



Garden Plain

PEDESTRIAN + BICYCLE PLAN

ACKNOWLEDGMENTS

The project team is grateful for the contributions of the residents of Garden Plain who gave their time, ideas, and expertise for the creation of this plan. It is only with their assistance and direction that this plan gained the necessary depth to truly represent the spirit of the community, and it is with their commitment that the plan will be implemented.

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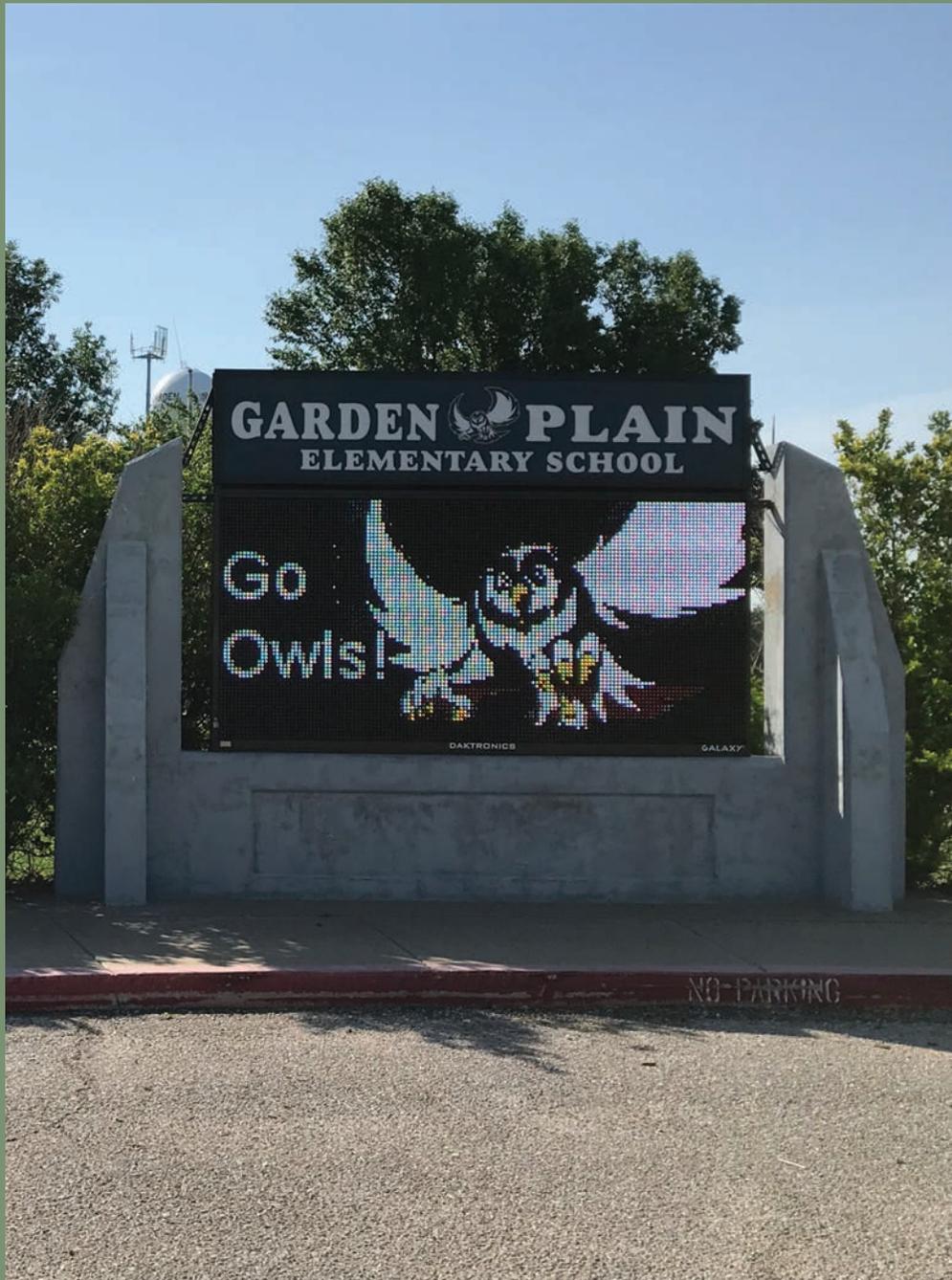
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Chapter One:

Introduction

INTRODUCTION

How we move is important to how well we live. It 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, all while thinking and taking delight in the beauty of our towns and natural environment. We can travel even further and faster by bicycle, a remarkable invention that easily lifts and travels at half the speed of cars in cities, yet gets the equivalent of hundreds of miles per gallon, produces no greenhouse gases, makes almost no noise, can be parked almost anywhere, and makes us healthier. New technologies and innovative products, such as pedal-assisted e-bikes and recumbent tricycles, can 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.

Self-propelled and low impact mobility also makes great economic and social sense. Pedestrian and bicycle infrastructure costs far less to build than streets and roads, and active users place very little stress on facilities. These methods of travel have almost no environmental impact, are enjoyable, and give us time and space to appreciate our fellow human beings and the places in which we live.

Many people in Garden Plain understand these virtues. It should be easy for all residents - including children - to visit neighbors, shops, parks, and schools using low impact travel modes; however, many residents report at least some level of discomfort or stress walking or riding a bike around town. This perception, especially related to children walking to school, led to the creation of this plan.

The Garden Plain Pedestrian and Bicycle Plan is dedicated to expanding the routine use of these healthy, low-impact, and enjoyable means of travel within Garden Plain. This plan will propose a program that considers the needs and opportunities throughout the community. The plan and its recommendations are efficient, increment, and deliver benefits that substantially outweigh the costs.

WHY THIS PLAN?

The support for this planning effort grew from an interest in creating a "Safe Routes to Schools" program. While providing safe and comfortable access to schools is still a priority, the pedestrian plan looks more broadly at how to create strong connections throughout all of Garden Plain. In addition, the community recognizes the value of the Prairie Sunset Trail, connecting Garden Plain to Wichita, both as an amenity for its residents and a potential source of growth to its economy.

So, why a pedestrian and bicycle plan?

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 positively 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, unnecessary and short local trips contribute to the deterioration of city streets.

Community happens outside of a car. Many places struggle to establish a sense of community due to an over emphasis on auto-oriented development; in these configurations, residents regularly travel to and from work without encountering their neighbors. While community cohesion is not a problem in Garden Plain, a continued focus on pedestrian and bicycle friendliness will increase Garden Plain's overall sense of community.

Pedestrians and bicyclists are good for business. Garden Plain's location as the western trailhead of the Prairie Sunset Trail could draw bicyclists, walkers, and runners who are potential customers for goods and services in town. Active transportation should be viewed as an economic development strategy that can benefit neighborhoods and strengthen its town center.



WHY PROMOTE ACTIVE TRANSPORTATION?

People in Garden Plain are vitally interested in health and active transportation, and the importance of individual choice and mobility within the town, as evidenced by their participation in all aspects of this study and the enthusiasm communicated to us during this planning process. 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 transportation as well as recreation. Garden Plain's easy topography and short travel distances are ideally suited to active transportation. A measurement of success will be a significant increase in trips taken on foot or by bicycle for a wide variety of purposes.

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. People most often walk or bike for recreational or school trips, and trips to parks, ballgames, and community centers. A successful system will connect primary destinations including schools with a seamless network of trails, sidewalks, and on-street pathways. These facilities 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 the community's investment in active transportation to reinforce the sense of community and the economic vitality of its downtown. A measurement of success will be the completion of a community "walk audit" that reveals a pedestrian comfort score of 75% or higher for the complete active transportation network.



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.

GOAL FIVE:

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. It is important to achieve short term rewards, and create a good initial system that is within the means of the region.

GOAL SIX:

Increase the community and economic benefits of the Prairie Sunset Trail. This excellent trail connects Garden Plain to the rest of the Wichita metropolitan area. As its western trailhead, Garden Plain and its businesses are ideally situated to capitalize on the economic potential of the trail to boost local businesses and attract new residents. Yet, the trail now stops short of the town center and is not well-connected to the community itself.

HOW TO USE THE PLAN

An active transportation plan is only as strong as its 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:

GARDEN PLAIN TODAY

The planning process included an extensive public engagement campaign. Chapter 2 summarizes the community opinions and preferences that emerged this effort. It also explores physical and social conditions that help frame an active network for the town.

CHAPTER 3:

SYSTEM CONCEPT AND FACILITIES

A central component of the plan is the "what" and the "where" of active transportation improvements proposed in Garden Plain. The chapter recommends the routes that form the active transportation network and the type of facility –sidewalk, trail, bike lane – proposed for each segment,

CHAPTER 4:

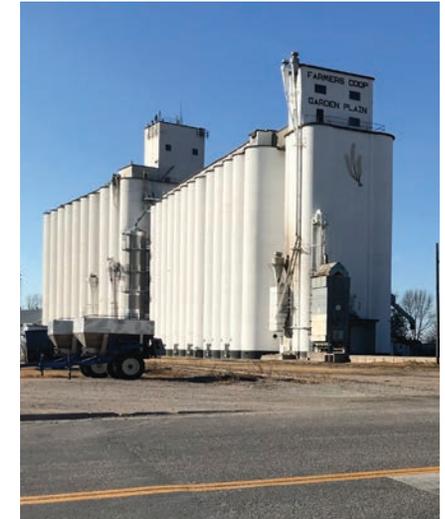
IMPLEMENTATION & SEQUENCING

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.

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 Garden Plain on foot, by bike, and by clean, low-speed vehicles. In the process, it can help make Garden Plain a better and more liveable community.





APPENDIX

DESIGN GUIDELINES AND CONSIDERATIONS

The appendix provides additional supporting 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 capacity to implement it. This capacity can be increased by a strategic implementation program that defines priority segments that address immediate needs while providing a basis for expansions through building partnerships and taking advantage of funding opportunities. Thus, this 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 strive to create connections of value to the community.

Priority-Based. The process of setting priorities should follow a transparent process that incorporates many factors including currently planned roadway improvements; engagement of community and/or financial partners; contribution to the segment in the overall system; 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.

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:

Garden Plain Today

INTRODUCTION

Garden Plain is well-positioned for the creation of an active transportation system that will benefit its residents, preserve small town character, attract future residents, and strengthen its town center and overall retail and service community.

The chapter summarizes local input and preferences, explores physical and social conditions in Garden Plain, and seeks to articulate the benefits of creating a complete transportation network.

LOCAL INPUT AND PREFERENCES

Many people contributed content to this plan through public open houses and workshops, a community survey, and an interactive map. Stakeholder input is essential to the process and has the following benefits:

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 is critical to creating a successful plan because this program must ultimately be implemented locally. 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 Preferences. Active transportation planning should not be a "one-size fits all model" but should instead recommend improvements tailored to the preferences of Garden Plain and its residents, including people of all ages and abilities. Major user groups include school children, families, seniors, and people with mobility disabilities.

SUMMARY OF PUBLIC ENGAGEMENT

PUBLIC KICKOFF AND DESIGN WORKSHOP

In May, 2018, the city and the planning team hosted a public kick-off and design workshop event at the Garden Plain High School which brought more than 30 stakeholders together



to learn about the project and offer their ideas through conversation and by interacting with presentation materials. The purpose of this event was to share, learn, and collaborate with members of the public.

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 received 124 responses or 13.87% of the total population, a very high response rate for an online, voluntary instrument.

INTERACTIVE MAP

An interactive map was launched concurrent with the community survey to allow stakeholders the opportunity to map their ideas and input. In addition to reviewing the inventory of sidewalks and trails, users were invited to identify the following item categories

- Barriers to walking / bicycling
- Important destinations
- Missing pedestrian crossing
- Where I walk / bike today
- Where I'd like to walk / bike

PRESENCE AT PUBLIC EVENTS

Not all residents engage with their community in the same ways. Therefore, City presence at public events helped community members learn about the project and contribute ideas on comment cards deposited into a comment box. The comment box traveled throughout the community with stops at the Fourth of July Festivities and City Hall.



REPRESENTATIVE TECHNICAL COMMITTEE

A technical 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 OPEN HOUSE

A second public open house took place on November 1st, 2018 at the Garden Plain High School. The event was designed to give stakeholders the opportunity to learn about the project, see progress, and contribute their ideas before the plan was adopted by the City.

PUBLIC HEARINGS

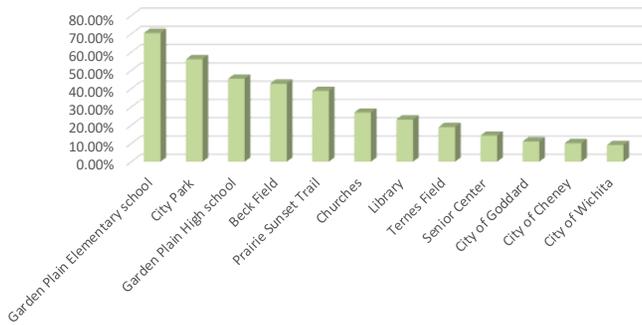
At the close of the project, the final draft of the plan was reviewed during a public hearing on January 2nd, 2019 by the Planning Commission and City Council. At this stage, members of the public had multiple opportunities to contribute their ideas.

COMMUNITY SURVEY

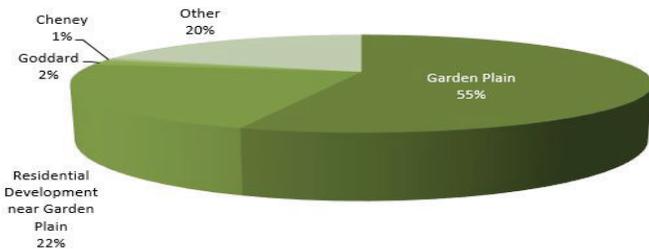
This planning process included a survey that elicited the preferences and opinions of current and prospective bicyclists and pedestrians. Survey questions addressed three general categories:

- Characteristics of respondents, including demographics, their active travel behavior (such as how often and for what purposes they walk or bike), and their self-perceptions as pedestrians or bicyclists.
- Opinions about the importance of various destinations to be served by a pedestrian and bicycle network and the relative effectiveness of different actions in increasing the number of people who walk or bike for specific purposes.
- Opinions about different types of pedestrian or bicycle facilities.

Importance of Bicycle and Pedestrian Access to Various Destinations



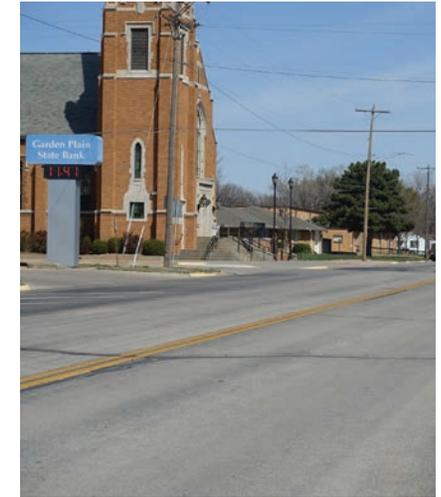
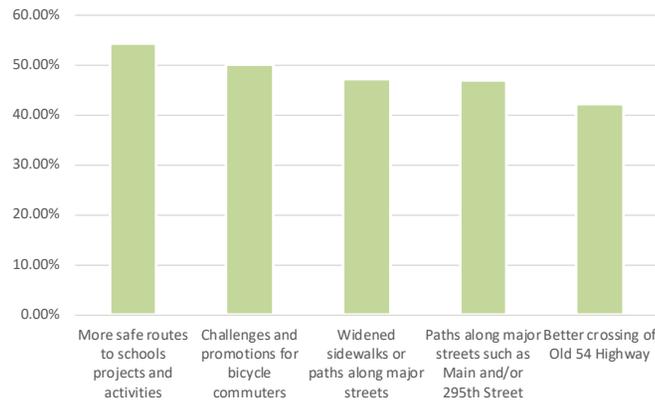
Respondent Residence



GENERAL QUESTIONS

Several questions addressed respondents' place of residence and opinions of the most effective means of increasing bicycle and pedestrian transportation within the city. Respondents placed highest priorities on safe routes to school (an impetus for the creation of this plan), sidewalk projects, and better paths and crossings along major streets. The most important local destinations included schools, parks, and the Prairie Sunset Trail.

5 Most Effective Improvements to Increase Bicycling in Garden Plain



PEDESTRIAN SPECIFIC QUESTIONS

Frequency of Walking for Enjoyment or Transportation

- The majority of respondents walk at least once or twice per week (55%). This indicates that investments to make Garden Plain more comfortable for walkers would be met with immediate use.
- A notable share walk occasionally or infrequently (33%). These individuals should be viewed as the market for pedestrian improvements.

5 Most Effective Pedestrian Improvements



FIGURE 1.1: How often do you walk for enjoyment or travel?

	Percent of Total
Never	0.00%
Very infrequently: a few times a year	11.38%
Infrequently: maybe every few months	12.20%
Occasionally: about once or twice a month	21.14%
Regularly: once or twice a week	32.52%
Frequently: several times a week to every day	22.76%

FIGURE 1.2: How often do you walk for enjoyment or travel?

	Percent of Total
Regular exercise or workout	75.00%
Family outings	48.33%
Trips to parks or recreational facilities	36.67%
Social visits	30.00%
Routine errands	17.50%
Trips to the library, museums, and similar places	17.50%
Commuting to work or school	8.33%
Shopping	6.67%
Going to meetings or in the conduct of business	5.83%
I do not walk often	5.83%

FIGURE 1.3: Which of the following best describes you as a pedestrian?

	Percent of Total
Confident and Fearless	2.63%
Committed Pedestrian	35.09%
Interested and Concerned	42.98%
Recreational Pedestrian	10.53%
Interested Non-Walker	5.26%
Non-Walker	3.51%

Reasons to Walk

- The most popular reason to walk in Garden Plain was "regular exercise or workout" (75%). Interventions that typically appeal to this group include sidewalk or trail loops, better access to trails, and support facilities oriented to fitness.
- A notable theme arose from the next categories - walking to and from destinations including parks, recreational facilities, and to meet their neighbors for social visits. Interventions to appeal to this group include improved sidewalks connecting the various parts of the community including destinations such as downtown.

