivers should stop and where pedestrians should cross, and the pedestrian should be visible to traffic (not obscured by landscaping or relegated to the far edge of the roadway) to best indicate their intent to cross.

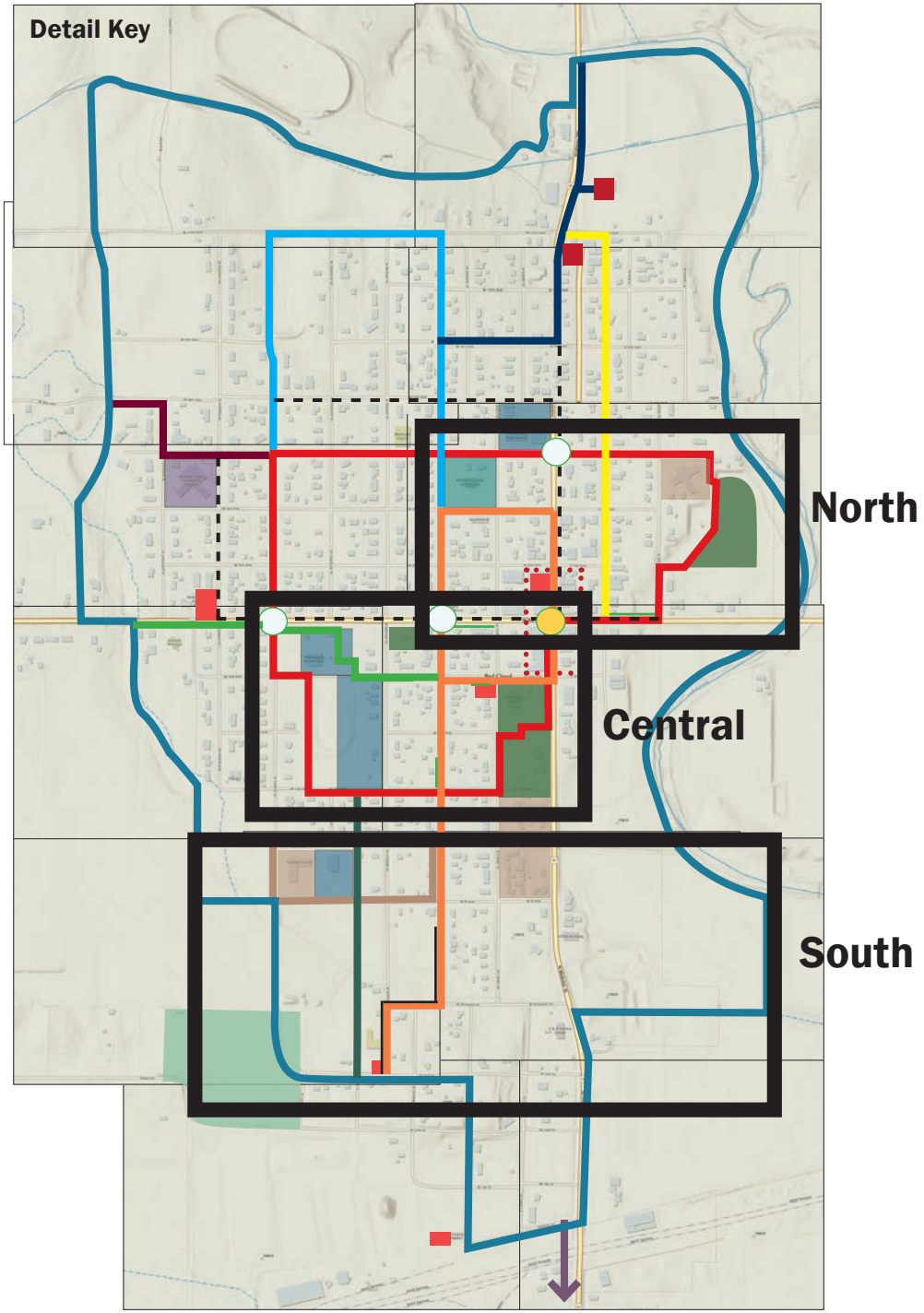
A review of intersection design measures appears in the following pages.

Figure 13: Intersection Safety Measures and Priority

Location	Proposed Treatment	Timing / Priority
4th Avenue and Seward	High visibility crosswalks Bike/Ped Crossing Sign, RRFB,	Short- term (2-5 years). Traffic is moving slower through this intersection because of proximity to existing Downtown signal
4th Avenue and Cherry	High visibility crosswalks , refuge median, upgrade to HAWK signalization	Immediate priority (0-2 years). Key crossing to elementary school and other major assets. RRFBs are not sufficiently visible and do not stop traffic.
Webster and Division	High visibility crosswalks Bike/Ped Crossing Sign, RRFB,	Medium to long-term. Need will emerge with development of Outer Loop Trail's eastern leg.
Webster and 7th Avenue	High visibility crosswalks , refuge median, upgrade to HAWK signalization	Immediate priority (0-2 years). Key crossing to high school and other major assets. No existing crosswalk markinjgs or signage
Webster and 10th Avenue	High visibility crosswalks Bike/Ped Crossing Sign, RRFB,	Short- term (2-5 years). Traffic is moving slower through this intersection because of proximity to existing Downtown signal

DETAILS

Pages 32 through 35 display greater detail and notes on active transportation segments through central parts of Red Cloud. These are areas with somewhat greater complexity and the context provided by aerial photography will help explain the routes.



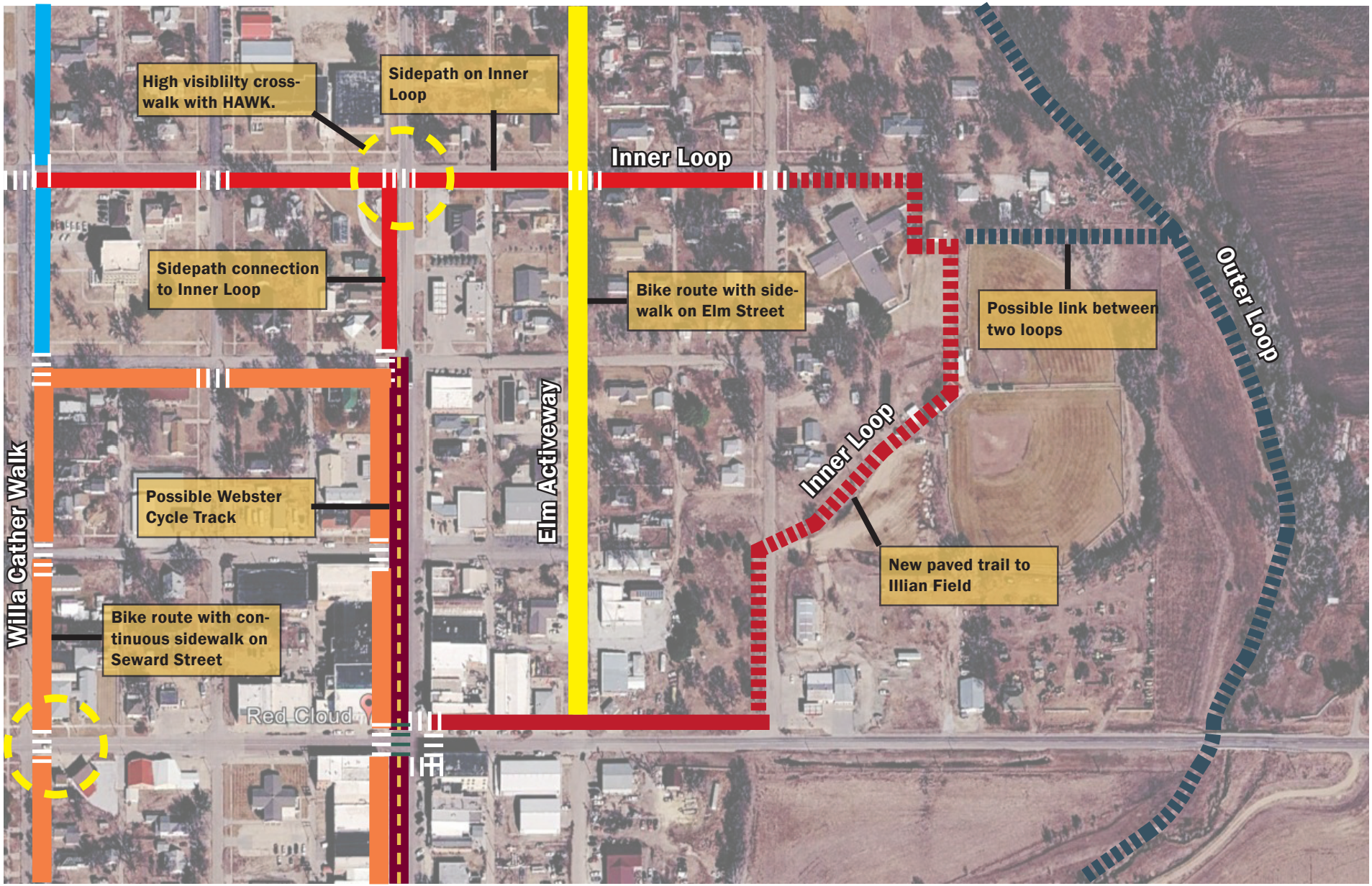


Figure 14: North Sector
Major elements include a much needed route to Illian ballfields and the eastern part of the Inner Loop. Dashed lines indicate off-road trails.

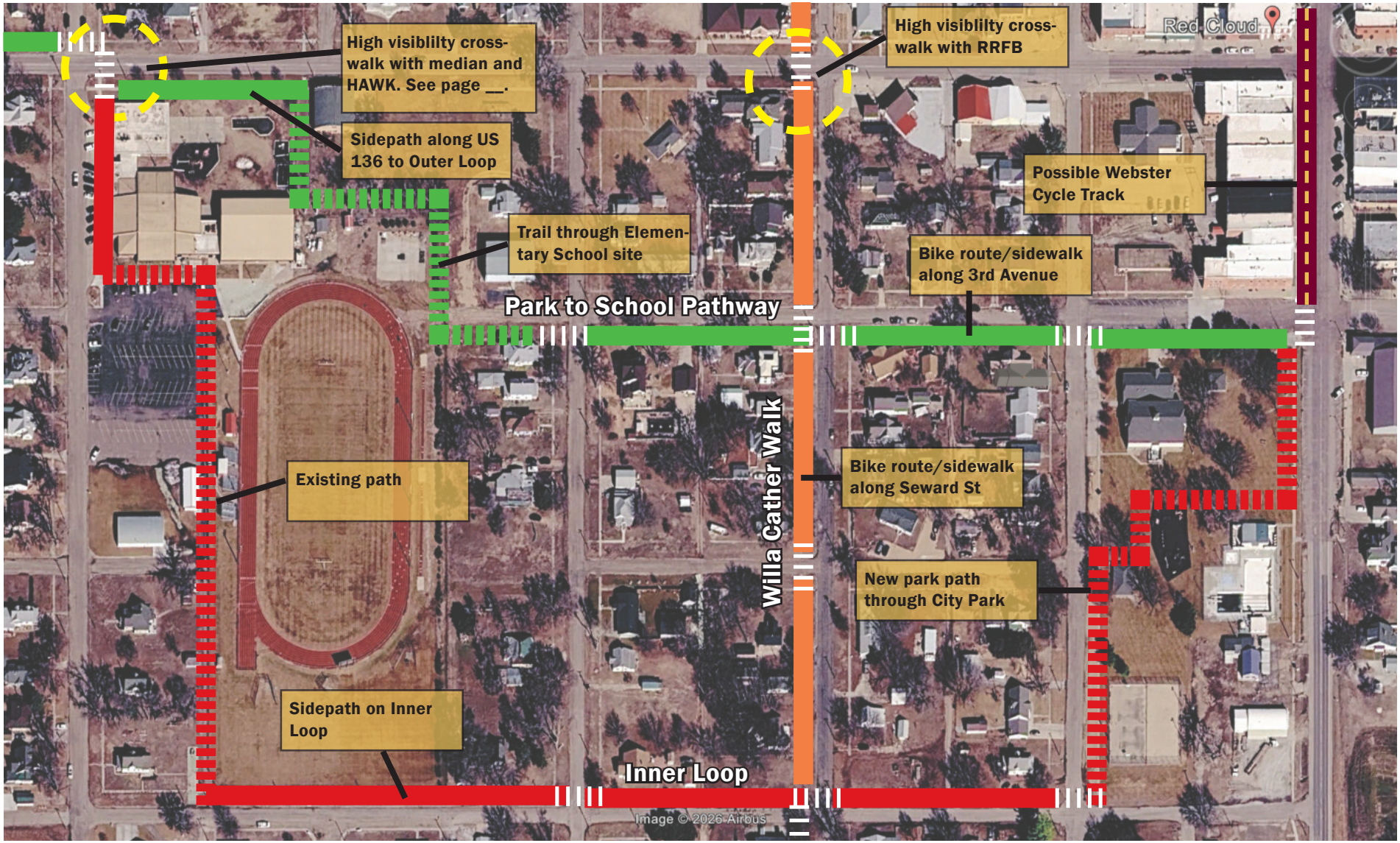


Figure 15: Central Sector
This area includes the connections between Downtown and City Park to westside destinations, notably the Elementary School and football field. An important individual project is a protected crossing of 4th Avenue (US 136) at Cherry Street, important for both the school and also for north to south connectivity. Dashed lines indicate off-road trail facilities.

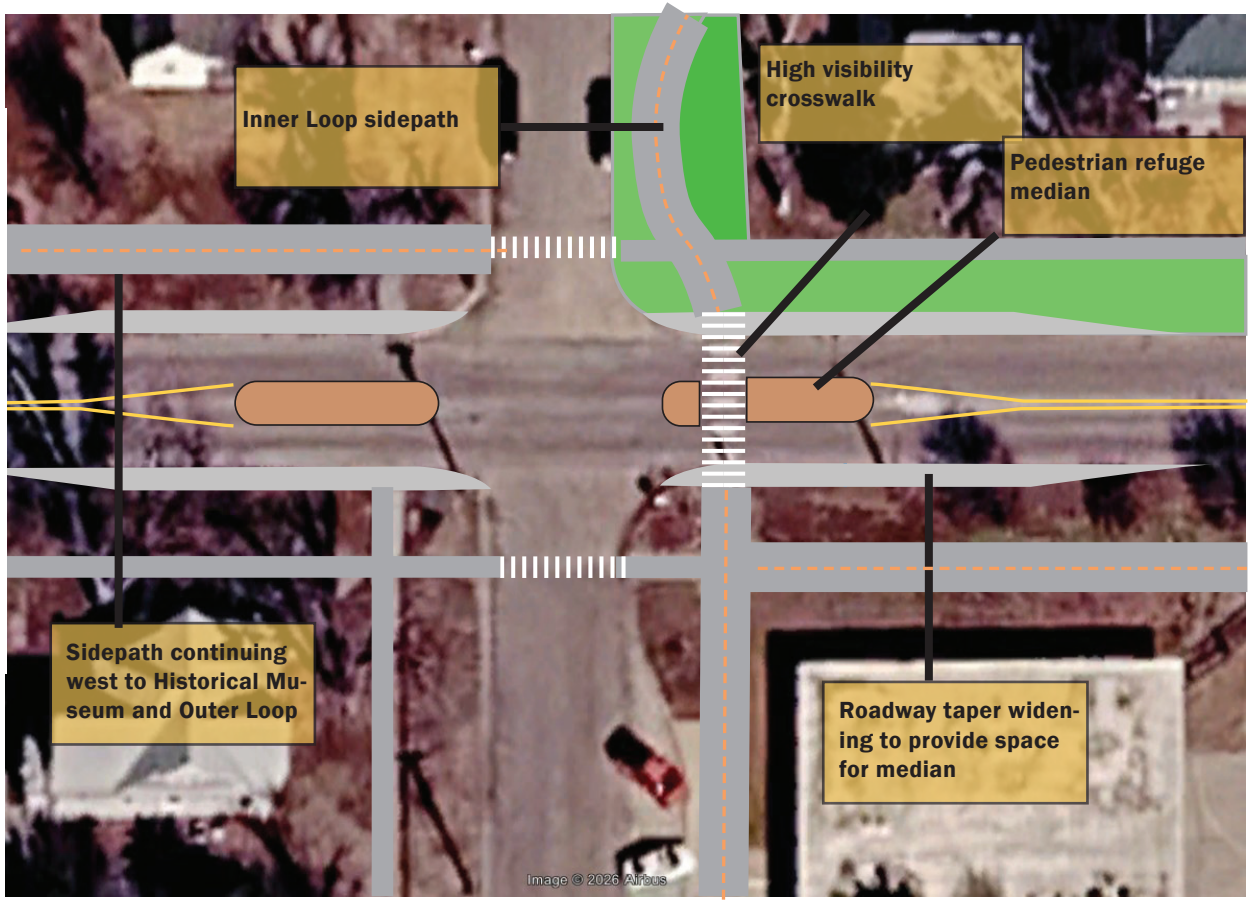


Figure 16: 4th Avenue and Cherry Street intersection

Intersection views. Left: Looking eastbound from US 136 (4th Avenue); Above from top: Northbound view and southbound view.

