GODDARD

PEDESTRIAN + BICYCLE PLAN

ACKNOWLEDGMENTS

The project team would like to acknowledge the contributions of the residents of Goddard, who gave their time, ideas, and expertise for the creation of this plan. It is only with their assistance and direction that the plan gained the depth necessary to truly represent the spirit of Goddard and it is with their commitment that the plan will be implemented. We also extend a special thanks to everyone on the Plan Advisory Team for their insight and assistance.

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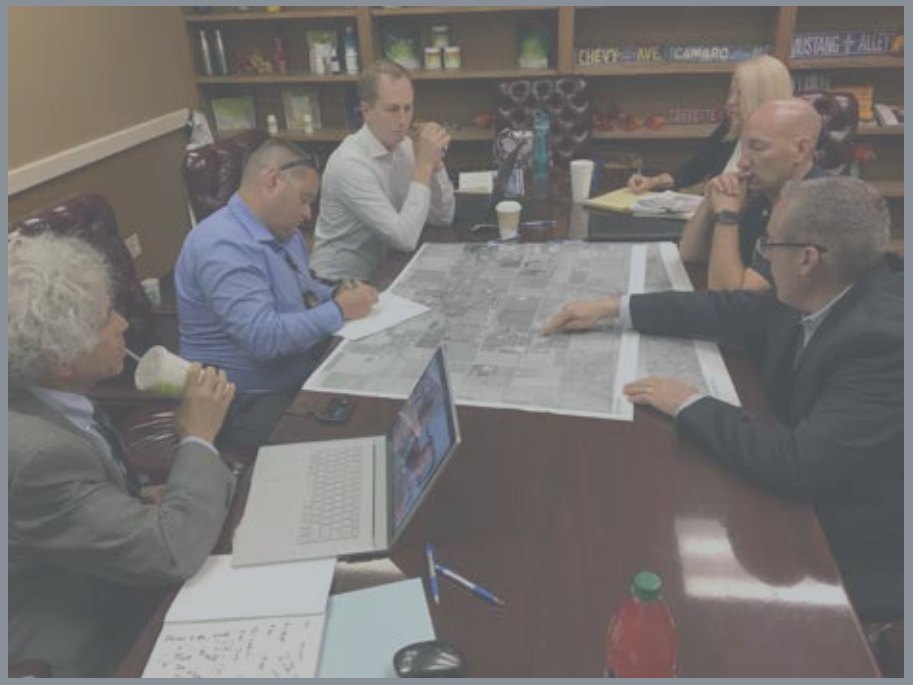


TABLE OF CONTENTS

CHAPTER ONE:
Introduction and Goals

INTRODUCTION

How we move is important to how well we live, affecting both 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. Active transportation, primarily encompassing mobility on foot and by bicycle, but also including a growing variety of low-impact mobility devices, is particularly well-suited to growing cities like Goddard. These modes use little or no fuel, are true zero-emission means of travel, consume very little space, generate no noise, and make us healthier. New technologies and innovative products, such as pedal-assisted e-bikes and recumbent tricycles, can bring pedal-powered 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.

Active modes also make great economic and social sense. Pedestrian and bicycle infrastructure costs far less to install than streets and roads, and active users place very little stress on facilities. These means of travel have almost no environmental impact. And they are enjoyable and give us time and space to appreciate our fellow human beings and the places in which we live.

Goddard's citizens understand these virtues. Many people in the city regularly use the Prairie Sunset Trail for enjoyment, exercise, and travel within the city. The trail defines the very popular Linear Park, and makes it possible for people of all ages to walk or bike to the park safely and comfortably. Goddard is also a major educational center, with nine public school buildings and one Catholic school. While the Goddard School District is regional in scope and size, local students should have the opportunity to walk or bike safely to school. However, this is not always possible for reasons discussed more fully below. Finally, Goddard citizens who participated in the Connect Goddard process expressed their hope of walking and biking to local destinations – parks, restaurants, churches, Tanganyika Nature Park, and other neighborhoods, and attractions yet to be built.

Active transportation planning for Goddard also faces some unique challenges and opportunities. These include:

- *The barrier and dividing effect of Kellogg Avenue (US 54).* This four-lane divided expressway corridor bisects the city and presents a major obstacle to connecting the north and south parts of the city. Many of the city's commercial destinations are located along Kellogg, the major arterial linking Goddard to Wichita. As such, a corridor like Kellogg should be a bridge, not a wall. But the highway not only presents a physical barrier, but also reinforces community divisions between the north and south, between new neighborhoods and the traditional town.

- *The need for a connected community structure.* Goddard is a city in the process of becoming a traditional rural town growing into a metropolitan community. That process inevitably creates a challenges as such a municipality tends to grow apart as it grows larger. Many effective active transportation plans work within a well-established street framework. But in Goddard, most of the area within the city

limits is not even platted. In the absence of a connected framework, the city may very well develop as an aggregate of self-contained subdivisions, each of which functions internally but does not create a connected community. The active transportation network plan provides an opportunity to establish a structure of paths, parks, and greenways that will benefit current and future residents and their city in many ways.

- *Future major road projects.* Two major highway projects have been on the board for the Goddard area. A programmed K-254 northwest bypass will follow an alignment between 167th and 183rd Streets, separating the Eisenhower/Explorer school campus from the rest of the city. A reconstruction of US 54 as a true limited access freeway has also been talked about and concept plans completed. These major roads should include features that ensure pedestrian and bicycle access. This planning process provides the opportunity to incorporate these features into the facility design.

- *New destinations and developments.* Goddard plans a new Star Bond project that will include major community recreation and other public facilities, along with substantial mixed use development. In such major community projects, pedestrian and bicycle access all too often is an afterthought. But this plan can help incorporate active modes as integral parts of this project. Similarly, the plan should provide a framework and standards for new other development to provide good connectivity to a community-wide bike and pedestrian network.

WHY A PLAN?

This planning effort started with Goddard's goals to provide greater transportation balance and choice, to address the physical division between the north and south side of town, and to improve routine access to community destinations. Transportation networks have an enormous influence on city form, which in turn influences how its residents interact and the community's ability produce a fabric that supports its existing residents and attracts new families and industries. This blueprint for a complete and practical active transportation network is built around four pillars:

1. Strategically retrofitting Goddard's existing street system to provide comfortable and safe space tor pedestrians, bicyclists
2. Providing a framework for new development, including a greenway and park system, that people of all ages can reach easily and realistically without an automobile;
3. Connecting the city's existing and developing neighborhoods to each other and to major community destinations.
4. Making walking and bicycling a greater part of routine life in Goddard.

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 be allowed to feel safe, slow, and at peace. As such, the physical environment should be designed to encourage people to experience their community on foot regardless of their age, mobility, or destination.

PEOPLE ARE EASIER ON INFRASTRUCTURE THAN CARS.

Our society has established the automobile as an essential part of normal behavior, even for short trips in walkable areas. While a car is important to regional transportation, 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 because of an overemphasis on auto-oriented development. The use of the car reduces the number of pleasant, individual encounters that we have with our neighbors – active travel increases them and reinforces and active civic life.

PEDESTRIANS AND BICYCLISTS ARE GOOD FOR BUSINESS.

Active transportation should be viewed as an economic development initiative to strengthen the Goddard's town center, the Kellogg commercial corridor and other potential community nodes. Also, questions such as: "is there safe space for me to take a run or go for a bike ride," "would I let my kids walk to school," or "is this a place I would ask my employees to live," factor into decisions that people make about their lives, places of residence, and even business and investment decisions.

DESIRED GOALS AND OUTCOMES

As evident from how engaged the public was throughout this process, it was clear that members of the community were interested in significant and short-term outcomes from the Goddard Bicycle and Pedestrian Plan. These goals and outcomes focus on producing long term progress through a series of incremental projects and comprehensive programs.

GOAL 1: INCREASE THE NUMBER OF PEOPLE WHO WALK AND BICYCLE FOR TRANSPORTATION AND RECREATION.

Ultimately, this plan envisions a future where all residents of Goddard can navigate the community by active means, accessing its destinations and amenities and using new facilities to build community with their neighbors. This future depends on increasing the number of people who walk and ride bikes for transportation and recreation.

MEASUREMENT:

- Conduct an online survey at least every three years to monitor change from the baseline response established through the public engagement in this planning process.
- Monitor trends in travel in data sources such as the Census Bureau's American Community Survey.
- As facilities develop, do periodic counts of pedestrian and bicycle activity at fixed points along major streets and paths.
- With community partners including the library, the senior center, park events programs, and schools, complete a bicycle and pedestrian count to establish a baseline of active transportation use. Then, at least every three years following,

complete a follow-up count to monitor change.

GOAL 2: IMPROVE ACCESS TO KEY DESTINATIONS FOR PEDESTRIANS, BICYCLISTS, AND OTHER LOW IMPACT MODES.

Another major goal of this plan is to connect people with the places they want to go. This requires infrastructure and educational programs to ensure the roads, trails, and sidewalks are both comfortable and safe, and that the overall network is clear and easy to understand.

People most often walk or bike for recreational or school trips, and trips to parks, ballgames, and community centers are important contributors to overall travel. A successful network will connect these and other key destinations with a continuous network of sidewalks, shared use paths, and on-street facilities and routes. Many of these facilities will also serve users of scooters, motorized wheelchairs, and other technologies that provide independence and mobility to people with disabilities.

MEASUREMENT:

- Conduct a walk audit at the outset of this implementation process and at least every three years following to monitor change.

GOAL 3: INTEGRATE BICYCLE AND PEDESTRIAN IMPROVEMENTS INTO NEW DEVELOPMENT AND TRANSPORTATION RELATED PROJECTS.

The Goddard Bicycle and Pedestrian Plan should ensure that the design of future private and community projects – new subdivisions, major civic facilities, commercial projects, and new roadways – should incorporate active transportation access in their design and implementation. Safe access for pedestrians and bicyclists does not end at the right-of-way line and should not require people to cross large parking areas. Similarly, Goddard's increasing development will require improved transportation facilities, ranging from new freeways like the K-254 northwest bypass proposal to upgrades of narrow rural section roads like 183rd Street. These projects should be "complete," including active transportation facilities in their design and, importantly,

providing safe crossing points to avoid becoming barriers. Finally, ongoing construction projects for pedestrian facilities should be built for the long-term, based on their ultimate function in the network. For example, the city in the past has developed conventional sidewalks along major arterials where full shared use paths will ultimately be needed. The marginal cost of building the wider path in the first place is substantially less than replacing or even retrofitting a previously installed sidewalk.

MEASUREMENT:

- Integrate the recommendations of this plan into the city's comprehensive plan, the city's capital improvement program, and negotiate with land developers to execute the physical recommendations of this plan.

GOAL 4: ESTABLISH A FRAMEWORK FOR FUTURE PARK AND GREENWAY SYSTEM.

Goddard's existing public park system is limited to the very popular Linear Park along the Prairie Sunset Trail. But future growth will create a need for a more comprehensive park system. While this plan is not intended to be a comprehensive plan or a park development plan, both of which are needed, it recognizes the importance of open space to both community quality and fabric. Furthermore, parks not be isolated from one another, but should create a connected system, by which individual parks are accessible to each other and to the entire city. This concept of a connected system recalls the great park systems of Kessler in Kansas City, Cleveland in Minneapolis and Omaha, and Olmsted in Boston, combining parks, greenways, and local transportation needs.

MEASUREMENT:

- Development and implementation of park service standards to guide new open space development.
- Advance adoption of an "official map" that defines general park locations and greenway corridors.

GOAL 5: UNITE THE COMMUNITY BY MINIMIZING BARRIERS PRESENTED BY MAJOR ROAD CORRIDORS.

Throughout the planning process, the dividing influence of Kellogg Avenue (US 54/400) was most frequently cited as Goddard's most serious active transportation problem. By preventing easy north-south access, this barrier prevents residents of the growing north side of Goddard from reaching schools, the library, the town center, and other major destinations on the south side. It also reinforces natural community divisions that merge in many growing suburban communities between the traditional town and newly developing areas. To the greatest degree possible, the Kellogg corridor should be common ground and a bridge. Other street corridors also present obstacles to active transportation and also require attention.

MEASUREMENT:

- With improvements at crossing points, conduct annual counts of pedestrian and bicycle crossings.
- Periodically monitor geographic point of origin and mode of travel at key community destinations such as the library, restaurants along Kellogg, convenience stores, and parks.

GOAL 6: INCREASE SAFETY AND COMFORT ON THE ROAD FOR ACTIVE TRANSPORTATION USERS.

Increasing safety for all users of the city's transportation system is an obvious goal for a Goddard active transportation system. While Goddard's crash data records relatively few incidents involving pedestrians or bicyclists, part of this is related to a relatively small number of users in potentially hazardous situations. This relates to the element of "comfort." Because many potential users do not feel comfortable in certain situations, they avoid them, which in turn reduces both the number of active transportation users and further reducing the safety level for those who venture across or along major streets.

MEASUREMENT:

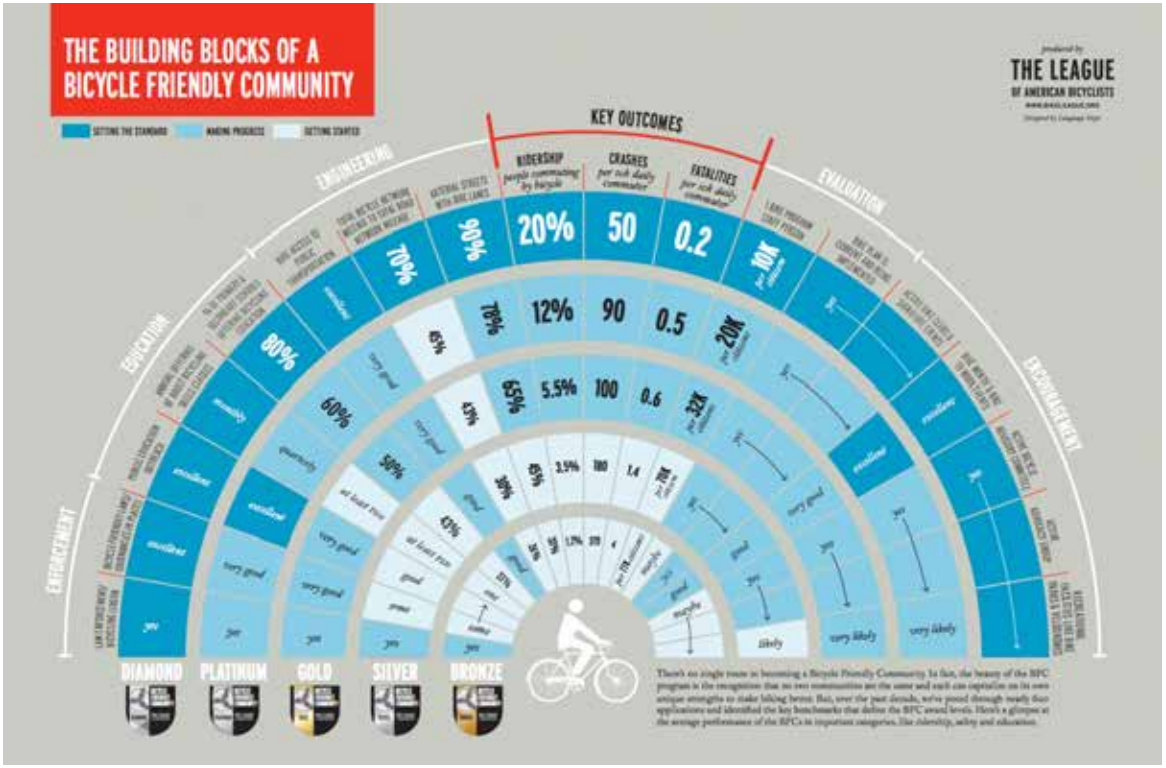
- Refine and monitor crash data to identify the number and causes of incidents involving pedestrians and bicyclists, espe-

cially at points where improvements are made.