Self Characterization

- Local factors affect the comfort and confidence of pedestrians in a given place. Local streets in a small community like Garden Plain have very light traffic, and walking within them is inevitably more comfortable there than in larger cities like Wichita.
- A relatively large share of respondents (35%) characterized themselves as committed pedestrians who, while they may appreciate pedestrian improvements, do not require them to feel comfortable.
- Most of the remainder expressed some hesitancy about walking or running in mixed traffic environments. These include those "interested but concerned" about their safety and those inclined to walk or run only on trails or wide sidewalks.



BICYCLE SPECIFIC QUESTIONS

Frequency of Bicycling for Enjoyment or Transportation

- A comparatively large share of respondents are infrequent bicycle users or non-users. 15% of respondents indicated they never use a bike and 21% indicated they bike a few times each year.
- A notable share indicated they ride a bike occasionally (24%). These individuals should be viewed as a significant focus for bicycle improvements.
- Despite the above, an unusually large percentage of respondents indicated regular or frequent use (26%). This indicates a relatively strong user group that will be supportive of improvements and may help drive investment and regional advocacy. This reflects a low-traffic environment, relatively short distances for most trips, and the popularity of the trail to local users.

Reasons to Bike

- The most popular reason for riding a bike was "regular exercise or workout" (57%). Interventions that typically appeal to these groups include better routes and access to trails.
- Respondents were interested in family rides and outings, trips to parks and other community facilities, and other social visits. The popularity of family-oriented trips underscores the importance of neighborhood streets being comfortable for all comfort levels.

Self Characterization

- Different types of bicycle facilities appeal differently to users in different places depending on their comfort.
- The largest categories include bicyclists who are "interested but concerned" about their safety (43%), "recreational bicyclists" interested in riding predominantly on trails (19.82%), and those who consider themselves "interested, but non-bicyclists today" representing 21.62%.

Favorability of Different Facilities: As a bicyclist or pedestrian, how comfortable would you feel using these routes, or other similar streets or paths?

MOST FAVORABLE



MODERATELY FAVORABLE



LEAST FAVORABLE



FIGURE 1.4: How often do you bike for enjoyment or travel?

	Percent of Total
Never	15.45%
Very infrequently: a few times a year	21.14%
Infrequently: maybe every few months	12.20%
Occasionally: about once or twice a month	24.39%
Regularly: once or twice a week	16.26%
Frequently: several times a week to every day	10.57%

FIGURE 1.5: How often do you bike for enjoyment or travel?

	Percent of Total
Regular exercise or workout	57.63%
Family outings	38.98%
Trips to parks or recreational facilities	30.51%
Social visits	19.49%
Trips to the library, museums, and similar places	15.25%
I do not ride a bike	15.25%
Bicycle touring	11.86%
Routine errands	11.02%
Commuting to work or school	9.32%
Shopping	2.54%
Going to meetings or in the conduct of business	0.00%



- Only 9% identified themselves as non-bicyclists in this question compared to the previous questions which indicated 15% for the non-bicyclist answer in both. This may indicate a larger potential market.

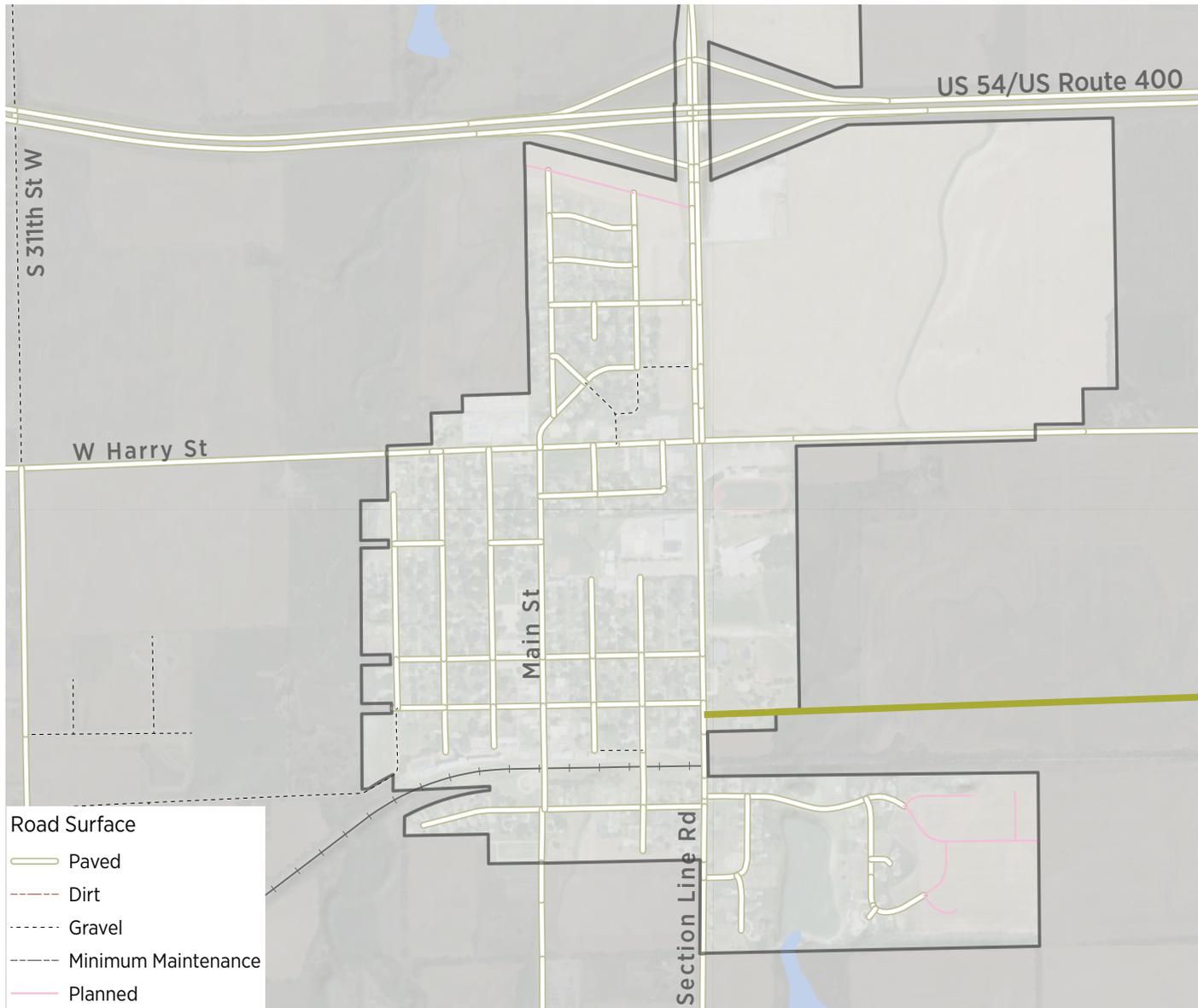
FIGURE 1.6: Which of the following best describes you as a bicyclist?

	Percent of Total
Confident and Fearless	0.00%
Committed Bicyclist	6.31%
Interested and Concerned	43.24%
Recreational Bicyclist	19.82%
Interested Non-Bicyclist	21.62%
Non-Bicyclist	9.01%

Findings

- Unsurprisingly, respondents indicated the greatest preference toward environments with least interaction with motorized vehicles. The trail examples provide exclusive space for pedestrians and bicyclists and, when interactions are required with streets, the clearly visible and protected crossings.
- Following trails that provide a separate place for walkers and bicyclists, respondents preferred environments that offered a dedicated place on the roadway. The example illustrated on the left is a protected bicycle lane that intentionally slows vehicular traffic to make the roadway more comfortable and safer for walkers and bicyclists.
- The least popular options are environments that mix bicycle and pedestrian traffic on relatively high speed roadways. The least favorable category illustrated on page 16 includes a sidewalk and a traditional bicycle lane, owes its low rating to the motor vehicle dominance of its environment. The addition of trees or a wide shared use path separated from the roadway would have certainly increased positive responses to this environment.

FIGURE 1.7: Road Surface



ATLAS OF EXISTING CONDITIONS

This section examines the existing conditions pertinent to bicycling and walking. This includes physical factors such as key destinations and existing bicycle and pedestrian facilities but also local human preferences. The atlas details the physical conditions of the active transportation environment but also summarizes community involvement including the survey, the interactive map, and themes from personal interactions. These factors – streets, destinations, and neighborhoods – are the foundation of the active transportation plan.

Road Surface

The most cost-effective way to create an active transportation network is adaptation of existing streets. An important determinant is the type of road surface or the presence of sidewalks. The majority of streets in Garden Plain are paved and sufficiently wide to accommodate on-street bicycle facilities.

Functional Classification

The Kansas Department of Transportation and Sedgwick County classifies streets according to their role and function in the transportation system. Among other purposes, this system helps identify priorities for roadway maintenance and improvements. While the vast majority of roadways in Garden Plain are local, city-roads, two higher-order roads will be central to creating a strong active transportation network:

- **Harry Street.** A minor arterial maintained by Sedgwick County. Harry Street separates the northern residential areas from the schools, downtown, southern neighborhoods, and the Prairie Sunset Trail. Harry Street was the original route of US 54.
- **Section Line Road (295th Street).** This major collector is maintained by Sedgwick County and is a major north-south route in Garden Plain. It serves the town's schools and major city park, but presents a barrier to easy access to and between these important destinations.
- **295th and PST Intersection.** Community input indicates that a strong pedestrian connection across 295th Street between Harry Street and the Prairie Sunset Trail is a clear community priority. This will improve the safety of pedestrians, including students, walking along and crossing the corridor between the schools.

FIGURE 1.8: Functional Street Classification

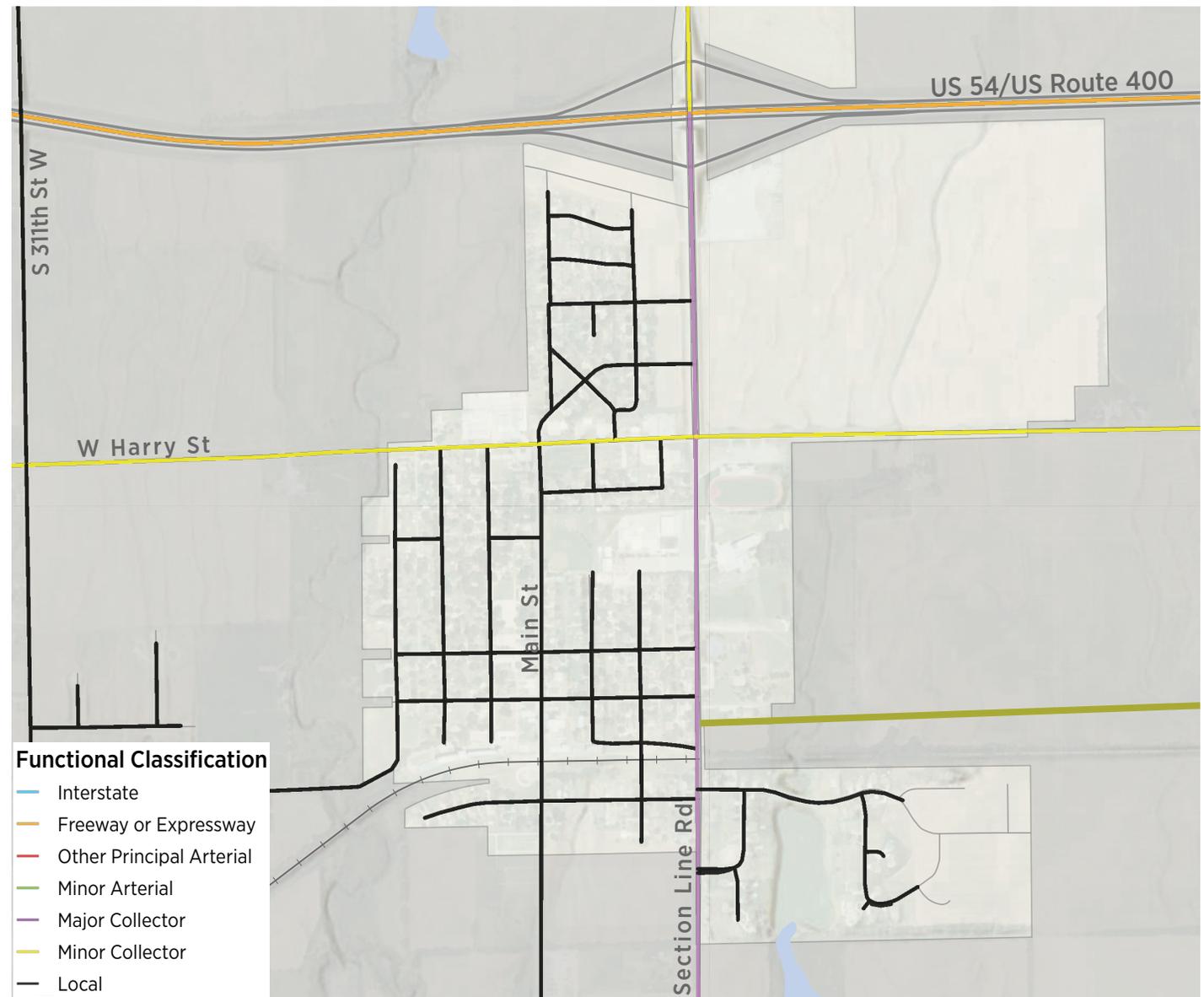
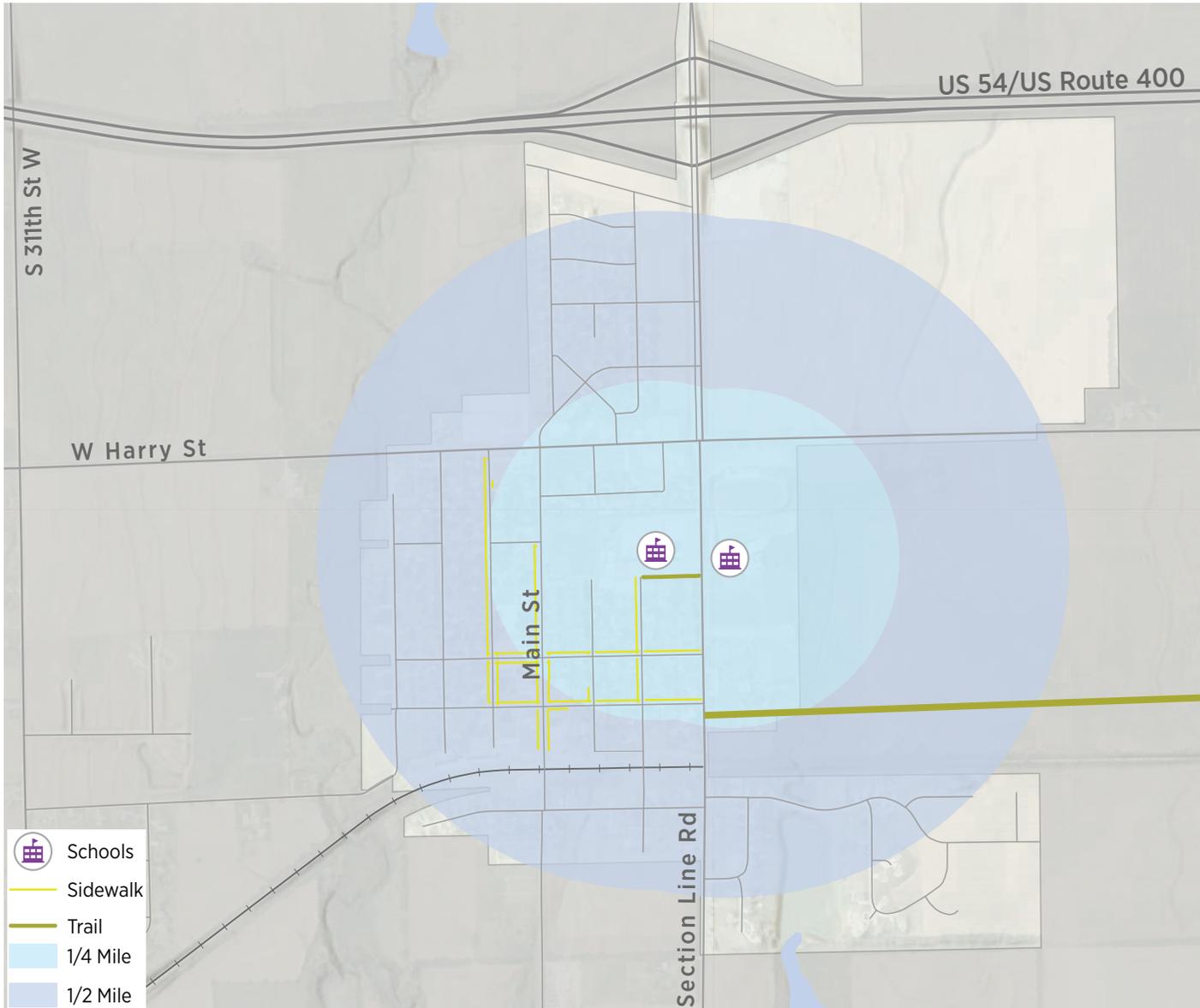