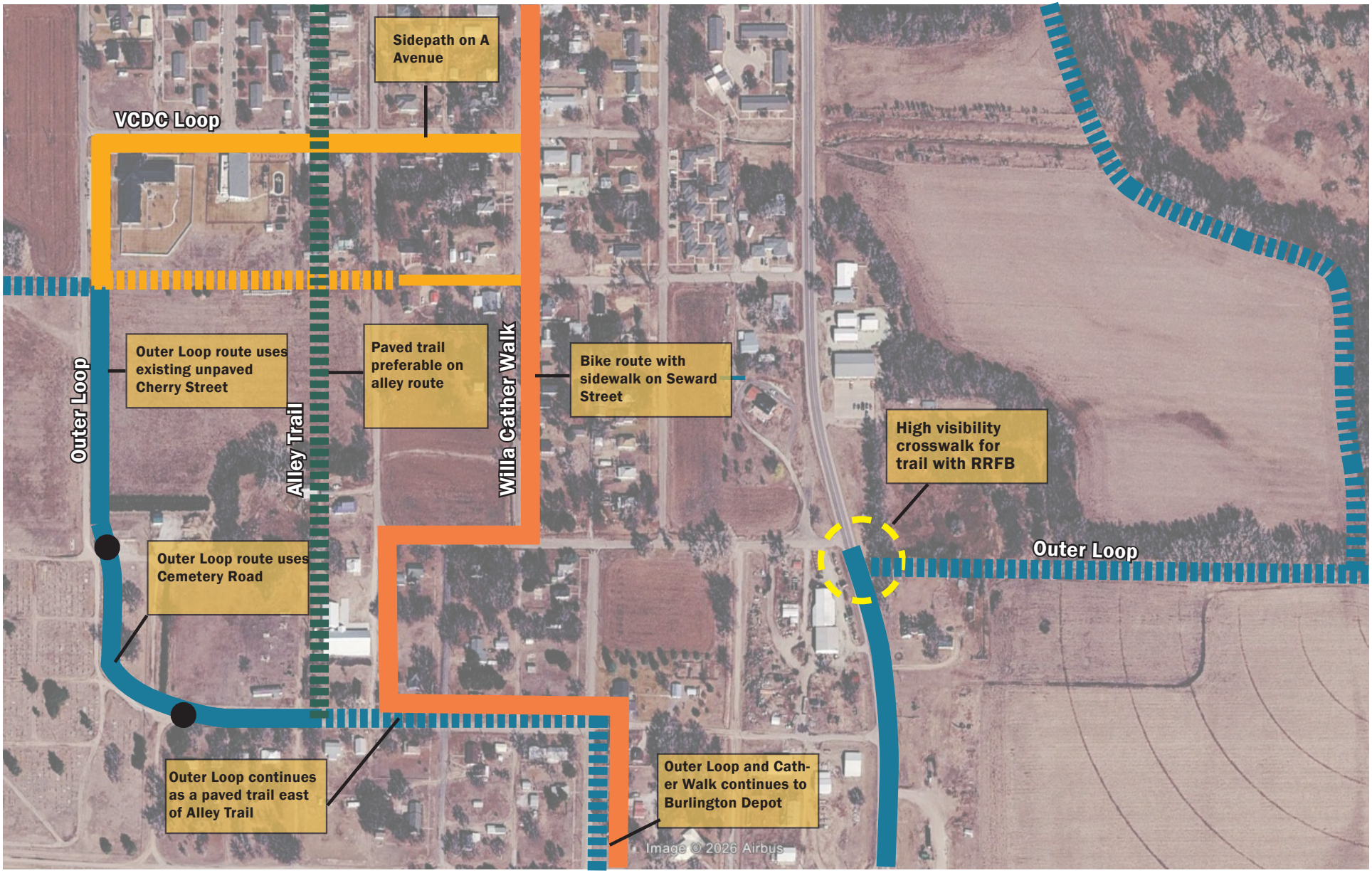


Figure 17: South Sector
This area includes connections to the Valley Child Development Center and includes the Alley Trail, a short but important trail opportunity linking the central part of town to the Burlington Depot and ultimately Indian Creek Pond and the Republican River Bridge.

Intersection Crossing Techniques and Methods

Case Study: City of Boulder Crosswalk Compliance Studies and Treatment Implementation.

The city of Boulder, CO was struggling with drivers not yielding to pedestrians in crosswalks, creating an unsafe environment and thereby discouraging many residents from walking. The solution was to develop a Pedestrian Crossing Treatment Warrants document and a year later hire a consultant to conduct a study to determine the effectiveness of the treatments. The treatments included in the study were rumble strips, raised pedestrian crossings, "State Law" signage, sign-mounted lights, and in-pavement lighting. The study was conducted during peak times and noted the number of yields to pedestrians with the legal right-of-way verses non-yields. Studies were completed before the treatments to create a basis to determine the level of effectiveness and six months after the treatments were installed. A variety of street widths, traffic and pedestrian traffic volumes, and intersection conditions were studied to provide comparison. The treatment with the largest impact were pedestrian activated sign-mounted lights and the treatment with the lowest impact was the advance rumble strips. The results of the study have been included in the Pedestrian Crossing Treatment Warrants.

Curb Extensions

Context

- Downtown settings with wide streets and on-street parking (Webster Street, 4th Avenue)
- Neighborhood streets with speeding issues

Technique

- Curb extensions that reduce the curb to curb width at an intersection.
- Curb extensions may also be painted.
- Care should be taken to provide for turning movement of long trucks

Benefits

- Reduces average traffic speed
- Reduces distance of pedestrian crossing
- Provides some protection for parked cars
- May provide opportunities for neighborhood plantings and beautification

Pedestrian Refuge Median

Context

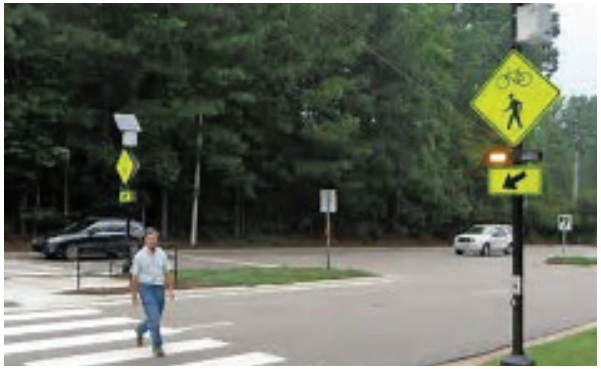
- Bike/pedestrian crossings of trails or sidewalks of major streets or highways. (Cherry Street at 4th Avenue, Webster Street at 7th Avenue)

Technique

- Refuge median in a two-way turn lane or small divergence of lanes to provide space for the median.
- High visibility crosswalks and pavement markings.
- Used in conjunction with yellow caution signs.
- Should include flashing beacons or HAWK protection.

Benefits

- Allows pedestrians to measure one lane or direction of traffic at a time before crossing
- Provides space for people requiring more time to cross
- Tends to reduce traffic speeds at crossings



High-Visibility Crosswalks

Context

- Crossings of major intersecting streets by on-street active network routes (Inner Loop) or primary sidewalks
- Any street intersection near a generator of pedestrian traffic including Downtown Red Cloud

Technique

- High visibility crosswalks with Continental or "zebra" pavement markings
- May be used in combination with rapid rectangular flashing beacons or hybrid signals
- Increased crosswalk width and visibility at highway crossings

Benefits

- Increases visibility of pedestrians and bicyclists
- Notifies motorists on intersecting major streets of presence of a significant number of active users

Rectangular Rapid Flashing Beacon (RRFB)

Context

- Important but lower-speed crossings (4th Avenue at Seward Street)
- Two-lane crossings, with lower traffic volumes

Technique

- Pedestrian actuated
- Rapid alternating patter of two yellow LED lights
- Used in conjunction with high visibility crosswalks
- Depends on motorists yielding to pedestrians, usually required by state laws but stops short of providing an actual red light

Benefits

- Relatively inexpensive and empirical evidence suggests effectiveness at reducing pedestrian fatalities
- Increases visibility of vulnerable user, but users should not assume safety

Hybrid Actuated Crosswalk Beacon (HAWK)

Context

- Multi-lane or higher/faster traffic settings
- High priority crossing points (Cherry Street at 4th Avenue, Webster at 7th Avenue)

Technique

- Pedestrian actuated, remainsing dark until actuated by a pedestrian
- Triangular configuration of lights with one yellow at bottom and two red at top
- Sequence is flashing yellow/solid yellow/solid red/flashing red/dark
- Red has full force of a red traffic signal

Benefits

- Provides a red signal that stops traffic for pedesrtains
- Applicable in higher speed areas or when RRFB does not provide adequate visibility
- Refuge medians are desirable for three-lane section


NEBRASKA
HISTORICAL MARKER
BURLINGTON DEPOT
Built in 1897, the main section of Red Cloud's Burlington Depot contained sleeping quarters on the second floor, and freight room, agent's office, and waiting room below. The building was moved here from its site near the tracks directly south of its present location. Depots and trains played a significant role in Willa Cather's life and writings, symbolizing both escape to the world and the door through which the world came to Red Cloud. Restored and donated by the Willa Cather Pioneer Memorial and Educational Foundation.

Chapter Four

Sequencing and Implementation

SEQUENCING AND IMPLEMENTATION

A plan like this one cannot be accomplished all at once without a huge and unexpected infusion of funds. Instead, we must plan for a more gradual process, with the system developing in increments as funding, energy, and partnership opportunities become available. Deciding what comes first requires a careful process based on specific criteria and principles:

Response to demands. In every phase, high priority routes should address existing demand patterns, and serve destinations that are valuable to both residents and visitors. The participation process helped us understand some of these patterns in the city, some of which were unexpected.

Route integrity. High priority routes and projects should provide continuity between valid endpoints. When developed incrementally, routes should not leave users at loose ends.

Extensions of existing facilities. Projects that make use of and extend the reach of key existing facilities that need attention.

Gaps. Small projects that fill gaps in current facilities can be especially useful at early stages of the system's development.

Opportunities. The implementation sequence should take advantage of street projects such as the major reconstruction of Webster Street through Downtown.

Safety enhancement. High priority projects should address safety concerns to increase safety and reduce user discomfort for people of all ages.

Demographic equity. Projects should provide bicycle and pedestrian access to underserved populations and connect people and households without access to a motor vehicle to destinations important to their lives and livelihood.

Service to key destinations. These include parks, schools, the library, and similar destinations.

Relative ease of development. It is important that a useful system be established relatively quickly and at comparatively low cost. Feasibility helps determine priorities. The initial system should serve major destinations and provide good connectivity while minimizing large scale projects or major obstacles like funding and land acquisition. Clearly economics and available resources are extremely important and facilities that meet user demands and preferences are often relatively expensive because they require a greater degree of separation from motor vehicles. Figure 18 identifies typical costs per mile for the different types of bicycle and pedestrian facilities proposed for the Red Cloud system.

SEQUENCING

The following pages present a sequencing program based on the above criteria and performance principles discussed earlier in this plan. Each phase must deliver a high level of service in even if no further progress is made.

The tables to follow display planning level opinions of cost to assist with both priority settings and grant application processes. The sequencing ideas shown here should be seen as guidelines and not absolute requirements. A combination of techniques will ultimately be used to fund and execute the overall network and these phases may change and some projects may move up in priority as opportunities present themselves. In any case, the design of programmed projects should incorporate the pedestrian and bicycle initiatives identified here.

Figure 18: Cost Assumptions for Infrastructure Types

Infrastructure Type	Cost per Mile	Typical Features
Marked and signed bike route	$25,000	Signage, shared lane markings
Sidewalk	$350-400,000	5 foot concrete sidewalk with ADA-compliant intersection ramps
Cycle track	$200,000	Cost is for buffer, delineators or curbs, paint and pavement markings. Project anticipates NDOR construction of the main corridor.
Shared use path (granulated stone)	$300,000	Cost is very approximate, and does not include the cost of excessive grading or land acquisition
Sidepath	$600,000	Assumes 8 foot width. Cost is somewhat moderated by wide rights-of-way in Red Cloud
Trail (paved)	$750,000	Cost is moderated by available right-of-way
Intersections or Barriers (Generic cost points)		
Major Intersection Construction	$375,000-600,000	Major projects such as protected intersections, frontage road relocation, or other substantial projects.
Median with HAWK	$400,000	Crossing refuge median with hybrid beacon
Crossing with flashing beacon	$100,000	Crossing with flashing warning beacons in place of positive red stop signal
Enhanced	$30,000-50,000	High visibility crosswalks, minor construction but normally without signalization.

PHASE 1A

Phase 1 is divided into two parts in the sequence. Both sub-phases represent major priorities, with an emphasis on local connectivity and safety. Phase 1a represents more immediate priorities and opportunities in our judgment. It includes the following initiatives:

- Upgrades for pedestrian safety of intersections at 4th Avenue and Cherry Street and 7th Avenue and Webster Street, the city's two highest highway crossing priorities.
- The southern half of the Inner Loop, connecting Downtown, City Park, the track and football field, the Elementary School, and the VCDC.
- A path connection to Illian Ballfield from Downtown and 7th Avenue.
- The Willa Cather Walk, the primary continuous north-south connection along Seward Street, connecting the Courthouse and Burlington Depot in its first phase.
- Important sidewalk installations along Webster Street from 10th Avenue north to Kenny's Hardware and Dollar General; 10th Avenue from Seward to Webster/ Highway 281; and 8th Avenue from Cherry to Seward Streets.
- Upgraded pedestrian crossings at 4th and Seward and 10th and Webster.
- The Webster Street cycle track, if developed, to take advantage of the reconstruction of Highway 281 through Downtown.
- Sidewalk rehabilitation programs on Webster Street from 7th to 10th Avenues and 7th Avenue from Webster to the Ballpark Path.

Figure 19: Phase 1A Developments

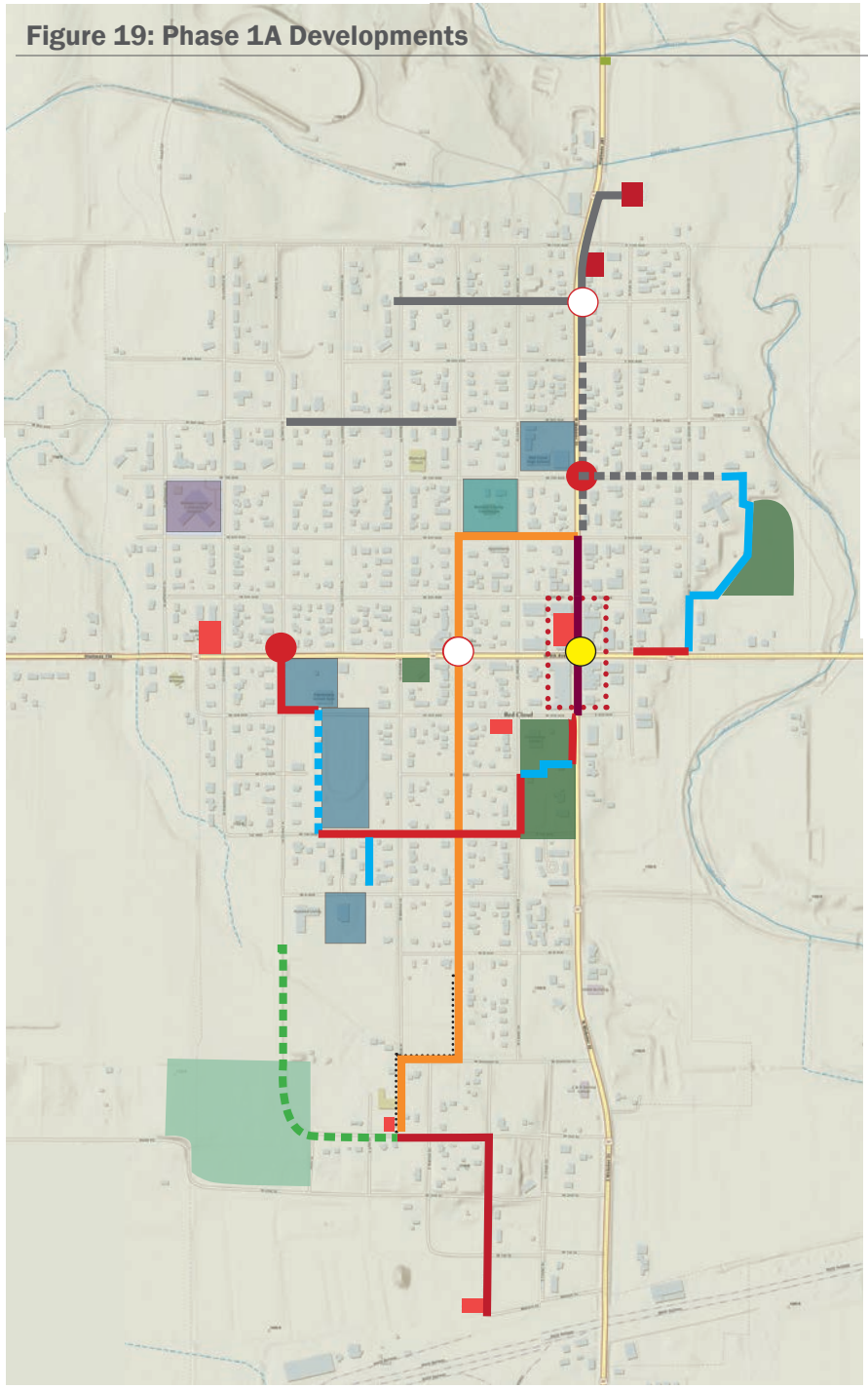


Figure 20: Phase 1A Cost Opinion

Route Project	Segment or Area	Segment Length (Miles)	Facility Treatment	Cost/Mile or unit	Street Channel or Path Cost	Required Sidewalk Length (Miles)	Sidewalk Cost/ Mile	Sidewalk Cost	Total Projected Cost
INTERSECTION ENHANCEMENTS	4th Avenue and Cherry Street	NA	Minor street widening, pedestrian refuge median, high visibility crosswalks, HAWK signalization	$400,000					$400,000
	7th Avenue and Webster Street	NA	Minor street widening, pedestrian refuge median, high visibility crosswalks, HAWK signalization	$150,000					$150,000
	10th Avenue and Webster Street	NA	Enhanced crosswalk with high visibility crosswalks and RRFB	$75,000					$75,000
	4th Avenue and Seward Street	NA	High visibility crosswalk with RRFB	$75,000					$75000
	Total								**$800.000**
INNER LOOP	8' sidepath	0.59	8' dual use sidepath in existing sidewalk setback, removal of existing sidewalk	$600,000	$360,000				$360,000
	City Park Pathway	0.13	10' shared use path	$600,000	78,000				$78,000
	Landscaping	LS	Sodding, some tree replacement of disturbed area	$1/SF	43,600				$43,600
	Total				**$481,600**				**$481,600**
BALLFIELD TRAIL	10' trail, 4th and Elm to 7th and Locust	0.37	10' shared use path	$750,000	$280,000				$37,650
	Total				**$280,600**				**$280,000**
WILLA CATHER WALK	On-street bike route with signage and limited street repair	0.94	Signage and pavement markings	$50,000	$47,000				$47,000
	Sidewalk rehabilitation on Seward Street from 6th Ave to B Avenue.	0.65	Assumption that 35% of sidewalk length will require repair or replacement			0.30	$350,000	$120,000	$120,000
	New sidewalk from B Ave to W 3rd Street	0.29				0.29	$400,000	$116,000	$116,000
	Total				**$47,000**			**$236,000**	**$283,000**
SIDEWALK INSTALLATIONS	W 10th Avenue, Walnut to Elm	0.28	1-side 5' sidewalk			0.28	$400,000	$112,000	$112,000
	W 10th Avenue, Walnut to Elm	0.16	1-side 5' sidewalk			0.16	$400,000	$64,000	$64,000
	W 8th Avenue, Cherry to Seward	0.22	1-side 5' sidewalk			0.22	$400,000	$88,000	$88,000
	Total								**$264,000**

Figure 20: Phase 1A Cost Opinion

Route Project	Segment or Area	Segment Length (Miles)	Facility Treatment	Cost/Mile or unit	Street Channel or Path Cost	Required Sidewalk Length (Miles)	Sidewalk Cost/ Mile	Sidewalk Cost	Total Projected Cost
WEBSTER STREET CYCLE TRACK	Webster Street, W 3rd to W 6th Avenue	0.22	Surface modification of pavement markings and separation feature on US 281 project to provide a parking-protected lane for bicycles, scooters, motorized wheelchairs, and similar modes	$250,000	$55,000				$55,000
	Total								**$55.000**
SIDEWALK REPAIR/ REHABILITATION	Webster Street, W 7th to W 10th Avenue (east side)	0.22	Assumption that 35% of sidewalk length will require repair or replacement			0.08	$350,000	$28,000	$28,000
	E 7th Avenue, Webster to Ballfield Path	0.18	Assumption that 50% of sidewalk length will require repair or replacement			0.09	$350,000	$31,500	$31,500
	Landscaping	LS	Sodding, some tree replacement of disturbed area						$59,500
	Total								**$59,500**
PHASE 1A	**Total**								**$2,223,100**

PHASE 1B

Phase 1b are also priority items that build on the strategic projects proposed in the earlier phase. It completes the Inner Loop and focuses on important projects in both the north and south sides of town. The phase includes the following investments.