- Use educational and response tools to reduce the number of unreported incidents.

GOAL 7: BUILD SUPPORT FOR AN ACTIVE GODDARD, USING THE LEAGUE OF AMERICAN BICYCLISTS BICYCLE FRIENDLY COMMUNITY CRITERIA AS A GUIDE.

A community culture that supports pedestrian and bicycle transportation is not implemented by infrastructure alone. It also requires a comprehensive approach that includes other programming, experience, and educational initiatives. The League of American Bicyclists has created the "bike friendly communities" program to help cities and counties achieve this kind of approach. The BFC program identifies 6 E's – dimensions of a comprehensive program: engineering, education, enforcement, encouragement, evaluation, and equity



MEASUREMENT:

- Complete an annual audit of active transportation, programs, and policies using the 6 E's established by the League of American Bicyclists.

USING THE PLAN

The Goddard Bicycle and Pedestrian Plan is only as strong as its execution and the purpose of this plan is to make its implementation as easy, efficient, and comprehensive as possible. Its organization builds the reader's understanding of active transportation planning generally, applies it is Goddard, and then provides a guide for how a comprehensive active transportation system would look and function in Goddard.

DOCUMENT ORGANIZATION

CHAPTER 1: INTRODUCTION AND GOALS

This current chapter explains the project, its goals, and special active transportation issues that affect Goddard.

CHAPTER 2: GODDARD TODAY

This chapter examines community input and preferences and local factors and physical conditions relevant to active transportation planning in the city.

CHAPTER 3: THE ACTIVE NETWORK

This chapter discusses the guiding principles of an active transportation network and presents the overall network concept. It also considers elements and influences that normally are further developed in a comprehensive plan, including a park system concept, future local and collector street connections, and potential nodes for walkable higher-density and mixed use development.

CHAPTER 4: SYSTEM FACILITIES AND

OVERCOMING BARRIERS

A central component of the plan is the "what "and the "where" of active transportation improvements proposed in Goddard. The chapter develops the network concept in more detail, examines design options for specific problem locations, and matches infrastructure types to specific contexts.

CHAPTER 5: IMPLEMENTATION AND PHASING

The network concept will be implemented in specific phases and will use a variety of funding opportunities and partnerships. Project phasing is further divided into projects that are located in the built-up area and longer-term concepts for future growth centers. Some projects are relatively low in cost and are designed for very short-term implementation, while others (such as potential crossings of Kellogg Avenue) involve major capital investment that are initiated by the state DOT.

INTEGRITY

DIRECTNESS

SAFETY

COMFORT

EXPERIENCE

FEASIBILITY

ABOVE: Six criteria for a successful active transportation network. These are developed fully in Chapter Three.

PLAN PRINCIPLES

A plan is only useful if it is also within the capacity of a community to implement. The mark of a strong implementation program is its ability to be phased, with priority segments serving the greatest needs while providing a basis for building partnerships and taking advantage of funding opportunities.

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 roadway improvements currently planned; engagement of community and/or financial partners; contribution to the segment in the overall system; and community input.

EFFICIENT

People often say that "the fastest path between two points in a straight line." This statement applies to community decision making and how projects should be implemented.

PRINCIPLES FOR A STRONG NETWORK

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 especially useful requirements to help determine the design of bicycle and pedestrian systems. An urban bicycle network should generally fulfill six basic requirements:

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.

DIRECTNESS

The active network should offer routes that are as direct as possible, with minimum detours or misdirection.

SAFETY

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

COMFORT

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

EXPERIENCE

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

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:
Goddard Today

INTRODUCTION

Goddard, in common with several other cities in the Wichita metropolitan area, began life as a small rural town that evolved into a growing suburb and full-fledged member of a regional community. This once small town is also now home to a regional educational complex that includes two high schools, two middle schools, and four elementary and intermediate facilities that make it a highly desirable residential setting for families. Its changing character has resolved itself into two somewhat distinct environments: the traditional "old town" to the south and contemporary subdivisions to the north – divided by the metropolitan area's principal east-west arterial, Kellogg Avenue. Each of these areas has individual needs and opportunities, but one common requirement – to be tied more closely together across Kellogg. To accomplish this overall goal of community connectedness, a planning process must learn from residents and reflect the ambitions, preferences, and physical opportunities in Goddard. This chapter reports on these existing conditions and preferences, and is organized into the following sections:

PUBLIC INPUT AND PREFERENCES, summarizing the results of the community engagement process.

ATLAS OF EXISTING CONDITIONS, examining factors that affect the planning an active transportation network.

OPPORTUNITIES, identifying possibilities on the ground that an active network should use to create linkages.

PUBLIC INPUT AND PREFERENCES

Many people contributed their voices to the contents of this plan through public open houses, workshops, a community survey, and an interactive map. Stakeholder input is essential to the process and offers numerous benefits.

FAMILIARITY WITH THE COMMUNITY

Local stakeholders understand barriers, opportunities, and their vision because they are intimately familiar with the community. The experiences and issues that people confront as they move within and through the city for various purposes provide critical input into system planning.

UNDERSTANDING LOCAL PRIORITIES

Community input is critical to creating a successful plan because this program will be implemented locally. Stakeholders frame the plan by articulating its goals and focus, defining priorities, and identifying partners to 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 Goddard and its residents, including people of all ages and abilities. Major user groups include school children, families, seniors, and people with mobility issues.

PUBLIC INPUT AND PREFERENCES

PROJECT ADVISORY TEAM

At the beginning of this project, the city assembled a team of local stakeholders to guide the development of the plan. This group met throughout the process to give direction to the plan, review draft documents, and serve as local ambassadors to the community. These team members helped create a plan that represents the goals and access needs of the community.

PUBLIC EVENTS

Public events are an exciting part of the process that allow the planning team to work side-by-side with members of the community to design an active transportation system. These highly interactive events were well attended and produced some of the best ideas and revelations in this plan.

COMMUNITY KICK OFF EVENT AND WORKSHOP

In May, 2018, a kick-off event initiated the planning process. Attendees learned about active transportation planning, shared local insights and ideas, and drew their own network concepts on large format maps

PLANNING STUDIO

On June 27, 2018, stakeholders participated in a planning studio to help define routes and priorities for the active network. A short presentation reviewed some initial thoughts and ideas of the plan, concepts for key project areas, and examples of national practice designed to start discussion. The results of this planning workshop provided substantial input into the design of the active transportation network.

OPEN HOUSE

On February 5, 2019, the preliminary plan draft was presented to the community for review and comment prior to submission to the Governing Body for review.

APPROVAL PROCESS

Goddard's Governing Body is tentatively scheduled to receive and file the document on March 18, 2019.

COMMUNITY SURVEY AND INTERACTIVE MAP

People engage with their community differently; while some will attend public meetings, others prefer less formal means. To involve as many residents as possible in the planning process, the planning team developed an online survey and an interactive map to solicit input on various components of the plan to create a comprehensive transportation system in Goddard. Throughout the planning process, more than 259 individuals responded to the survey.

COMMUNITY SURVEY SUMMARY

The community survey was designed to explore the priorities and preferences of current and prospective active transportation users. The questions fall into three 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 using national and local examples.

PEDESTRIAN CHARACTERISTICS

Frequency of Walking for Enjoyment or Transportation

Over half of the respondents indicated they walk at least once or twice a week. An additional 25 percent walk about once or twice per month. This response indicates the constituency that would immediately benefit from improved pedestrian infrastructure.

Reasons to Walk

By a significant margin, regular exercise or workout was the most common purpose cited as the reason for walking. Other

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

	Percent of Total
Never	5.43%
Very infrequently: a few times a year	5.81%
Infrequently: maybe every few months	7.75%
Occasionally: about once or twice a month	25.58%
Regularly: once or twice a week	29.46%
Frequently: several times a week to every day	25.97%

FIGURE 1.2: Why do you walk for enjoyment or travel?

	Percent of Total
Regular exercise or workout	81.89%
Family outings	44.03%
Trips to parks or recreational facilities	40.74%
Social visits	28.81%
Trips to the library, museums, and similar places	25.51%
Routine errands	11.52%
Shopping	8.64%
I do not walk often	7.00%
Commuting to work or school	6.17%
Going to meetings or in the conduct of business	2.47%

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

	Percent of Total
Confident and Fearless	2.76%
Committed Pedestrian	23.96%
Interested and Concerned	55.76%
Recreational Pedestrian	11.06%
Interested Non-Walker	3.23%
Non-Walker	3.23%

significant responses involve activities broadly related to community such as trips to parks and recreational facilities, family outings, social visits, and trips to the library and similar places.

Self-Characterization of Pedestrian Comfort

The survey asked people to characterize how they feel as a pedestrian based on their comfort and confidence in their city. The question includes two noteworthy dimensions: 1) the relative comfort of Goddard's streets and 2) the comfort the respondent has established in the environment.

More than half of respondents identified themselves as "interested but concerned" and an additional 24 percent identified themselves as "committed" (i.e.: confident but appreciative of infrastructure improvements). Together, these two groups represent nearly 80% of respondents interested in improved pedestrian infrastructure.

BICYCLIST CHARACTERISTICS

Frequency of Bicycling for Enjoyment or Transportation

While significantly lower than the responses for walking which is typical nationally, more than 25% of respondents indicated that they ride a bike at lease once or two a week. This group should be viewed as an immediate market for bicycle infrastructure improvements.

More than 20% indicated that they ride a bike between once or twice per month and another 9% reported riding a few times per year. In addition to representing additional constituency, this group should be viewed as the expansion market that would be served by infrastructure investment to make it easier, safer, and more comfortable to ride bikes in Goddard.

Reasons to Bike

The most popular reason for riding a bicycle is regular exercise or workout which was cited by more than 25% of all respondents. The following two most common reasons for riding a bike are "family outings (18.73%) and "trips to parks

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

	Percent of Total
Never	18.60%
Very infrequently: a few times a year	21.32%
Infrequently: maybe every few months	9.30%
Occasionally: about once or twice a month	22.09%
Regularly: once or twice a week	16.67%
Frequently: several times a week to every day	12.02%

FIGURE 1.6: How often do you bike for enjoyment or travel?

	Percent of Total
Regular exercise or workout	28.18%
Family outings	18.73%
Trips to parks or recreational facilities	16.18%
Social visits	8.36%
Trips to the library, museums, and similar places	7.82%
I do not ride a bike	7.27%
Bicycle touring	5.82%
Commuting to work or school	2.55%
Routine errands	2.36%
Shopping	2.18%
Going to meetings or in the conduct of business	0.55%

FIGURE 1.7: Which of the following best describes you as a bicyclist?

	Percent of Total
Confident and Fearless	0.46%
Committed Bicyclist	14.61%
Interested and Concerned	37.90%
Recreational Bicyclist	25.57%
Interested Non-Bicyclist	8.22%
Non-Bicyclist	13.24%

and recreational facilities (16.18%)."

Self-Characterization of Comfort as a Bicyclist

The largest number of respondents (37.90%) identified with being "interested but concerned." The second largest characterize themselves as recreational bicyclists (i.e.: trail users) at 25.57% of the total. The expansion market should be considered the recreational bicyclists who may gradually expand their habits to include short transportation trips and the 8.22% who characterize themselves as "interested non-bicyclists" (ie: those who may consider riding with improved infrastructure.

DESTINATIONS

Goddard Linear Park ranked first among active transportation destinations, with over 83% of respondents rating it as either important or very important. Other destinations in the first rank of importance included the pool, the Prairie Sunset Trail and Downtown.

1. Goddard Linear Park 83.4%
2. Goddard City Pool 81.6%
3. Prairie Sunset Trail 76.3%
4. Downtown 69.4%
5. Goddard Community Center 57.9%
6. Walmart 56.3%
7. Restaurants / convenience stores 55.2%
8. Tanganyika Wildlife Park 51.4%
9. Lake Afton Park 50.5%

Respondents were asked in a separate question to rate the many schools in Goddard by the importance of bicycle and pedestrian access. All schools received a rating of between 70 and 82%, also in the top range.