FIGURE 1.9: Distance to School



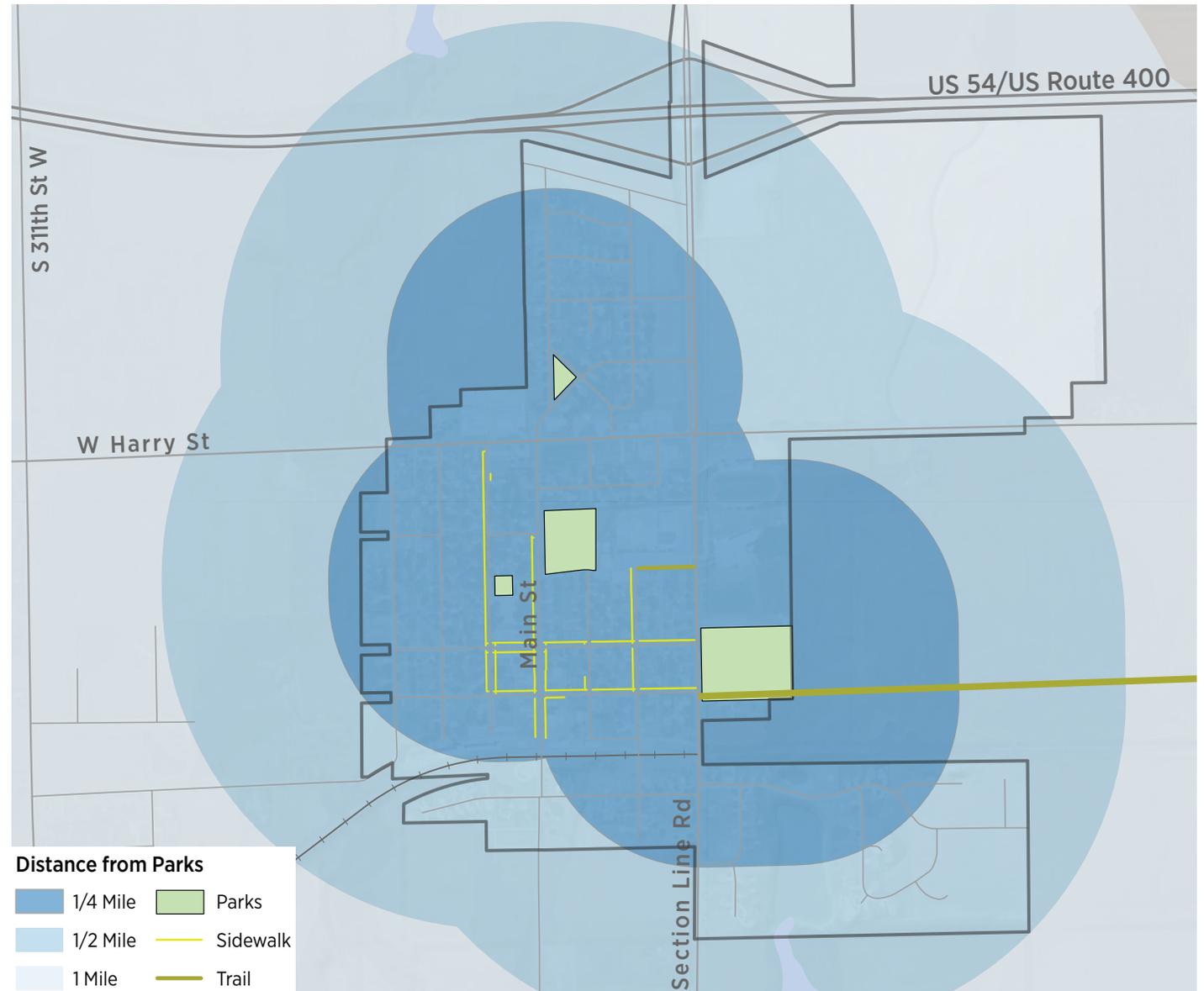
Distance to Schools and Sidewalk Coverage

- The presence of sidewalks, trails, and their relation to schools often indicates the reach of the current pedestrian system.
- The connection between the two schools is very strong. The sidewalks and pedestrian crossing beacon on 295th Street (Section Line Road) increases motorist awareness of pedestrians crossing between the two school facilities.
- Routes to schools rely heavily on Harry and Section Line Road with relatively high traffic volume and speeds and no sidewalks.
- Sidewalks should allow residents - regardless of their comfort as a pedestrian - to walk safely to key destinations.
- State and federal programs often place a priority on projects that provide pedestrian and bicycle improvements near schools. While the Safe Routes to School Program has been folded into the Transportation Alternatives program, local priorities should concentrate on better and safer access to schools and recreational resources.

Distance to Parks and Sidewalk Coverage

- In addition to schools, residents should be able to walk or ride a bike safely and comfortably to parks and recreational facilities. These are major destinations for young people and others who may rely on non-motorized or low-impact motorized means of travel.
- The state of the system appears fairly strong with connections between Main Street, City Park, and proximity to the Prairie Sunset Trail which, for the purpose of this plan, should be considered a park feature.
- Connected sidewalk access is poor between residential areas across Harry Street.

FIGURE 1.10: City Parks and Recreation Facilities





Chapter Three:

System Concept & Facilities

INTRODUCTION

Garden Plain should offer its residents comfort and safety as they travel around the community to reach destinations on foot, by bike, or by using other low-power personal mobility devices. It should also offer direct local access to the regional Prairie Sunset Trail for both residents who use the trail for recreation and travel purposes and regional trail users who use the town as a trailhead or destination (and are likely to patronize local businesses). Garden Plain can achieve these goals 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 or bike through and to Garden Plain. 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. f

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.

Special Conditions. 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 Garden Plain. This section illustrates these special conditions.

SYSTEM PRINCIPLES

Performance principles guide how routes are selected 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 ability to minimize hazards and improve safety for users of all transportation modes.
4. **Comfort.** Consistency with the capacities of users and avoidance of mental or physical stress.
5. **Experience.** The quality of offering users a pleasant and positive experience.
6. **Feasibility.** The ability to maximize benefits and minimize costs, including financial cost, inconvenience, and potential opposition.

An effective active transportation system conveys its users between the places they want with minimal discomfort and inconvenience. The system is comprised of access points, pathways, and interventions to increase comfort and safety when the system must cross a busy roadway.

In fulfilling these performance principles, Garden Plain'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 destinations that define and are served by the system include:

- Elementary School
- High School
- Downtown





- City Park and Ballfields
- Senior Center
- The Prairie Sunset Trail and current trailhead at the Covered Bridge

It will serve as a tool for economic development. Garden Plain's active transportation system is an investment that will provide economic benefits for the town. By connecting the Prairie Sunset Trail to the center of town, it will encourage users of this popular trail to come into town, rather than simply turning around at the current trailhead and returning to Goddard, Wichita or points further east. It also will provide a quality of life feature that can increase the community's appeal to prospective residents.

It will encourage development and use of Garden Plain's parks and recreational features. Extending the Prairie Sunset Trail west to Main Street railroad right-of-way represents an opportunity to create an important community park and gateway connection on the model of Goddard's Linear Park six miles to the east. It would also open the possibility of elevating the PST into a chain of community parks that, if fully developed, could expand its potential for family outings. The rural Tammany Trace Trail on the north shore of Lake Ponchetrain is an excellent example of enhancing a trail to provide a range of community-based family experiences that further expands its economic potential. In addition, the system should also increase access to and use of the existing City Park south of the elementary school.

It will unite the north and south sides of the city. While most of the town is south of Harry Street, which still retains aspects of its previous status as US 54, newer residential development has occurred north toward the current multi-lane highway and any new development is likely to continue in that direction. In addition, commercial and industrial development has been proposed around the 295th Street interchange. While Harry Street presents a more minimal barrier than the current US 54, a better crossing at Main Street would provide a safer connection between traditional and more contemporary parts of the city and improve access to the Senior Center, which is north of Harry Street.

THE NETWORK DIAGRAM

Figure 3.1 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

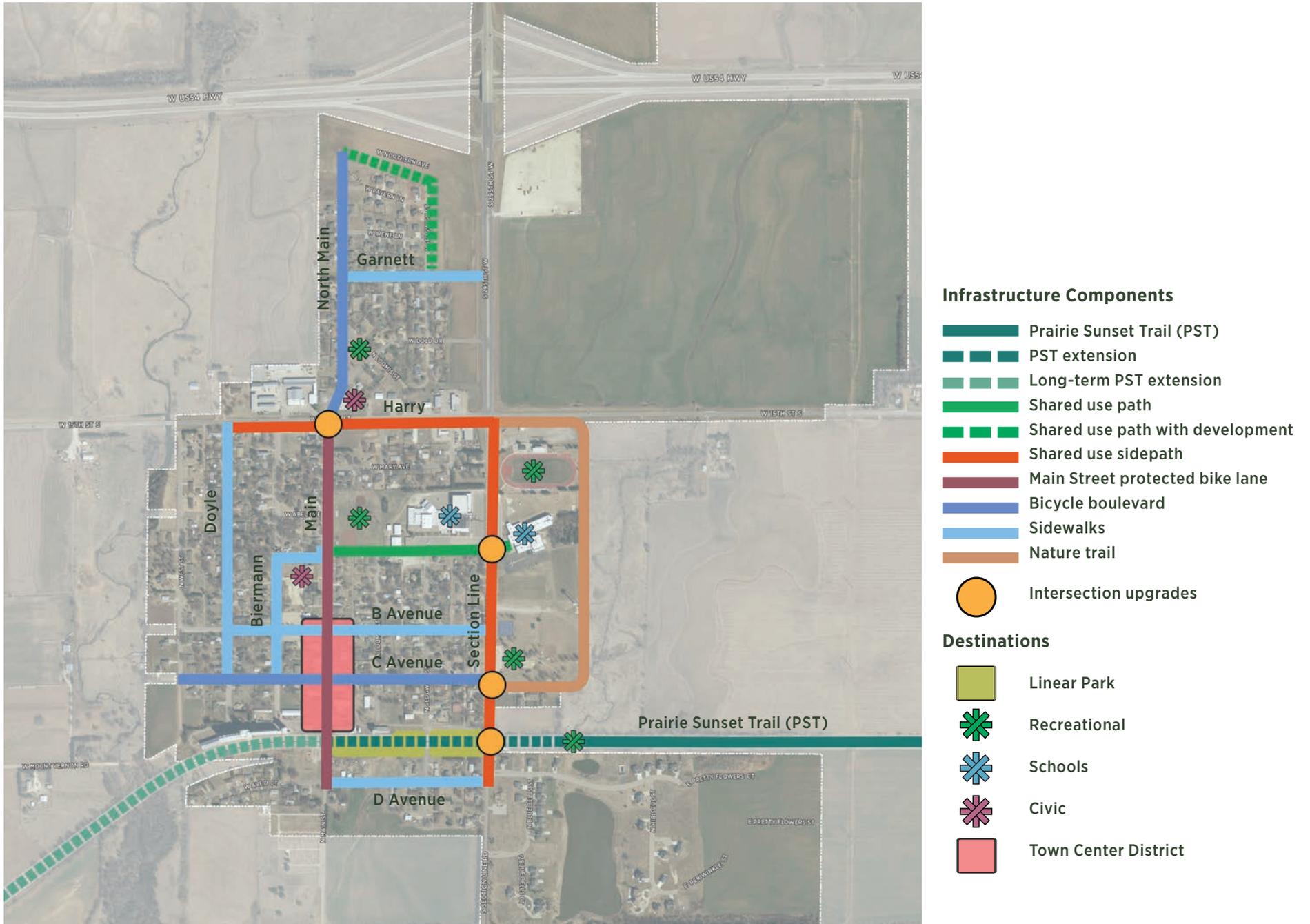
The system includes both major and minor facilities. Major facilities include trails, shared use facilities like sidepaths, and protected or separated bicycle lanes. Minor facilities include sidewalks and other pedestrian paths and bike routes using low-volume local streets.

The system proposes three elements of major infrastructure.

- **295th Street (Section Line Road) Sidepath.** Most participants in the planning process defined a pedestrian/bicycle facility along and across 295th Street (Section Line Road) as the highest priority project for Garden Plain. This facility serves both schools along the street as well as City Park and the Prairie Sunset Trail. However, construction is complicated by roadside drainage ditches and the current location of the boundary fence on the west side of the high school field and track. Options to address this problem include:
 - » Developing a sidepath on the east side of 295th Street, adjacent to the elementary school and City Park. This may involve tubing a drainage ditch on the east side of the road adjacent to the high school track and developing the path above the pipe or relocating the existing pole vault approach.
 - » Developing the path on the west side of the road, adjacent to the high school and residential properties. This probably requires tubing the drainage ditch on the west side of the road and developing the path over the new pipe; or negotiating with adjacent properties to secure right-of-way for the path.
 - » A hybrid solution that uses both sides of the road, upgrading the current pedestrian crossing between the two schools across 295th Street.

This path may be complemented by a recreational walking path that loops around the periphery of the elementary school, track, and City Park. In addition the

FIGURE 3.1: Active Transportation System





plan envisions upgrading the existing street crossing with a pedestrian refuge median and a rapid rectangular flashing beacon.

- **Prairie Sunset Trail Extension.** This extension requires acquisition of all or part of the existing railroad right-of-way between the trailhead and Main Street, with the possibility of an eventual extension further west. A short-term linkage could be achieved by defining and signing an on-street route from the current trailhead to the center of town.
- **Main Street.** This extremely wide street (68 to 70 foot) is now striped for two lanes with diagonal parking (much of which is unnecessary) between the trail and Harry Street. Its width could be used more effectively to provide a safe environment for a variety of travel modes along the central corridor, including pedestrians, bicycles, and low-impact mobility conveyances such as scooters, golf carts, and motorized wheelchairs. The plan envisions a parking-protected two-way bike/low-capacity vehicle lane to accommodate these modes of travel. This is essentially a trail that uses existing pavement more efficiently.

In addition the plan envisions upgrading the existing Harry Street crossing with a pedestrian refuge median and a rapid rectangular flashing beacon.

- **Harry Street.** A shared use sidepath should be developed along Harry Street between 295th Street and Main Street. This could be extended to Doyle Street in the future to

complete a loop route with a Doyle Street pedestrian route.

The network proposes the following minor improvements:

- **East-West School/Park Connection.** This connection uses internal sidewalks and established paths to connect the schools and City Park with Main Street. It connects a shared use sidepath along 295th Street to Main Street and its proposed protected bike lane.
- **A Local Street Grid.** This provides north-south and east-west local street connections across town to feed the major north-south facilities and their destinations. It is also designed to address the problem of long blocks between Harry and Avenue B. The active grid improvements include a continuous sidewalk on at least one side of each street and appropriate signage designating the active route. Avenue C would be signed as an east-west "bicycle boulevard" between while Abel Avenue, and Biermann Street to complete a pedestrian loop that connects back to Main Street. A north-south pedestrian route along Doyle Street between Harry and Avenue C connects the west side of town back to Main Street and the rest of the network. On the north side, Main Street north of Harry would be a bicycle boulevard, connecting to potential development at the interchange.

Infrastructure on these designated routes may include conventional sidewalks or an unusual but less expensive buffered multi-use pedestrian lane described below.

INFRASTRUCTURE TYPES

The Garden Plain 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, proposed for 295th Street (Section Line Road), Harry Street, and the Prairie Sunset extension accommodate all types of non-motorized users and, in Garden Plain, low-powered, low-speed devices such as motorized wheelchairs, scooters, and golf carts. They fall into two basic categories: 1) trails on their own right-of-way not adjacent to roads and sidepaths, separated from but adjacent to roadways. A typical desirable minimum path width is 10 feet, although 8 feet may be used in constrained conditions. Ten feet is a required 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.

Cost and 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 3 foot width is acceptable.
- 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.

- Costs for shared use paths differ widely, based on factors such as subsurface conditions, drainage, and unusual structural conditions. Concrete trails typically range from \$400,000 to \$600,000 per mile. Non-paved surfaces such as crushed limestone typically range from \$30,000 to \$50,000 per mile, but structures such as bridges can increase costs substantially. On corridors like 295th Street, where drainage ditches may need to be replaced by pipes, costs will tend toward the higher end of this cost range.

ON-ROAD TREATMENTS

Bicycle lanes provide dedicated space for bicycling, low-power mobility devices, and, in small town environments like Garden Plain, pedestrians within roadways, using striping and pavement markings or physical separations. These facilities can provide a low-cost option when adequate right-of-way is available, and can be incorporated into street paving, sealcoating, and restriping projects. In low-traffic, small community environments like Garden Plain, these on-road facilities may accommodate other methods that are not otherwise street-legal but provide mobility to people with disabilities.

Bike Lanes

Most of Garden Plain's streets have very low traffic volumes that normally do not require bike lanes. However, in some cases with very wide streets like Main, bike lanes may offer a variety of benefits, including traffic calming and greater user comfort. Different types of on-road bike lanes include:

- **Standard Bike Lanes.** Separated from traffic by a single white line.
- **Protected Bike Lane.** Sometimes referred to as "cycle tracks," these facilities are separated from traffic by a vertical element such as a curb, flexible bollards or delineators, planters, or other physical barriers. These may be either one-way or two-way facilities. This type of facility is proposed for Main Street, providing a relatively low cost way to accommodate all kinds of users and effectively provide an "on-street trail."



Above: a good intersection design, with painted or raised bump-outs that provide better visibility for a protected bike lane and also benefits pedestrians who are crossing wide streets (Armour Boulevard in Kansas City)

Bike lanes are typically not recommended on streets with conventional head-in diagonal parking.

Cost and Design Considerations

- Minimum width for a one-way bike lane is 5 feet (parking adjacent) to 6 feet (curb adjacent).
- For buffered bike lanes, a minimum buffer width of 2 feet is recommended.
- For separated bike lanes, small barriers such as flexible delineator posts or removable curbs can be separated with a minimum 2-foot buffer. A curb may also be used as a separator from parking or travel lanes and may reduce the width of the buffer.
- Separated two-way bike lanes, such as this plan's recommendation for Main 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.
- Standard bike lanes are relatively inexpensive, with costs ranging from \$27,000 to \$50,000 per mile. Buffered lanes are slightly more expensive because of additional materials. The cost of separated lanes can vary widely, depending on the level of finish and structure. These costs can be as low as \$100,000 per mile or as high as \$1.9 million per mile when very elaborate landscaping and urban design features are included. The Garden Plain facility will fall within the lower part of this range and will primarily use paint and relatively low-cost materials.

BICYCLE BOULEVARDS

Bicycle boulevards (sometimes referred to as “neighborhood greenways” or “green streets”) are a type of shared street that applies to low- to moderate traffic neighborhood streets that have good crosstown continuity; or to existing or future streets that parallel high traffic corridors and provide access to the same destinations. Bicycle boulevards may use bike route identification and wayfinding signs and may use shared

lane markings, or “sharrows,” a pavement marking recognized within the Manual of Uniform Traffic Control Devices (MUTCD). Sharrows, made up of a bicycle symbol and a directional chevron, provide wayfinding guidance for cyclists, increase motorist awareness of bicycles on the street, and help bicyclists position themselves safely on a street away from the “door zone” of adjacent parked cars. Other pavement markings that can help create a safer bicycle environment include striping of parking lanes, particularly helpful on wider streets to help slow traffic. All bicycle boulevards also include barrier-free sidewalks and clear intersection crossings.