- The northern half of the Inner Loop, completing the loop along Cherry Street and W. 7th Avenue. This segment begins on the west at the enhanced W 4th Avenue crossing at Cherry Street and connects to the proposed path to Illian Ballfield. It also includes a short sidepath link to the Historical Museum.
- The Hospital Link, connecting Webster County Memorial Hospital to the Inner Loop.
- Continuation of the Willa Cather Walk along Seward Street north to 10th Avenue.
- The Park to School Route, connecting City Park and the facilities at the Elementary School campus and the west leg of the Inner Loop.
- The Alley Trail, an important off-road link that connects the Inner Loop and VCDC to the south part of town and ultimately to the Republican River. This is connected to a path loop around the VCDC and the Cherry Corner retirement center.
- Sidewalk connections between apartment groups and the VCDC.
- Sidewalk rehabilitation programs on Webster Street from 7th to 10th Avenues and 7th Avenue from Webster to the Ballpark Path.
- Connection from the Elm Street district to northside commercial.

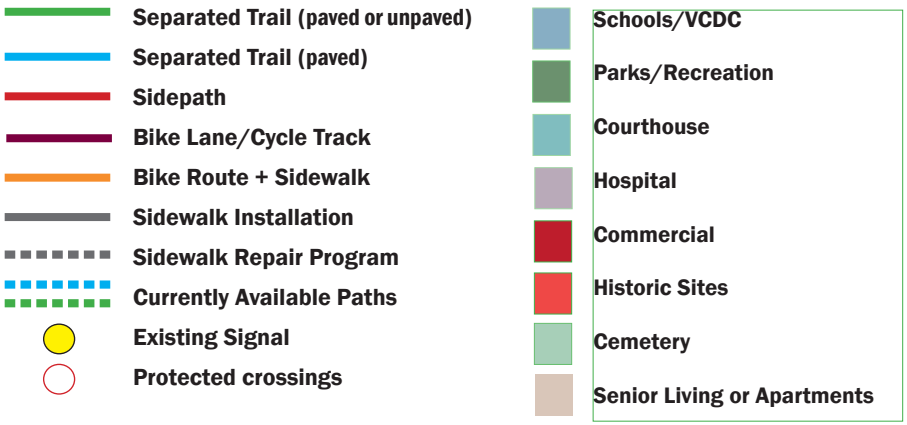


Figure 21: Phase 1B Developments

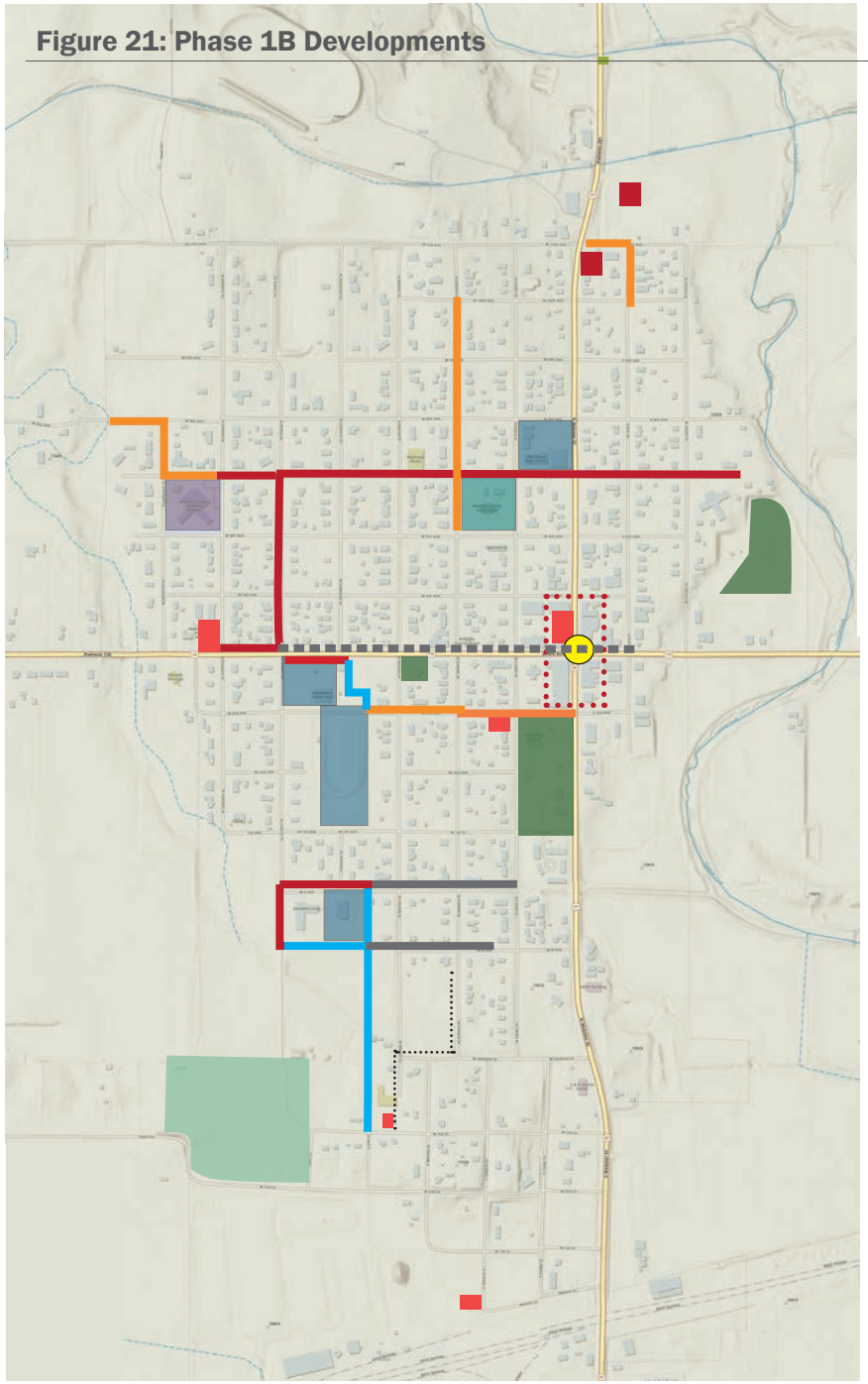


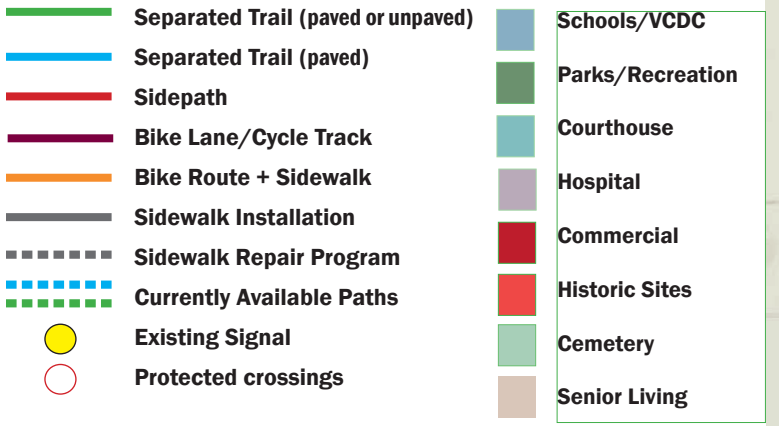
Figure 22: Phase 1B Cost Opinion

Route Project	Segment or Area	Segment Length (Miles)	Facility Treatment	Cost/Mile or unit	Street Channel or Path Cost	Required Sidewalk Length (Miles)	Sidewalk Cost/ Mile	Sidewalk Cost	Total Projected Cost
INNER LOOP NORTH	8' sidepath	1.06	8' dual use sidepath in existing sidewalk setback, removal of existing sidewalk, including hospital connection	$600,000	$636,000				$636,000
	Landscaping	LS	Sodding, some tree replacement of disturbed area	$1/SF	78,355				$78,355
	Total								**$714,355**
PARK TO SCHOOL ROUTE	On-street bike route with signage and limited street repair on W 1st Avenue	0.26	Signage and pavement markings	$50,000	$13,000				$13,000
	Sidewalk rehabilitation on W 1st Avenue	0.13	Assumption that 50% of sidewalk length will require repair or replacement			0.065	$350,000	$23,000	$23,000
	W 1st Avenue, Cedar St to Track	0.13	1-side 5' sidewalk. New sidewalk on 50% of segment			0.13	$400,000	$52,000	$45,500
	10' trail on Elementary School campus	0.16	10' shared use path	$750,000	$120,000				$120,000
	Total				**$481,600**				**$201,500**
ALLEY TRAIL	10' trail, W A Avenue to W 3rd Street	0.30	10' shared use path	$750,000	$225,000				$225,000
	Total				**$280,600**				**$225,000**
WILLA CATHER WALK	On-street bike route with signage and limited street repair to W 10th Ave	0.22	Signage and pavement markings	$50,000	$11,000				$11,000
	Sidewalk rehabilitation on Seward Street from 6th Ave to B Avenue.	0.22	Assumption that 35% of sidewalk length will require repair or replacement			0.08	$350,000	$28,000	$28,000
	Total				**$11,000**			**$28,000**	**$39,000**
SIDEWALK INSTALLATIONS	W A Avenue, Alley Trail to Seward Street	0.18	1-side 5' sidewalk			0.18	$400,000	$72,000	$72,000
	W B Avenue, Alley Trail to Seward Street	0.18	1-side 5' sidewalk			0.18	$400,000	$72,000	$72,000
	W 4th Avenue sidewalk rehabilitation	0.30-	Assumption that 35% of sidewalk length will require repair or replacement			0.11	$350,000	$38,500	$38,500
	N Elm/E 11th Avenue to Webster Street	0.12	1-side, 5' sidewalk			0.12	$400,000	$48,000	$48,000
	Total								**$230,500**
PHASE 1B	**Total**								**$1,410,355**

PHASE 2

Phase 2 completes most of the system within Red Cloud and begins the development of more capital intensive extensions on the edges of the city. Projects include:

- The Highway 281 sidepath, taking the city trail network to the Republican River, and connecting to Indian Creek pond and its potential enhancement. Park enhancement would include improvement of the existing path, clean-up of the pond, and a new walking path around the pond.
- The reuse of the historic Republican River Bridge as a public park, possibly themed around prairie life and art. We project completion of the new highway bridge during this period, making the older bridge available for reuse.
- The 11th Avenue Loop, a bike route with sidewalks connecting to the north limit of the city, and serving the northwest side of the city.
- The Elm Bikeway, a bike route and complete sidewalks through the Elm Street historic district.
- A link along Franklin Street between the hospital and historical museum.



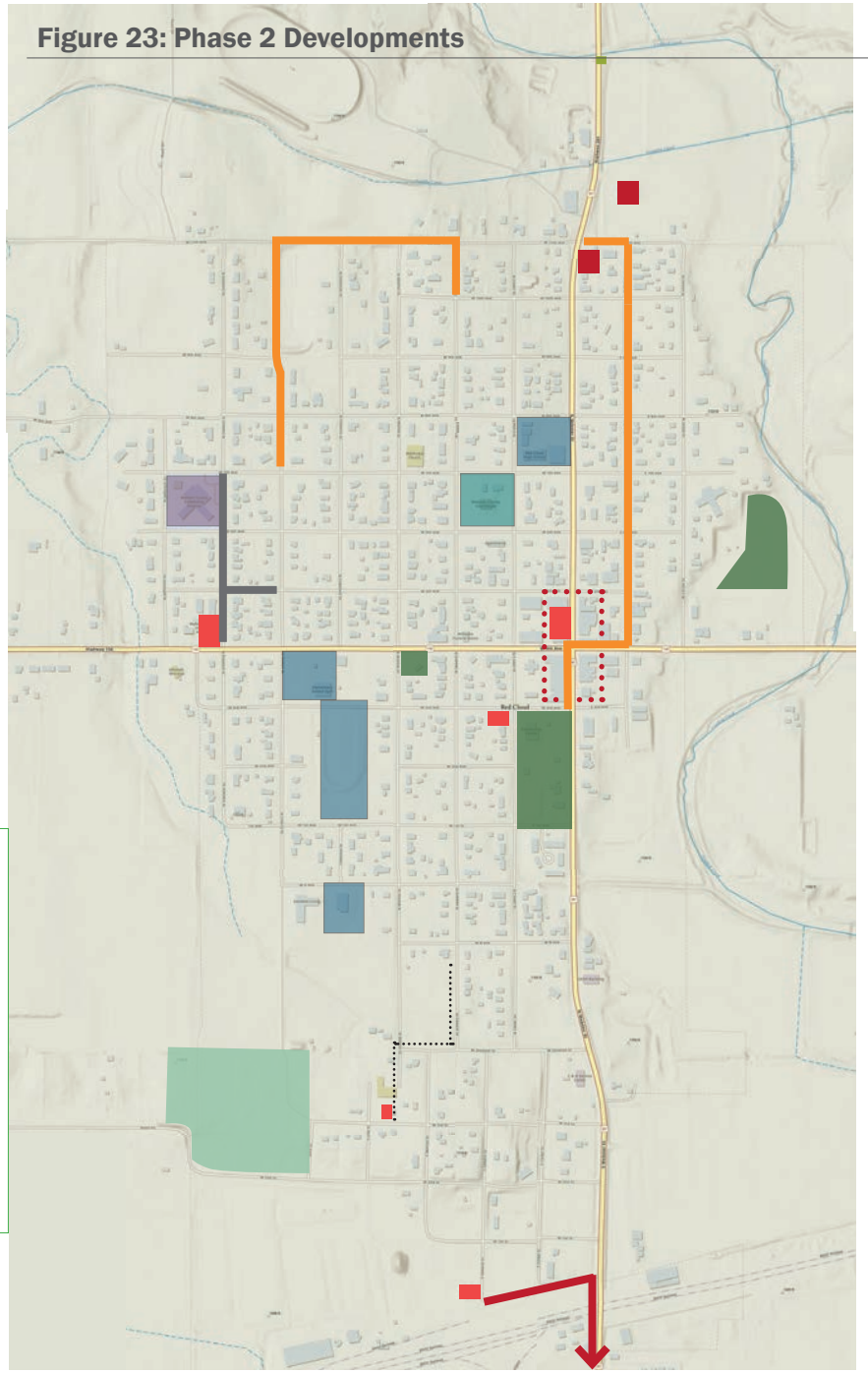


Figure 23: Phase 2 Developments

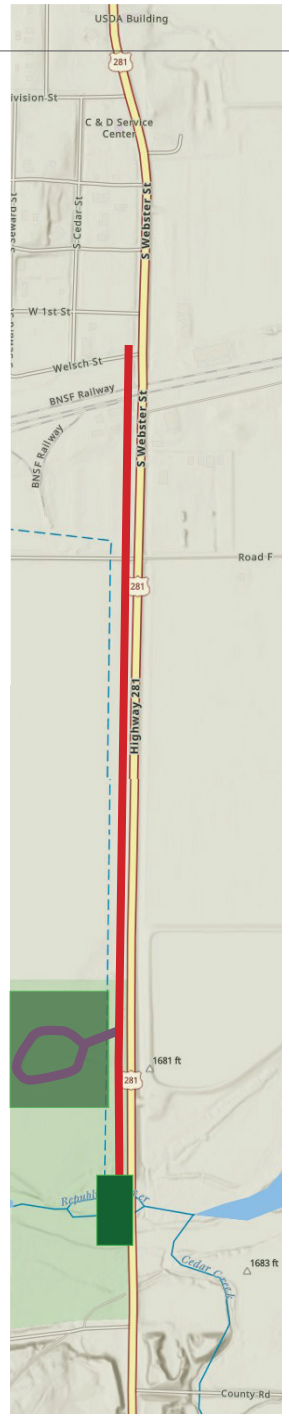


Figure 24: Phase 2 Cost Opinion

Route Project	Segment or Area	Segment Length (Miles)	Facility Treatment	Cost/Mile or unit	Street Channel or Path Cost	Required Sidewalk Length (Miles)	Sidewalk Cost/ Mile	Sidewalk Cost	Total Projected Cost
HIGHWAY 281 TRAIL	10' sidepath from Burlington Depot to Republican River Bridge	1.21	10' shared use sidepath	$750,000	$908,000				$908,000
	Total				**$908,000**				**$908,000**
PARK PATH	Path round Indian Creek Pond.	0.3	6' paved walking path			0.3	$450,000	$135,000	$135,000
	Nature Trails on state property	0.5	Granulated stone nature trail			0.5	$150,000	$75,000	$75,000
	Total								**$210,500**
11TH AVE LOOP	On-street bike route and limited street repair on N. Cherry Street, W 11th Avenue, and Seward Street	0.60	Signage and pavement markings	$50,000	$30,000				$30,000
	Sidewalk construction and rehabilitation	0.60	Most of the length of this segment will require new 5' sidewalk			0.6	$400,000	$240,000	$240,000
	Total				**$30,000**				**$270,000**
ELM BIKEWAY	On-street bike route	0.42	Signage and pavement markings	$50,000	$21,000				$21,000
	Sidewalk rehabilitation on Seward Street from 6th Ave to B Avenue.	0.22	Assumption that 40% of sidewalk length will require repair or replacement	$350,000		0.1	$350,000	$35,000	$35,000
	Total				**$21,000**			**$35,000**	**$56,000**
FRANKLIN LINK	Sidewalk construction and rehabilitation, N 4th to N 7th Avenue	0.28	Assumption that 50% of sidewalk length will require repair or new installation			0.14	$400,000	$56,000	$56,000
	Total								**$56,000**
PHASE 2	**Total**								**$1,500,500**

PHASE 3

With completion of the city system and connection to the south and the bridge, the multi-phase development turns to the peripheral Outer Loop Trail. It is possible that funding, including private philanthropy, could move the priority ahead of others, It is always important to take advantage of opportunities when they present themselves. This phase includes:

- The southeast segment of the Outer Loop from Webster Street at Division Street to the north side of Illiad Field. A short paved trail would connect to the ballfield trail and the Inner Loop.
- A sidepath continuation from Division to Welch Street, connecting the Outer Loop to the Highway 281 South Sidepath, with a high-visibility crossing with RRFBs at Webster and Division.
- A sidewalk extension along S Webster Street from Division to a new trail between the highway and Cedar Street through Park View Apartments
- A north/northwest segment of the Outer Loop between Highway 281 and W. 8th Avenue, with a short path segment to 11th Avenue and the 11th Avenue Loop.