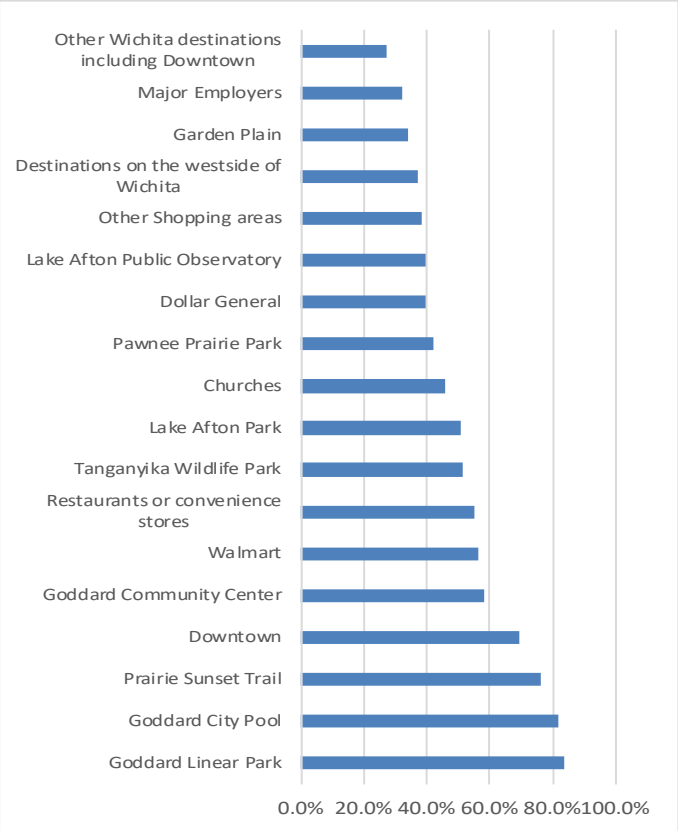
PRIORITIES FOR ACTION

In ranking various actions for their effectiveness in improving Goddard's pedestrian and bicycling environments, most proposed actions received high rankings for importance. All pedestrian proposals were considered important by over 80% of respondents, with sidewalk construction, a Kellogg Avenue overpass, and better major street crossing at the top of the list. The range of responses was somewhat wider for bicycle-related actions. Top rated initiatives for importance included more safe routes to schools, a Kellogg Avenue overpass, safer at-grade street crossings at Kellogg, better crossings of major streets, and more trails

CONCLUSIONS AND THEMES FROM PUBLIC ENGAGEMENT

DESIGN INFRASTRUCTURE FOR FAMILIES AND CHILDREN

Residents indicated that the system should be designed to

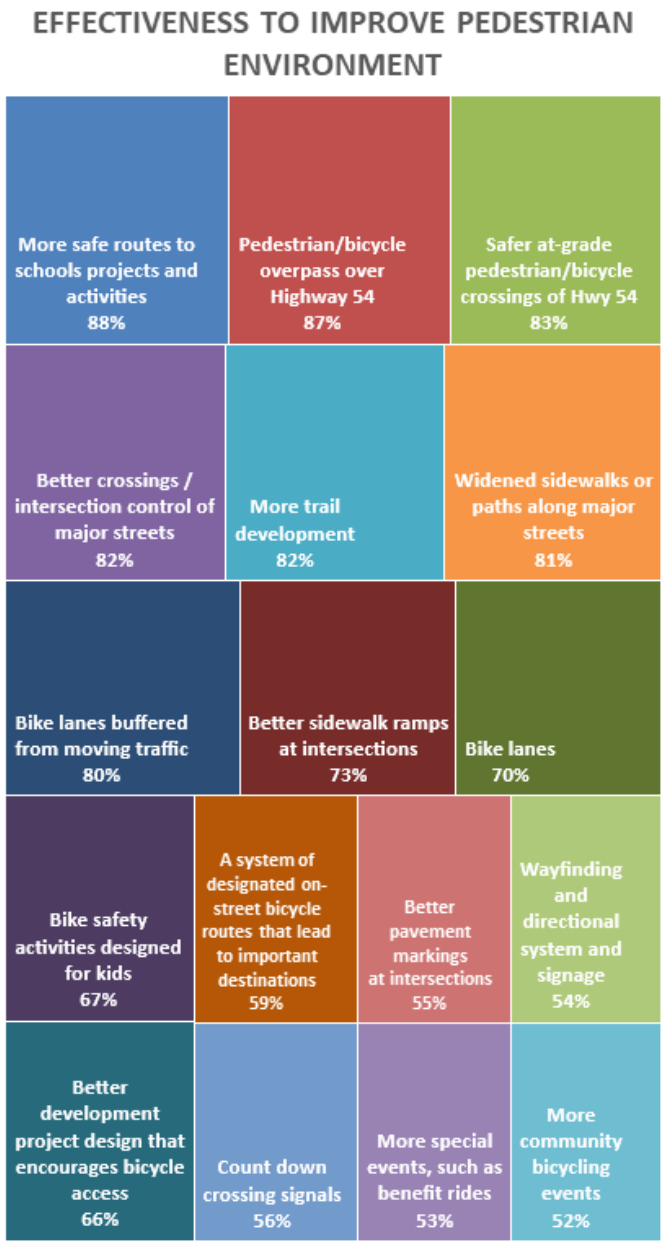


How effective do you believe each of the following improvements would be in improving Goddard's pedestrian environment?

1.	Providing sidewalks on at least one side of the streets around schools	92.5%
2.	Constructing sidewalks on other streets that have a lot of pedestrian use	91.1%
3.	Constructing sidewalks on at least one side of all major streets	90.5%
4.	Pedestrian/bicycle overpass over Highway 54	89.5%
5.	Better crossings at major streets	88.9%
6.	More safe routes to school activities	87.2%
7.	Installing pedestrian crossing signals at school crossings and other important locations	84.9%
8.	Safer at-grade pedestrian/bicycle crossings of Highway 54	84.7%
9.	Providing protected area for pedestrians at crossings of wide streets	84.5%
10.	Pedestrian crossing signals at strategic points across 183rd and 199th	84.1%
11.	Sidewalks or continuous paths along Highway 54 for access to businesses	84.0%
12.	Sidewalk requirements for new development areas	81.7%
13.	Providing pedestrian paths within retail developments	81.3%

How effective do you think the following improvements would be in increasing bicycling for transportation in Goddard

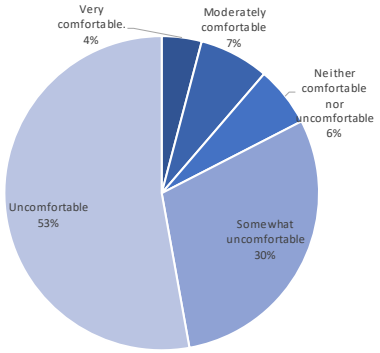
1.	More safe routes to schools projects and activities	88.1%
2.	Pedestrian/bicycle overpass over Highway 54	87.3%
3.	Safer at-grade pedestrian/bicycle crossings of Highway 54	82.8%
4.	Better crossings / intersection control of major streets	82.3%
5.	More trail development	81.7%
6.	Widened sidewalks or paths along major streets	81.1%
7.	Bike lanes buffered from moving traffic	79.7%
8.	Better sidewalk ramps at intersections	73.3%
9.	Bike lanes	69.9%
10.	Bike safety activities designed for kids	67.0%
11.	Better development project design that encourages bicycle access	65.5%
12.	A system of designated on-street bicycle routes that lead to important destinations	59.0%
13.	Count down crossing signals	56.4%

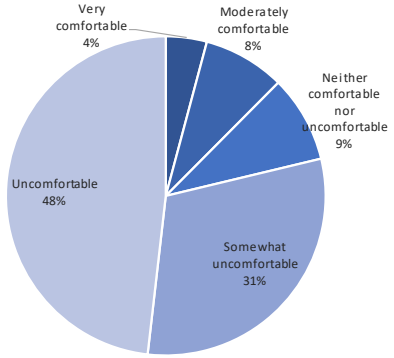


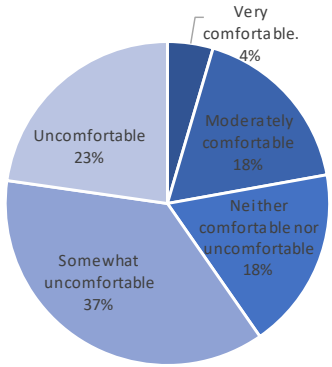
Visual Preference Survey

The results of the visual preference survey similar levels of comfort for both pedestrians and bicyclists. The areas with the highest levels of discomfort were highways with no shoulders, large intersections, and wide streets with sharrows (shared bike lanes). The area's where bicyclist and pedestrians had the highest rate of comfort were on separated trails and paths, usually with wide boulevards separating the user from traffic. The highest rated photograph was a separated shared use path that can already be found in Goddard. The second highest rated photograph is a shared use path along a main corridor in Burbank, CA which is striped for pedestrian and bicyclists and

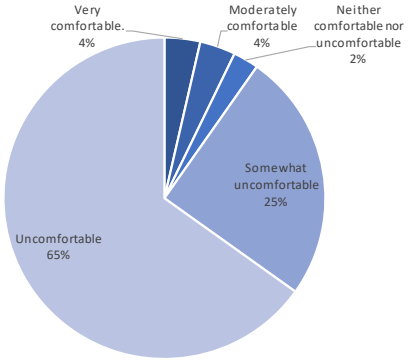
Lowest Bicyclist Comfort

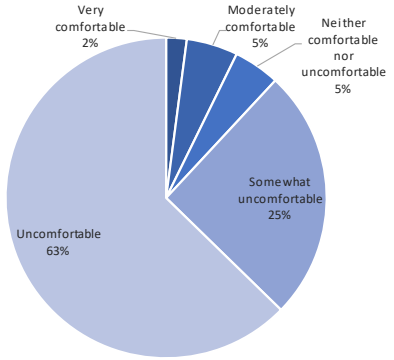


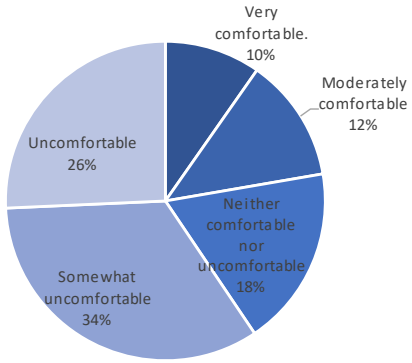




Lowest Pedestrian Comfort

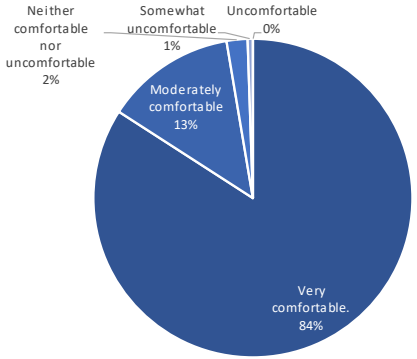


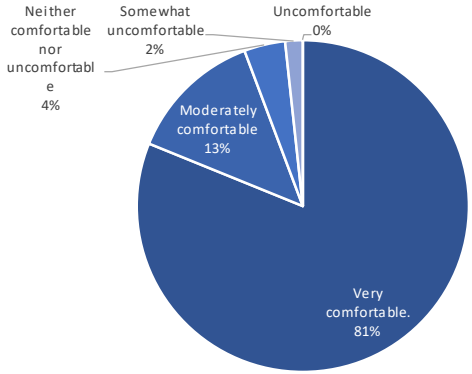


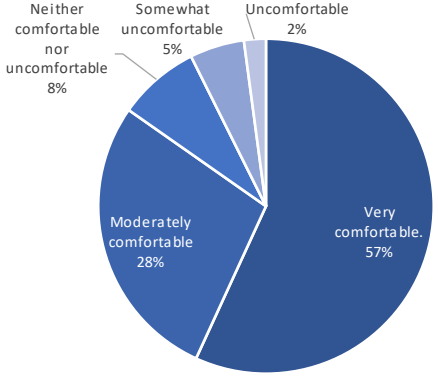


landscaped with a grass buffer separating vehicular traffic from the path. Infrastructure with mid-range rankings in the survey include sidewalks with no visual interest such as buildings or landscaping adjacent, areas with painted crosswalks, neighborhoods with wide streets and no sidewalks, and two lane traffic with a painted bike lane between parking and vehicular traffic. The results of this survey indicate residents want to see separate lanes, sidewalks, or trails for bicyclists and pedestrians and have a strong preference for those with landscaping or other visual interest.

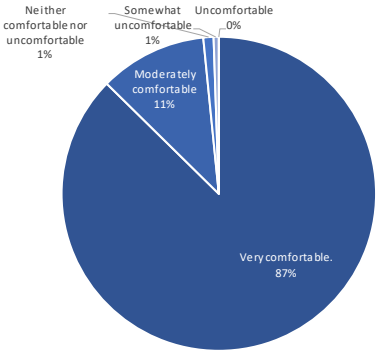
HIghest Bicyclist Comfort

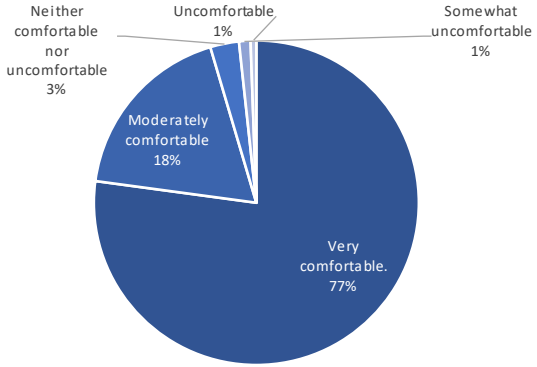


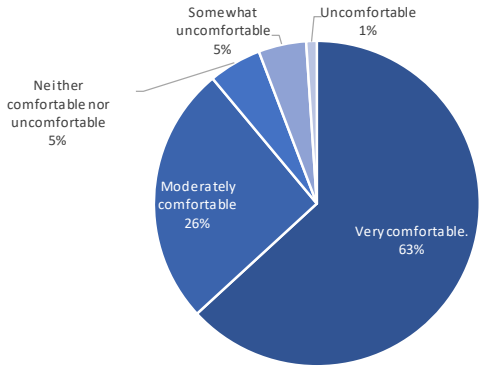




Highest Pedestrian Comfort







allow children and families to safely and comfortably navigate the community on foot or by bicycle.

IMPROVE CROSSINGS AND CROSS BARRIERS ALONG KELLOGG AVENUE

Clearly, the Kellogg corridor presents the city's greatest barrier to pedestrian and bicycle access. Notable problem areas include:

183rd Street intersection. 183rd is the section line road that serves the Seasons and St. Andrews Place subdivisions, the city's largest subdivisions north of Kellogg, and Walmart, the largest commercial site south of the highway. The existing intersection places pedestrians and bicyclists out of view of motorists and lacks clear crosswalks, a crossing signal, or a refuge median, and requires a crossing of 100 feet from edge of pavement.

199th Street (Goddard Road) intersection. This signalized intersection requires active users to negotiate about 280 feet from the outside edge of the Kellogg Drive frontage roads. It lacks pedestrian accommodations, refuges, and crosswalks, and adds the complicating factors of parallel service roads with shallow setbacks from the mainline.

Main Street intersection. This unsignalized intersection is the primary access to Downtown, Linear Park, and Discovery School but lacks pedestrian accommodations or signals.

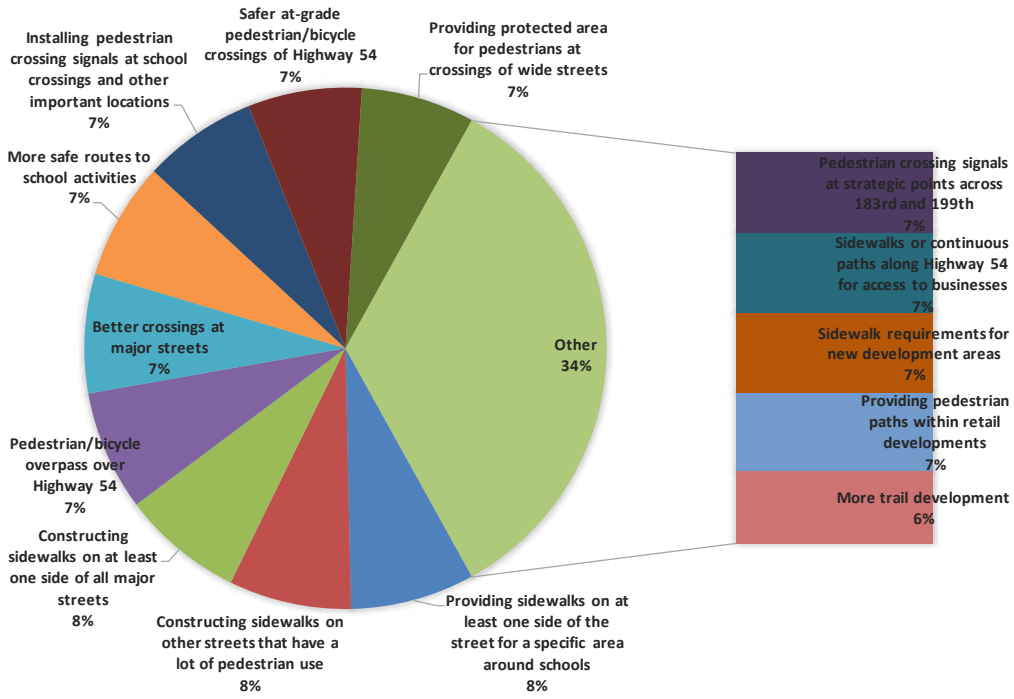
Walnut Street intersection. This unsignalized intersection provides the most direct access to Challenger Intermediate and Clark Davidson Elementary Schools.