Despite the name, “bicycle boulevards” are open as usual to motor vehicles, but include some features to make them more hospitable to bicyclists and pedestrians. These vary in level of capital investment and complexity, and include (in relatively ascending order of complexity):

- **Signage.** Signage is both visible and low in cost. Bicycle boulevard signs include identification signs (special street signs and bicycle boulevard identifiers) and advisory or caution signs (share-the-road signs). The entire system will also use a common signage system that incorporates identifying, directional, and wayfinding signs.
- **Sidewalks.** “Bicycle boulevards” are true multi-modal streets that serve pedestrians as well as bicycles and other wheeled users. Continuous sidewalks should be provided on at least one side of bicycle boulevards.
- **Intersection and road priority.** Bicycle boulevards 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 traffic circles, 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.

- **Arterial 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 induction loops at signalized intersections sensitive enough to detect bicycles; pedestrian and bicyclist activated 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.

Cost Considerations

- Bicycle boulevard costs range from about \$30,000 to \$80,000 per mile, depending on the degree of development. Higher cost facilities use traffic calming devices like mini-roundabouts or neckdowns to slow motor vehicles. These are probably unnecessary in Garden Plain's relatively low traffic environment and can be retrofitted if the need for them arises.

The bicycle boulevard concept applies to Avenue B from 295th to West Street and Main Street from Harry Street north in the Garden Plain network.

BICYCLE AND PEDESTRIAN ROUTES

Sidewalks and Signage

Most of Garden Plain's streets have very low traffic volumes that normally do not require bike lanes. But some streets provide important east to west connections that help direct pedestrians, along with bicyclists and other users, to major destinations and more extensively developed routes. These streets should provide continuous sidewalks on segments designated as part of the active network and may also include wayfinding and route identification signs. New residential sidewalks should attempt to achieve a 5-foot unobstructed width where possible. Sidewalks in the town's central business district south of Avenue B are considerably wider.

Design and cost considerations for sidewalks include the following:

- 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.
- Ramps that comply with ADA standards should be provided at all intersections on the active network. These ramps should be directional, guiding pedestrians into crosswalks rather than diagonally into intersections.
- Estimated cost of a conventional 5-foot sidewalk with Americans with Disabilities Act compliant intersection ramps is \$175,000 per mile.

A Protected On-Street Option

While sidewalks and shared use paths are popular and effective, they are also costly and sometimes controversial with property owners. This may in turn delay the implementation of this plan. Garden Plain's relatively wide, low-traffic local streets make another alternative possible— an on-street buffered pedestrian path. On a 36-foot wide street, this concept provides a 5-foot wide on-street path, buffered by a 2 to 3-foot painted buffer. Parking would be provided on one side of the street only. This path is equivalent to a sidewalk and limited to pedestrian use. A wider street like Avenue B at 42 feet can provide a wider path or buffer, and might be available to other non-motorized or low-powered users, more like a protected bike lane.

Design and Cost Considerations

- Minimum width should be 5 feet for pedestrians only, 8 feet if other uses are permitted. Buffer should be clearly visible during the day and night using traffic approved reflectors or reflectorized paint.
- Installation should be limited to city streets with relatively low traffic volume.



- Estimated cost is \$100,000 per mile.

INTERSECTION IMPROVEMENTS

An active network is made up of more than linear segments. To be effective, these routes must also comfortably and safely cross barriers, most commonly major streets. Intersection improvements that increase safety and comfort for vulnerable users include:

- Pedestrian activated crossing beacons such as Rapid Rectangular Flashing Beacons or HAWK (hybrid beacon) signals, often coupled with crossing improvements.
- 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.

Priority intersections in the Garden Plain network include Harry and Main Streets; the existing 295th Street crossing between the two schools; and the Prairie Sunset Trail

extension's 295th Street crossing. Figure 3.2 lists these and other important intersections in the proposed network.

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.
- When evaluating the investment of whether to install intersection improvements, the following factors should be considered:
 - » Does the crossing fill a gap in the active transportation network?

FIGURE 3.2: Enhanced Intersections, Treatments, Cost Estimate, and Timing

Location	Proposed Treatment	Timing / Priority
Prairie Sunset Trail Extension, Crossing Section Line Road	Striped Crosswalk, Bike/Ped Crossing Sign, RRFB, Welcome signage	Implemented with the extension of Prairie Sunset Trail to Main Street
Avenue B, Crossing Section Line Road	Crosswalk, Bike/Ped Crossing Sign	Short term / high priority, implemented with the Section Line Road Shared Use Path
Between Schools, Crossing Section Line Road	Striped Crosswalk, Bike/Ped Crossing Sign, RRFB, Refuge median	Short term / high priority, implemented with the Section Line Road Shared Use Path
Harry Street, Crossing Section Line Road	Pedestrian Crossing Median (explore repurposing existing median), Bike/Ped Crossing Sign, Install Stop Signs on Harry Street to make the intersection a four way stop	Medium term / medium priority, to be implemented with Harry Street trail / sidewalk
Harry Street / Main Street Intersection	Bike/Ped Crossing Sign, four way stop (install stop signs on Harry Street); High visibility Crosswalk.	Short term/high priority, implemented with Main Street project
East-West School Trail, Connection with Main Street	Bike/Ped Crossing Sign, High visibility Crosswalk;	Medium term / medium priority, implemented with school trail

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 versus 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



Neckdown

Graphic by Alta Planning + Design

Neckdowns

Context

“Bicycle boulevards” – relatively low volume streets with good continuity.

Technique

- Curb extensions that reduce the curb to curb width at an intersection to 22- to 24-feet. Especially appropriate on network streets 32 feet or greater in width.

Benefits

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



Refuge Median

Graphic by Alta Planning + Design

Pedestrian Refuge Median

Context

Trail crossings of major streets and bike/ped crossings of major streets where left-turns are not required.

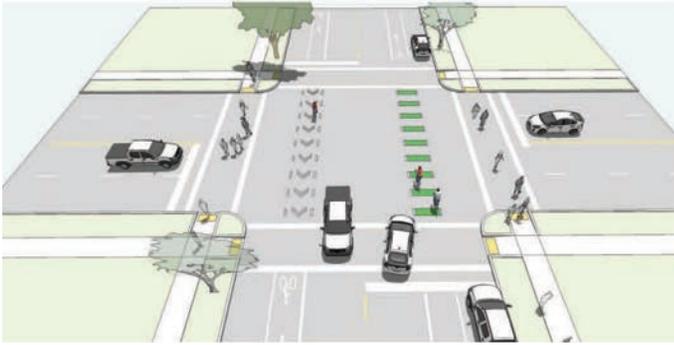
Technique

- Refuge median in a two-way turn lane. Alternative is removal of parking from crossing area and diverging lanes slightly to provide space for the median.
- High visibility crosswalks and pavement markings.
- Used in conjunction with yellow caution signs.
- May include flashing beacons or HAWK protection.

Benefits

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





Intersection Pavement Markings

Context

Crossings of major intersecting streets by on-street active network routes

Technique

- High visibility crosswalks with pavement markings using various methods to define a bicycle track across an intersection
- May be used in combination with rapid rectangular flashing beacons or hybrid signals

Benefits

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



Differentiated bicycle and pedestrian paths and pedestrian refuge median at 13th Street crossing of the Woodchuck Bicycle Boulevard in Wichita.



Rapid Rectangular Flashing Beacon (RRFB). This pedestrian activated device has twin, very bright beacons that flash alternatively and very effectively indicate the presence of pedestrians in a crosswalk to motorists. However, they do not include a red signal.



The Hybrid Beacon or HAWK signal. This three-headed pedestrian actuated device is normally dark. When activated by a push button, its single amber light flashes to warn motorists of an impending red signal. The two upper heads then turn red to stop traffic.

CONTEXT	CONDITION	EXAMPLE
Major street crossings with signals/crossing upgrades	Traffic signal control. Some cases are large intersections with poor definition of pedestrian and bicycle crossings. Treatments include high visibility crosswalks, bicycle crossing markings, refuge medians.	
Major street crossings without signals	Routes on secondary streets crossing arterials or major collectors without traffic control. Possible treatments include warning signage, high visibility pavement markings, flashing beacons, hybrid beacons, full pedestrian signals, refuge medians.	295th at school crossings, Main and Harry, 295th and Prairie Sunset Trail extension
Offset intersections	Two legs of an intersection are offset from one another. Possible treatments include establishing one crossing point and using short sidepath segments to transition to single alignment; or use pavement markings to guide path through the intersection.	295th and Avenue C/park access
Continuity interruptions	Breaks in route continuity created by lack of railroad crossings, streams or gaps in streets. Treatments include alternate routes or reasonable diversions consistent with network standards; new bridges; or interim paths on proposed street links.	

TECHNIQUE	DESCRIPTION	POTENTIAL APPLICATION
Pedestrian refuge median	Island in middle of a two-way street, allowing pedestrians and bicyclists to address crossing traffic in one direction at a time from a protected place.	295th Street at school crossing, Avenue C, Prairie Sunset Trail
High visibility crosswalks	Well-defined crosswalks, using durable reflective materials and typically using Continental or Zebra/Ladder crosswalk markings. Also includes green or chevron markings to guide bicycle path or lane across intersection.	Main and Harry

- » Does the crossing address a barrier crossing identified in the active transportation network?
- » Does the traffic volume and speed warrant the installation of a flashing beacon, enhanced crosswalk, refuge median, or bump-outs?

SPECIAL CONDITIONS

This section discusses sections of the Garden Plain system that require special design consideration or explanation.

295TH SIDEPATH

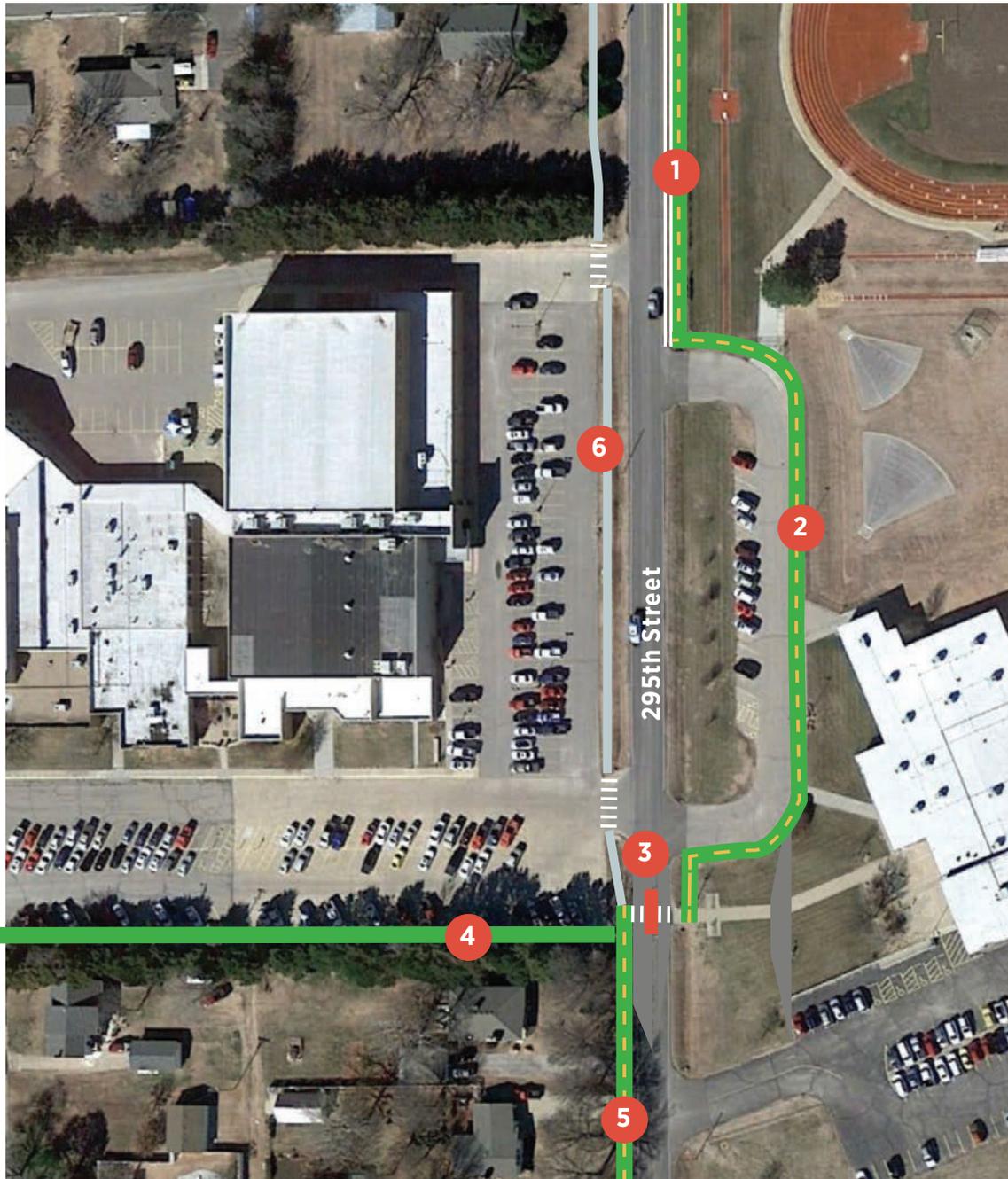
295th Street (Section Line Road) from Avenue D to Harry Street is correctly recognized by any residents as the highest priority. The corridor serves both schools, City Park, and the Prairie Sunset Trail, and is a high volume and sometimes excessively high speed rural section road. The various constraints and options for a Section Line sidepath were discussed earlier.

The preferred community option for this corridor is illustrated in Figure 3.3 and includes the following:

- A sidepath on the east side of 295th Street between Harry Street and the existing school crosswalk. To avoid relocating the fence along the runway, this path may be adjacent to the east pavement edge with a free-standing raised curb to separate the path from motor vehicles. This would require earthwork to relocate the ditch closer to the fenceline. Alternatively, the ditch could be replaced by a buried culvert, as recommended below for the segment south of the crosswalk.
- At the elementary school loading loop, the path would widen or replace the existing path along the drop-off loop.
- The route crosses to the west side via an enhanced crosswalk. Crossing treatment envisions a minor widening of 295th Street to provide space for a pedestrian refuge median. This would be protected by an RRFB when crossing guards are not present.
- The drainage is directed through a culvert and covered by the sidepath, continuing south to the trail and Avenue D. Alternatively, a curb could be built along the west side of the road, with drainage directed to the east.
- An enhanced pedestrian crossing would be provided at Avenue B to connect back to City Park.



FIGURE 3.3: 295th Street Sidepath - Option 1 Detail



- A conventional sidewalk would extend from the crosswalk to Harry Street on the west side of 295th.

Advantages of this option include:

- Placing the main path adjacent to residential blocks and directing users to a protected crossing of 295th.
- Avoiding conflicts with school parking lots, driveways, and loading areas.
- Connecting the track and stadium directly to overflow parking at Harry Street.

Disadvantages of this option are:

- The expense of replacing ditches with culverts
- The possible impact on the fencing and runway approaches at the school track
- Requiring a street crossing to reach City Park.

These problems can be minimized by reducing the facility along the track to a six-foot wide sidewalk that can be built without burying the drainage.

A less expensive option, illustrated diagrammatically in Figure 3.4:

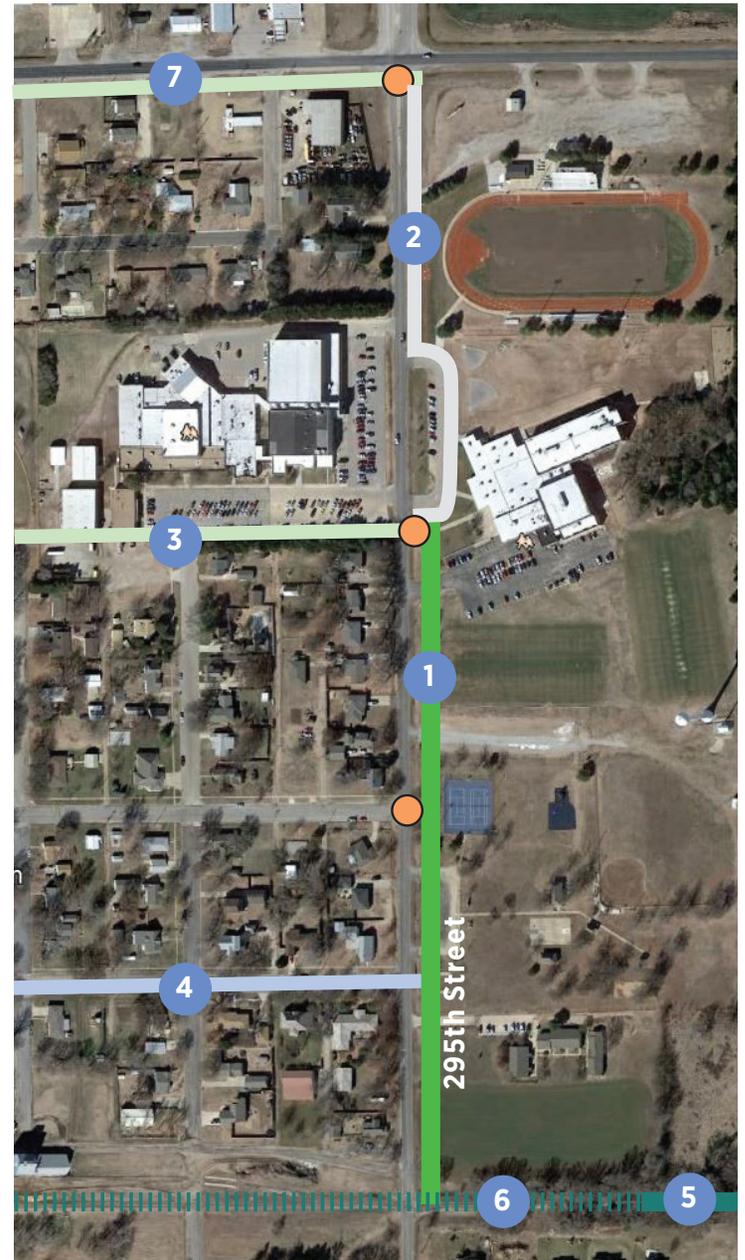
- Places the shared use path on the east side of 295th, with the path located behind (or east of) the drainage ditch and along the City Park frontage. This path would then continue along the elementary school's loading loop.
- Extends a conventional sidewalk north of the loop to the open site along Harry Street north of the track and used for event parking.
- Adds an enhanced intersection Section Line Road crossing at Avenue B, and directs people going to school or the park to use the East-West Passage (see below) or Avenue B.
- Connects the high school to Harry with a conventional sidewalk on the west side of the street.