Figure 25: Phase 3 Developments

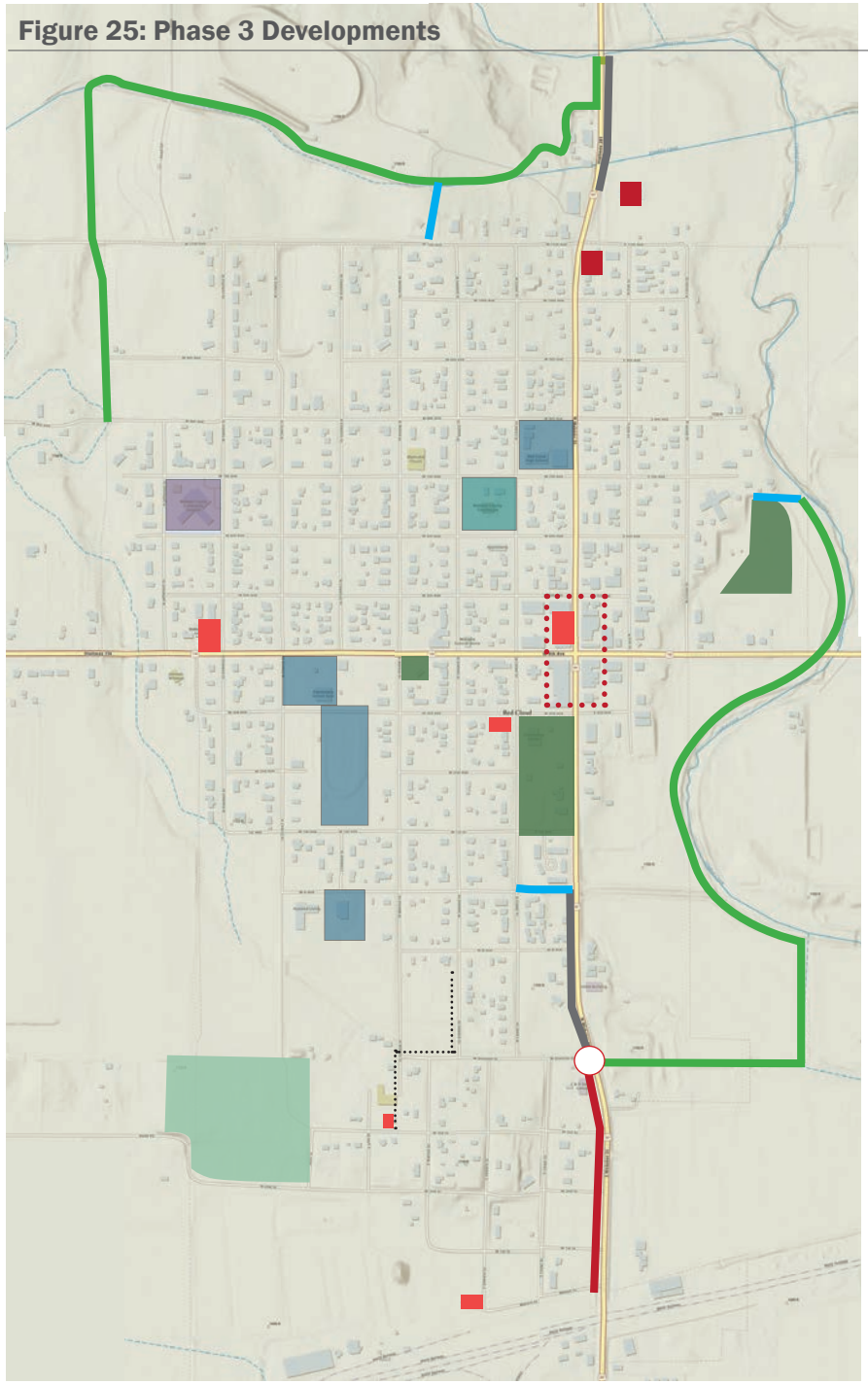


Figure 26: Phase 3 Developments

Route Project	Segment or Area	Segment Length (Miles)	Facility Treatment	Cost/Mile or unit	Street Channel or Path Cost	Required Sidewalk Length (Miles)	Sidewalk Cost/ Mile	Sidewalk Cost	Total Projected Cost
OUTER LOOP TRAIL SE	10' trail between S Webster and Division and the edge of Illiad Park.	1.21	10' shared use trail. Cost here assumes granulated stone trail.	$400,000	$480,000				$480,000
	10' trail between Outer Loop and Inner Loop/ ballfield segment	0.1	10' paved shared use trail	$750,000	$75,000				$75,000
	Total				**$908,000**				**$555,000**
HIGHWAY 281 SOUTH CONNECTION	Sidepath from Division to Welch	0.27	8' paved sidepath	$600,000	$162,000				$162,000
	Sidewalk from Division to Park View Apartment Path	0.22	5' sidewalk			0.22	$400,000	$88,000	$88,000
	Webster and Division Street intersection	NA	Enhanced crosswalk with high visibility crosswalks and RRFB	$75,000	$75,000				
	Total				**$238,000**			**$88,000**	**$326,000**
OUTER LOOP TRAIL NW	10' trail between Highway 281 North and W 8th Avenue	1.17	10' shared use trail. Cost here assumes granulated stone trail.	$400,000	$468,000				$468,000
	Highway 281, Dollar General to Outer Loop	0.16	New 5' sidewalk			0.16	$400,000	$64,000	$64,000
	Path link, Outer Loop to W 11th Avenue	0.07	10' shared use path	$750,000	$52,500				
	Total				**$520,000**			**$64,000**	**$584,000**
PHASE 3	**Total**								**$1,465,000**

PHASE 4

Phase Four fully implements the plan by completing the northeast and southwest segments of the Outer Loop. It includes:

- The northeast segment of the Outer Loop from the north side of Illiad Field to Highway 281 North. Clear trail crossing signage and high-visibility pavement markings are included in this segment. While this current version assumes a surface crossing of the highway, passage under the road along the creek should be considered.
- The southwest segment of the Outer Loop from W 8th
- A north/northwest segment of the Outer Loop between Highway 281 and W. 8th Avenue and S. Cherry Street.
- A short sidepath along Highway 136 between the Historical Museum at Franklin Street and the Outer Loop.

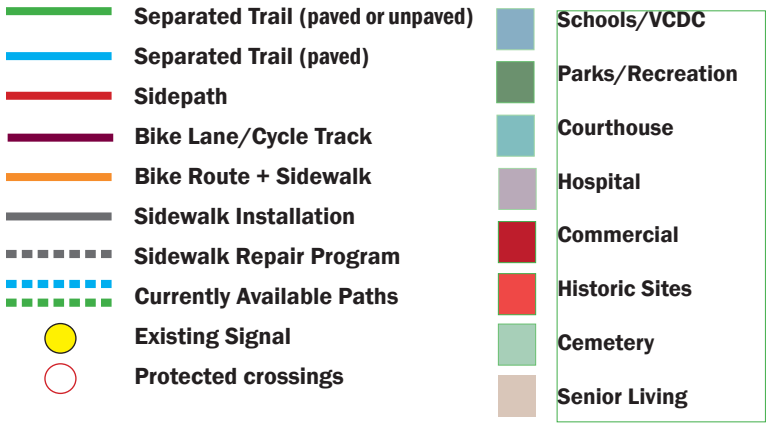


Figure 27: Phase 4 Developments

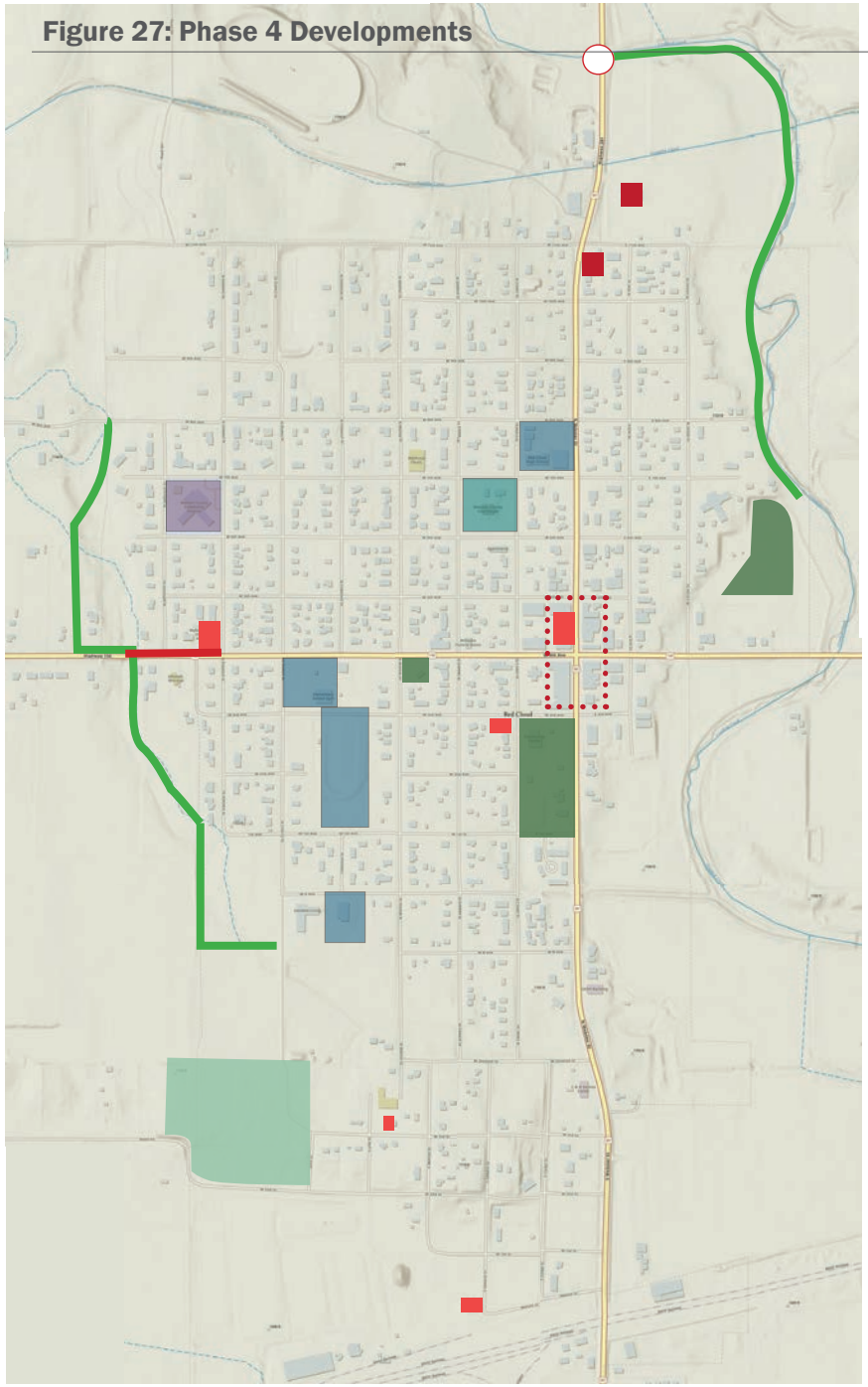
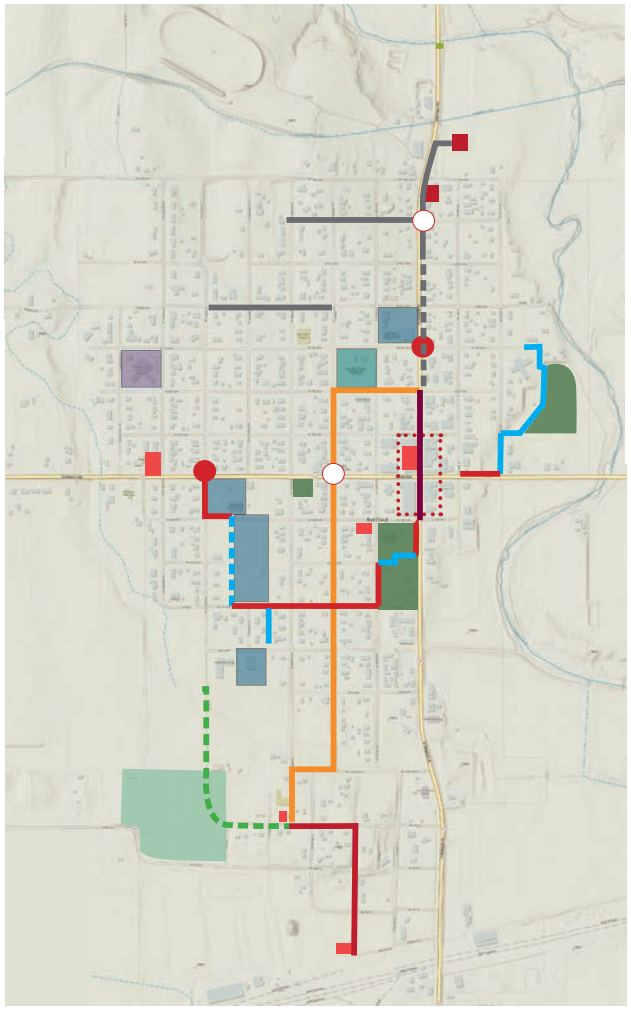


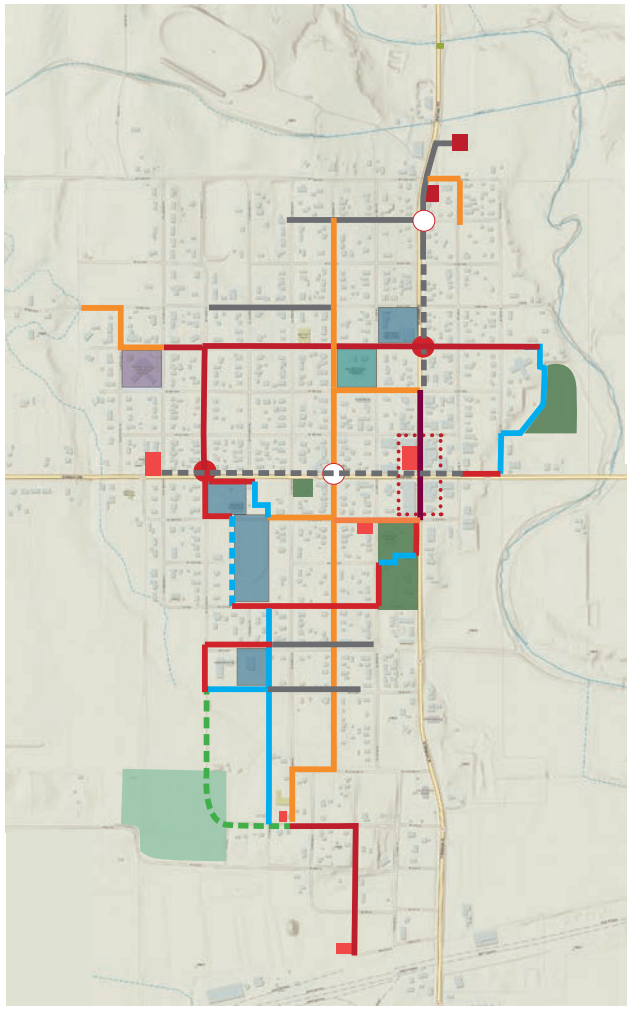
Figure 28: Phase 4 Developments

Route Project	Segment or Area	Segment Length (Miles)	Facility Treatment	Cost/Mile or unit	Street Channel or Path Cost	Required Sidewalk Length (Miles)	Sidewalk Cost/ Mile	Sidewalk Cost	Total Projected Cost
OUTER LOOP TRAIL NE	10' trail between the edge of Illiad Park.and Highway 281 North	0.76	10' shared use trail. Cost here assumes granulated stone trail.	$400,000	$304,000				$304,000
	High visibility trail crossing of Highway 281 North	NA	High visibility pavement markings with extensive warning signage and speed limit reduction entering Red Cloud	$50,000	$50,000				$75,000
	Total				**$908,000**				**$379,000**
OUTER LOOP TRAIL SW	10' trail between W 8th Avenue and Cherry Street	0.86	10' shared use trail. Cost here assumes granulated stone trail.	$400,000	$344,000				$344,000
	4th Avenue sidepath, Franklin Street to Outer Loop	0.13	8' paved sidepath	$600,000	$78,000	0.22	$400,000	$88,000	$88,000
	Total				**$238,000**			**$88,000**	**$326,000**
PHASE 4	**Total**								**$705,000**