CONNECT PEOPLE WITH THE PLACES THEY WANT TO GO

Residents of Goddard should be able to safely navigate to common destinations on foot or by bicycle. The next chapter will include a detailed exploration of local destinations that will be served by the active transportation network.

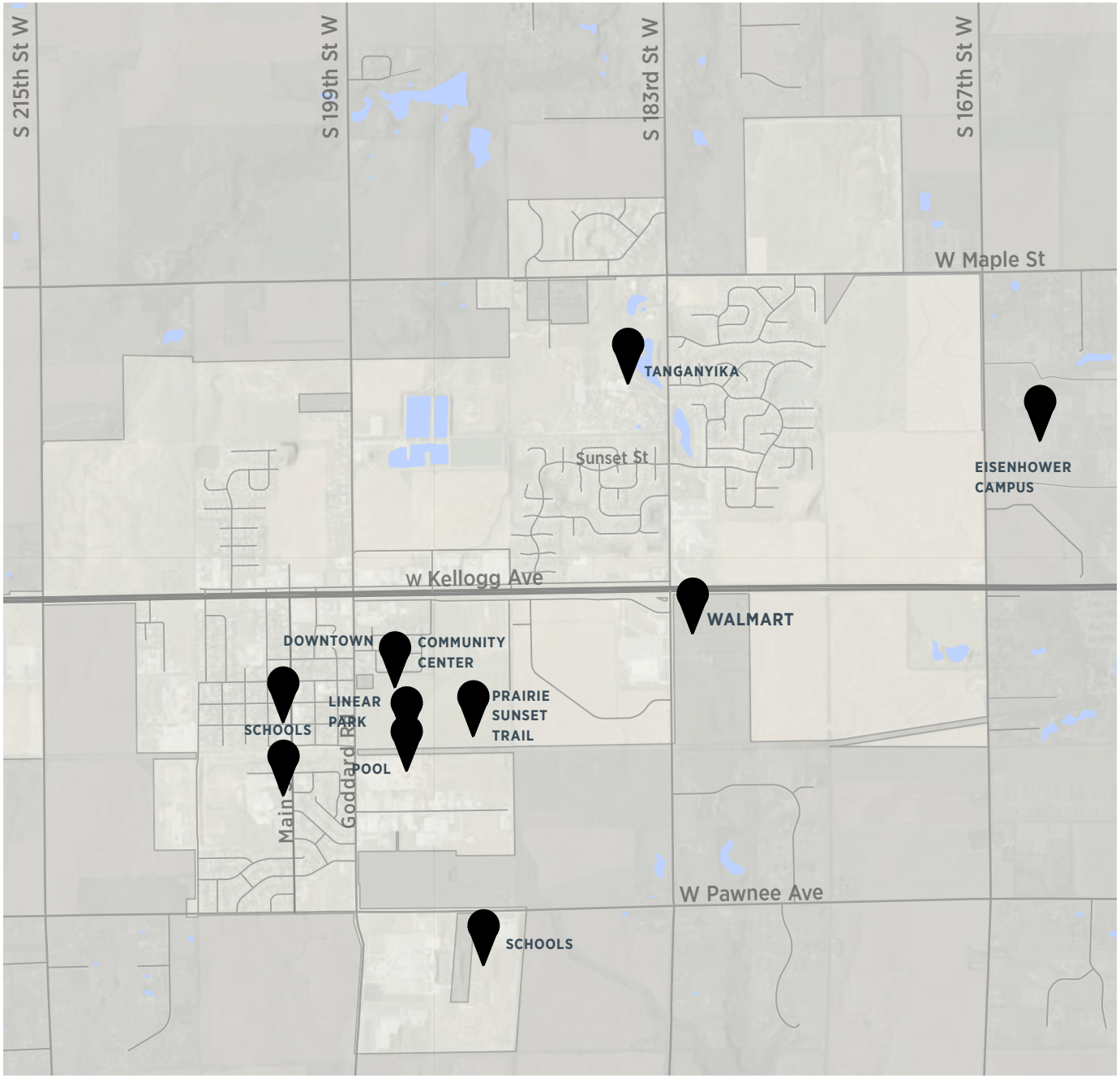
USE ACTIVE TRANSPORTATION TO BUILD COMMUNITY

EFFECTIVENESS TO INCREASE BICYCLING



An underlying theme of virtually all conversations for this project related to the desire to connect people with community amenities such as parks, schools, and commercial services; this issue is common in suburban neighborhoods where land development has traditionally been oriented to the automobile. In response to this need and desire, the plan focuses on community development through trails, complete streets, and providing neighborhood amenities to both existing neighborhoods and areas that will accommodate new development.

FIGURE X.X: Study Area with Destinations



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 preferences. The atlas details the physical conditions of the active transportation network.

These factors – streets, destinations, and neighborhoods– form the foundation of the active transportation plan.

DESTINATIONS

A transportation network should connect people with the places they want to go. The following destinations are viewed as the greatest priorities:

- Schools and Churches
- Prairie Sunset Trail, Linear Park, and Downtown
- Tanganyika
- Public Library

LAND USE

FUNCTIONAL CLASSIFICATION

Existing land use helps define origin and destination points that create demands for active transportation facilities. A future land use plan describes the city's intended land use policy and geography, helping to define the network of the future.

Through a comprehensive plan, land use is explored in three steps:

- Inventorying current Land Use showing the types of developments and their locations within the city.
- Projecting population to help inform the amount of land needed for various urban purposes within the plan's timeframe.
- Developing a Future Land Use map to illustrate how and where land development should occur for each of the major land classifications

The Goddard Comprehensive Plan was adopted in 2015 and contains the elements required by Kansas Statute including a future land use map; however, the community requires more guidance on connectivity and community development.

CURRENT LAND USE

The Current Land Use Map illustrates how what the land use within the Goddard Corporate Limits looks like today. As a pattern, it shows the predominance of residential with

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. Goddard's system includes a mix of local roads, collector streets, arterial streets, and a highway; while these typically function together as a hierarchy, Goddard's low degree of street connectivity in its northern neighborhoods produced fewer collector streets than expected. This causes busy arterial streets to play a larger role in local transportation which is more inefficient.

FIGURE X.X: Functional Classification

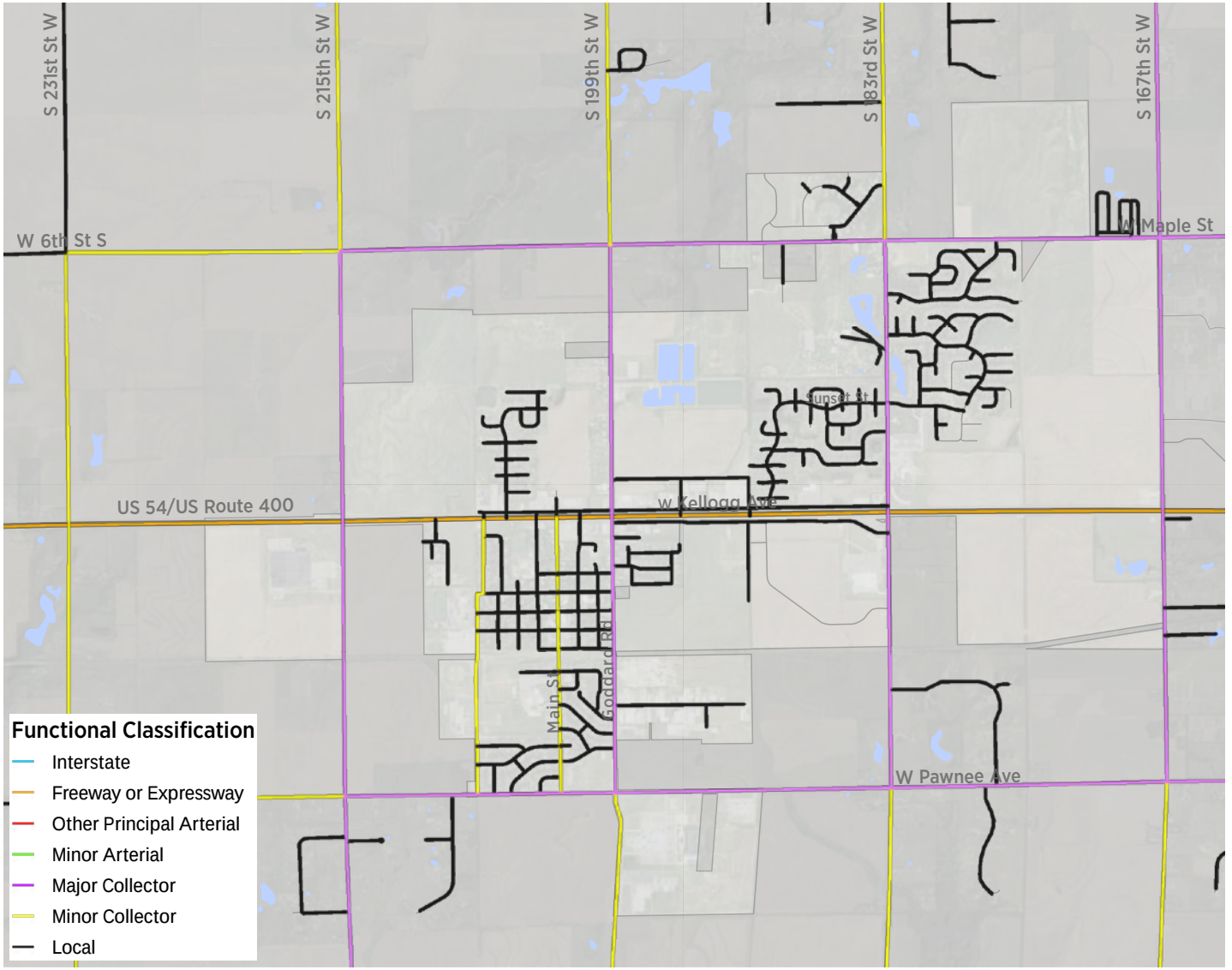
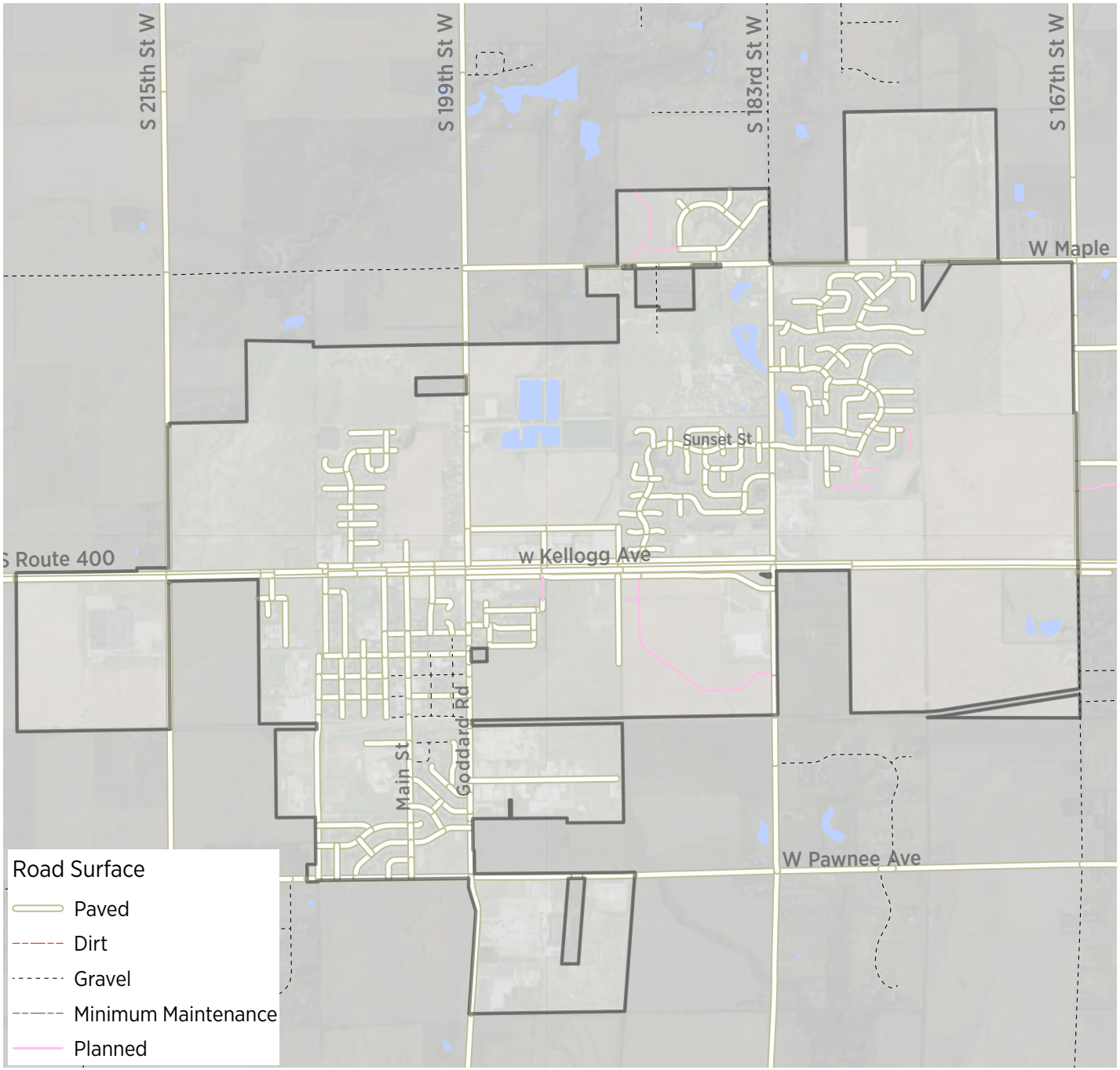


FIGURE X.X: Road Surface



ROAD SURFACE

The majority of roads in Goddard are paved however there are several roads in the old town that remain unimproved. While the percentage is low, unimproved roads are a deterrent to bicyclists and pedestrians in addition to being viewed as indicative of disinvestment. As such, these roadways should be improved including sidewalks and other facilities as recommended by this plan.