FIGURE 3.4: 295th Street Sidewalk Options - Comparative Diagrams



- 1 Shared use path on east side
- 2 Shared use path on west side
- 3 East-West Passage
- 4 Ave C Bike Boulevard
- 5 Prairie Sunset Trailhead
- 6 Prairie Sunset Extension
- 7 Sidewalk
- 8 Harry Street Sidepath
- Enhanced Crosswalk

- Shared use path on east side 1
- Sidewalk 2
- East-West Passage 3
- Ave C Bike Boulevard 4
- Prairie Sunset Trailhead 5
- Prairie Sunset Extension 6
- Harry Street Sidepath 7
- Enhanced Crosswalk





- 1 Existing sidewalk
- 2 Crosswalk with connection of Sedgwick Street sidewalk to path
- 3 New paved path immediately south of building, moving parking to the south
- 4 Painted path through ballfield plaza area

EAST-WEST SCHOOL CONNECTION

This project will provide a safe route for students walking to school from the center of town. This route between Main and 295th Street is already used today, as evidenced by multiple 'goat paths' worn into lawns. This proposal will strengthen the connection with a path that is more clearly defined and connected to the proposed 295th Street and Main Street protected low-speed vehicle lane.

Proposed Treatment

- Use the sidewalk (7.5' wide) along the south side of the High School parking lot which accounts for about

35% of the total distance. Install bumpers to ensure parked vehicles do not overhang the sidewalk. Remove prohibition of bicycles from this path. Ideally, sidewalk should be widened to 10 feet.

- Build new 10 foot path south of existing buildings.
- Mark the Sedgwick Street crossing with a crosswalk and trail crossing sign. Connect Sedgwick Street sidewalk to path.
- Paint a defined path through the plaza/concourse area south of the ballfield.



MAIN STREET TREATMENT

Main Street is Garden Plain's "community street," central to the image and identity of the city. The active transportation system provides an opportunity to bring additional life, vitality, and economic opportunity to the historic downtown center through improved connections and by restructuring the character of public spaces in downtown.

Main Street is approximately 65' wide (curb to curb) with

diagonal parking from the current railroad (and future Prairie Sunset Trail extension) to Mary Avenue. The street is wider than necessary, and is striped for underutilized on-street diagonal parking largely to take up this width. A better use of space would be reallocating the street width to provide a two-way protected lane for bicycles and low-speed mobility devices such as scooters, golf carts, and motorized wheelchairs. This type of infrastructure has several major advantages, including:

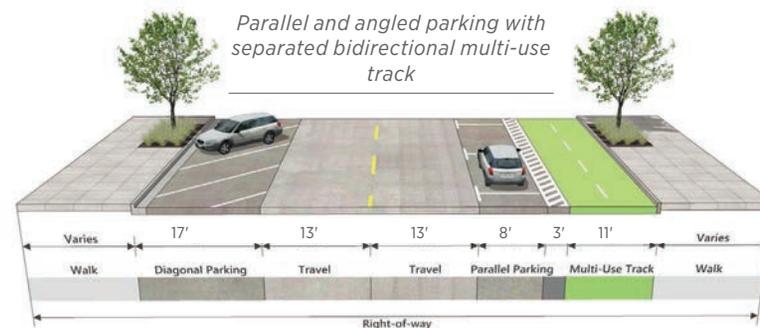
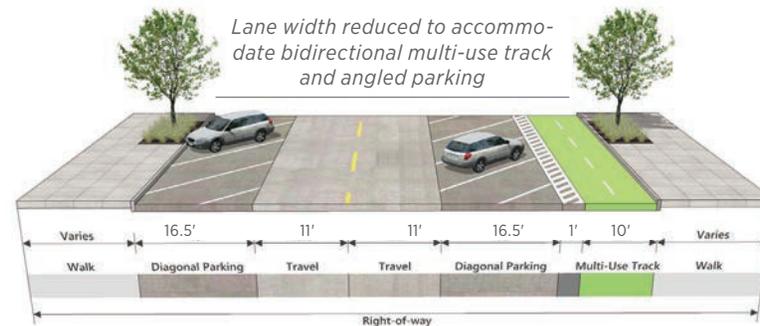
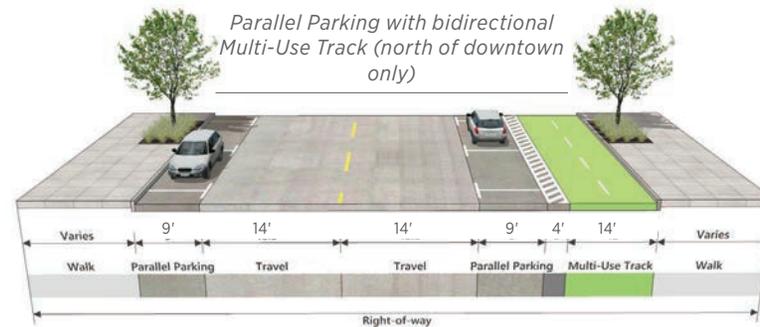
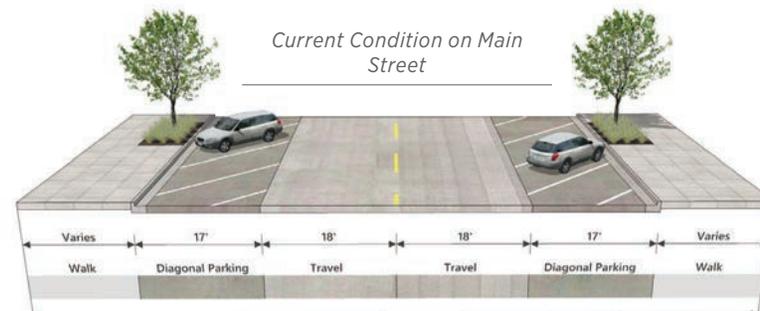
- Providing an innovative multi-use facility at relatively low-cost.
- Creating a direct trail-like link from many of the town's attractions to the Prairie Sunset Trail.
- With intersection improvements at Harry Street, producing a direct link to the Senior Center and the north side of Garden Plain.

Currently, the street also lacks sidewalks north of Avenue B on the east side and north of Abel Avenue on the west side.

Treatment Proposed

The protected shared use lane concept provides a two-way path on the east side of Main Street with a minimum width of 10 feet, separated from parked cars by a three-foot painted buffer with flexible bollard delineators or a raised curb. The illustrations at right display the existing street section and options for modifying the street between curbs.

- Installation of sidewalks between Abel and Harry on the west side of the street and Avenue B and Harry on the east side.
- Conversion of diagonal parking to parallel parking from Avenue B to Harry, or diagonal parking on one side with parallel parking on the opposite side and installation of a parking protected two-way facility for bicycles and low-impact motorized conveyances.
- Consider extending the diagonal one-side/parallel opposite side parking treatment with a parking-protected multi-use track between Avenue D and a future Prairie Sunset Trail extension and Avenue B.



Main Street Today

- Diagonal parking on both sides for a distance of 1/3 of a mile (exceeds demand)
- 19 foot travel lanes (excessive and leading to high traffic volume and pedestrian discomfort)
- An excess of 12 feet added to the travel lanes

Multi-Use Track with Parallel Parking (north of Ave B)

- Reduce the travel lanes to 16 feet
- Provide parallel parking on both sides
- Establish protected two-way track for bicycles, scooters, motorized wheelchairs, golf carts

Multi-Use Track with Diagonal Parking (Town Center south of Ave B)

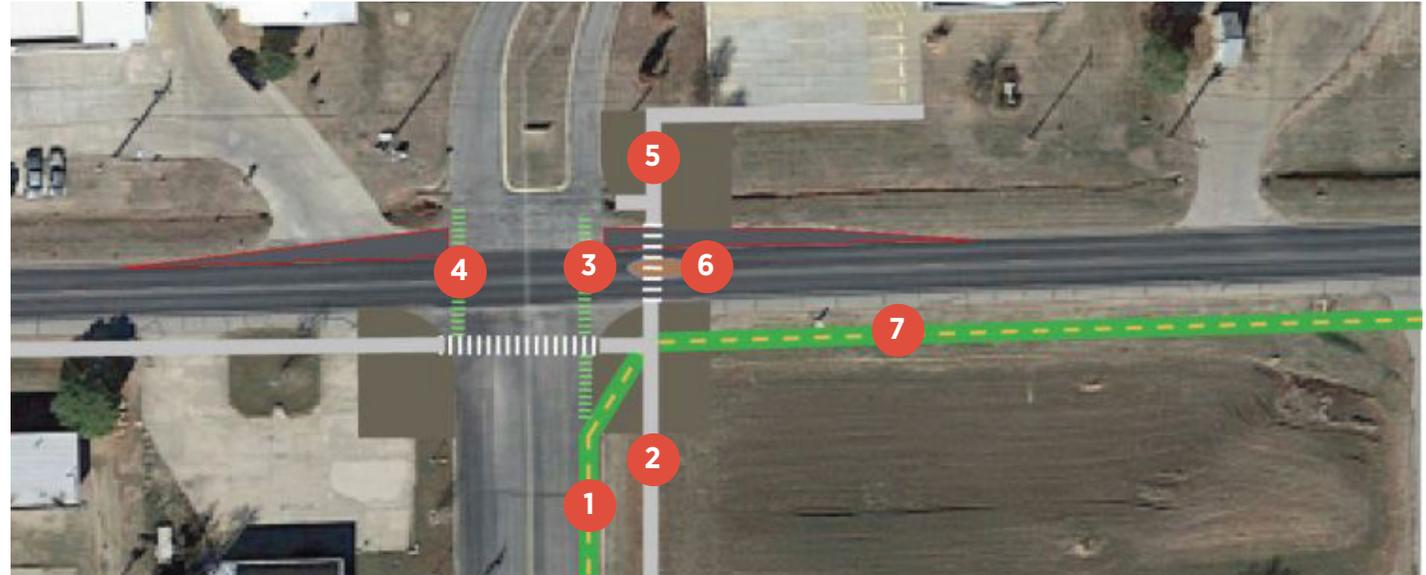
- Reduce the travel lanes to 11 feet
- Provide diagonal parking on both sides with 16.5 feet perpendicular distance from curb
- Provide free-standing raised curb between two-way shared use track

Multi-Use Track with West Side Diagonal and East Side Parallel (full length)

- 13 foot travel lanes.
- West side diagonal and east side parallel parking
- Recommended for downtown blocks, but also applies to the Avenue B to Harry segment



From top: Two-way protected bike lane using raised curb; painted buffer with flexible bollard delineators; parklet adds color and amenity by converting a parking space into a small seating area.



Harry and Main Intersection

- 1 Main Street protected shared use lane
- 2 New sidewalk East-West Passage
- 3 Northbound bicycle crossing
- 4 Southbound bicycle crossing
- 5 Sidewalk to Senior Center
- 6 Minor widening and refuge median
- 7 Harry Street Sidepath

- Redesign Main and Harry Street intersection to provide a safe crossing to the Senior Center and between the north and south sides of town.
- Tactical interventions such as public art, planters, traffic calming, and parklets at occasional locations in place of parking stalls.

SIDEWALK CIRCULATORS

Sidewalks are an important component of any city's residential pedestrian system. Several of the streets in the core of the city already contain sidewalks including parts

of Avenue B, C, and Main Street. The circulator concept improves the condition of sidewalks and extends them to link neighborhoods with the active transportation network.

Specifically, the sidewalk circulator network includes the following segments:

Avenue C. A direct east-west connection from 295th Street to Biermann Street, the Avenue C segment would use existing sidewalks on the north side of the street to take pedestrians through the core of the city. Avenue C serves the Prairie Sunset Trail, City Park, Downtown, and the Community Library. Avenue C is also designated as a bicycle boulevard and will serve as an interim connection from the Prairie Sunset Trail to the center of town before the PST extension is complete.

Avenue B. Like Avenue C, Avenue B provides additional service between 295th Street and Doyle Street and the destinations along its path.

Biermann Street. Biermann Street provides a north-south connection parallel to downtown, from Avenue C to Harry Street. The segment provides service to the mill, the Community Library, and the residential areas west of Main Street.

Treatment Proposed

- Preserve, maintain, and replace existing sidewalks when necessary. Standard for new sidewalks and substantial repairs should be a minimum of 5' wide.
- Intersections should include ADA compliant sidewalk ramps and directional crossings and crosswalks.
- Use signage to designate these routes as Bike Routes.
- A "virtual on-street sidewalk" might be considered as an interim measure or application in very low traffic conditions when standard sidewalks are considered too expensive or encounter opposition. In the typical 36-foot local street section, parking is limited to one-side. A five foot walking lane is separated by a two to three foot painted buffer.



"Virtual sidewalk" concept for local streets may provide a lower cost option to conventional sidewalks on appropriate streets.

Implementation Approach

- Complete an inventory of sidewalks conditions throughout the extent of the sidewalk circulator network, identify deficiencies, and budget for improvements annually.
- Engage with the school district, St. Anthony's and the Wichita Area Metropolitan Planning Agency regarding the completion of the East-West School Connection (West Extension).

HARRY STREET

Harry Street is Garden Plain's second major arterial street. As the former US 54 Highway, it is home to several commercial ventures and community destinations, including the Senior Center and the school's track and recreational fields. As a component in the network, Harry Street connects 295th Street (and its proposed trail) and Main Street (and its proposed improvements) while also providing an important connection between the neighborhoods north and south of Harry Street.

Treatment Proposed

- Enhanced Sidewalk/Shared Use Path

NATURE TRAIL

Envisioned as the completion of a loop around the school using the improved sidewalk/sidepath along the east side of 295th Street. The nature trail would leverage the existing pedestrian crosswalk, the planned trail along 295th Street, and the location of floodplain land east of the middle school.

The nature trail could be paved or use natural materials. As an amenity, it is primarily for recreation and perhaps education, but could serve as a destination in and of itself.



Harry Street Existing Condition

Treatment Proposed

- 6-10 feet of graded trail composed of either pavement or natural materials
- Consider interpretive or education signage to tell the stories of the prairie and its settlement
- Consider signage that includes distance measurements and material about the health impacts of walking to promote physical activity



Top: Louisiana's Tammany Trace Trail boasts a variety of family-friendly features that make it a compelling destination for people of all ages.

Above: Children's Museum and Kids Konnection

Goddard's linear park and a similar potential in Garden Plain could provide the same kind of attraction for families with kids in the Wichita area.

PRAIRIE SUNSET TRAIL EXTENSION

The Prairie Sunset Trail is a great asset for Garden Plain as a quality of life amenity and potential economic resource. Garden Plain is a common turn-around and the community should seek to leverage this through commercial ventures, such as the snow-cone business in Goddard.

Many stakeholders have expressed an interest in extending the trail westward; while this will likely happen eventually due to a well-established advocacy organization in ongoing conversations with the railroad, it is not an immediate priority of this plan. Garden Plain would benefit most from a short extension of the trail to Main Street that would enable the creation of a central park. By bringing trail users directly into the commercial core, the downtown would receive a more immediate benefit from trail users who may be interested in spending time and money in Garden Plain.

Treatment Proposed

- Shared use path, crushed limestone, former railroad bed

Cost and Implementation Partners

- 0.23 miles * (\$75,000/ 1 mile) = \$17,250 for a crushed limestone trail from Section Line Road to Main Street
- Direct trail access to downtown
- Align with the central park opportunity
- Economic opportunity in downtown



Top: Prairie Sunset Trail; Above: Goddard's popular linear park

AFTERWORD: THOUGHTS ON THE PRAIRIE SUNSET CORRIDOR

The Prairie Sunset Trail, developed through the volunteer efforts and considerable private contributions of Prairie Travelers provides its users with a great experience. It is parallel to but largely sheltered from the traffic of Kellogg Avenue, the main street of the Wichita region. The trail remains a relatively undiscovered resource by many residents of the Wichita metropolitan area. The popularity of Goddard's Linear Park and splash pad, crowded with kids and parents in the summer, hints at what this trail could be as it travels from the edge of Wichita through Goddard and eventually reaches its western end at Garden Plain's iconic covered bridge.

We think that Louisiana's Tammany Trace Trail, on the north shore of Lake Ponchartrain between Covington and Slidell, provides a sense of the potential of the PST, with its passage through the heart of Goddard and, we hope, someday Garden Plain. The Tammany Trace, on former Illinois Central right-of-way purchased in 1992, now stretches for 31 miles and connects a string of family-oriented activities. These include the barrier-free and inclusive Kids Konnection Playground and Pavilion and Children's Museum; the Covington Trailhead with a bandstand, visitor center, movie theater, exhibit hall, and Wednesday Farmers' Market; the Abita Springs Trailhead Museum, playground, and Tourist Park; the Mandeville amphitheater, splash fountain, pavilion tower, and iconic businesses including a candy store; the Lacombe drawbridge; and the Slidell Heritage Park, as well as endless opportunities to wander off the trail into the natural setting of this unique part of the country. The trail is a sequence of features, a short bike ride apart, all specially designed to peak the interest of kids and their families. Despite the fact that reaching it from New Orleans requires a 30-mile drive across the lake, it has become an enormous attraction and resource for an already attraction rich metropolitan region.

We believe that the PST, from Wichita to Goddard to Garden Plain could have a similar quality for the Wichita metropolitan area. The Goddard Linear Park has already become a destination in its initial year, the trail has distinctive features and environments along its length, and Garden



Above: Abita Springs Hotel and Gardens,

Right from top: Iconic bike and coffee shop at historic Covington; Abita Springs Museum; Abita Springs Music Pavilion and Park; Candy Bank at Mandeville

All these features are in the westernmost 12 miles of the Tammany Trace Trail in Louisiana.

Plain's possibility of a downtown trailhead is still a blank and unrealized canvas. We don't know what this trail can be, and would leave that to the creativity and imagination of the people who started this process and use the trail. But we do think that this can be more than just a nice out-and-back trail experience. It can be a destination where users of all ages visit and make memories that will stay with them throughout their lives.





Chapter Four:

Implementation and
Sequencing

PHASING AND IMPLEMENTATION

The active transportation system should emerge in increments as funding, energy, and partnership opportunities align. The sequencing of the system proposed here follows these criteria and principles:

Response to demands. In every phase, high priority routes should address existing demand patterns, and serve destinations that are valuable to users and appropriate endpoints for active transportation. The survey results summarized in Chapter 2 provide valuable information on the importance of various destinations.