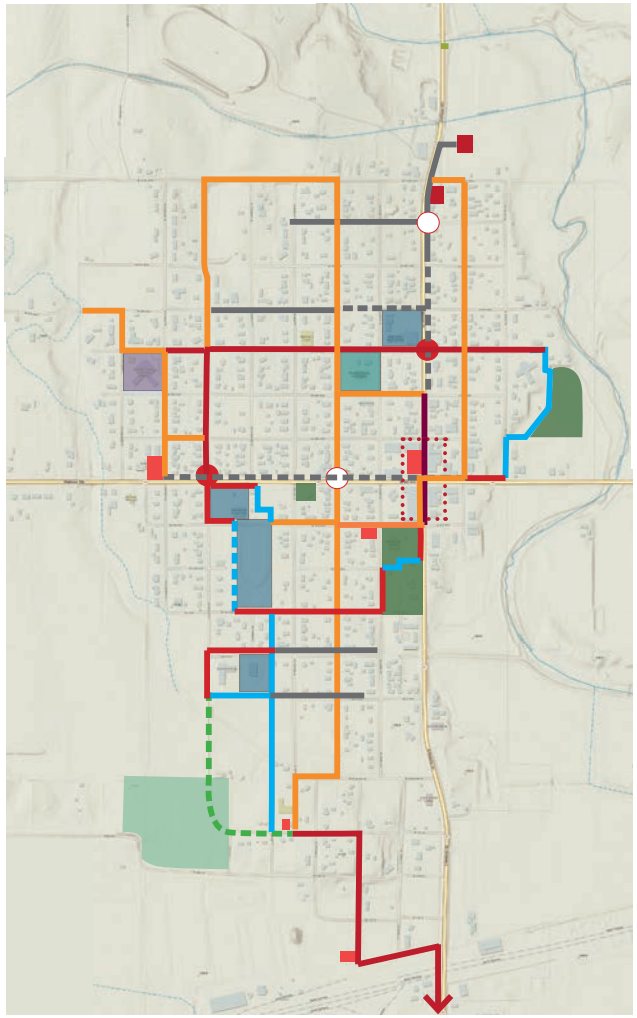
Figure 29: Phasing Summary



After Phase 1A



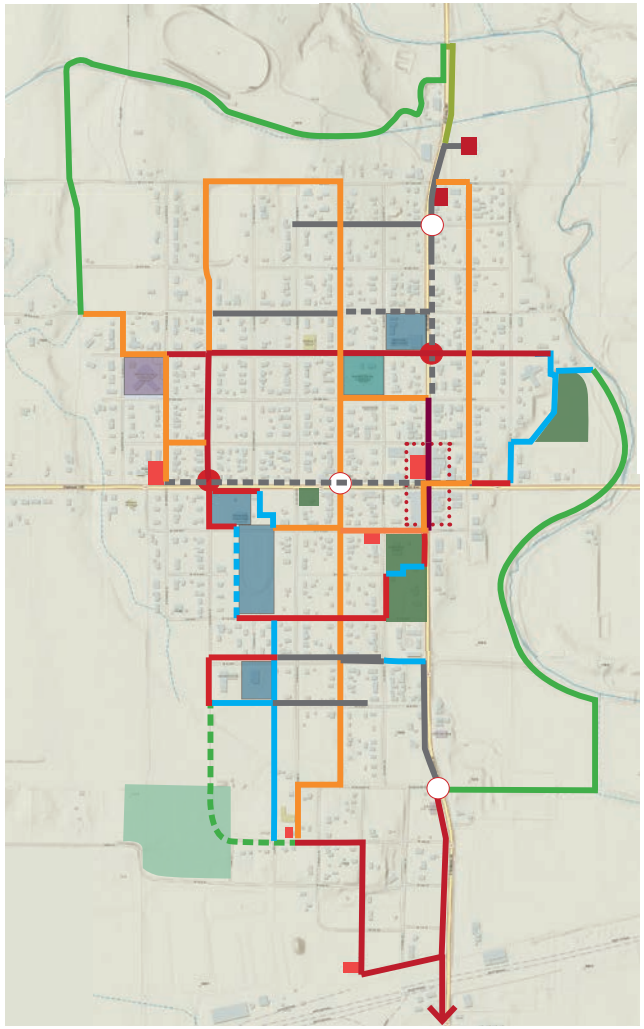
After Phase 1B



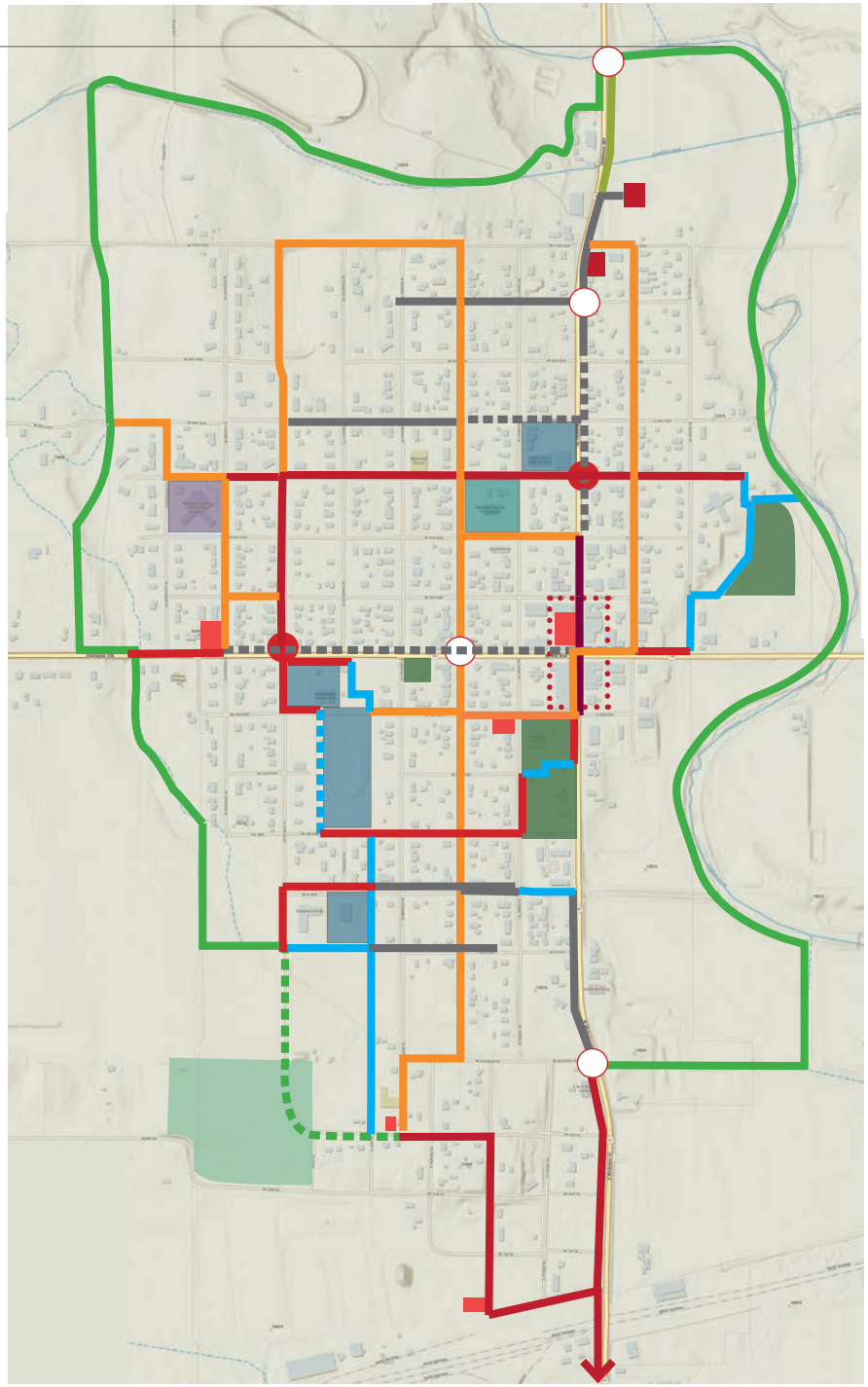
After Phase 2

How the Red Cloud Network Develops

Figure 29: Phasing Summary



After Phase 3



After Phase 4
Complete Network

FUNDING OPTIONS

Given the multi-year nature of the Trails for Red Cloud program, identifying and sustaining funding sources is critical. The bike route with sidewalks can be implemented through relatively inexpensive wayfinding or street signage as well. Even the Inner Loop can be implemented on an initial, lower cost basis through signage with some short-term sidewalk repair and gap filling. But other projects involve substantial capital cost. Highest among these are those projects that users like best – those that offer separation from motor vehicles.

This is a particularly fraught time for trail and active transportation funding. The future of Transportation Alternative Program (TAP) funding through the Federal transportation act is unclear. This has been the primary source of government support for trail and pedestrian/bicycle facilities, and its loss greatly complicates implementation. This review considers possible funding sources that can complement the largely private initiatives and civic mindedness of groups like the Red Cloud Community Foundation. The following discussion identifies sources available as of the writing of this plan.

FEDERAL TRANSPORTATION ACT PROGRAMS

Up to the present, the federal government has numerous programs and funding mechanisms to support bicycle and pedestrian projects, most of which are allocated by the US DOT to state, regional, and local entities. This funding was also substantially increased through the Bipartisan Infrastructure Law (BIL). However, as of 2026, the federal administration has held up funding for a number of projects that are specifically viewed as hostile to cars. To date, the status of funds already allocated or to be allocated through a re-authorization of the transportation program is very uncertain. At least as of this writing, the following programs remain available for bicycle and pedestrian projects:.

The Flint Hills Nature Trail in east-central Kansas was originally developed through the private efforts and volunteerism of the Kanza Rails to Trails Conservancy. The trail used TAP funding to bring it up to its current standard of one of America's best rail-trails, recently inducted into the National Trails Hall of Fame.

- **The Transportation Alternatives Program.** The TAP, first authorized in 2012, has been the primary source of funding for pedestrian and bicycle facilities. Eligible project activities for TAP funding include a variety of smaller-scale transportation projects such as pedestrian and bicycle facilities, recreational trails, safe routes to school projects, and community improvements such as historic preservation, vegetation management, and some environmental mitigation related to storm water and habitat connectivity. For communities like Red Cloud, these funds are administered by the Nebraska Department of Transportation and distributed on a competitive basis.
- **Surface Transportation Block Grant.** The STBG provides funding that may be used by states and localities for projects to preserve and improve the conditions on any federal-aid highway, bridge and tunnel projects, public road projects, pedestrian and bicycle infrastructure, and transit capital projects. Bicycle and pedestrian infrastructure projects include ADA sidewalk modification, recreational trails, bicycle transportation, on- and off-road trail facilities for non-motorized transportation, and infrastructure projects and systems that will provide safe routes for non-drivers, including children, older adults and individuals with disabilities to access daily needs.
- **Highway Safety Improvement Program.** The HSIP program funds projects consistent with the state's Strategic Highway Safety Plan. Within the context of this plan, it is most useful for helping to fund specific safety infrastructure improvement projects. Highly competitive projects in the Red Cloud plan for safety funds include the intersection improvements proposed at W 4th Avenue and Cherry Street and W 7th Avenue and Webster Street – the two highest safety priorities in the plan.
- **National Recreational Trails Program.** This venerable program, administered in Nebraska by the Game and Parks Commission, was originally established in 1991 and provides funding assistance for recreational projects, such as park trails. This contrasts with TAP funds that must be used for projects with a significant transportation component. Trail projects can include hiking and walking, bicycling, cross-country skiing, snowmobiling, horseback riding, canoeing, and off- highway vehicles. This program is particularly appropriate for the Outer Loop.

STATE AND LOCAL FUNDING SOURCES

- **State Funding.** Given uncertainties over federal funds, state and local funding emerges as the most reliable option for multi-year programs. Nebraska created a precedent for participation in trail projects by creating the Trail Development and Maintenance

Fund, principally to complete the gap in the Mopac Trail between Omaha and Lincoln. However, some of these funds have been re-allocated and in 2026, the state has proposed re-allocating remaining funds to help close a budget deficit. Other that this imperiled fund for a specific purpose, the State of Nebraska does not have a substantial program to fund active transportation facilities specifically with state funds.

- **Easement Property Tax Exemption.** The state does offer a tax incentive for donation of trail easements, adopted in 2025. The Recreational Trail Easement Property Tax Exemption Act allows a ten cents per square foot property tax exemption for granting permanent trail easements. This could be very helpful for securing right-of-way for the Outer Loop Trail.
- **Natural Resources Districts (NRDs).** NRDs have been very successful in funding and developing trails, especially when stormwater and waterway management is involved. Recreational development and benefits fall within the scope of NRDs. Red Cloud, located within the jurisdiction of the Lower Republican NRD, could participate in trail development, especially in the Outer Loop which largely follows drainage corridors.
- **Local Capital Improvement Funding.** As a small community, Red Cloud has limited local funding ability to fund active transportation projects. Nevertheless, the importance that people place on safety, access to schools, and senior mobility suggest some ability and willingness to provide funds to help build sidewalks and make other improvements. This plan's perspective is that a strategic pedestrian system is a community benefit and responsibility and that special assessments on adjacent property owners should *not* be used. Establishing a moderate, dedicated set-aside in the Capital Improvement Program can help the city prepare for implementing this plan for trails, on-street bikeways, and other projects that improve conditions for bicycling and walking. This set-aside may also be used as a local match for external funding sources, or as contributory towards bicycle elements of larger projects.

General obligation bonds are a frequently used for long-term financing of capital improvements. GO Bonds may be used to fund a continuing set-aside for complete streets and active transportation improvements.

PRIVATE PHILANTHROPY

Private organizations and philanthropic giving can be a significant source of financial assistance. In some cases, communities have raised money for popular trail segments through foundations, avoiding the delays and processes that typically come attached to private grants. Health-related enterprises such as insurance organizations and hospitals have funded active transportation initiatives in many areas.

Red Cloud's strong identification with pioneer and literary history, connected with Willa Cather's work, gives the city an unusual ability to attract private funding. The Red Cloud Community Fund (RCCF) has been instrumental in assembling resources for such major projects like the Valley Child Development Center and the Hotel Garber. The hotel was an $8.8 million project, funded by a major gift from one donor, over 100 other private donors, equity from historic tax credits, and community development block grant funds. In common with the Garber project, major elements of this plan are designed to serve and link visitor destinations and to add to the city's tourism potential.

Hotel Garber. This superb boutique hotel was developed largely with private philanthropic funds for the purpose of increasing tourism in Red Cloud. It demonstrates the commitment of Nebraskans to Red Cloud and the national interest in pioneer history.

MAINTENANCE FINANCING

Like any transportation improvement, active transportation projects need to be maintained through their life cycle and will have an impact on operating budgets. Paint must remain visible to continue to function as planned and capital improvements like paths and trails require repairs to continue to serve their users. Maintenance costs may also vary from year to year, depending on factor such as weather and level of use. Figure-- presents approximate costs for maintenance of different types of facilities, based on current experience. They can be used as a guide for allocation of resources and do not include staff time.

Figure 30: Typical Cost Factors

Facility Type	Annualized Cost/ mile	Typical Maintenance Elements
Paved Shared-Use Path (Inner Loop)	$2,000	Sweeping, trash removal, mowing, weed abatement, public snow removal
Sidepath (Highway 281 South)	$2,000	Sweeping, trash removal, mowing, weed abatement, public snow removal
Separated/Protected Bike Lanes (Downtown Webster Street)	$4,000	Debris removal/sweeping, repainting stripes and stencils,sign replacement, replacing damaged barriers
Unpaved Rural Trail (Outer Loop)	$2,800	Surface repair, debris removal/sweeping, signage replacement as needed
Bicycle Route (Seward Street)	$1,500	Sign and shared lane marking stencil replacement as needed, sidewalk snow removal by adjacent properties

Chapter Five

Support Systems

SUPPORT SYSTEMS

There is more to active transportation than trails, streets, and sidewalks. The League of American Bicyclists (LAB), the nation's leading advocacy group for bicycle and by extension pedestrian transportation, has developed the Bicycle Friendly Communities model that is effective for creating a culture that encourages routine walking and bicycling. The approach outlines five essential elements of an active transportation program which are discussed in detail below.

ENGINEERING

Most of this plan has been devoted to the subject of infrastructure, specifically trails, paths, streets, sidewalks, and infrastructure. But "engineering" improvements need the support of a balanced approach to provide the greatest benefit to the community. Areas considered under the engineering category include:

- Existence and content of a bicycle (and pedestrian) master plan, which is the purpose of this document.
- Accommodation of cyclists on public streets and roads.
- Presence and good condition of trails, paths, and sidewalks in the community
- Availability of secure bike parking
- Condition and connectivity of both the off-road and on-road network
- Providing information to lead people to destinations, very important in a town like red Cloud that has made a significant investment in attracting visitors.

In addition to the physical recommendations of this plan, two other facility-oriented initiatives can have significant, relatively inexpensive benefits: a citywide wayfinding system and bicycle parking.

Citywide Wayfinding System

A well-designed identification and directional graphics system can both welcome visitors to town and even help local residents navigate the street system. While a wayfinding system may have individual features, it should generally follow the guidelines of the Manual of Uniform Traffic Control Devices (MUTCD) that is familiar to people all around the country. Types of signs in the system include:

- The D11-1c Bike Route Guide Sign, identifying a street or trail as a bike route and describing the route's end point or a landmark destination along the way. These are sometimes used in conjunction with arrows (M6-1 through M6-7) that indicate changes in direction of the route. These are located periodically along the route to both reassure cyclists and advise motorists.
- A version of the D1 family of destination signs (D1-1c, D1-2c, or D1-3c), identifying the direction (and distance when appropriate) to specific destinations. These signs are typically located at intersections of routes or at a short directional connection to a nearby destination.

Special street sign for bike routes. These reinforce the special quality of these streets and would be used in place of standard street signs.

The W11-15 sign would be used at unsignalized crossings of bike and pedestrian routes at major streets. The signs provide advance warning of the presence of pedestrians and bicyclists and is oriented to the major street.

The D11-1c Bike Route sign is used at the start of each route and at key points along the way, usually after major street crossings or the crossing of two routes. It displays the standard bicycle symbol and either the endpoint of the route or a dominant destination along the way. After passing the destination, the destination line changes to the endpoint or another key destination later on the route.

The R4-11 sign. This sign has generally received acceptance over the older "share the road" signs. We recommend its use where necessary or appropriate.

The R4-11 sign. The standard sign system does have space to accommodate a local or regional symbol. Trail signage does invite individualized signs as opposed to street or highway signage.

Bike parking as art. Inverted U's at the University of Nebraska at Omaha, enhanced with the school's maverick mascot.

- On bicycle/sidewalk routes like Seward Street or Cherry Street, a special street sign may be used to help provide additional notification to motorists and wayfinding information to bicyclists.
- Motorist advisory signs. The R4-11 Bicycles May Use Full Lane is usually the preferred sign on shared routes.
- Trail identification signs. The standard sign system does allow space for individual graphics or community identification as shown on this page along the Lewis and Clark Trail in Council Bluffs, IA. But signs on trails can use a number of different designs.

Installation of a wayfinding system is an inexpensive way to implement a major part of the bike network ahead of major capital expenditures, especially on streets like shared and marked routes or bicycle boulevards that do not require extensive infrastructure to be operational.

Parking

Strategically located bike parking is a low cost but significant physical improvement that both encourages cycling, provides greater security, and keeps bikes from damaging trees or street furniture, or obstructing pedestrians. The parking program should:

Identify key locations for facilities. Priority locations include City Hall, the Public Library, the schools, Illiad Field, and City Park.

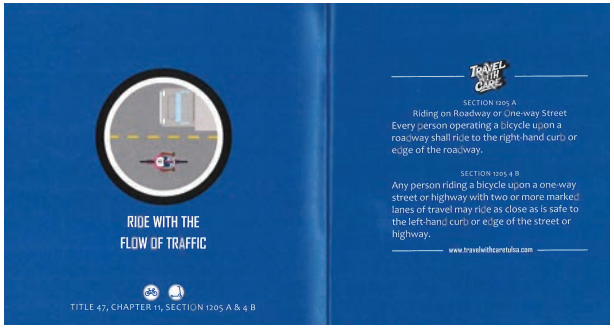
Use standardized bike parking equipment that is durable, relatively inexpensive, and unobtrusive. Many of the bike racks in use today, including the so-called "schoolyard" rack and "waves" are inefficient, take up too much space, and, in the case of the former, can actually damage bikes. Better in most cases are less obtrusive, inexpensive designs such as the inverted U. The inverted U can also be embellished by art, creating an interesting community project that can involve industrial arts students.