LINEAR OPPORTUNITIES AND EASEMENTS

Goddard's greatest bicycle and pedestrian amenity - the Prairie Sunset Trail - grew from the opportunity presented by a railroad abandonment. Linear features are significant for their ability to provide continuous corridors for off-street trail development or system links. These opportunities include:

SW to NE Pipeline Easement. Gas easements, which must remain free of buildings, can create linear parks and trails. The easement illustrated on Figure XX runs from the corner of Goddard Road and Pawnee Avenue to and through the school campus in the northeast of the city and intersects the Prairie Sunset Trail.

Floodplains. Zone A (100 year floodplains) should not be built on and can provide important possibilities for parks and greenway development.

Opportunity streets. These are low-volume local streets that have reasonably good connectivity. Examples are Seasons Street and Sunset Drive.

The Wastewater Lagoons. These municipal lagoons will be decommissioned in the relatively near future and provides an opportunity for a major park development north of Kellogg Avenue.

FIGURE X.X: Linear Opportunities

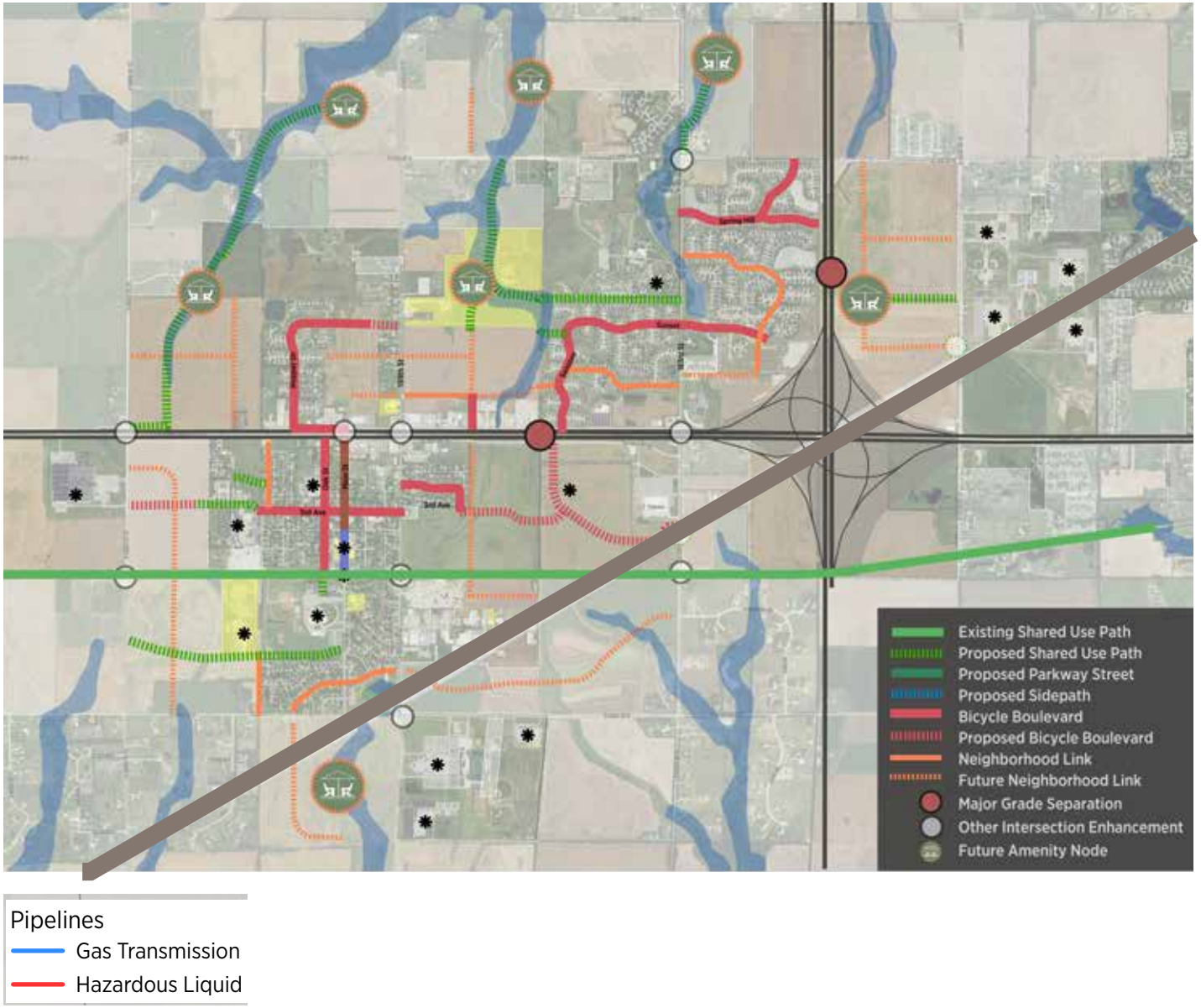
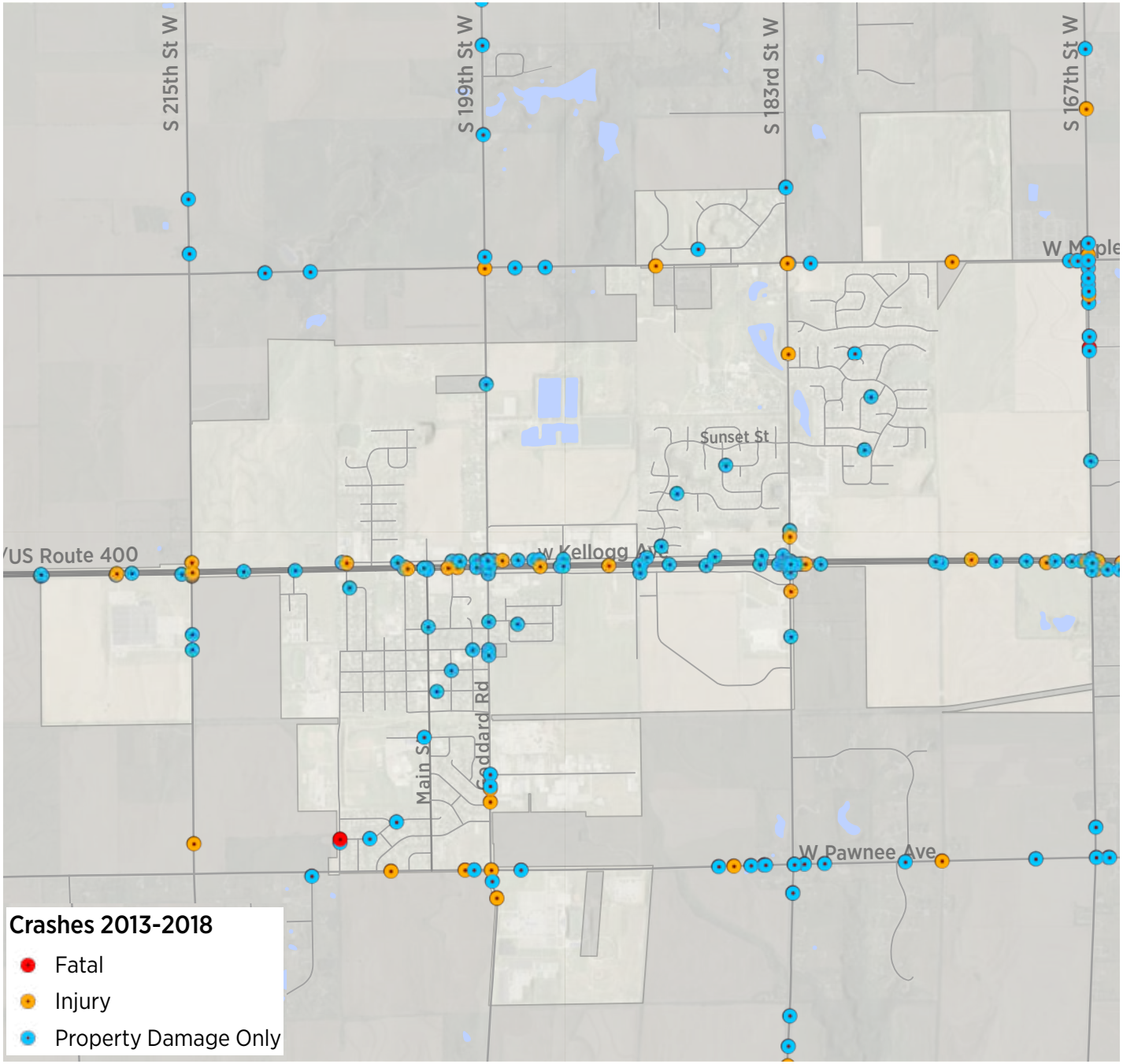


FIGURE X.X: Crashes, 2013 - 2018



CRASH INCIDENCE

Figure XX illustrates all reported crashes between 2013 and 2018 and Figure XX parses this data to illustrate only those crashes including bicyclists and pedestrians. Following are notable observations.

U.S 54 AS A BARRIER

The majority of crashes in Goddard appear to occur on U.S. 54 and at local junctions with the highway. These are typically the crossings most important for pedestrians and bicyclists to cross.

GODDARD ROAD

Goddard Road is one of the major north-south connections between U.S. 54, the schools, and the community center. Improving the design of the roadway and implementing pedestrian and bicycle improvements would likely decrease crash incidence.

LOCAL STREETS NOT CRASH FREE

Local streets represent a notable number of total crashes in Goddard. This can likely be attributed to:

- Excessive speed due to low connectivity of streets
- Expectation that there will not be other vehicles present
- Uncontrolled intersections

There were only three reported incidents but one (at 183rd and U.S. 54) was a pedestrian fatality.

FIGURE X.X: Crashes involving Pedestrians and Bicyclists, 2013 - 2018

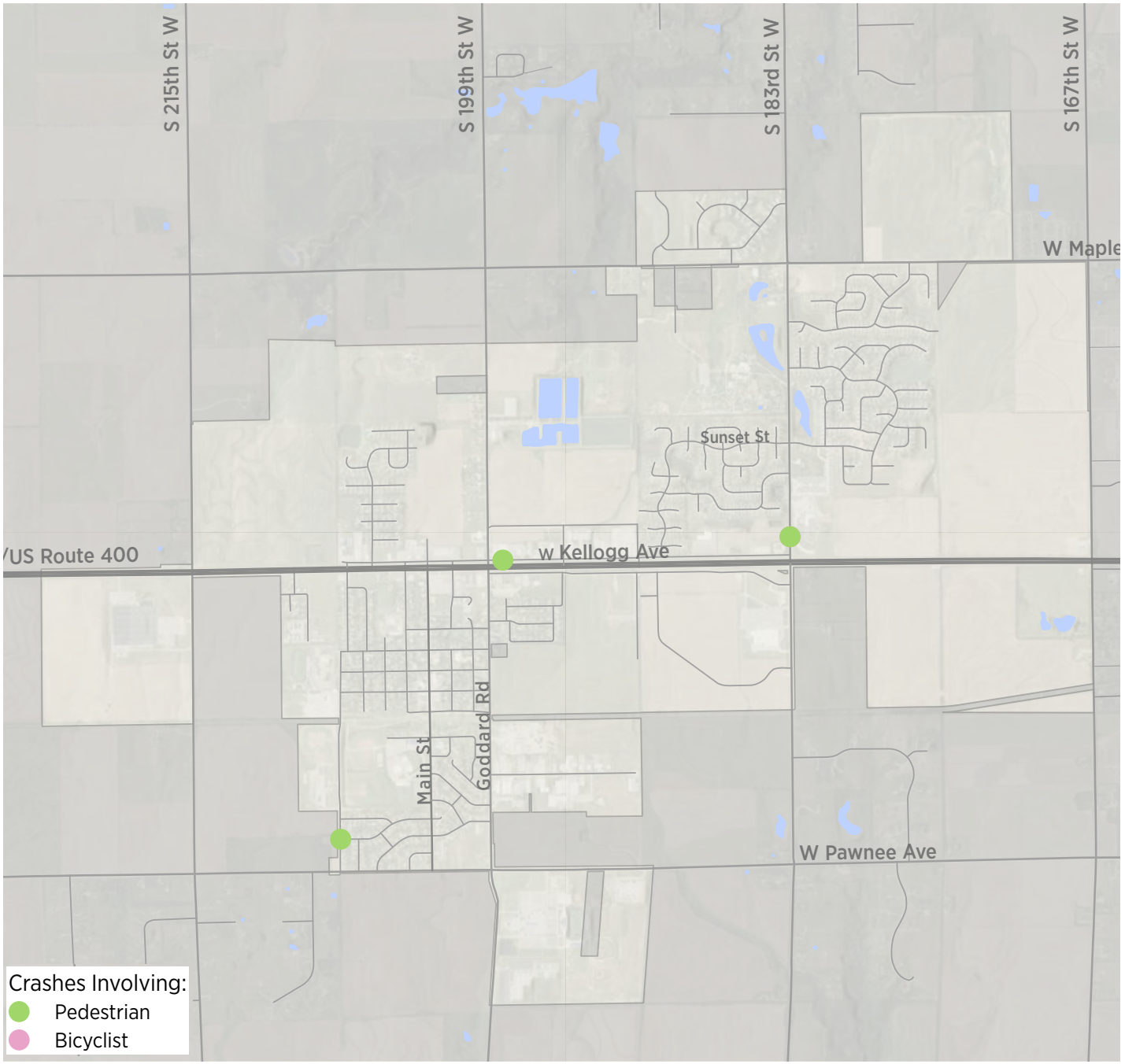
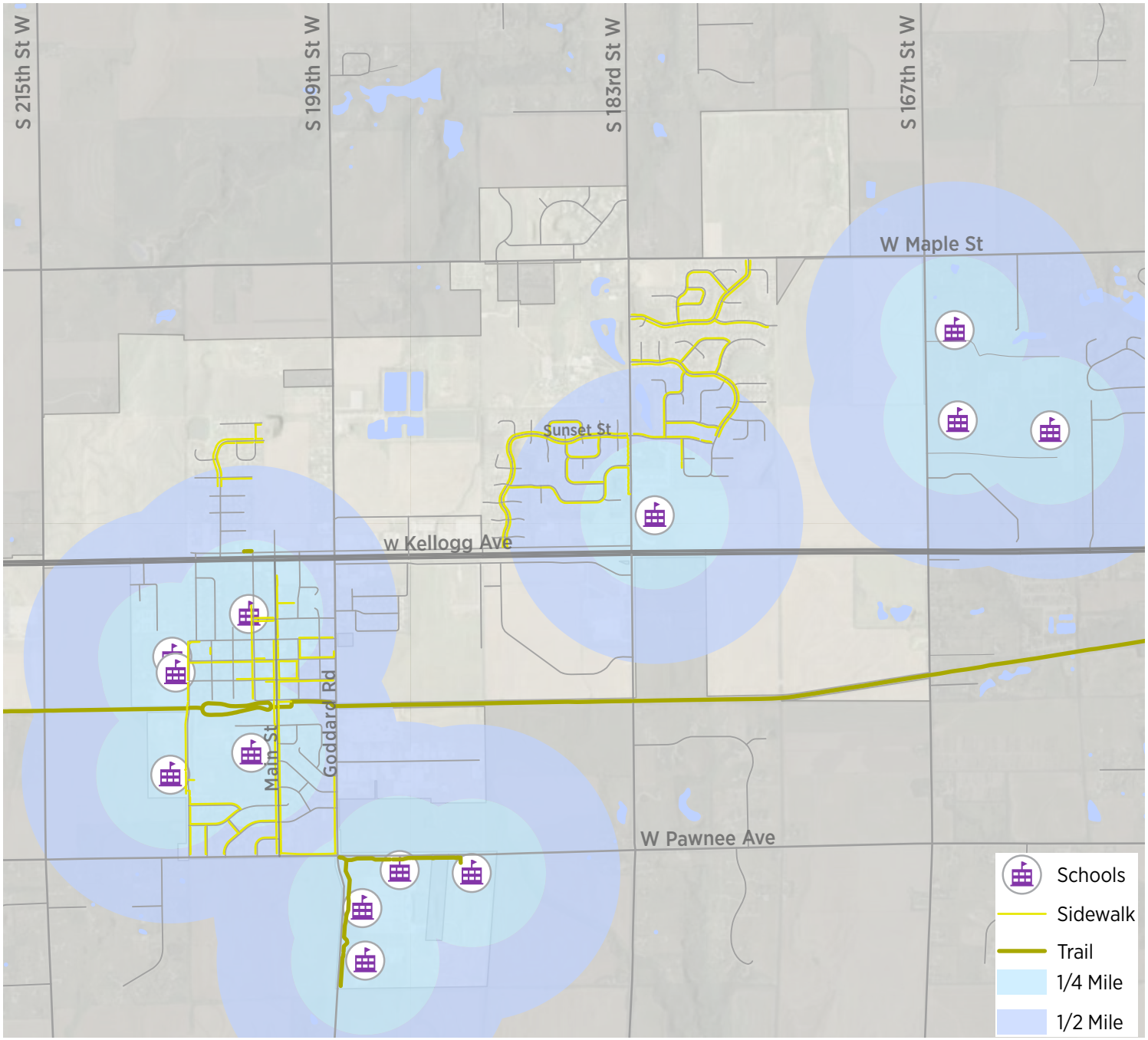