Route integrity. High priority routes and projects should provide continuity between valid endpoints such as destinations and trails. 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, resurfacing and street rehabilitation projects, and other infrastructure projects

Safety enhancement. High priority projects should 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. Developability helps determine priorities. The initial system should serve major destinations and provide good connectivity while minimizing large scale projects.

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 4.1 identifies typical costs per mile for the different types of bicycle and pedestrian facilities anticipated for the network in Garden Plain.

SEQUENCING

The following pages present a prioritized sequencing program based on the above criteria and performance principles discussed earlier in this plan. The first phase must deliver a high level of service in Garden Plain 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. For example, a metropolitan area program to upgrade major rural corridors like 295th Street can present an opportunity to accomplish the previously discussed project. In any case, the design of programmed projects should incorporate the pedestrian and bicycle initiatives identified here.



FIGURE 4.1: Cost Estimates for Infrastructure Installments

INFRASTRUCTURE TYPE	COST/MILE	TYPICAL FEATURES
Marked and signed route	\$17,000	Signage, shared lane markings
Bicycle boulevard	\$40,000-70,000	Signage, shared lane markings, routine intersection enhancements such as crosswalks, stop control modifications, occasional traffic calming features
"Virtual sidewalk"	\$70,000	Painted parking lane on one side, buffered on-street walking lane on opposite side, signage
Conventional bike lanes	\$102,000	Lanes defined by white lines in both directions on a street
Protected bike lanes (Painted buffer)	\$115,200 two way	Painted bike lanes with cross-hatched buffer area between bike lane and parking; flexible bollard delineators
Protected bike lanes (Curb separation)	\$200,000 two way	Painted bike lanes with cross-hatched buffer area between bike lane and parking; flexible bollard delineators
Shared use sidepath	\$400,000-600,000	10 foot paved roadside shared use path, cost depends on need for major earthwork, retaining walls, other structures
Shared use path (paved trail on exclusive right of way)	\$400,000-600,000	10-foot paved path on right-of-way separate from roadways. Range reflects various levels of construction complexity. Higher cost reflects more complicated construction, such as additional grading and sitework.
Shared use path (gravel)	\$100,000	Gravel on separated right-of-way or parallel to a roadway
Sidewalk	\$175,000	5 foot concrete sidewalk with ADA-compliant intersection ramps
Drainage ditch burial in culvert	\$400,000	30 inch concrete culvert
Intersections or Barriers (Generic cost points)		
Type A: Major Intersection Construction	\$250,000-500,000	Major projects such as protected intersections, frontage road relocation, or other substantial projects.
Type B: Arterial Crossing	\$100,000	Major intersections but requiring less capital work than protected intersections. May include improved signalization, improved crosswalks, bumpouts, minor construction
Type C: Median with HAWK	\$150,000	Crossing refuge median with hybrid beacon
Type D: Median with flashing beacon	\$75,000	Crossing refuge median with flashing warning beacons in place of positive red stop signal
Type E: Enhanced	\$30,000-50,000	High visibility crosswalks, minor construction but normally without signalization. Higher end includes RRFB



PHASE 1

Section Line Road. The Section Line Road (295th Street) sidepath from Avenue D to Harry Street is Garden Plain's top priority, even though it is one of the highest cost elements of the network. This important project increases access to the schools, city park, and the Prairie Sunset trail while also tying into existing pedestrian elements including sidewalks and the enhanced crossing of Section Line Road at the schools. The improvements to Section Line Road address the most immediate need in the city and should be a project that builds the momentum that will lead logically to the later phases of the system. If necessary, this path may be built in two sections: 1) from the Prairie Sunset Trail to the East-West School Connection and the pedestrian crossing between the two school campuses and 2) the balance of the path extending south to Avenue D and north to Harry Street.

The alternative shown in the table assumes:

- A 6-foot path from Harry to the elementary school drop-off loop.
- Using the drop-off loop sidewalk to the Section Line Road crosswalk.
- Enhancing the crosswalk with high-visibility markings and a Rapid Rectangular Flashing Beacon.
- Placing surface drainage in a buried culvert and building a shared use path on top between the crosswalk and the Prairie Sunset Trail.
- Continuing the shared use path to Avenue D.

East-West School Connection. This provides an extremely cost-effective bicycle and pedestrian connection between Main Street and both schools.

Main Street. Completing a protected shared use lane for low-speed vehicles and filling sidewalk gaps to connect the center of town to the Senior Center and north side. This includes an enhanced crossing of Harry Street.

Avenue C "Bicycle Boulevard". This provides a complete east-west connection to west side streets with a continuous sidewalk.

Trail Connection to Section Line. This completes an unfinished section of the PST from the trailhead to Section Line Road.



FIGURE 4.3: PHASE ONE ESTIMATED COSTS

Route Project	Segment	Segment Length (Miles)	Facility Treatment	Cost/Mile or unit	Street Channel or Path Cost	Required Sidewalk Length (Miles)	Cost/Mile Required Sidewalk Length (Feet)	Sidewalk Cost	Total Projected Cost
Section Line Road (295th Street)	Harry to elementary school loading loop, east side	0.12	6' path	\$210,000	25,200				\$25,200
	East-West Path/south edge of high school parking lot to D Avenue	0.35	10' shared use sidepath	\$500,000	175,000				\$175,000
	East-West Path/south edge of high school parking lot to Santa Fe Street	0.27	Burial of surface drainage ditch in culvert	\$400,000	108,000				\$108,000
	School crosswalk enhancement	LS	High visibility crosswalk with RRFB	\$40,000	40,000				\$40,000
	Harry to high school parking, west side	0.12	5' sidewalk			0.12	\$175,000	21,000	\$21,000
	Total	0.74			348,200			21,000	\$369,000
East-West Path	Existing path on south edge or parking lot, Section Line to Sedgwick	0.08	Existing walkway. Parking lot could be striped to provide advisory path for bikes on north side of lot, with 90 degree parking	Existing	0				0
	Sedgwick to Loomis	0.07	10' shared use path	\$400,000	28,000				\$28,000
	Loomis to Main	0.07	Striping of bike track through exiting paved plaza	\$50,000	3,500				\$3,500
	Total	0.22			73,900				\$31,500
C Avenue	Doyle to Section Line	0.38	Bicycle boulevard signage and shared lane markings; 5-foot continuous sidewalk on north side	\$30,000	11,400	0.15	\$175,000	26,250	\$37,650
	Total	0.38			11,400			26,250	37,650
Main Street	D Avenue to beginning of diagonal parking	0.09	Protected low-speed vehicle track with painted buffer and flexible delineators	\$120,000	10,800				\$10,800
	Downtown district to B Avenue	0.13	Protected low-speed vehicle track with raised parking curb, breaks for driveway access	\$210,000	27,300				\$27,300
	B Avenue to Harry	0.43	Protected low-speed vehicle track with painted buffer and flexible delineators; continuous 5-foot sidewalks on both sides	\$120,000	51,600				\$51,600
	B Avenue to Harry	0.43	Continuous 5-foot sidewalks on both sides			0.43	\$175,000	75,250	\$75,250
	Enhanced intersection at Main and Harry	LS	Crossing median, high-visibility crosswalks, walkway to Senior Center	\$125,000	125,000	0.05	\$175,000	8,750	\$133,750
	Total	0.65			214,700			84,000	\$298,700
Prairie Sunset Trail	Trailhead to Section Line Rd	0.10	Continuation of shared use path	\$100,000	10,000				\$10,000
	Total	0.10			10,000				\$10,000
PHASE ONE TOTAL		1.71							\$736,850

FIGURE 4.5: PHASE TWO ESTIMATED COSTS

Route Project	Segment	Segment Length (Miles)	Facility Treatment	Cost/Mile or unit	Street Channel or Path Cost	Required Sidewalk Length (Miles)	Cost/Mile Required Sidewalk Length (Feet)	Sidewalk Cost	Total Projected Cost
Sidewalk Routes	B Avenue, Section Line to Doyle	0.38	5' sidewalk on the north side			0.13	\$175,000	\$21,000	\$22,750
	Doyle St,	0.38	5' sidewalk on the east side			0.38	\$175,000	\$66,500	\$66,500
	Biermann, Abel to C Avenue	0.38	Existing sidewalk on west side			0	\$175,000	0	0
	Abel, Biermann to Main	0.10	5' sidewalk on the north side, crosswalk to Main Street			0.10	\$175,000	\$17,500	\$17,500
	D Avenue, Section Line to Main	0.23	5' sidewalk on north side			0.23	\$175,000	\$40,250	\$40,250
	Total	1.47						\$145,200	\$145,200
Harry Street	Section Line to Doyle	0.38	Shared use sidepath on south side	\$500,000	\$190,000				
	Total	0.38			\$190,000				\$190,000
North Main	Harry to Northern	0.38	Bicycle boulevard signage and shared lane markings; 5-foot continuous sidewalk on east side to serve park	\$40,000	15,200	0.38	\$175,000	\$66,500	\$81,700
	Total	0.38			15,200			\$66,500	\$81,700
Prairie Sunset Trail	Section Line Rd to Main	0.23	Continuation of shared use path, land preparation and grading	\$200,000	46,000				\$46,000
	Total	0.23			46,000				\$46,000
	PHASE TWO TOTAL	2.56							\$462,900

PHASE 3

Phase three extends the core network to the north and west, and assumes eventual development of properties along 295th Street and at the interchange.

Nature Trail. A complement to the improvements on Section Line Road, the proposed nature trail around the perimeter of the elementary school, city park, and "wet" areas on adjacent properties would provide a recreational asset for residents.

Paths around development areas. Paths along the platted Northern Drive and existing Sedgwick Street would serve development sites on the southwest quadrant of the US 54 interchange.

Garnett Avenue. Sidewalk along this street would connect a 295th Street development corridor to north side neighborhoods.

Future growth. While not on the basic system, several other potential corridors exist that should be incorporated into future development when it occurs. These include:

- A path or greenway between existing houses on Sedgwick and the 295th Street corridor, connecting back to the 295th and Harry intersection.
- An enhanced crossing at Garnett as development occurs on the southeast quadrant of the interchange.
- Depending on the nature of development, a shared use path that provides a direct connection back to 295th and Harry, with access to the schools.

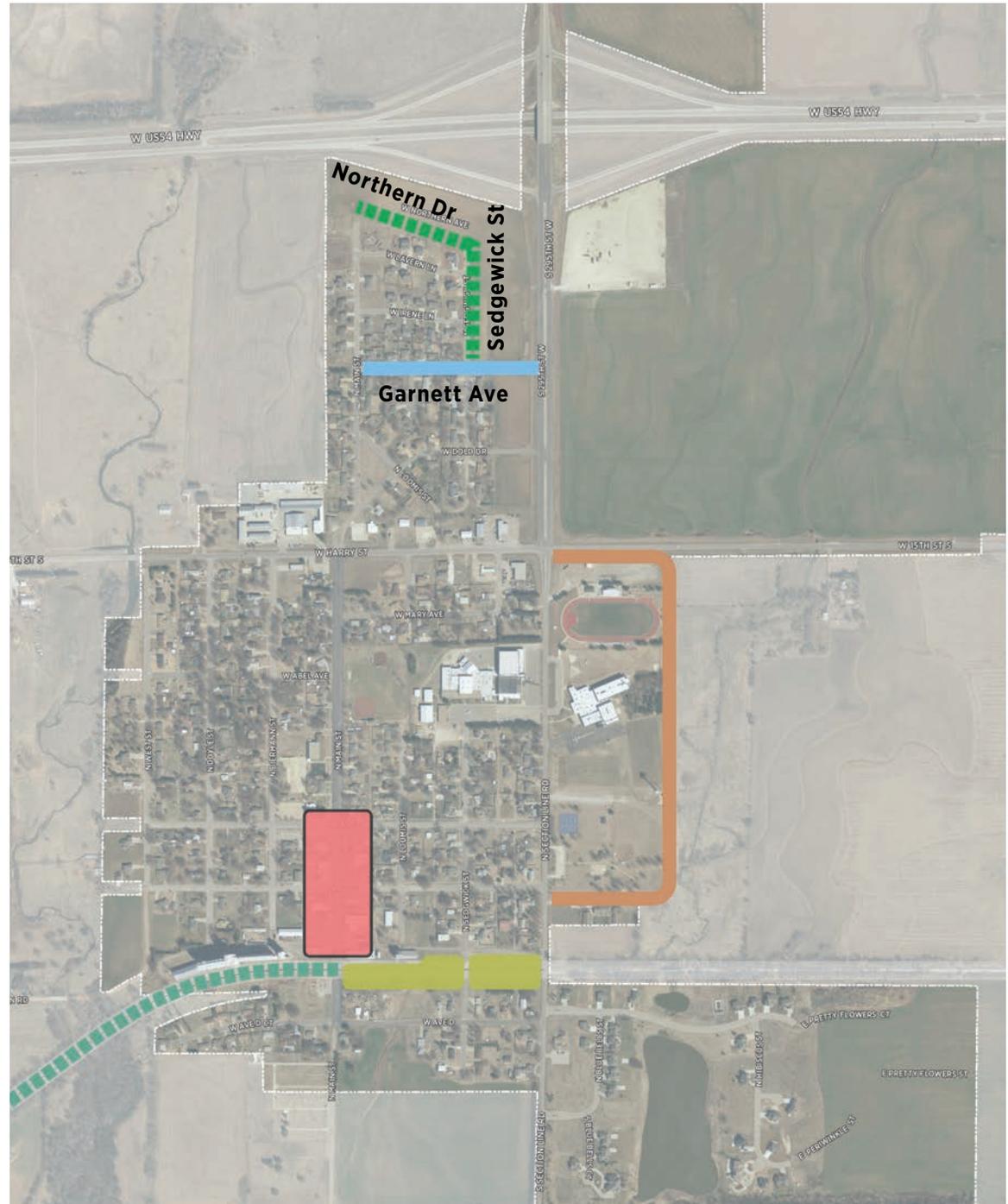


FIGURE 4.6: PHASE THREE NETWORK

FUNDING DIRECTIONS

Given the multi-year nature of this active transportation program, identifying and sustaining funding sources is critical. Many projects involving on-street routes could be incorporated into normal maintenance activities - thus the marginal cost of activities such as painting and maintaining multi-use shoulders may be significantly lower than the cost factors incorporated here. Bicycle boulevards and routes could be implemented through relatively inexpensive wayfinding or street signs as well. But some projects involve substantial capital cost. Highest among these are those projects that users like best - those that offer separation from motor vehicles.

The Wichita Area MPO, through its funding of this and other planning efforts in the metropolitan area, has demonstrated a strong focus on active transportation, and is likely to back up this commitment with competitive funding programs. This review considers possible funding sources that can complement the largely private initiatives and civic mindedness of groups like Prairie Travelers, which have developed and maintained one of the region's best active transportation facilities. Many of these programs involve federal transportation and recreational funding assistance that may be uncertain in the future. The following discussion identifies sources available as of the plan adoption.

FEDERAL TRANSPORTATION ACT PROGRAMS

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. In many cases, state and regional entities administer these funds to local agencies through competitive grant programs. The following is a list of the current federal programs available for bicycle and pedestrian programs.

FAST ACT

The FAST (Fixing America's Surface Transportation) Act became law in 2015 and remains at present the primary source of transportation assistance.



The Flint Hills Nature Trail 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.

FAST programs include:

- **The Transportation Alternatives Program.** The TAP was authorized by MAP-21 in 2012 and has been continued by the FAST Act, through federal fiscal year 2020. 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. The TAP program replaced multiple programs, including the Transportation Enhancement Program, the Safe Routes to School Program, and the National Scenic Byways Program.
- **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.

TIGER DISCRETIONARY GRANTS

TIGER (Transportation Investment Generating Economic Recovery) originated as part of the American Recovery and Reinvestment Act and has focused on funding for innovative livability, sustainability, and safety projects. Despite several threats to funding, this program remains in operation at present. TIGER could be a source for enhancing and expanding the Prairie Sunset Trail (PST) as a regional resource with improved connections into Wichita, development of trail-related economic development activities, and coordination with regional transit.

NATIONAL RECREATIONAL TRAILS

This venerable program, administered in Kansas by the Kansas Parks, Wildlife and Tourism Department (KDPWT), 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.

STATE AND LOCAL FUNDING SOURCES

Given uncertainties over federal funds, state and local funding emerges as the most reliable option for multi-year programs.

KANSAS ATTRACTION DEVELOPMENT GRANT

This program provides economic assistance to public and private entities and nonprofits that are developing tourism attractions. It may be applicable to develop the PST corridor into a major family-oriented recreation and attraction corridor with regional appeal.

CAPITAL IMPROVEMENT PROGRAM

As a small community, Garden Plain has limited local funding ability to direct to active transportation. 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.

Major industries may see the direct benefit to them in trail projects that improve health, advance recruitment programs,

FIGURE 4.8: Planning Level Maintenance Costs

FACILITY TYPE	ANNUALIZED COST/ MILE	TYPICAL MAINTENANCE TASKS
Shared-Use Path	\$10,000	Sweeping, trash removal, mowing, weed abatement, snow
Removal, crack seal, sign repair	\$2,500	Sweeping, trash removal, mowing, weed abatement, snow removal, crack seal, sign repair
Sidewalk	\$2,500	Sweeping, trash removal, mowing, weed abatement, snow
Removal, crack seal, sign repair	\$1,500	Sign and shared lane marking stencil replacement
Separated/Protected Bike Lanes	\$4,000	Debris removal/sweeping, repainting stripes and stencils, sign replacement, replacing damaged barriers
Bike Lanes/Advisory Bike Lanes	\$2,500	Repainting stripes and stencils, debris removal/sweeping, snow removal, signage replacement as needed
Bicycle Boulevard	\$1,500	Sign and shared lane marking stencil replacement as needed
Shared Connecting Route	\$1,000	Sign and shared lane marking stencil replacement as needed

and expand access choices. Other significant trail and active projects have been funded by community contributors through fund-raising drives and even naming rights.

In Kansas, the Sunflower Foundation has been a major conduit for philanthropic funding of trails and other active communities projects. Other state and national foundations with substantial local interest also have funded related improvements in the past.

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 4.8 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.