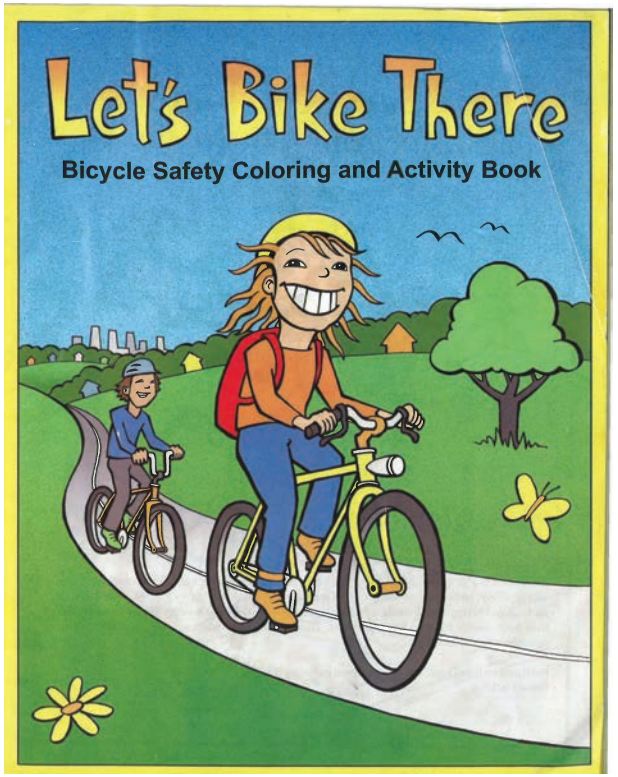
EDUCATION

Education is about showing and teaching people the value of walking and biking, the appropriate way to use the improvements, and to include stakeholders of all ages and backgrounds in active transportation. Education often includes programs conducted by the schools and the city government such as bike rodeos or group walks/bike-rides.

Areas considered under education include:

- Community programs teaching cyclists of all ages how to ride safely in any area from multi-use paths to city streets.
- Education for motorists on how to share the road safely with cyclists.
- Availability of cycling education for adults and children.
- Distribution of safety information to both cyclists and motorists in the community such as bike maps, tip sheets, and as a part of driver's education manuals and courses.





Travel with Care materials from Tulsa. From top: Excellent guide to bicycling laws; safety and activity coloring book from Indian Nations Council of Governments (INCOG)

The LAB's Quick Guides are part of the League's Smart Cycling program and an excellent introduction to safe bicycling practices for people of all ages.

Smart Cycling Programs

- **Encourage training of one or more League Certified Instructors (LCI's) in Red Cloud, in cooperation with Bike Walk Nebraska.** The League of American Bicyclists (LAB) Smart Cycling programs are recognized as the standard for bicycle safety education, and includes a variety of courses that serve young cyclists, recreational riders, and everyone up to experienced commuters. Successful operation of the program is dependent on the presence of local instructors. A critical part of the program is training of instructors through the League Certification process. In this process, cyclists complete both prerequisite courses and a three-day course conducted by a specially trained instructor. Successful completion and passing written and on-road evaluations qualifies individuals as League Cycling Instructors (LCI), who are then authorized to provide training to other cyclists. In addition to a cadre of instructors, a successful training program requires marketing and placement to match instructors with demand from schools, corporations, and other organizations. Bike Walk Nebraska (www.bikewalknebraska.org) can assist with arrangements to train LCI's to serve the Red Cloud and expand class opportunities here would help expand bicycle use and safety.

- **Develop and implement bicycle education programs for kids.** Young bicyclists perceive the riding environment differently from adults, and obviously have neither the visual perspective nor experiences of older riders. Schools and safety groups often offer "bike rodeos" which may or may not address the skills of riding even on local streets. The LAB's Smart Cycling program has a specific track that addresses these issues and skills, and they should be incorporated into these more frequently offered safety events.

ENCOURAGEMENT

Encouragement is about demonstrating to residents that Red Cloud can be a place where people feel comfortable walking and biking around town. Encouragement initiatives include things like bike rodeos, walking school-buses, and fun community events oriented around walking and biking. Areas considered under this element include:

- Programming such as Bike Month and Bike to Work Week events.
- Community bike rides and commuter incentive programs.
- Safe Routes to School programs.
- Promotion of cycling or a cycling culture through off-road facilities, BMX parks, and road and mountain bicycling clubs.

St. Paul Bikes in St. Paul, Nebraska. This amazing program teaches kids both bike skills and the importance of community service. In return for their volunteerism, they have use of a bike until they outgrow it. They then receive another bike that fits and pass their previous one to a new, smaller owner. In return, they serve the community in a number of ways.

- Community-based programs directed at kids who learn important skills, provide community services, and in exchange for receiving a bike for their exclusive use until they outgrow it.

Events

- **Expand participation in pedestrian and bicycle transportation through programs that engage corporations in competitions and fun.** These programs track participation by number of trips and miles traveled during a multiple-month period, and give awards to winners at an event at the end of the period.
- **Institute a Bike/Walk Month celebration.** Red Cloud has proven itself to be a great host for the Bicycle Ride Across Nebraska (BRAN). Bike month events typically occur during May, and can involve a variety of activities, including short rides led by the mayor or other public officials, clinics on subjects such as riding technique and bicycle repair, special tour events, screenings of bicycle-related movies, and other programs.
- **Organize special rides that are within the capabilities of a broad range of riders and encourage family participation.** Many community rides and benefits have different lengths and routes to appeal to all ages. These events build interest, and make cycling comfortable and attractive to more people. A loop ride or walk for families around the town and an optional road ride to a nearby town like Blue Hill or Franklin with a pioneer theme could be the center of such an event.
- **Implement a bicycle ambassador program in the high schools.** Ambassadors are students with a special interest in bicycling who share that interest with their peers.

Bicycle Friendly Businesses

Encourage local businesses and employers to participate in the League of American Bicyclists Bicycle Friendly Business (BFB) program. The program recognizes businesses that both encourage their employees to use bicycles for transportation and provides special services and discounts to customers who walk or bike to their establishments.

Bike Share

Bike share programs can be very attractive in small, visitor-oriented communities with moderate distances to attractions and very low traffic. They can also be useful as a form of general transportation to residents as well. While bike share programs are generally found in large cities, they can also be effective in smaller places. In Valentine, for example, Heartland Bike Share, Omaha's nonprofit provider, maintains a station popular with visitors and residents for the short two-mile ride on the Cowboy Trail to the Niobrara High Bridge.

Rural Bike Share. Heartland Bike Share station in Downtown Valentine, NE – the best way to see the famous Niobrara High Bridge.

Source: walkingschoolbus.org

Walking School Bus

Institute a walking school bus program at the elementary school. Several Midwestern communities operate successful walking school bus programs. As defined by the National Center for Safe Routes to Schools, " a walking school bus is a group of children walking to school with one or more adults. It can be as informal as two families taking turns walking their children to school to as structured as a route with meeting points, a timetable and a regularly rotated schedule of trained volunteers." The idea could be highly relevant to Red Cloud, where distances are short but many kids walking to school must cross a highway.

ENFORCEMENT

Enforcement is a unfortunately a necessary component of an active transportation system. It can be especially important in Red Cloud, at the intersection of two principal highways with substantial truck traffic. An effective enforcement system establishes expectations for the behavior of walkers, bicyclists, and motorists (for how they behave around the aforementioned). Typically, enforcement initiatives should begin as education (walker, bicyclist, law enforcement, and motorists) before implementing warnings and eventually citations when necessary. Items considered under enforcement include:

- Liaisons with law enforcement.
- Targeted enforcement to encourage cyclists and motorists to share the road safely.
- Knowledge of state bicycling related laws such as those requiring helmets or the use of sidepaths.
- Involve a Police Department or Sheriff's Office representative in bike education efforts, and other aspects of the active transportation program.
- Enforcement of bicycle laws for both motorists and bicyclists. All users of the road have responsibilities to each other. Effective enforcement begins with police officers being completely familiar with legal rights and responsibilities of cyclists. But bicyclists must not have free passes to disobey traffic laws, and irresponsible riders often create backlash against all. Enforcement for all users leads to better, safer behavior and greater predictability and cooperation by all.

EVALUATION

Evaluation is about setting goals, keeping track of performance, and using the information to make decisions about future initiatives. For example, it might make sense to track bicycle and pedestrian use on a significant complete facility like the Inner Loop to quantify the value of the improvement as a quality of life amenity or an economic asset. Items considered under the evaluation component include:

- Measuring the amount of walking and cycling taking place in the community.
- Tabulating crash and fatality rates, and ways that the community works to improve these numbers.
- Maintaining and implementing the active transportation plan.
- Creating a local advisory committee to work with Red Cloud's government and key associated organizations including Red Cloud Heritage Tourism and the Red Cloud Community Fund, The purpose of the Committee is to direct the implementation of the plan and evaluate its impact and effectiveness. Good evaluation information measures the effectiveness of the program and informs adjustments and improvements.
- Complete periodic surveys of system users, monitoring customer satisfaction and recommendations. In addition to being an excellent measure of user satisfaction and recommendations for improvement, surveys keep the bicycle community actively engaged in the process of improving active transportation in Red Cloud and the surrounding area.

Appendix

Design Guidance

Sources. Sources that establish detailed standards for the design of bicycle facilities include the *Urban Bikeway Design Guide* (National Association of City Transportation Officials, 2011), the *Manual of Uniform Traffic Control Devices* (Federal Highway Administration, 2023), and the AASHTO *Guide for the Development of Bicycle Facilities* (American Association of State Highway and Transportation Officials, 2024). Designers of facilities should use these primary sources. The guidelines and standards included in this plan are intended to provide guidance that augments these authoritative standards to specific situations.

FACILITY TYPES

The various infrastructure components of the Red Cloud network uses the facilities included in this Appendix. This section provides additional material and guidance to supplement the more general information included in the body of the plan's narrative. It can be used in combination with the specific guidance presented in the major reference sources shown at left to inform specific design of features in the Red Cloud network. Facilities included here are:

Bicycle Routes/Shared streets and sidewalks. Local streets included in the network are both short and have very low traffic volume and do not require special attention in addition to those described in the body of this plan. This section also contains information on sidewalks, ramp design, driveway cuts, and other details that may be relevant to specific situations.

Paved shoulders, typically but not always rural section roads without curbs where hard-surfaced shoulders are provided that separate the travel lane from the edge of the pavement. Shoulders normally are provided on higher volume highways to provide a greater measure of safety for motorists and a place to pull over safely in case of emergencies or mechanical failure. While not an integral part of the Red Cloud vocabulary, US Highway 281 south to the Republican River bridge and north from the city has paved shoulders.

Bike lanes, in which bicyclists share the street right-of-way but operate within marked lanes reserved for their use. Bike lanes usually provide for one-way movement in the same direction as motor vehicles. Standard bike lanes are appropriate on streets that can comfortably accommodate bicyclists, but have more traffic than shared streets; are wide enough for both motor vehicles and bicycles; or are included in new street construction projects that integrate pedestrians, bicycles, and transit into their design (complete streets). Bike lanes also help manage traffic speed on wide streets by visually narrowing travel lanes for motorists.

The Red Cloud system does not include standard bike lanes, but it does include a concept for a protected bike lane or cycle track for three blocks of Webster Street in Downtown Red Cloud. This has a neutral area or buffer that separates the path from parallel parking and travel lanes. motor vehicle travel lanes. This creates a comfortable setting for many users. In Red Cloud, the Webster Street facility may be shared with low-performance motorized vehicles to assist people with reduced mobility.

Shared-Use Paths: Trails and Sidepaths. Shared-use paths provide paths fully separated from motor vehicles and are normally divided into two categories: sidepaths and trails. Sidepaths are shared-use paths located within a street right of way but fully separated from travel lanes. These facilities are popular in Europe and are frequently used in the United States, but must be carefully designed because of potential bicycle-motor vehicle conflicts at intersections of streets and driveways. These facilities are especially useful along the street frontages of major campuses, parks, open spaces, and limited entry developments with long distances and few interruptions.

Shared-use trails follow their own right-of-way, typically following waterways, railroads, parks, and other open spaces. The Outer Loop Trail and Alley Trail are proposed examples of shared use trails. They are typically paved within communities and may use either pavement or granulated stone surfaces in rural areas.

Sidewalks and pedestrian paths. Sidewalks are included along strategic streets in the proposed system, but are not proposed on every street. Pedestrian paths, like multi-use trails, are distinct from street right-of-way, but do not meet width or surfacing standards associated with shared-use paths. They are designed primarily for people on foot.

BIKE ROUTES: SHARED STREETS OR "ACTIVEWAYS"

Signage concepts for activeways. Signs are the least expensive solution but can be very effective in distinguishing these multi-use streets.
Top to bottom: Street signs with bicycle boulevard designations in Topeka and a bicycle boulevard identifier in Berkeley.

Left to right: intersection crossing caution in Portland, OR, and "bicycles may use full lane" signage in Boulder, CO.

Bike routes may include other identifying and functional enhancements. They include some features to make them more hospitable to bicyclists and pedestrians. They also should have continuous sidewalks or pedestrian paths on at least one side of the street, with fully accessible intersections. These vary in level of capital investment and complexity, and include (in relatively ascending order of complexity):

Signage. Signage has the advantage of being visible and low in cost. Bike route signs include identification signs (special street signs and other identifiers) and advisory or caution signs (share-the-road or bicycles may use full lane signs). The entire system will also use a common signage system that incorporates identifying, directional, and wayfinding signs.

Intersection and road priority. Bike routes should provide reasonable through priority to bicyclists, and by extension other users of the street. These include turning stop signs to stop traffic on cross streets in favor of bicyclists and other users of the boulevard, and installing signs that give priority to cyclists.

Traffic calmers. These features slow motor vehicle traffic at key points to equalize speeds between bicycles and cars. These techniques may include corner nodes with well-defined crosswalks, mini roundabouts, speed tables, and patterned or textured pavements at crosswalks or in intersections. In addition to aiding bicyclists, they provide a better pedestrian environment and tend to discourage unwanted through traffic from using continuous neighborhood streets.

Traffic calmer on a bicycle boulevard in Boulder, CO

Major street crossing installations. These features at crossings of bicycle boulevards and major streets help bicyclists cross arterials and preserve system continuity and safety. Techniques include installation or tuning of sensors to detect bicycles; high visibility crosswalks; rapid rectangular flashing beacons; pedestrian and bicyclist activated hybrid beacons, and crossing refuge medians, short medians that allow bicyclists and pedestrians to negotiate one direction of traffic at a time. A special bicycle symbol is marked on the pavement to emphasize the point where the loop detects bicycles.

SHARED USE SIDEPATHS

Shared use sidepaths are significant parts of the Red Cloud system, proposed along the Inner Loop and the Highway 281 Path to Indian Creek Pond and the Republican River Bridge. They provide the separation from motor vehicles that many people want by using available right-of-way off the street or highway. They are very useful for families with small kids, especially in low-speed urban settings. But sidepaths have been controversial as well. They became popular in the early 20th century bicycle facilities movement, but gradually fell out of use as automobiles became more dominant. In 1999, AASHTO standards generally advised against their use. The more recent 2012 standards were somewhat more tolerant, but still included major reservations about these roadside facilities but are now generally accepted. by the new AASHTO standards. Specific concerns about their use focus on discourteous or inattentive motorist behavior and include:

Hazardous intersections. On two-way paths, motorists do not expect, and often do not see, bicyclists in the counterflow direction. Right-turning motorists in many cases ignore path users moving straight ahead, creating the possibility of a crash. This always places path users on the defensive.

Right-of-way ambiguities at driveways and intersections. Usually, cyclists on a sidepath along a major street are forced to yield to intersecting traffic. Cyclists traveling on streets, on the other hand, have the same right of way rights as motorists.

Path blockages. Cross traffic on driveways and intersecting streets frequently blocks the sidepath by stopping across it.

Consequently, experienced cyclists often prefer on-road facilities to roadside facilities. Yet, sidepaths,

Sidepath with well-marked crossing, Clayton Road in Saint Louis County, MO

Sidepath with landscaped setback, Bettendorf, IA

despite these issues, are used frequently and remain popular with many users. Many cyclists justifiably fear rear-end (or overtaking) crashes or distracted drivers wandering into even a well-designed bicycle lane. Sidepaths also accommodate pedestrians and other wheeled users who cannot use streets. Along major streets, they also provide continuity where other alternatives, including trails or parallel local streets, are not available. Newer facility guides like the NACTO and STAR publications include sidepaths among their recommended facility types and concentrate on improving their design and addressing safety issues.

Roadside paths and cycle tracks are integral to the national bicycle system of the Netherlands, one of the world's premier cycling countries, and work because of careful design and motorist respect and acceptance of bicyclists. While research on American sidepath safety is scarce, a recent Harvard University study based on the Montreal system compared crash rates on sidepaths to on-street facilities. It suggested that sidepaths had higher crash rates at intersections and lower rates along their main line, producing about the same overall crash rates as on-street facilities. Since crashes at speed in mid-block areas have a higher probability of fatality than lower speed crashes at intersections, the study indicated that these facilities should not be excluded from urban bicycle systems in this country.

APPLICATION TO THE RED CLOUD SYSTEM

- Sidepath use within the city is the primary infrastructure type for the Inner Loop. These are intended for very leisurely speeds because of their relatively short distances and urban setting. More comfortable users may continue to use parallel streets.
- The objective of sidepath design guidelines should be to make these facilities as safe as possible, specifically by addressing

their greatest weakness: road and driveway intersections.

DESIGN GUIDELINES FOR SIDEPATHS

PATHWAY STANDARDS

Shared use sidepaths are usually developed as two-way facilities. Most US practice of off-road sidepaths are two-way facilities, adhering to a standard ten-foot width, typical off-road shared use paths. However, the low speeds and relatively low anticipated travel on the Inner Loop may permit a minimum of 8 feet. Structure and materials for sidepaths should follow standards for multi-use trails on separated right-of-way.

PATHWAY SETBACKS

Research conducted for the Florida Department of Transportation indicates that, to maximize safety, separation of the sidepath from a roadway should increase as road speeds increase. The Florida data suggest that at lower adjacent road speeds, a smaller separation produces crash rates lower than those of the adjacent road, while that threshold is reached at greater separations for high speed facilities. The STAR Guide recommends a minimum 5-foot separation from roadways, with 6.5 feet preferred. On high-speed roads, recommended separation is 16.5 to 20 feet.

ACCESS MANAGEMENT

Access management makes sidepaths safer. There is no one clear standard for frequency of access points. Reasonable guidance is provided by the Idaho Department of Transportation, recommending a maximum of eight crossings per mile, with a preferred maximum of five crossings per mile. This access management policy should apply to the primarily arterial streets proposed for these three corridors.

SIDEPATHS AND ADJACENT ROADWAY CHARACTER

Two-way sidepaths set up an unexpected counterflow direction that creates the possibility of crashes. Florida DOT research indicates that two-way sidepaths appear safer along 2- and 3-lane roadways and less safe along multi-lane roads with 2 or more lanes in each direction. In addition to the higher speeds typical of wider roads, this phenomenon can be explained by:

- The field of vision of motorists opposite the sidepath. On wider roadways, motorists cannot see or are less aware of a sidepath on the opposite side, creating a particular crash hazard between path users and left-turning traffic.
- Motorists exiting intersecting driveways or streets are looking for oncoming traffic at a shallower angle because of the greater street width, directing attention away from the already unexpected sidepath traffic to their right.