FIGURE X.X: Schools and Sidewalks - Buffers from Schools



SCHOOLS AND SIDEWALKS

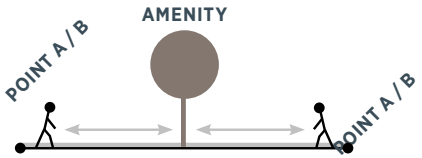
Many of the schools in and around Goddard are regional facilities, centralized locations based on the assumption that the majority of students would be driven or bussed to school each day. The Goddard District's schools are located on large campuses or clusters in the northeast section of town and in the southwest. Unfortunately, the distance between schools within these campuses tends to discourage walkability; but some campuses are close to actual or potential active transportation facilities, and existing and future students who live in Goddard should be served by the network.

Several schools are in or close to established neighborhoods. These schools, located near the core of old town, are well served by nearby sidewalks and the Prairie Sunset Trail. The primary challenge lies in districting that requires children north of U.S. 54 to cross the highway to get to school.

PARKS AND SIDEWALKS

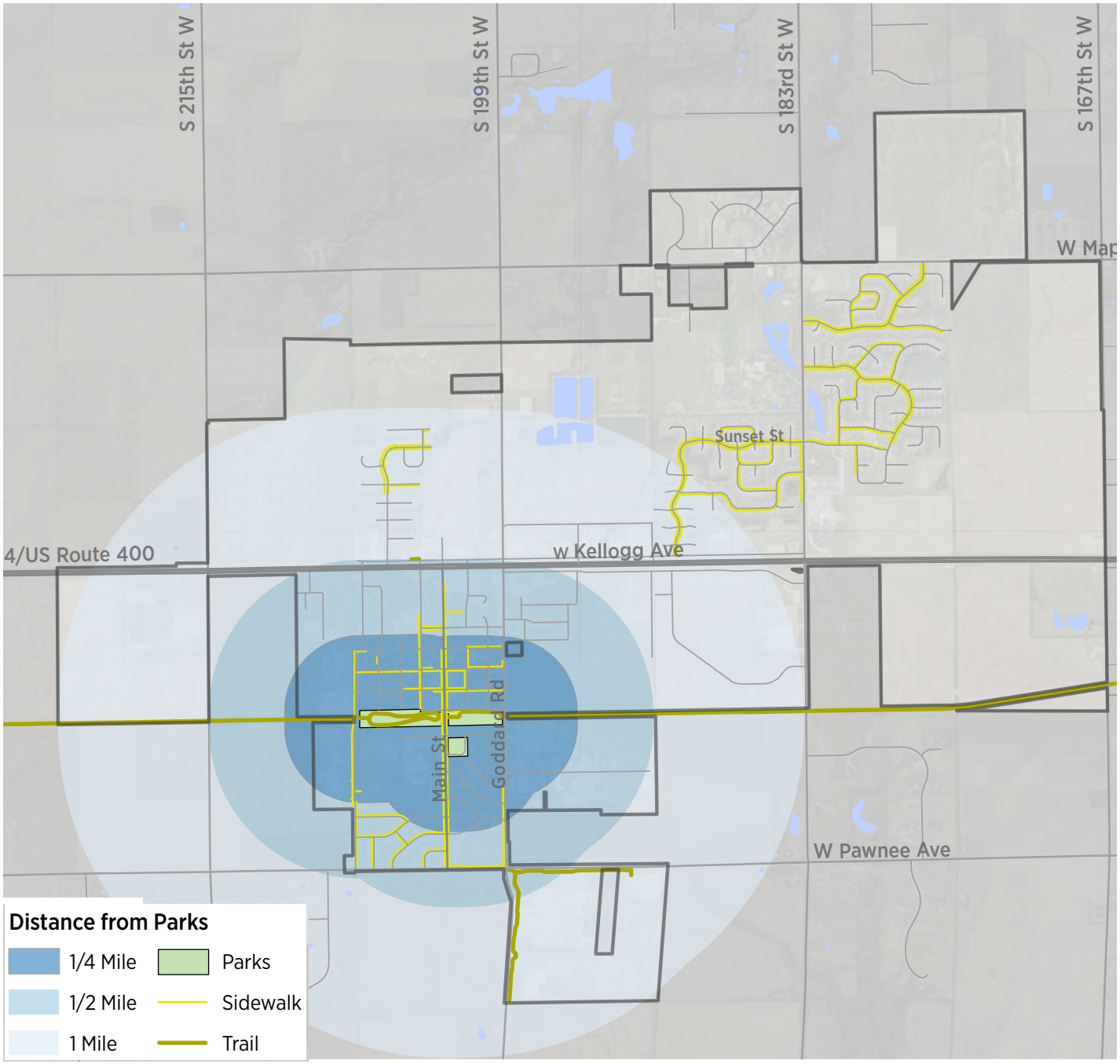
As with schools, residents should enjoy that same access to parks.

In Goddard, the most obvious park service issue is a lack of parks to service the neighborhoods north of U.S. 54. Parks should both provide direct recreational facilities and services and contribute to the walkability and bikeability of a place. For example, a park or other amenity can serve as a mid-point which 1) decreases the perceived distance and 2) generates greater reason for people to travel in both directions making an investment in sidewalks and trails worthwhile.



- *Shortens the perceived distance*
- *Creates bi-directional travel*
- *Supports trail / sidewalk projects*

FIGURE X.X: Parks and Sidewalks - Park Walking Radius



Linear Park. Photo credit: City of Goddard

EMPLOYMENT AND POPULATION DENSITY

The next two maps should be considered as a pair: employment density (where people work) and population density (where people live). The maps display the division of Goddard by U.S. 54 in terms of employment and population density. As a result, even short trips in the city often require crossing U.S. 54 or using it for a short distance.

FIGURE X.X: Population Density

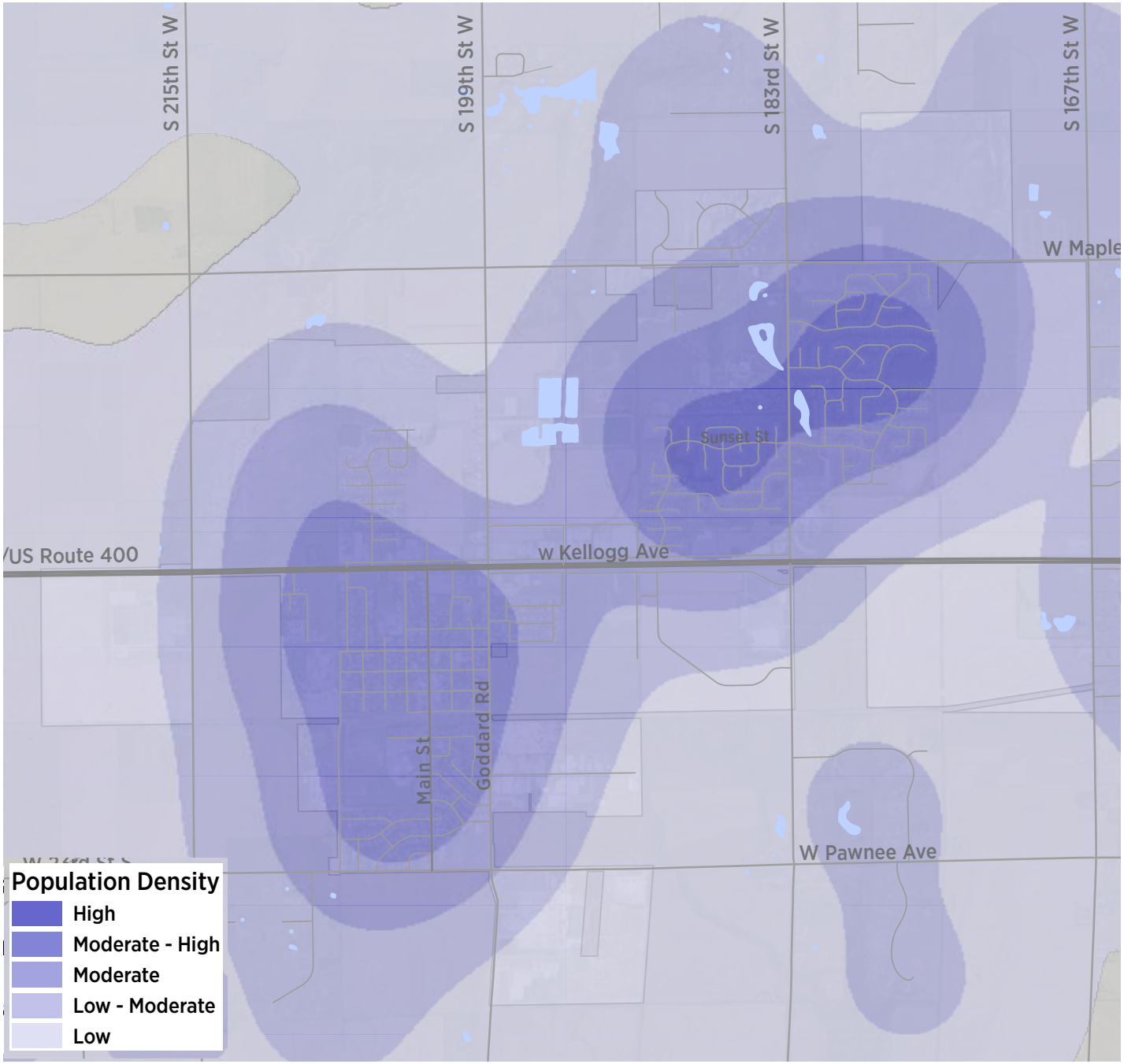
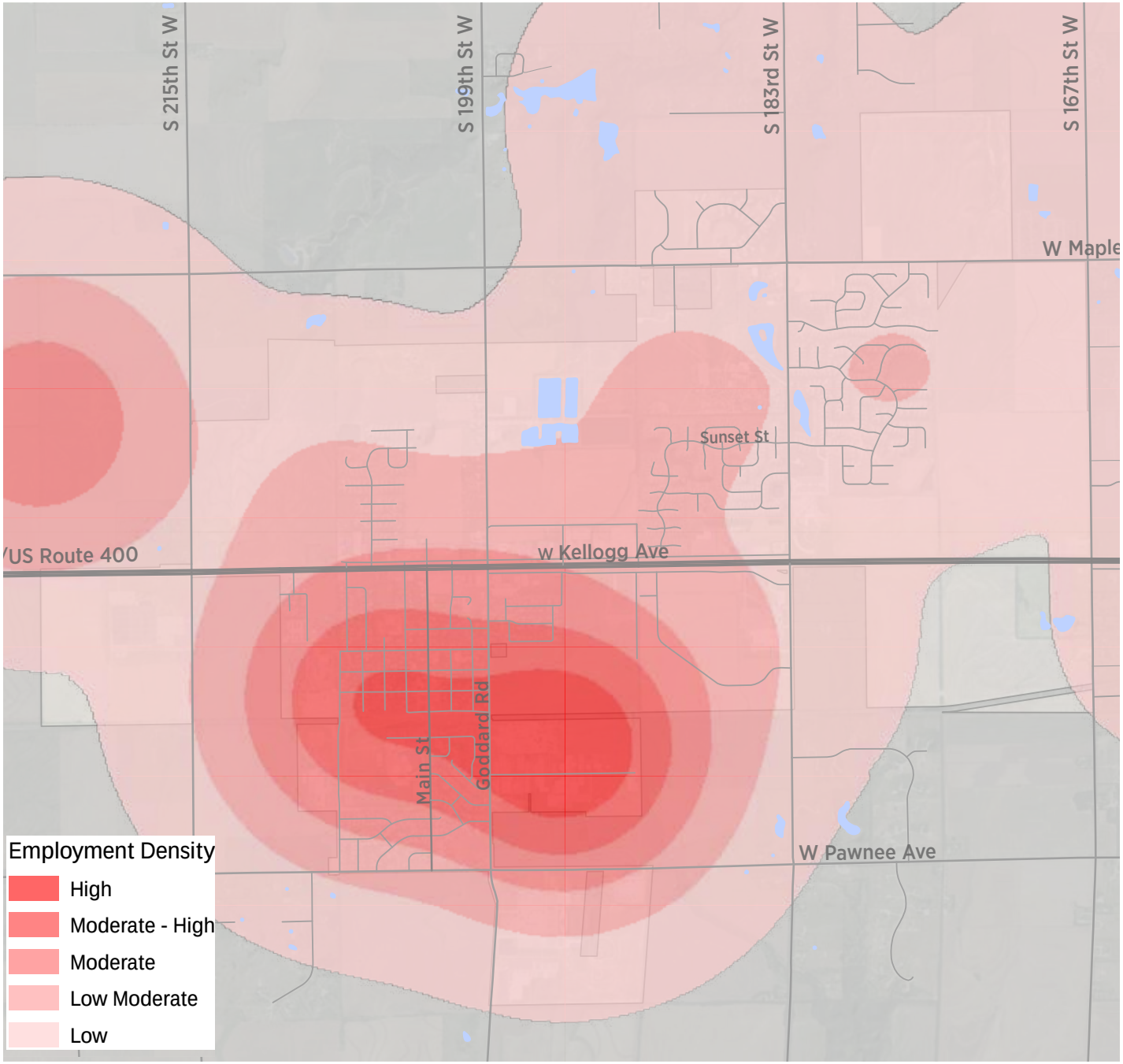