Chapter Five:

Support Programs

IMPLEMENTATION

While active transportation planning often relies heavily on infrastructure, it also should build a culture and daily routine that supports walking and biking as a normal part of life. Even in a small town where many local trips can be made on foot, bike, or low-speed vehicle, people drive from place to place out of habit. Garden Plain is commendable for its efforts to ingrain walking into the everyday lives of its children.

The League of American Bicyclists (LAB) 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

The most obvious element of the approach are trails, sidepaths, sidewalks, bicycle lanes, and street crossings. While an essential element - most of this plan is dedicated to physical projects - engineering improvements need the support of a balanced approach to yield the greatest possible benefit to the community as a whole. Areas considered under the engineering category include:

- Existence and content of a bicycle (and pedestrian) master plan
- Accommodation of cyclists on public roads
- Presence of both well-designed bike lanes and multi-use paths in the community
- Availability of secure bike parking
- Condition and connectivity of both the off-road and on-road network

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 increase users' comfort and ease of navigating the street system. Most important, it can lead users of the Prairie Sunset Trail to the center of town and other local attractions. 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 also being used in the Wichita metropolitan area. 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.
- On bicycle boulevards such as Avenue C or North Main Street, a special street sign may be used to help provide additional notification to motorists and wayfinding information to bicyclists.



Special street sign for bicycle boulevards. These reinforce the special quality of these streets and would be used in place of standard street signs. Topeka is using a version of this concept on its primary bike routes.



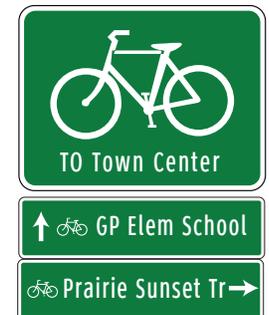
The W11-15 sign would be used at unsignalized crossings of bike and pedestrian routes at major streets. The signs provide advance warning of the presence of pedestrians and bicyclists and is oriented to the major street.



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 standard D1 series Bicycle Guide Sign uses specific destinations with distances if necessary. It is more appropriate in places where people have less familiarity with the bicycling environment, such as rural areas. These signs may be combined on a single (above) or stacked on a single pole (below).



- Motorist advisory signs. The R4-11 Bicycles May Use Full Lane is usually the preferred sign on shared routes.

The graphic system should be modular to provide maximum flexibility and efficiency in fabrication. Signs should also use reflective material for night visibility. The Clearview font is recommended as a standard for text.

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 Senior Center, both existing city parks, the stadium and ballfield, both schools, the Prairie Sunset Trailhead, and convenience stores. In downtown, one diagonal parking stall may be converted to a bike corral, with bike parking installed within the stall. This arrangement can accommodate up to 20 bikes.



Left: Bike parking as art. Inverted U's at the University of Nebraska at Omaha, enhanced with the school's maverick mascot. Right: Standard inverted U's and an umbrella sheltered vertical parking facility at a regional transit station outside of Boulder.



Above: On bike routes without pavement markings other than shared lane markings, the Bicycles May Use Full Lane has generally received acceptance over the older "share the road" signs. We recommend its use where necessary or appropriate.

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

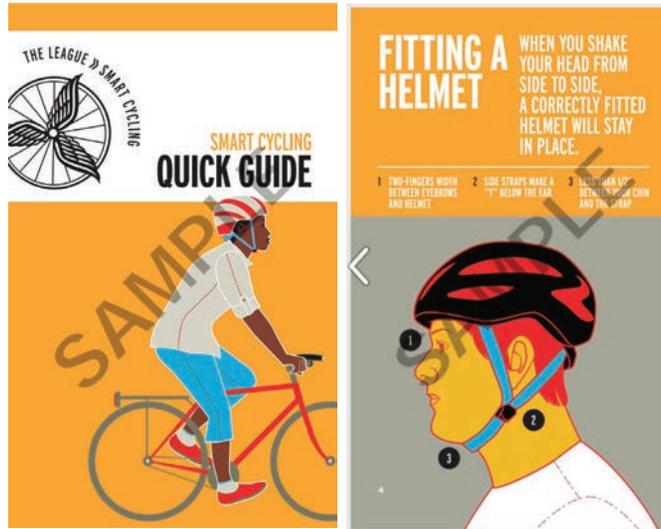
Education is about showing and teaching people the value of active transportation, the appropriate way to use the improvements, and to include stakeholders of all ages and backgrounds in active transportation. Education often includes programs conducted by the schools and the city government such as 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.
- Number of League Cycling Instructors (LCI) in the community. The LCI program includes a standard BikeEd program that is executed by local residents who are trained and certified as instructors.
- 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.

Smart Cycling Programs

- **Encourage training of league certified instructors (LCI's) in the area in cooperation with Bike Walk Wichita.** 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 Wichita (www.bikewalkwichita.org) offers a variety of Smart Cycling classes and promotional efforts. Working with this metropolitan advocacy organization to train LCI's to



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.

serve the Garden Plain/Goddard area and expand class opportunities here would help expand bicycle use and safety.

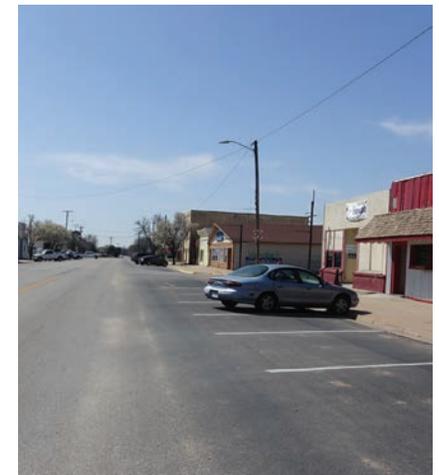
- **Develop and implement bicycle education programs for kids.** Young bicyclists perceive the riding environment differently from adults, and obviously have neither the visual perspective nor experiences of older riders. Schools and safety groups often offer “bike rodeos” which may or may not address 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 making a concerted effort to demonstrate to residents that Garden Plain should be a place where people feel comfortable walking and riding their bikes around town. Encouragement initiatives include things like bike rodeos, walking school-buses, and fun community events



Future Prairie Sunset Trail link from tail-head to the town center.



Main Street Looking South Towards Ave C



Case Study: Orange County, Florida's Comprehensive School-Age Pedestrian Safety Program.

In response to a number of crashes involving school-aged children the Orange County, Florida's safety team initiated a curriculum for children K-12. The safety team was made up of volunteers from the Sheriff's Office, Police and Fire departments, engineers, the school board, and various other community groups; this strong conglomeration of people ensured that the group was heard and their call to action met. The curriculum was developed largely by the school board and launched with the help of the Sheriff's Office, spreading the message of safety in age appropriate ways. Elementary school children were guided by safety specialists through various situations that they would encounter on their walks to school. Older children in the middle schools and high schools were presented the material via posters, videos, books, presentations, and in-class assignments. The development and implementation of the program took roughly a year and a half. The program is a comprehensive approach given the background and disciplines of all those involved and its inclusion of safety procedures and the laws governing pedestrian activity in its creation.

oriented around walking and biking. Areas considered under this element include:

- Programming such as Bike Month and Bike to Work Week events.
- Community and county bike maps and route finding signs.
- 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.

ENFORCEMENT

Enforcement is a unfortunately a necessary component of an active transportation system. 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 between the law enforcement and cycling communities.
- Presence of bicycle divisions of the law enforcement or public safety communities.
- Targeted enforcement to encourage cyclists and motorists to share the road safely.
- Existence of 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. Police participation adds a critical perspective to facility and safety program planning and implementation.
- Enforce 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.

- At the state level, Kansas has made two major statutory steps to become more friendly to bicyclists: the 3-foot separation requirement for motorists passing bicycles, and the Dead Red law, permitting bicyclists and motorcyclists to go through red signals that do not detect their presence. Barton County has installed signs advising motorists of the 3-foot legislation. This could be especially helpful on county section line roads like 295th Street and Harry Street.

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 the Prairie Sunset Trail or the Section Line Road Trail to quantify the value of the improvement as a quality of life amenity or the potential economic value that trail users could bring to Garden Plain businesses. 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.

While Garden Plain is a small community, it has proven its ability to accomplish big things. However, many productive supporting elements may be difficult for a community of 900 people to implement fully. One concept to address this

issue is a unified program with Goddard. Like Garden Plain, Goddard is developing an active transportation plan and both communities have an important stake in the Prairie Sunset Trail. With a combined population approaching 6,000 and likely to grow, the two communities together have the critical mass to launch an effective, cooperative active transportation program. Each community also has an important interest in the Prairie Sunset Trail and increasing the number of people in the Wichita metropolitan area who use it. The following discussion provides recommendations for the support systems for bicycling in the city, organized around the LAB's five categories of bicycle friendliness.

- **Create a local advisory committee to work with Garden Plain's local government and police to evaluate the impact and effectiveness of programs and activities.**

This committee should include representatives of the senior community to consider different types of mobility devices such as scooters, as well as pedestrian and bicycle interests. 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.** The very high response to the survey in Chapter Two indicates a large and committed constituency that is a great source of information and input. 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 bicycle transportation in Garden Plain and the surrounding area.

ENCOURAGEMENT

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.** 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. Monthly Garden Plain to Goddard community family rides on the trail could be both highly anticipated events and partnership opportunities for residents in the two towns.
- **Implement a bicycle ambassador program in middle and high schools.** Ambassadors are students with a special interest in bicycling who share that interest with their peers.

Bicycle Friendly Businesses

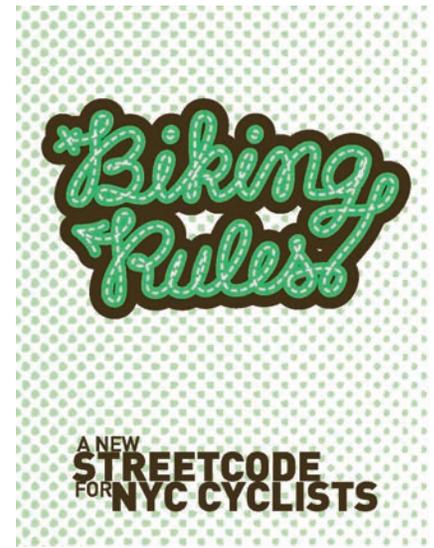
Encourage local businesses and employers to participate in the League of American Bicyclists Bicycle Friendly Business (BFB) program. The program recognizes businesses that both encourage their employees to use bicycles for transportation and provides special services and discounts to customers who walk or bike to their establishments. In Oregon, BFB programs have been very effective at promoting bicycle tourism along its Active Bikeways system. On a smaller scale, a BFB effort would help attract Wichita metro area hikers and bicyclists to the Prairie Sunset Trail.

Walking School Bus

Institute a walking school bus program at the elementary school. Several Kansas 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." Hoisington has an especially effective program, and the idea could be highly relevant to Garden Plain, where distances are short but kids walking to school must cross a busy road.



Source: walkingschoolbus.org



BIKING RULES STREET CODE:

6

PEDESTRIANS RULE
Pedestrians always have the right of way. PERIOD.

CrossWALKS
Leave crosswalks free and clear for safe walking. A bike in the crosswalk can take up as much space as a car. (Low: VTL §1231)

CLAIM A LANE
Claim space on the street, not the sidewalk. We know we hate it when cars drive in bike lanes. (Low: AC § 1976)

RIDE RIGHT
Ride in the direction of traffic. When we're on bicycles, we ARE traffic! And it is safer for everyone else on the street. (Low: VTL §1231)

Biking Rules. Excerpts from a street code to promote responsible urban cycling, developed by New York City's Transportation Alternatives advocacy organization. A similar regional approach to rules and ordinances can apply to the Wichita metro area as well.



Appendix:

Design Guidelines and Considerations



FACILITY TYPES

The various infrastructure components of the Garden Plain 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 Garden Plain network. Facilities included here are:

Shared streets and roads. 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. However, consideration is given here to the type of shared street referred to as "bicycle boulevards." The two streets in the Garden Plain system that fall in this category are C Avenue and North Main. 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. 295th Street from the US 54 interchange to Harry Street includes 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.

While the Garden Plain system does not include standard bike

lanes, two special types are applicable. These include:

- Buffered or protected bike lanes, which have a neutral area or buffer that separates them from motor vehicle travel lanes. This treatment is proposed for Main Street from D Avenue to Harry Street. They create a more comfortable setting for many users than standard bike lanes. In some situations, the bike lane is developed along the curb, and is separated by both on-street parked cars and a visual or physical buffer. In Garden Plain, the Main Street facility may be shared with low-performance motorized vehicles to assist people with reduced mobility.

- Advisory bike lanes. This new and still experimental facility uses dashed striped lanes to identify a territory for bicycles on streets too narrow for standard bike lanes. Cars use the advisory bike lane when passing each other in opposite directions.

Shared-Use Paths. 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 Prairie Sunset Trail and its proposed extension are 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. Examples in the system include the Nature Trail east of the

BICYCLE BOULEVARDS



Signage concepts for bicycle boulevards. 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.

Bicycle boulevards (sometimes referred to as neighborhood greenways, neighborhood bikeways, or quiet streets) are proposed for C Avenue and North Main in the Garden Plain system. Bicycle boulevards use the pavement marking conventions discussed above, but also may include other identifying and functional enhancements. Despite the name, "bicycle boulevards" are open as usual to motor vehicles, but 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. Bicycle boulevard signs include identification signs (special street signs and bicycle boulevard 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. This

Intersection and road priority. Bicycle boulevards 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.

Major street crossing installations. These features at crossings of bicycle boulevards and major streets help



Traffic calmer on a bicycle boulevard in Boulder, CO

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.

ADVISORY BIKE LANES

Advisory bike lanes are a type of shared roadway that clarify operating positions for bicyclists and motorists to minimize conflicts and increase comfort. Similar in appearance to bike lanes, advisory bike lanes are distinct in that they are temporarily shared with motor vehicles during turning, approaching, and passing. This experimental treatment is most appropriate where traffic volumes are low to moderate (500 to 3,000 vehicles per day) and where there is insufficient room for bike lanes or credible multi-use shoulders. If on-street parking is present, parking lanes should be highly utilized or occupied with curb extensions to separate the parking lane from the advisory bike lane.

Applications for advisory bike lanes in and around Garden Plain include:

- Relatively narrow, lightly traveled streets that are intended to function as principal bikeways. They could be used on the proposed bicycle boulevard segments of the system.
- Streets or roads with parking to establish a distinct area that motorists and bicyclists can expect to share the road.



Advisory bike lanes in practice. From top: Used in combination with a defined parking lane; along a narrow rural road (both photo credits: Alta Planning + Design); and in a contrasting pavement color in a downtown setting.

- Secondary paved rural roads with very low traffic and flat topography that connect communities or follow frequently used routes. On these roads, advisory bike lanes replace a painted center line. Motor vehicles travel in the primary center lane and use the full width of the road with advisory lanes when passing traffic in an opposing direction.

Short-term engineering evaluation studies have been performed on five US ABL installations. All of them have found the facilities to be safe and operating as intended. For more detail on this new technique, we recommend the Federal Highway Administration's Small Town and Rural Multimodal Networks design guide.

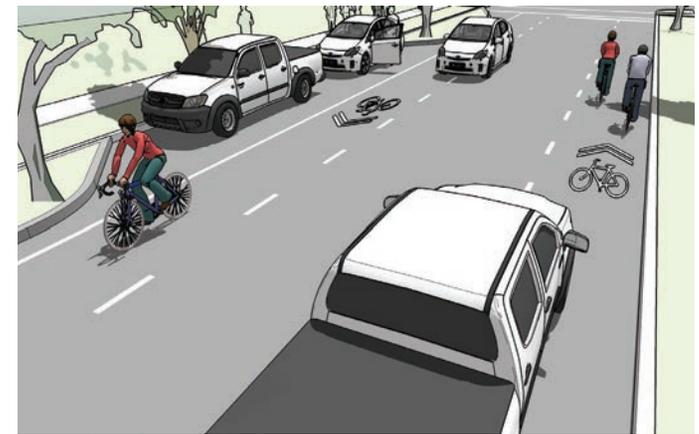


Diagram of advisory bike lanes

SHARED USE SIDEPATHS

Shared use sidepaths are significant parts of the Garden Plain system, proposed along Section Line Road and Harry Street, with possible applications in new growth areas as they emerge. They provide the separation from motor vehicles that many people want by using available right-of-way off the roadway itself for the shared-use path. 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 new 2012 standards were somewhat more tolerant, but still included major reservations about these roadside facilities. The likelihood is that the proposed AASHTO standards, now in review, may be still more accepting of these commonly used facilities. 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.

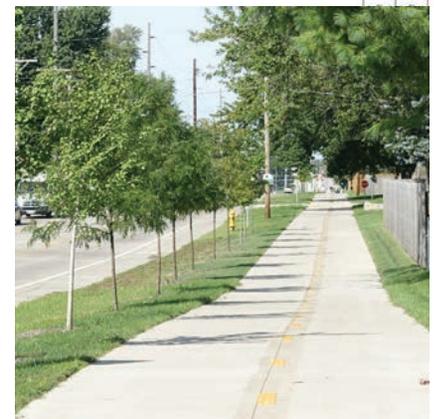
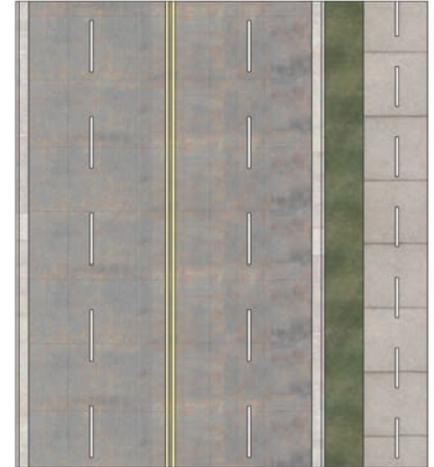
Consequently, experienced cyclists often prefer on-road facilities to roadside facilities. Yet, sidepaths, despite these issues, are used frequently and remain popular with many users. Many cyclists justifiably fear rear-end (or overtaking) crashes or distracted drivers wandering into even a well-designed bicycle lane. Sidepaths also accommodate pedestrians and other wheeled users who cannot use streets. Along major streets, they also provide continuity where other



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

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.



Sidepath section. Sidepath width and construction standards are similar to those for multi-use trails.