The previously discussed Harvard study on the Montreal system also suggests that sidepaths are safer than on-street operation between intersections, but more hazardous at street crossings. Therefore, markings that increase the visibility of these crossing or conflict zones should be considered when sidepaths are used.

DESIGN OF IN-LINE CROSSINGS AT DRIVEWAYS AND STREETS

Sidepaths and off-road shared use paths and trails share design characteristics at intersections. Guidelines for multi-use trails are presented later in this section. However, roadside facilities have special problems not experienced by the largely grade-separated trail system. Recommendations for the special conditions presented by sidepath crossings are presented here.

RAMP DESIGN

- Curb/intersection cuts or ramps must be logical and in the direct travel line of both pedestrians and bicyclists. We suggest avoiding the common practice of placing the ramp on a diagonal at the corner, which tend to direct users into the middle of the intersection rather than to a crossing.
- A design that places a curb in the direct travel line of active users is hazardous. The intersection area must be free of obstructions, such as poles for traffic signal mast arms or lighting standards.

SEPARATION DISTANCE

Inadequate separation of the sidepath crossing from the edge of the roadway can put users in serious jeopardy by reducing their visibility to or the reaction time of motorists or inadequate reaction time. Figure A.1 displays recommended separation distance from the edge of the roadway, increasing as adjacent roadway speeds increase.

These distances are based on the interaction of five variables: motor vehicle turning speed, stacking distance, driver and/or pathway user awareness, and chance of pathway right-of-way priority. These categories are designed to prevent awkward conditions that may impair visibility and not give either the trail user or motorist opportunity to respond.

DEFINING CROSSINGS

- All crossings across streets and major driveways should be clearly defined. Street intersection markings should utilize continental or ladder markings incorporated at mid-block crossings and other major intersections. Colored concrete or asphalt surface treatments or green paint may also be used.

Use of color to increase visibility for sidepaths and bike lanes.

- At intersections controlled by stop signs or signals, stop bars should be provided for motor vehicles ahead of the crosswalk to discourage motorists from obstructing the path.

SIGNAGE

- Use warning signs along roads with sidepaths similar to advisories for parallel railroad tracks. This provides motorists with a background awareness of the parallel sidepath.
- Use signs facing intersecting streets to advise approaching motorists of the presence of a sidepath. A particular hazard is the likelihood that motorists will look in the direction of oncoming traffic, but will not think to look in the opposite direction for pedestrians or cyclists.

RIGHT-OF-WAY ASSIGNMENT

Ideally, pathway users paralleling a street with right-of-way priority should share that priority. However, sidepath users must be advised to ride defensively, and assume that they will often be forced to yield the right-of-way.

Overly frequent stop signs will cause many path users to ignore the traffic control entirely. The Florida manual states that path users may be intolerant to delay, wish to maintain momentum, or have limited traffic knowledge. When stop signs are installed on a path at extremely low volume intersections or even driveways, path users tend to disregard them. The wheeled user cyclist or skater is, in effect, being taught this dangerous behavior by these “crying wolf” signs since he or she thinks there is little chance of cross traffic.

INTERSECTION GEOMETRICS

In addition to crossing visibility and access management techniques, AASHTO 2012 advises the following design measures to address intersection and driveway crossing safety:

- Intersection and driveway design to reduce speed and heighten driver awareness of path users through tighter corner radii, avoidance of high-speed free flow movements, median refuge islands, and good sight lines.
- Design measures to reduce pathway user speed at intersection approaches, being certain that designs do not create hazards.
- Calming traffic speeds on the adjacent roadway.
- Designs that encourage good cyclist access between roadway and sidepaths at intersections.
- Keep approaches to sidepaths clear of obstructions, including stopped motor vehicles, through stopbars and yield markings.

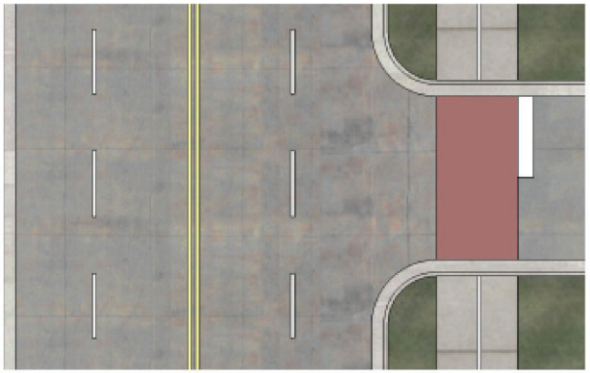
SIGNAL CYCLES

- Avoid permissive left turns on busy parallel roads and sidepath crossings. Use a protected left-turn cycle with a sidepath-oriented bicycle/pedestrian signal, giving a red signal to the sidepath user when left turns are permitted.
- Prohibit right turns on red at intersections with a major sidepath crossing.

Figure A-1: Sidepath Separation at Road Crossings

Adjacent Road Speed Limit (mph)	Recommended Minimum Sidepath Separation (feet)
<25 mph	6.5
35-45	6.5-16.5 feet
>55 mph	16.5-24 feet

Source: STAR Multimodal Networks Guide



Crossing Definition. Sidepath crossings should be defined for maximum visibility. Colored or textured surfaces can be effective in these situations. A clear stop bar should also be used with advisory signage, to discourage motorists from blocking the path.

Poor Sidepath Intersection Design. Top: Ramps are narrow and located off line from a bicyclists normal path, creating a potential hazard. Above: The base of a signal mast arm obstructs the logical path through the ramp.

Good sidepath intersection design: Ramp is directly in line with travel path, crosswalk is unobstructed and clearly marked.

Sidepath Advisory Signs. Top: Variation of the MUTCD's Railroad Advance Warning Sign, modified as a sidepath advisory. This sign should be used on both sides of a road with sidepaths. This installation is on Speer Boulevard in Denver, advising of the parallel Cherry Creek Trail. Florida DOT advises a similar sign. Below: Trail crossing advisory sign on an intersecting side street, installed on Clayton Road in suburban Saint Louis.

SHARED USE PATHS (TRAILS)

The Prairie Sunset Trail in Garden Plain, Kansas. This trial between the west edge of Wichita and Garden Plain converted a disused rail corridor into a rural shared use path, surfaced with granulated stone. The trail was developed and is operated by the nonprofit Prairie Travelers Inc. This kind of private initiative may be a way to develop the Outer Loop.

Trails – shared use paths on right-of-way separated from streets and roads – are an important part of the Red Cloud concept.

DESIGN GUIDELINES FOR TRAILS

ADA/AASHTO COMPLIANCE

Trails should comply with American Association of Street and Highway Transportation Officials (AASHTO) standards and Uniform Federal Accessibility Standards and the "Americans with Disabilities Act Accessibility Guidelines."

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Figure A.2: Comparison of Trail Surfaces

Surface	Advantages	Disadvantages
Soil Cement	Natural materials, more durable than soil, low cost, relatively smooth surface	Uneven wear, erodible, difficulty in achieving correct mix.
Granular Stone	Natural material, firm and smooth surface, moderate cost, multiple use	Erodible in storms, needs regular maintenance to maintain surface, discourages on-line skaters and some wheeled users
Asphalt	Hard surface, smooth with low resistance, stable, low maintenance when properly installed, multiple use	Relatively high installation cost, requires periodic resurfacing, freeze/thaw vulnerability, petroleum based material, construction access and impact
Concrete	Hardest surface, easy to form, lowest maintenance, best cold weather surface, freeze-thaw resistance	Highest installation and repair cost, construction access and impact
Native Soil	Natural material, very low cost, low maintenance, easy for volunteers to build and maintain	Dusty, ruts, limited use, unsightly if not maintained, not accessible
Wood Chips	Natural material, good walking surface, moderate cost	Decomposes when wet, requires regular maintenance and replenishment, not accessible
Recycled Materials	Good use of materials, surface can be adequate	High cost, uncertain performance

MATERIALS

Figure A-2 reviews attributes of various trail surface materials. Asphalt provides an excellent surface when new and is somewhat less expensive than concrete. Concrete is often thought to provide a more durable, longer-lived surface, particularly in view of freeze-thaw cycles, and can be replaced panel by panel if necessary. Without prescribing specific regional standards, AASHTO 2012 recommends a six inch minimum depth, including both surface and base courses, over a compacted subgrade. A stable sub-base is especially important to the durability of both materials. This is especially important around drainageways, where stream banks tend to slough off and produce serious cracking and deterioration. Expansion joints on concrete trails should be saw-cut to provide room for movement and minimize cracking. The existing PST has a high-quality granulated stone surface. Paving a segment in the center of town may be considered if funding allows.

TRAIL WIDTH AND CLEARANCES

- The accepted minimum width for two-way trails is 10 feet. Eight feet may be adequate for secondary segments in areas with severe right-of-way limits. However, eight feet width does not safely accommodate passing of or by users who require greater width than narrow profile

road bicycles, including in-line skaters, bicyclists with child trailers, and recumbent bicycles and tricycles.

- A two-foot minimum shoulder with a maximum 6:1 cross-slope should be provided as a recovery zone adjacent to trails.
- Signs or other traffic control or information devices should be at least two feet from the edge of the trail surface. The bottom edge of any sign should be at least 4 feet from the grade of the trail surface.
- A soft surfaced two-foot extension to a paved trail can improve conditions for walkers and runners because of its resilience and lower impact.
- Minimum vertical clearance for trails is 8 feet; 10 feet is recommended unless clearance is limited. When conditions, like the height of a culvert or bottom of a bridge structure, further limits clearance, cyclists must be advised to walk bicycles.

GRADES AND GRADE CHANGES

Recommended maximum grades for multi-use trails are 5% for any distance, 8.3% for distances up to 200 feet, and 10% for distances up to 30 feet (bicycles only).

- Grades over 5% must include landings and handrails compliant with the Americans with Disabilities Act.
- Ramps, bridges, and landings adjacent to abrupt grade changes must include 42-inch handrails, designed to meet AASHTO recommendations. Ramp surfaces should be slip-resistant.
- When underpasses require slopes over 5%, consider an alternate accessible route with reduced grades if possible, even if this route requires a grade crossing.
- Warning signs for trail users should be used on grades approaching 5% and greater.
- AASHTO 2012 recommends avoiding grades less than 0.5% because of ponding problems.

SUBSURFACE AND DRAINAGE

- • Typically 4 to 8-inch compacted, smooth, and level. Individual conditions may require special design.
- • Trail cross-section should provide adequate cross-drainage and minimize debris deposited by runoff. Typically, this involves a cross slope between 1% and 2%.
- • When trails are adjacent to or cut into a bank, design should catch drainage on the uphill side of the trail to prevent slope erosion and deposits of mud or dirt across the trail.

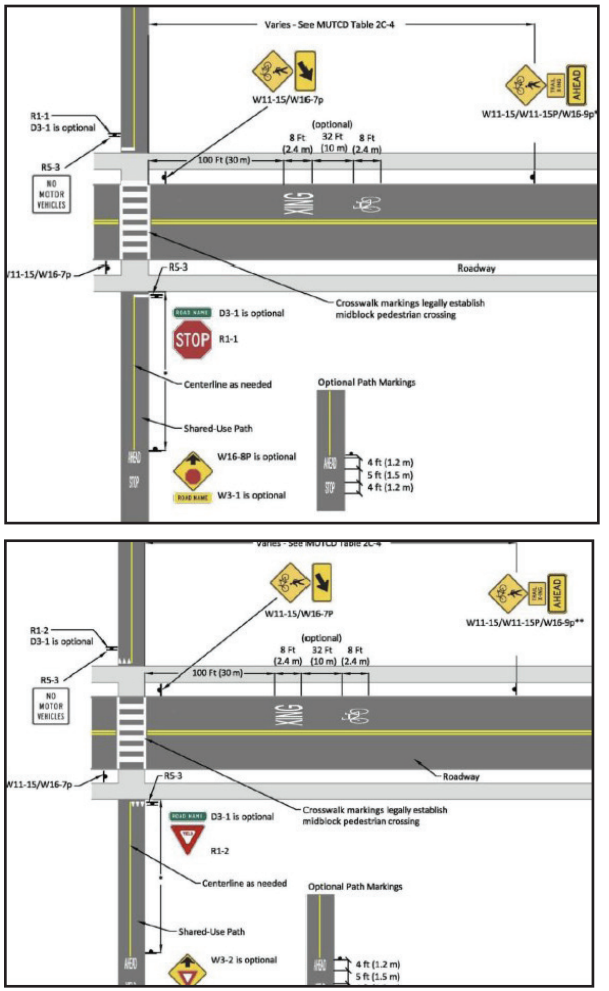
INTERSECTION DESIGN

- Design speed of 20 mph, with horizontal and vertical geometrics and stopping sight distances consistent with AASHTO standards, as published.
- In most cases, trail traffic will be subordinate to motor vehicles on intersecting roads. Figure A.3 illustrates crossing treatments at mid-block intersections.
- Align or widen trail at railroad intersections to permit perpendicular crossing of tracks.

CROSSWALK DELINEATION

- The crossing surface should clearly delineate the trail right-of-way.
- Trail crossings should be delineated with high visibility crossing markings, such as the "ladder" or "zebra" patterns. Another option is providing a contrasting surface that clearly defines the trail domain. These may include the use of stamped concrete, colored concrete, pavement marking or patterning products.

Figure A-3: Intersection Designs for Mid-block or Rural Trail/Road Crossings



Source: AASHTO 2012

- At mid-block crossings of multi-lane roads, refuge medians should be used to reduce the distance that trail users must negotiate at one time.

CURB CUTS AND TRAIL ACCESS POINTS

- Avoid the use of bollards or obstacles at grade-level intersections unless operations prove they are needed. If necessary, use entrances with a median separating directional movements in place of bollards. Medians should be placed about 25 feet in from the edge of the roadway to permit space for cyclists to clear the intersection before slowing.
- When bollards or gateway barriers are used, provide a minimum opening of five feet, adequate to permit adequate clearance for all bicycles. Avoid poorly marked cross barriers that can create hazards for entering bicyclists, particularly in conditions of darkness.
- At mid-block crossings of multi-lane roads, refuge medians should be used to reduce the distance that trail users must negotiate at one time.
- The bottom of the curb cut should match the gutter grade and have a minimal lip or bump at the seam. Truncated domes should be used to alert visually impaired users to the street crossing.
- The bottom width of the curb cut should be full width of the intersecting trail.

SIGNAGE

- Provide regulatory and warning signs consistent with the 2009 Edition of the Manual of Uniform Traffic Control Devices (MUTCD).
- Standard trail crossings signs, typically a bicycle in a diamond, should always be used to alert motorists of the trail crossing.
-

TRAFFIC CONTROL

- Right-of-way should be clearly established. Ordinarily, the trail will be stopped with right-of-way preference given defensively to the motorist.
- Controls for pedestrian signals should be easily accessible to trail users and should not require cyclists to dismount or move out of their normal path.
- New crossing technologies such as the hybrid beacon apply well to trail crossings.

DESIGN FOR MAINTENANCE

- Provide adequate turning radii and trailhead access to maintenance and emergency vehicles.
- Information and Support Facilities
- Establish a consistent informational sign system that includes an identifying trail name, trail maps at regular intervals, mileage markers for reference and locating emergency situations, directional signage to destinations, and safety rules and advisories.
- Provide periodic minor rest stops, including benches, shaded areas, picnic areas, and informational signing. Ensure reasonable access to water, restrooms, and shelter.
-

SIDEWALKS

Sidewalks should provide safe, comfortable, and continuous accommodations for pedestrians along streets. In towns the size of Red Cloud, sidewalk networks are rarely complete, and providing them on both sides of every street is not practical. Therefore, sidewalks should fill key community functions, including:

- Serving corridors with significant community destinations.
- Being located along corridors that require pedestrian access but have traffic, speed, or other characteristics that make walking in the street unsafe.
- Providing access to schools, parks, playgrounds and other destinations likely to attract children.
- Circulation to and within business districts and significant business or service destinations.
- Serving people who may have limited transportation options.
- Filling gaps in the continuity of existing sidewalks.

SIDEWALK ZONES

Sidewalks have three functional zones. The STAR Guide calls them the furnishing, pedestrian through, and frontage zones.

The furnishing zone (sometimes referred to as sidewalk setback, boulevard, parkway, or tree lawn) is the area between the back of the curb or edge of pavement to the front edge of the sidewalk. This area is the location for street lighting, signs, utilities, snow storage, and street landscaping. Traditional streets, including streets with significant civic value, often had deep furnishing zones, providing a high degree of separation between pedestrians and vehicles and a generous and pleasing streetscape. To save on money and maintenance, more contemporary sidewalk development has reduced the furnishing zone, and sometimes eliminated it entirely. This creates a far less comfortable pedestrian environment and compromises many of the functional features of the zone. A desirable minimum width for a functional furnishing zone is four feet, while wider sidewalk setbacks in the six to eight foot range (and even wider on special streets) produces a better looking street, a more comfortable pedestrian experience, and opportunities for street trees and better overall landscaping.

The pedestrian through zone is the clear path through which pedestrians will travel. While it is usually straight and directly parallel to the street, the through zone may have some curvature or even change in line, provided that an easily accessible, continuous path is provided. Past sidewalks have been 4 feet wide or narrower, but contemporary practice calls for a five-foot minimum width, sufficient for two people to walk side by side. However, continuous sidewalks (outside of business districts) wider than eight feet read as shared use sidepaths and should be designed to those standards.

The frontage zone is the any remaining area between the sidewalk pavement and the adjacent property line. This area provides space for building access and, in some cases like downtown districts, space for outdoor activity like outdoor seating or dining, door swings, displays, and browsing without obstructing normal pedestrian circulation. In central business districts or other areas with active ground floor uses and structures built on or close to the property line, a normal minimum of 4 to 6 feet is recommended.