FIGURE X.X: Employment Density

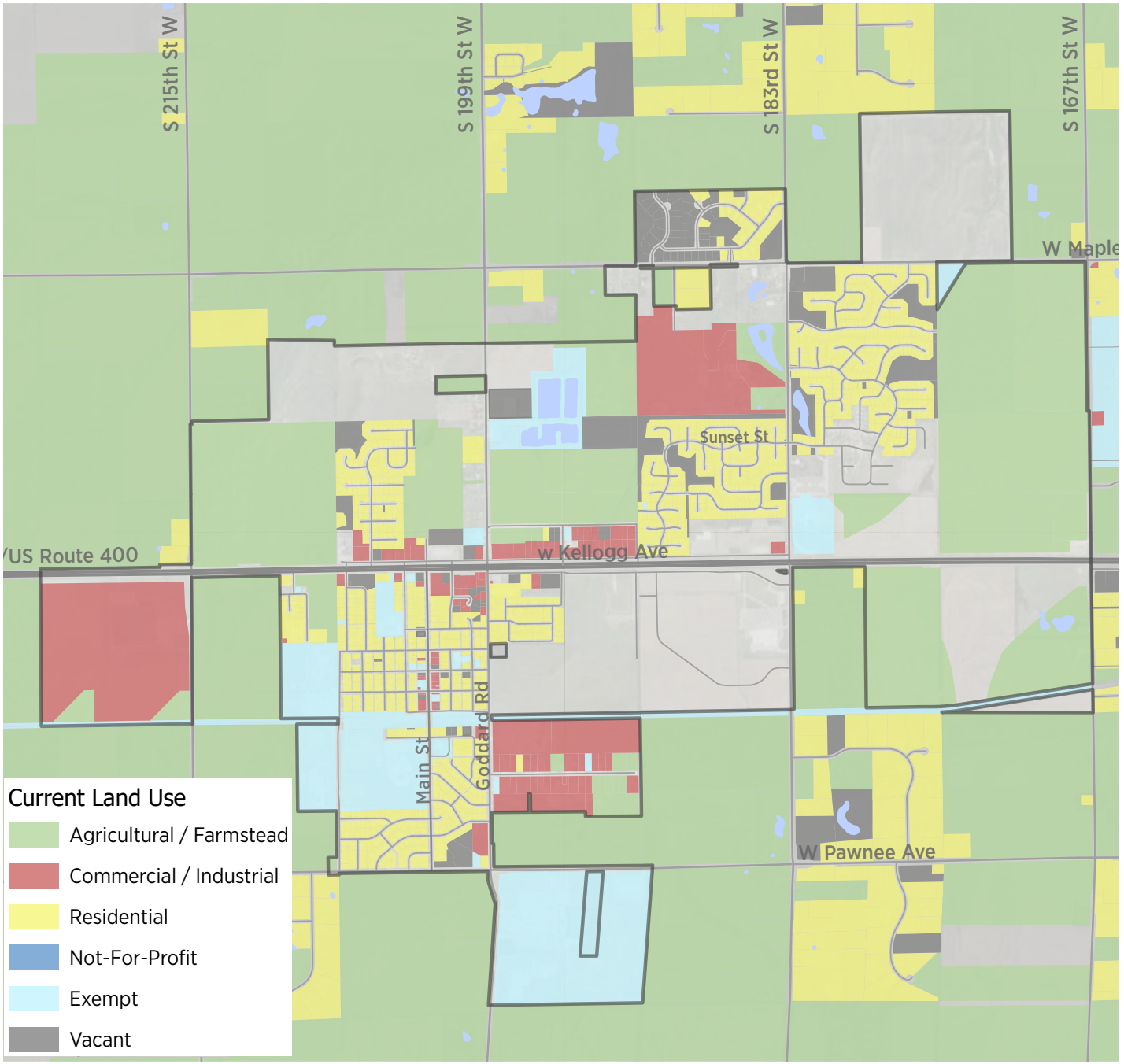


some commercial amenities, typical of suburban cities in the Wichita area.

FUTURE LAND USE

While a comprehensive plan must include a future land use plan, a modern plan would typically provide additional guidance on the important connections that should occur between parcels slated for future development. The current Goddard Comprehensive Plan is primarily a general land use map. This plan helps bridge the gap and contains a development concept that will help guide the connections necessary to ensure the community grows together.

FIGURE X.X: Current Land Use



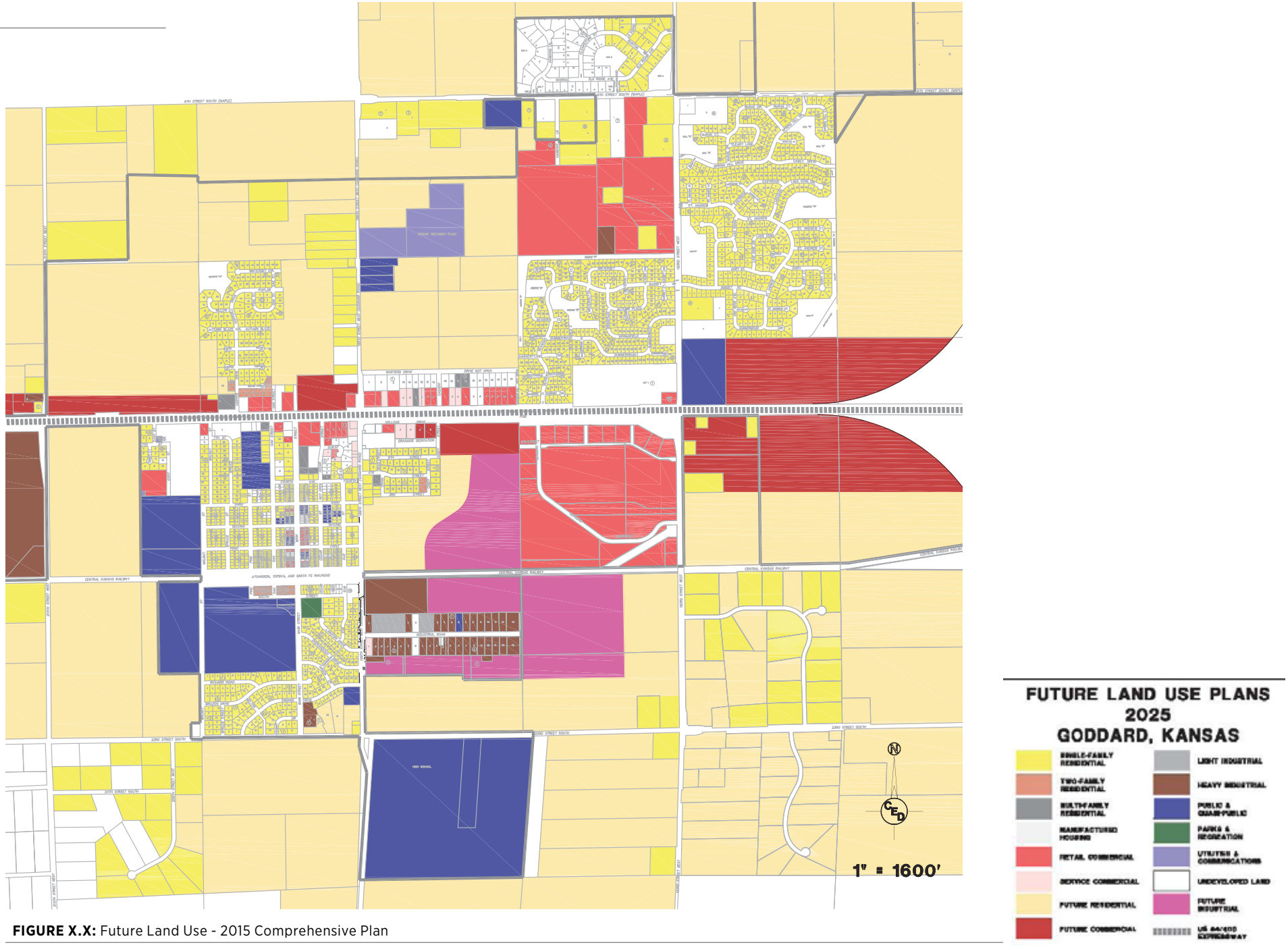


FIGURE X.X: Future Land Use - 2015 Comprehensive Plan

CHAPTER THREE:
The Network Concept

INTRODUCTION

Any investment in transportation must recognize the inherent connection between mobility and land development; if one is allowed to occur without consideration of the other, problems such as traffic hazards, congestion, and depressed property values will result. An important part of this project is to set the path for future urban growth through transportation planning.

This chapter presents a Network Concept, unusual in that it addresses the needs of the existing built Goddard community and also establishes a development framework for the future community. This framework is based on a close relationship among parks, paths, and local transportation – using these systems to help form a cohesive and connective Goddard. The development concept demonstrates how land development can occur incrementally while remaining connected to the fabric and features of the pre-existing community. The chapter is organized as an atlas that advances, map by map, as additional features are added to demonstrate how land use, linear connections, and amenities come together to create a cohesive and connected community for the future.

The process of creating an active network begins with identifying and developing the six guiding requirements for an effective system, adapted from work completed by the Netherlands Centre for Research and Contract Standardization in Civil and Traffic Engineering:

Integrity: The ability of a system to link starting points continuously to destinations, and to be easily and clearly understand by users.

Directness: The capacity to provide direct routes with minimum misdirection or unnecessary distance.

Safety: The ability to minimize hazards and improve safety for users of all transportation modes.

Comfort: Consistency with the capacities of users and avoidance of mental or physical stress.

Experience: The quality of offering users a pleasant and positive experience.

Feasibility: The ability to maximize benefits and minimize costs, including financial cost, inconvenience, and potential opposition.

These six requirements express the general attributes of a good local and county network, but must have specific criteria and even measurements that both guide the system's design and evaluate how well it works. Tables 3.1 through 3.6 describe performance criteria to guide implementation of the network over time and evaluate its effectiveness. Each table includes:

- The **performance factors r**elevant to each requirement. For example, the INTEGRITY requirement addresses the ability of users to understand the system and use it to get to their destinations. Examples of performance factors that help satisfy this requirement include clear wayfinding and directional information and continuity, ensuring that users do not confront dead-ends as they move along the route.

- The **measurements** that can be used to evaluate the success of the system and its ultimate design. For example, we can measure the effectiveness of a wayfinding system by its ability to guide users intuitively without either creating too many signs.

- The **performance standards** that establish the design objectives and guidelines for each of these factors. For example, a wayfinding system should avoid ambiguities that confuse users and follow graphic standards that are immediately and clearly understood.

Integrity issue Examples

- Bike lanes drop cyclists in high-traffic highway conditions.
- Sidewalks that end without connections to other sidewalks or lack barrier-free access at intersections.

Table 3.1: The **INTEGRITY** Principle Developed

Performance Factor	Measures	Performance Standard
Comprehensiveness	Number of connected destinations on system	Major destination types, including parks, sports fields, schools, libraries, the town center, retail features like grocery stores and restaurants, government service offices, regional tourism destinations like Tanganyika, and the Star Project should be served by the network. New destinations as developed should be developed along the network or served by extensions.
Continuity	Number of discontinuities along individual routes	Users headed on a route to a destination must not be dropped at the end without route or directional information. Even at incremental levels, route endings must make functional sense. Transitions between facility types must be clear to users and well-defined. Transitions from one type of infrastructure to another along the same route should avoid leading cyclists of different capabilities into uncomfortable settings or beyond their capacities. Infrastructure should be recognizable and its features (pavement markings, design conventions) consistent throughout the system Sidewalks should not end without connections to other sidewalks or paths.
Wayfinding/directional information	Completeness and clarity of signage Economy and efficiency of graphics Complaints from users	Signs must keep users informed and oriented at all points Sign system should avoid ambiguities that cause users to feel lost or require them to carry unnecessary support materials. Signs should be clear, simple, consistent, and readable, and should be consistent with the MUTCD or other state standards.
Route choice	Number of alternative routes of approximately equal distance	Ultimate system provides most users with a minimum of two alternatives of approximately equal distance. Minimum distance between alternative routes should be about 500 feet
Consistency	Percentage of typical reported trips accommodated by the ultimate network.	Typically, a minimum of 50-70% of trips to identified destinations should be accommodated by the active network.

Directness and Safety issue Examples.

Lack of facilities or convenient highway crossings can force users to take indirect routes.

Lack of a path or sidewalk on 183rd Street or 199th Street can cause hazardous conditions or force pedestrians to take less direct routes.

Table 3.2: The **DIRECTNESS** Requirement Developed

Performance Factor	Measures	Performance Standard
Access	Coverage Access to all parts of the county and largest tons	The network should provide convenient access to all parts of the city. As a standard, all urban residential areas should be within one-quarter to one-half mile from one of the system's routes, and should be connected to those routes by a relatively direct local street connection.
Bicycling speed	Design and average speed of system	The network should permit relatively consistent operation at a steady speed without excessive delays. System should be able to deliver an average point to point speed between 12 and 15 mph for users. Through portion of routes should permit operation in a 15 to 20 mph range.
Diversions and misdirections	Maximum range of detours or diversions from a straight line between destinations. "Detour ratio:" Ratio of actual versus direct distance between two points.	Pedestrian and bike routes should connect points with a minimum amount of misdirections. Users should perceive that the route is always taking them in the desired direction, without making them reverse themselves or go out of their way to an unreasonable degree. For bicyclists, maximum diversion of a straight line connecting two key points on a route should not exceed 0.25 miles on either side of the line. For pedestrians, diversions should not exceed one block in either direction. Detour ratio (distance between two points/shortest possible distance) should not exceed 1.2 over long distances and 1.4 over short distances.
Delays	Amount of time spent not moving per mile	Routes should minimize unnecessary or frustrating delays, including excessive numbers of stop signs, and delays at uncontrolled intersections waiting for gaps in cross traffic. Routes should maximize use of existing signalized crossings.
Intersections	Bicycle direction through intersections	Bicyclists should be able to continue through intersections as vehicles. Situations that force cyclists to become pedestrians in order to negotiate intersections should be avoided.