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

APPLICATION TO THE GARDEN PLAIN SYSTEM

- Conventional multi-use sidepaths, typically wide paths parallel to arterial streets, should ideally be used with relatively few driveway or street interruptions. Sidepaths are proposed along 295th Street (Section Line Road) and Harry Street.
- 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. An absolute minimum of 8 feet may be used in constrained areas. A one-way sidepath specifically for bicycle use may be combined with a sidewalk, providing separate territory for bicyclists and pedestrians and include directional markings for bicyclists. These territories can be defined by paint or changes in pavement color. Minimum width for a one-way cycle path is four feet (five feet recommended) with an adjacent pedestrian path of similar width. 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-

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

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 2.13 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. Figure 2.15 summarizes the relative performance of each placement for these variables.

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.
- 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.

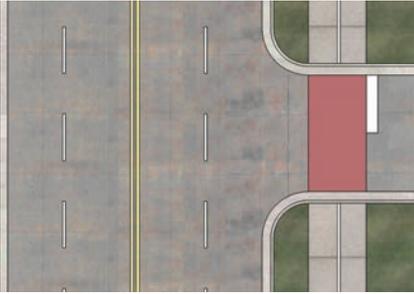
Overly frequent stop signs will cause many path users to ignore the traffic control entirely. The Florida manual states that path users may be intolerant to delay, wish to maintain momentum, or have limited traffic knowledge. When stop signs are installed on a path at extremely low volume intersections or even driveways, path users tend to disregard them. The wheeled user cyclist or skater is, in effect, being



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



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



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.



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.

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.



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 trail 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.

Garden Plain's preeminent active transportation facility, the Prairie Sunset Trail (PST), actually does not enter the town. But a high priority for the network will bring the facility to Main Street and eventually farther west to Cheney. The trails extension and possible new growth area's in the more distant future will be part of the active network.

DESIGN GUIDELINES FOR MULTI-USE TRAILS

ADA/AASHTO Compliance

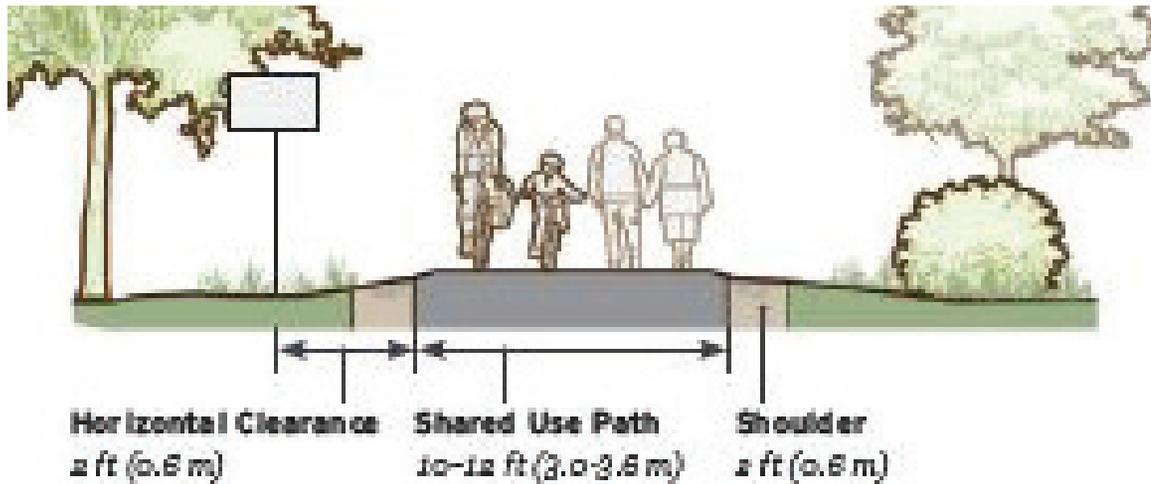
Trails should comply with American Association of Street and Highway Transportation Officials (AASHTO) standards and Uniform Federal Accessibility Standards and the "Americans with Disabilities Act Accessibility Guidelines."

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 2.16 illustrates crossing treatments at mid-block intersections.
- Align or widen trail at railroad intersections to permit perpendicular crossing of tracks.

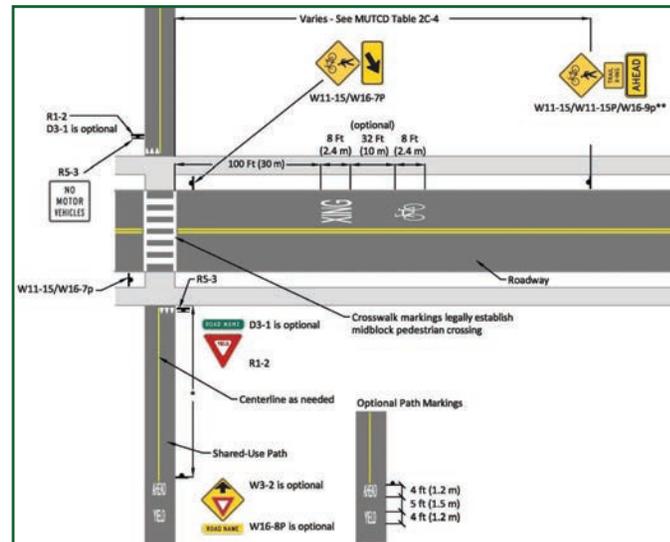
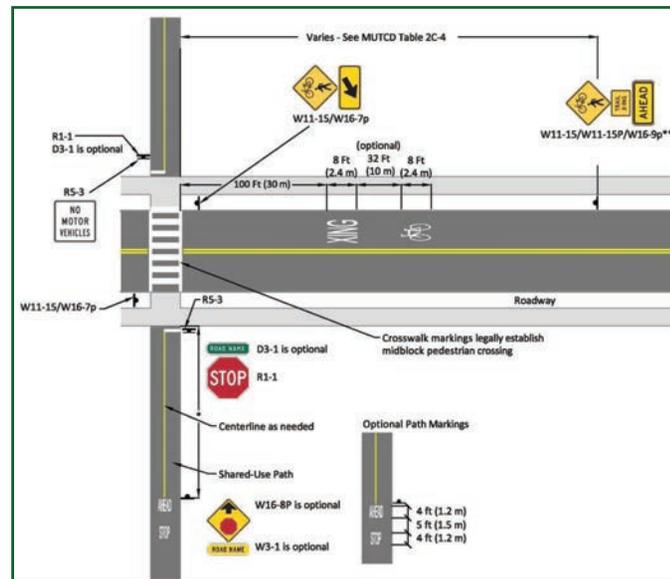
Crosswalk Delineation

- 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.
- 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

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



* Advance warning signs and solid centerline striping should be placed at the required stopping sight distance from the roadway edge but not less than 50 feet (15m).
 **W11 series sign is required, supplemental plaques are optional

Source: AASHTO 2012



Advance warning sign and beacon at the Walnut Street crossing of the PST at Goddard



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. See Figure 2.1 for suggested sign placement.



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



MUTCD compliant wayfinding sign on the Shunga Trail in Topeka

SIDEWALKS

Sidewalks should provide safe, comfortable, and continuous accommodations for pedestrians along streets. In towns the size of Garden Plain, 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

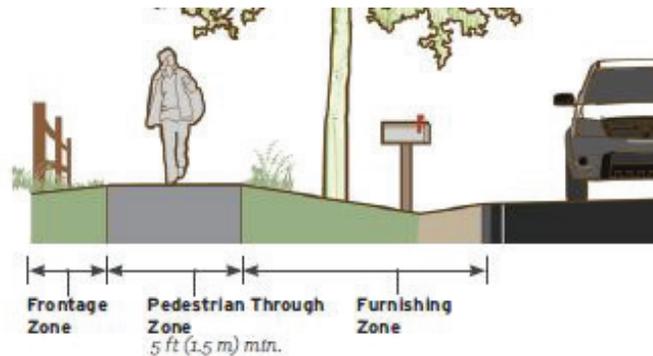
Sidewalks have three functional zones. The STAR Guide calls them the furnishing, pedestrian through, and frontage zones.

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



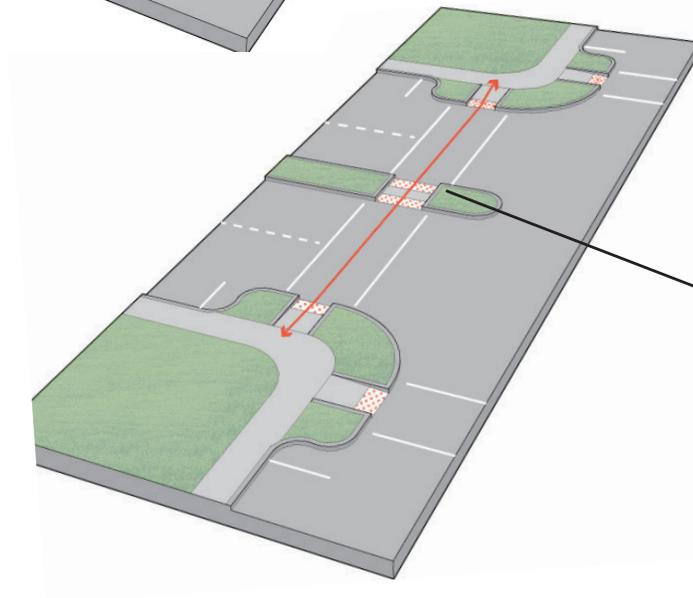
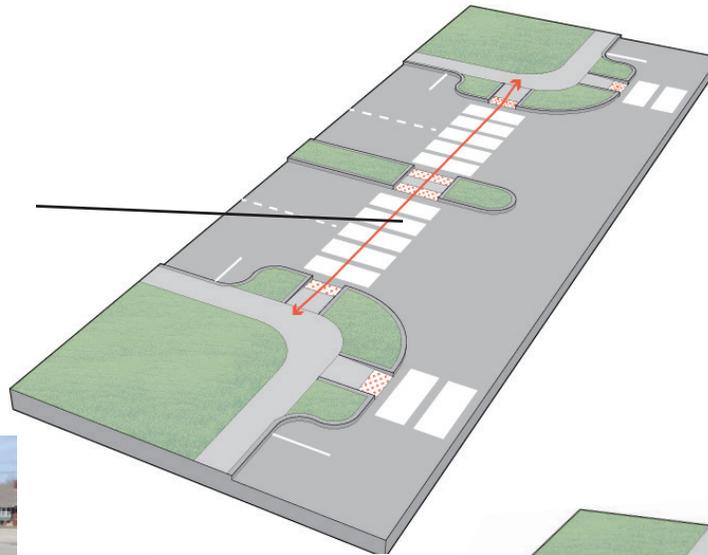
Environment	Frontage Zone	Pedestrian Through Zone	Furnishing Zone	Total Width
Constrained	1 ft	5 ft	2 ft	8 ft
Recommended	2 ft	5 ft	4 ft	11 ft

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 include Section Line Road and Harry Street crossings. 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.

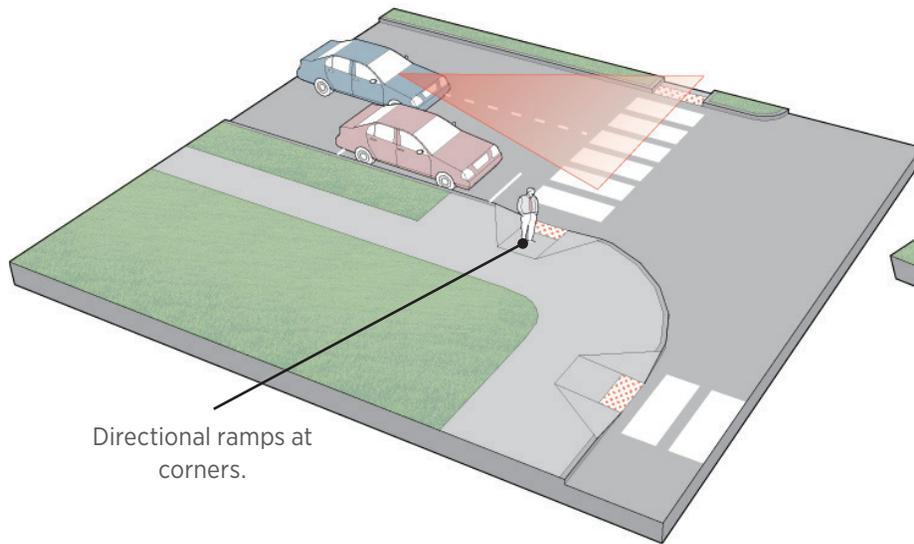
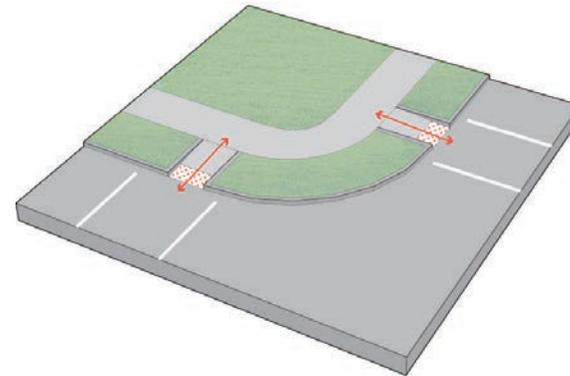


Rectangular Rapid Flashing Beacon (RRFB). This is a relatively cost effective measure to increase crossing safety of major roads. It is pedestrian actuated and provides a high-visibility strobe like warning to motorists.

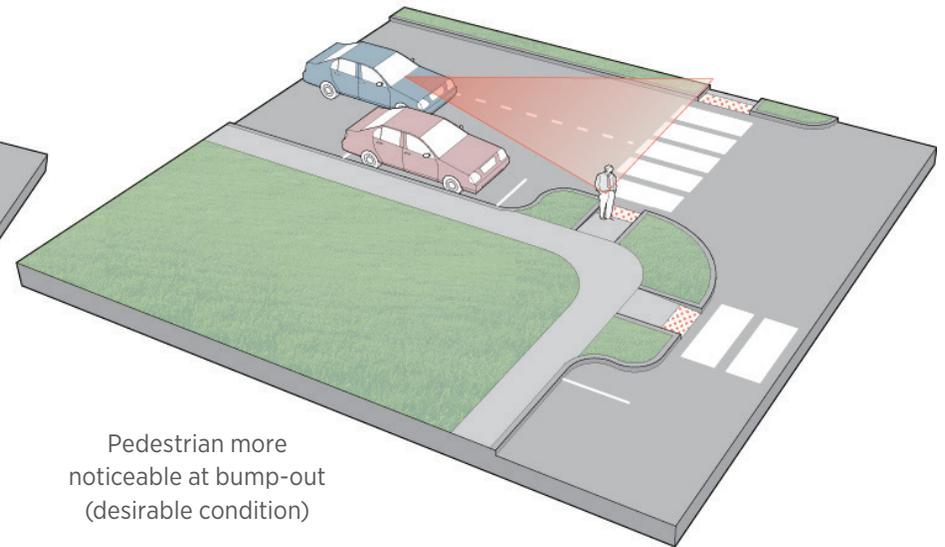
Medians and pedestrian refuge islands at street crossings shall be cut through level with the street or comply with the curb ramp requirements. The clear width of pedestrian access routes within medians and pedestrian refuge islands shall be a minimum 5.0 feet. If a raised median is not wider than 6 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.

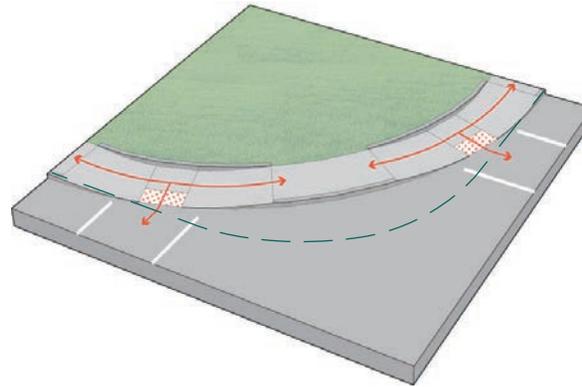


Pedestrian more noticeable at bump-out (desirable condition)

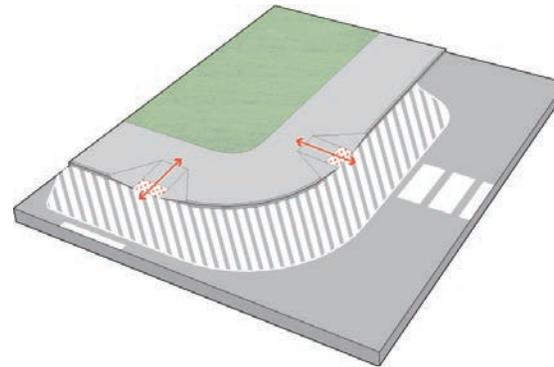
Crossing Locations. Awareness between drivers and pedestrians increases with improved visibility. Crosswalk locations should maximize visibility. The illustrations above illustrate desirable alignments for pedestrian crossings. However, in some cases (including crossings protected by pedestrian signals) 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-outs in Omaha



Virtual Bump-Out in Esparto, CA

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.

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



Downtown

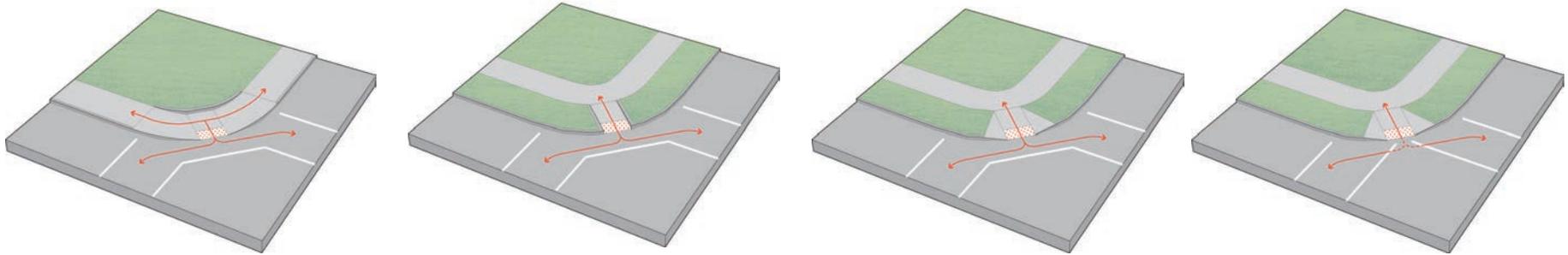


Neighborhoods



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