Figure A.3: Sidewalk Domains and Widths

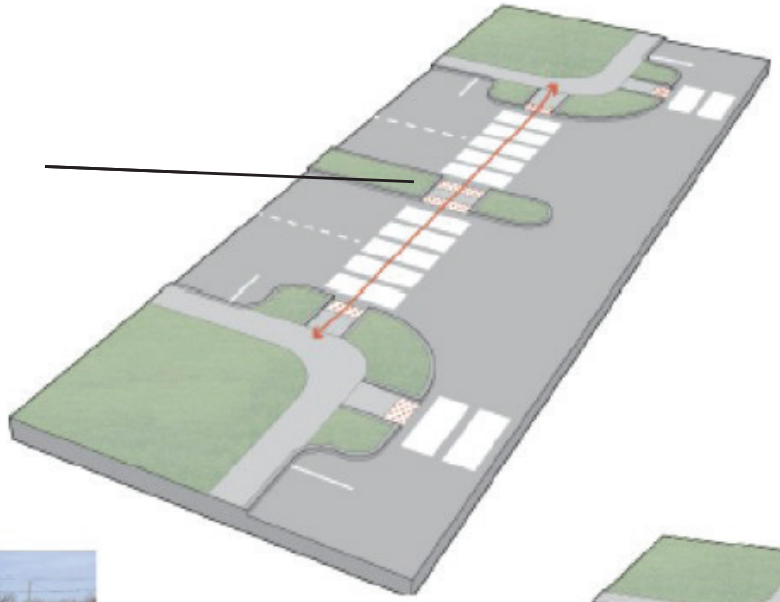
Environment	Frontage Zone	Pedestrian Through Zone	Furnishing Zone	Total Width
Constrained	1 ft	5 ft	2 ft	8 ft
Recommended	2 ft	5 ft	4 ft	11 fr

Source: STAR Multimodal Networks Guide

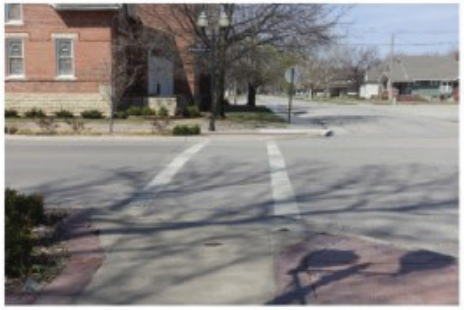
MAJOR STREET CROSSINGS

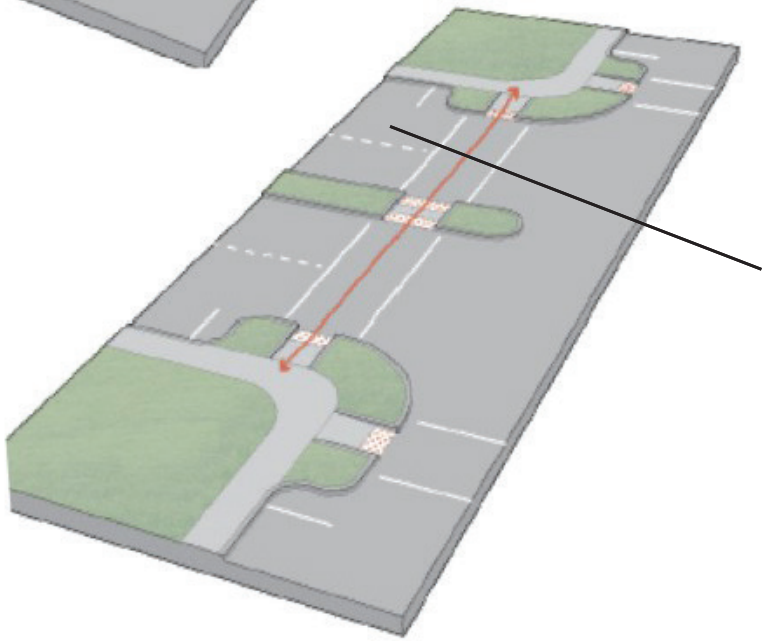
Pedestrian safety at major street crossings is a key concern. Examples of problem corridors that tend to discourage pedestrian access includeW 4th Avenue and Cherry Street. These diagrams describe design features that can help address the problems of crossing these corridors.

"Continental" (ladder) crosswalks vs "Transverse" parallel lines. As noted above, Continental striping creates a much more visible crosswalk than the traditional parallel lines. While transverse crosswalks are less expensive to install and maintain, they are more difficult to see, especially with wear.



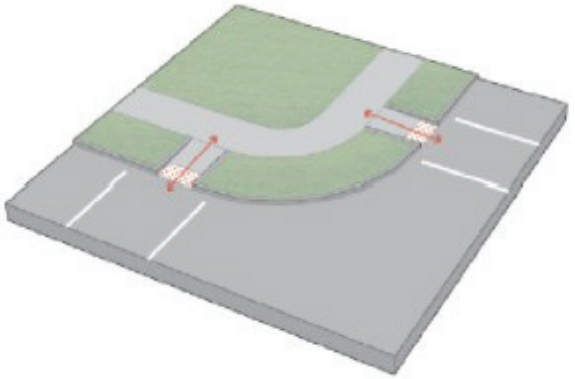
Rectangular Rapid Flashing Beacon (RRFB). This is a relatively cost effective measure to increase crossing safety of major roads. It is pedestrian actuated and provides a high-visibility strobe like warning to motorists.

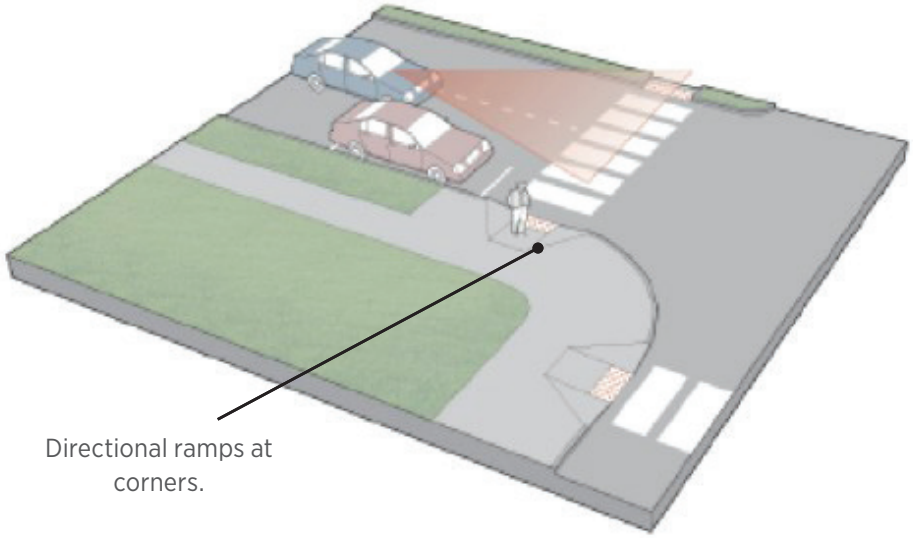




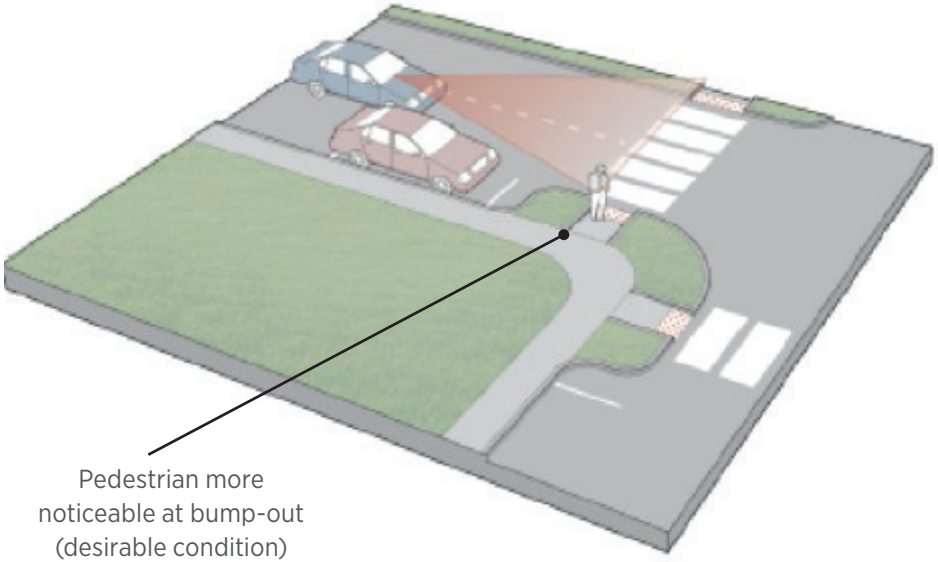
Medians and pedestrian refuge islands at street crossings shall be cut through level with the street or comply with the curb ramp requirements. The clear width of pedestrian access routes within medians and pedestrian refuge islands shall be a minimum 5.0 feet. If a raised median is not wider than 6 feet, it is recommended the nose not be placed in the pedestrian street crossing (SUDAS Chapter 12 Section 12A-2). As discussed above, refuge medians become logical with potential lane diets on major four-lane corridors, or redesign of two lane streets.

Directional crossing ramps orient pedestrians in the most direct travel path across the street. We recommend against the common practice of using one combined ramp that for both intersecting streets that tends to direct pedestrians into the middle of the intersection.





Directional ramps at corners.

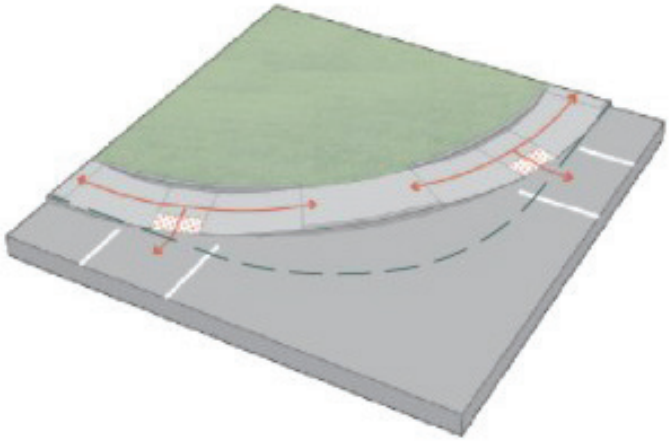


Pedestrian more noticeable at bump-out (desirable condition)

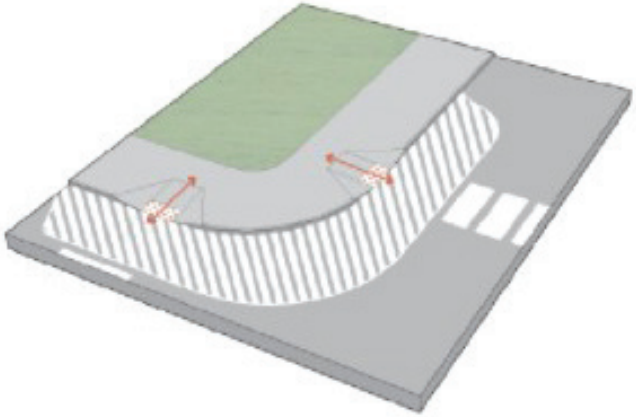
Crossing Locations. Awareness between drivers and pedestrians increases with improved visibility. Crosswalk locations should maximize visibility. The illustrations above illustrate desirable alignments for pedestrian crossings. However, in some cases (including crossings protected by pedestrian signals) mid-block locations that eliminate ambiguity about right of way and conflicts with turning traffic are desirable. Typically, curb ramps and pedestrian street crossings should be located as close to the edge of the adjacent traveled lane as practical. Where a stop sign or yield sign is provided, MUTCD requires the pedestrian street crossing, whether marked or unmarked, be located a minimum of 4 feet from the sign, between the sign and the intersection. Recommended locations for stop and yield signs be are no greater than 30 feet from the edge of the intersecting roadway; however, MUTCD allows up to 50 feet. Consult MUTCD for placement of curb ramps and pedestrian street crossings at signalized intersections (SUDAS Chapter 12 Section 12A-2).

CORNER DESIGN

Corner Radius. A tighter corner radius slows down the motorist when turning, while a broader radius encourages motorists to move faster through the intersection. The design of the corner improves the mobility of motorists at the cost of reducing safety for the pedestrian. Both practices to the right are acceptable. However, a tighter radius is preferred for pedestrian safety.



Bump-Outs. Bump-outs calm traffic, protect the edge of diagonal parking, and make streets more crossable for pedestrians. Bump-outs may include planting beds, including tree planting, paving, and street furniture. The nodes may also include interpretive graphics and public art. This technique has been used successfully in recent streetscape projects in Little River and Sterling but can also be used successfully outside of central districts.



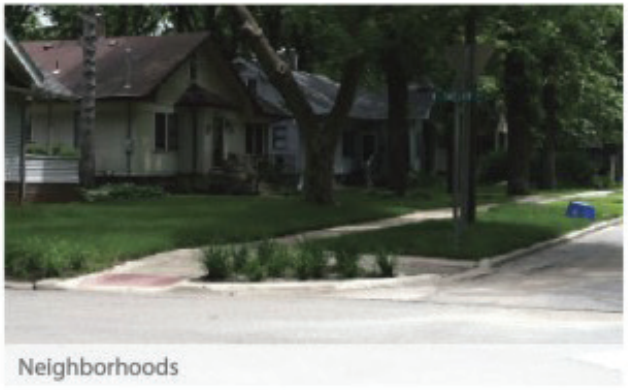
Bump out applications. *From top, intersection bump-outs in Little River, KS; a small bump-out that still puts pedestrians in a more visible position (Santa Monica); a landscaped bumpout in a residential setting.*

Bump-outs in Omaha

Virtual Bump-Out in Esparto, CA

Recommended Practices. Photos indicate desirable practices at intersections in various urban settings.

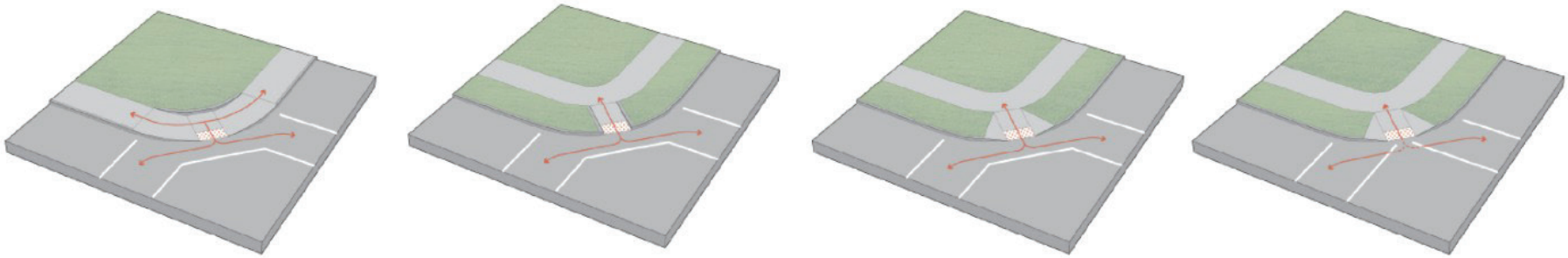
Downtown



Neighborhoods

Neighborhoods (Update pedestrian signage)

Undesirable Practices. Intersection design should avoid directing pedestrians into the center of the intersection. Photographs represent situations where intersections need to be completed or retrofitted.



Incomplete corners

Drain intakes (hazards) at intersection

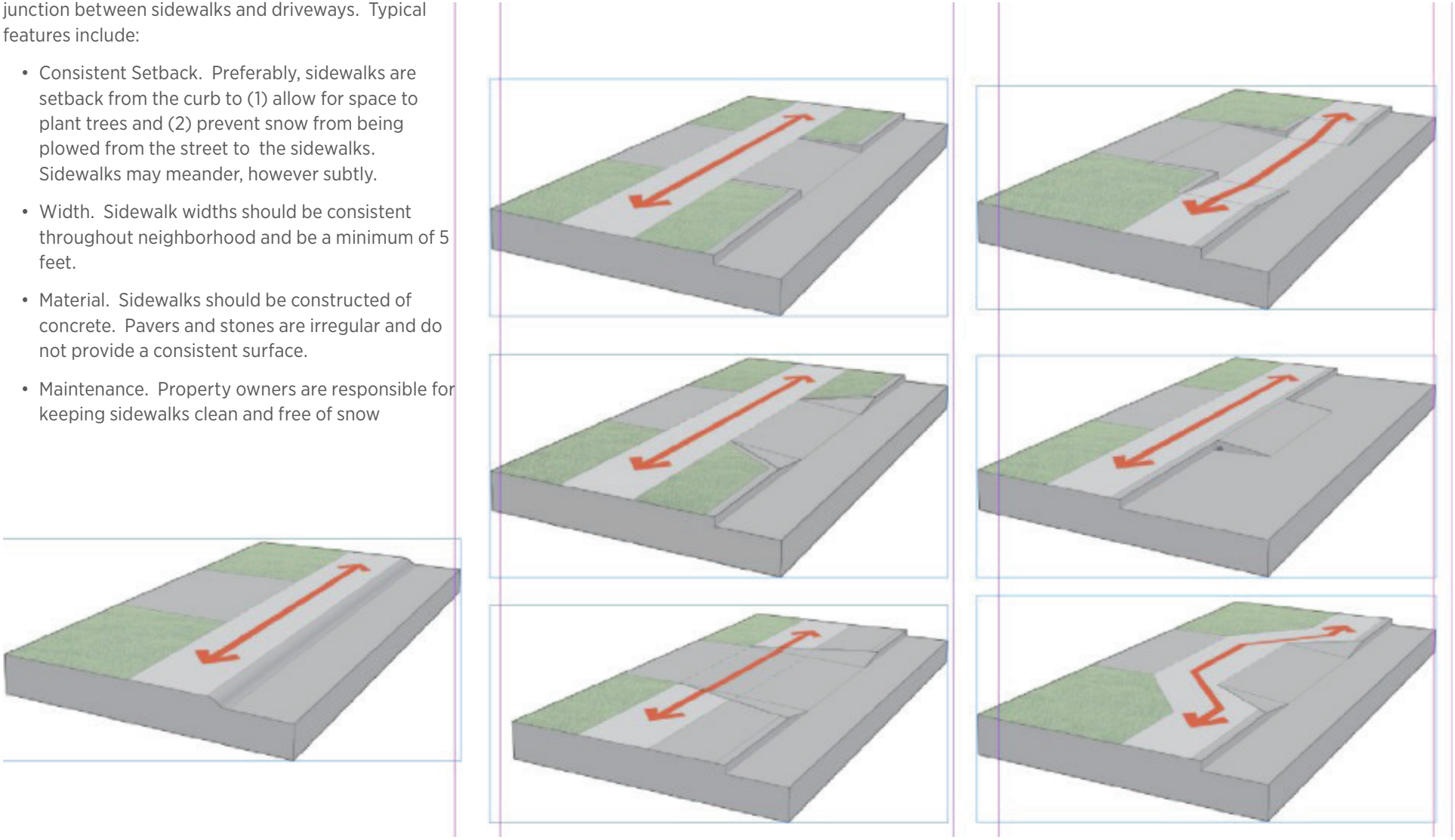
Incomplete corners

SIDEWALKS AND DRIVEWAY CROSSINGS

Sidewalks in existing neighborhoods should provide continuous access. The alignment of the sidewalk to the driveway is an important junction. Sidewalks should be flush with the driveway and allow the pedestrian to walk on an unobstructed path.

The figures on this page identify typical points of junction between sidewalks and driveways. Typical features include:

- Consistent Setback. Preferably, sidewalks are setback from the curb to (1) allow for space to plant trees and (2) prevent snow from being plowed from the street to the sidewalks. Sidewalks may meander, however subtly.
- Width. Sidewalk widths should be consistent throughout neighborhood and be a minimum of 5 feet.
- Material. Sidewalks should be constructed of concrete. Pavers and stones are irregular and do not provide a consistent surface.
- Maintenance. Property owners are responsible for keeping sidewalks clean and free of snow




ART