Table 3.3: The **SAFETY** Requirement Developed

Performance Factor	Measures	Performance Standard
Reduced number and fear of crash incidents	Number of incidents Reactions/perceptions of users	Bikeways system users should feel that the system protects their physical safety, as measured by both use of routes and survey instruments. Particular area of concern are crossings of Kellogg Avenue.
Appropriate routing: mixing versus separation of traffic	Average daily traffic (ADT) criteria for mixed traffic Traffic speed criteria for mixed traffic	System design should avoid encounters between bicyclists and incompatible motor traffic streams (high volumes and/or high speeds). Separation and protection of vulnerable users (including pedestrians) should increase as incompatibilities increase.
Infrastructure, visibility, signage	Pairing of context and infrastructure solutions Mutual visibility and awareness of bicycle and motor vehicles	Infrastructure should be designed for utility by at least 80% of the potential market. Infrastructure types should be matched with appropriate contexts. MUTCD-compliant warning signage directed to motorists should be sufficient to alert them to the presence of cyclists and pedestrians along the travel route. Surfaces and markings should be clearly visible to all users. Obstructions, such as landscaping, road geometry, and vertical elements, should not block routine visibility of pedestrians, cyclists and motorists. Trail and pathway geometries should avoid sharp turns and alignments that hide cyclists operating in opposing directions. Where these conditions are unavoidable, devices such as mirrors and advisory signs should be used to reduce hazards.
Door hazards and parking conflicts	Number of incidents Parking configurations Location of bicycle tracking guides	Component design should track bicycles outside of the door hazard zone. Back-out hazards of head-in parking should be avoided or mitigated when diagonal parking is used along streets.
Intersection conflicts	Location and types of pavement markings Number of intersections or crossings per mile	Intersections should provide a clearly defined and visible path through them for pedestrians and cyclists. As a rule, sidepaths should be used on continuous segments with a minimum number of interruptions.
Complaints	Number of complaints per facility type	Complaints should be recorded by type of infrastructure and location of facility, to set priorities for remedial action.

Comfort issues.

A greater separation from sidewalk to street, For example, a back of curb "sidewalk" suggests that the car is dominant, even on a residential street.

Table 3.4: The **COMFORT** Requirement Developed

Performance Factor	Measures	Performance Standard
Road and sidewalk surface	Quality and type of road surface Materials Incidence of longitudinal cracking and expansion joints	The network's components should provide a reasonably smooth surface with a minimum of potholes and areas of paving deterioration. Roads should be free of hazardous conditions such as settlement and longitudinal cracks and pavement separation. Sidewalks should be free of tripping hazards and obstacles, and should be maintained in good condition on the major active network. All routes in the urban system should be hard-surfaced, unless specifically designated for limited use.
Hills	Number and length of hills and inclines Maximum grades on component for both long and short distances	Hills and grades are generally not a factor in Goddard. As a general rule, routes should avoid more than one incline over 5% for each mile of travel Maximum average design grades should not exceed 7% over a hill not to exceed 400 feet in length; or 5% over the course of a mile.
Traffic stress	Average daily traffic (ADT) Average traffic speed Volume of truck traffic	Generally, the network should choose paths of lower resistance/incompatibility wherever possible and when DIRECTNESS standards can be reasonably complied with. The network should avoid mixed traffic situations when average daily traffic (ADT) exceeds 5,000 vehicles per day when alternatives exist. Alternatives can include bike lanes, separations, or alternative right-of-way.
Stops that interrupt rhythm and continuity	Number of stop signs/segment	Network routes should avoid or redirect frequent stop sign controls. The number of stops between endpoints should not exceed three (1 per quarter mile average) per mile segment.

Table 3.5: The **EXPERIENCE** Requirement Developed

Performance Factor	Measures	Performance Standard
Surrounding land use	Neighborhood setting Adjacent residential or open space use, including institutional campuses Adjacent street-oriented commercial	Surrounding land use should provide the network user with an attractive adjacent urban environment. Routes should provide access to commercial and personal support services, such as food service, convenience stores, and restrooms.
Landscape	Location and extent of parks or maintained open space	Network should maximize exposure of or use right-of-ways along or through public parks and open spaces. Environmental contexts to be maximized include parks, waterways and lakes, and landscaped settings.
Social safety	Residential development patterns Observability: Presence of windows or visible uses along the route Population density or number of users	The network should provide routes with a high degree of observability – street oriented uses, residential frontages, buildings that provide vantage points that provide security to system users. Areas that seem insecure, including industrial precincts, areas with few street-oriented businesses, or areas with little use or visible maintenance should generally be avoided, except where necessary to make connections.
Furnishings and design	On-trail landscaping, supporting furnishings	Network routes should include landscaping, street furnishings, lighting, rest stops, graphics, and other elements that promote the overall experience. These features are particularly important along trails.

Table 3.6: The **FEASIBILITY** Requirement Developed

Performance Factor	Measures	Performance Standard
Cost effectiveness	Route cost Maximum use of low-cost components Population/destination density	The network should generate maximum benefit at minimum cost. Where possible, selected routes should favor segments that can be adapted to bicycle use with economical features rather than requiring major capital investments. Initial routes should be located in areas with a high probability of use intensity: substantial population density and/or incidence of destinations. Initial investments should integrate existing assets, extending their reach into other neighborhoods and increasing access to them. Major off-street investments should concentrate on closing gaps in an on-street system.
Phasing and incremental integrity	Self-contained value Ability to evolve	The network should provide value and integrity at all stages of completion. A first stage should increase bicycle access and use in ways that make future phases logical. The network should be incremental, capable of building on an initial foundation in gradual phases. Phases should be affordable, fitting within a modest annual allocation by the city, and complemented by major capital investments incorporating other sources.
Neighborhood relationships and friction	Parking patterns Development and circulation patterns	The network should avoid conflict situations, where a route is likely to encounter intense local opposition. Initial design should avoid impact on potentially controversial areas, such as parking, without neighborhood assent. Involuntary acquisition of right-of-way should be avoided wherever possible. Detailed planning processes to implement specific routes should include local area or stakeholder participation.

Trail underpass across major arterial, Boulder, C)

NETWORK PRINCIPLES

Consistent with the performance guidelines and standards in the previous section, the proposed Goddard active network is designed around the following guiding principles and ideas:

AN INTERNAL FOUNDATION OF CROSSTOWN COLLECTOR STREETS

Streets that serve as collectors, providing between neighborhoods and across town, are the starting point for the active network. For the most part, they have existing sidewalks and can be adapted to accommodate bicyclists at relatively minimum cost. Examples include Seasons/Sunset Streets, Spring Hill Drive, and Hooper Drive on the north side; and Oak Street, and 3rd Street on the south side. Several of these streets end in open-ended stubs, but will logically be extended as development continues. When connected to shared use paths and neighborhood street links serving existing built-up areas and new growth, they will provide the crosstown foundation for the network

SECTION LINE ROADS AS COMPLETE STREETS

The section line grid (north-south 167th, 183rd, 199th, and 215th Streets and east-west Maple Street and 23rd Street) form Goddard's major street system and should evolve as "complete streets," serving all modes of transportation. This is accomplished by developing shared use paths separated from roadways but located within road right-of-way. Paths should develop as independent projects or incorporated into upgrades from rural to urban street design standards. These facilities tie the internal system described above together and to major community and regional destinations. Kellogg Avenue, another section line corridor, is a special project described below.

STRATEGIC SHARED USE TRAILS ON SEPARATE RIGHT OF WAY

The Prairie Sunset Trail, a rail-trail on the half-section line between Kellogg and 23rd Street, is a key element of Goddard's network on a number of levels, serving at once as a recreational and quality of life asset, a commuter route to Wichita, a local transportation resource, and a potential economic development tool. Strategically placed off-road trails can complement the PST and other components of the network to reach other major destinations. Opportunities include the pipeline and utility easements, the periphery of the proposed K-254 bypass, floodplain corridors, and the edge of major site assemblages such as school campuses.

PERMEABLE "BARRIERS:" PRESENT AND FUTURE

Kellogg Avenue (US 54/400) is at once Goddard's gateway corridor and greatest barrier. The network concept envisions a different Kellogg Avenue, providing comfortable bike and pedestrian access along its length using service roads and shard use paths, improved grade level intersections, and a grade separated bicycle and pedestrian crossing at 191st

Street, serving the planned Star Bond community recreation center and mixed use project. Complicating this is uncertainty over the future form of the highway, including functional plans for a grade separated freeway prepared in 2005. Alternative ideas for Kellogg Avenue are presented in Chapter Four.

Another potential "barrier" is the proposed northwest bypass, carrying K-254 to US 54/400 and possibly continuing to the south. This project will follow a corridor between 167th and 183rd Street, with a major interchange at Kellogg. The Goddard network proposes trails and greenways buffering this freeway from existing and future adjacent residential development, with a trail underpass and trail segments linking St. Andrews Place and other west of K-254 neighborhoods to the Eisenhower school campus.

MAIN STREET AS COMMUNITY CORRIDOR

Main Street is a major civic axis, serving Discovery School, Linear Park and the Prairie Sunset Trail, the traditional town center, and a potential mixed use node north of Kellogg. The network envisions Main as both a multi-modal street and a community investment corridor. In the short-term, it should provide a clear and welcoming link from the PST to Downtown Goddard.

PARK AND PARKWAY SYSTEM AS THE STRUCTURE FOR GROWTH

Goddard is still a growing community, with development that is likely to accelerate as it matures. People will be attracted its cluster of great schools, existing features like Tanganyika, future initiatives like the Star Bond proposal, the potential and civic quality of a traditional town center, a great regional trail, and new transportation access with the K-254 bypass and improvements along Kellogg Avenue. However, without an overriding community vision, this growth is likely to occur incrementally through individual subdivision plats.

Subdivision developers understandably have a primary interest in how their specific projects work – the layout of lots and local streets, compliance with stormwater management requirements, operation of the wastewater system, and the economics of land development. But these individual actions alone will not create the connected, distinctive community that benefits everyone. It is the responsibility of the public sector to establish the broader structure and context that specific projects fit into and benefit from. The traditional grid of section line streets is an excellent example of how the public sector has established a connected framework for private land use.

The need for parks and open spaces to serve new growth in Goddard and the city's aspiration for connectedness and unity creates a unique opportunity to fashion a new kind of community. This connectedness concept is achieved by viewing parks, local vehicular circulation, active transportation, stormwater management, and environmental preservation as a unified park and parkway system. This adapts the work of great American landscape architects and urban designers like George Kessler, Frederick Law Olmsted, and Horace W.S. Cleveland to Goddard's growth opportunities and needs.

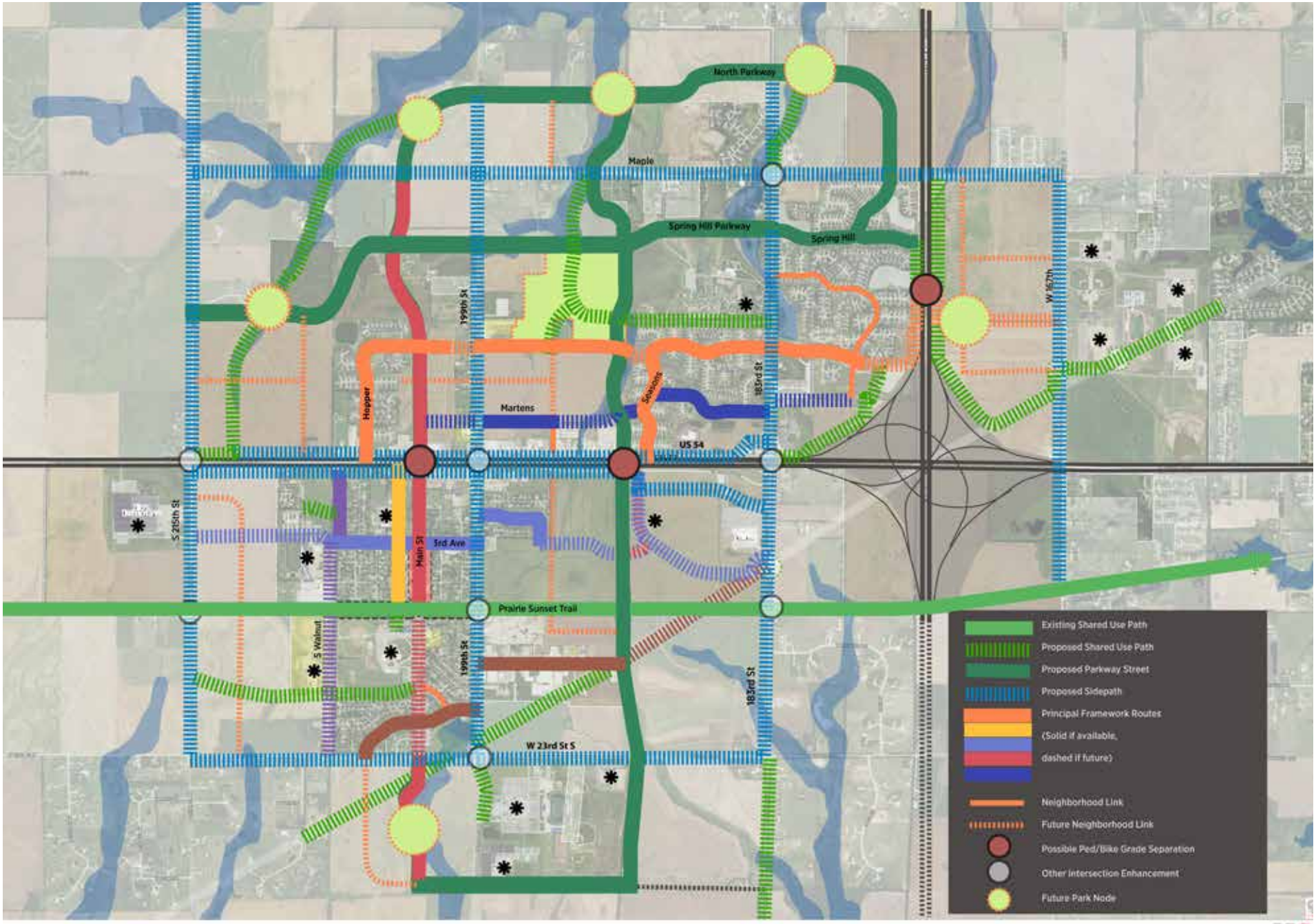
Chapter Four presents a fuller discussion of this concept, whose major building blocks include:

- A major northside park. This opportunity is created by the planned decommissioning of the city's wastewater lagoons east of 199th Street and west of Tanganyika Wildlife Park.
- A system of neighborhood parks in future growth areas, connected to each other by parkways, with location associated with floodplains and stormwater corridors.
- Multi-modal parkways that connect parks together, extend existing street segments, and creates a system of local collector streets that link new neighborhoods. These parkway streets would be designed for slow to moderate speeds with clear but narrow lanes, attractive lighting, shared use paths, street trees, and streetscape features – the kind of civic streets that people want to live along and turn their homes toward rather than away from.

CROSSABLE INTERSECTIONS

The planning of active transportation networks often focuses

Figure 3.1: Goddard Active Network



on linear segments, but the barriers posed by major street intersections and trail crossings are equally important. Connectivity is broken if pedestrians, bicyclists, and other users fear for their safety at unfriendly intersections that put them at risk. Intersection treatments involve both short- and long-term approaches – for example, creating safer travel across Kellogg Avenue cannot wait for implementation of a project that could be fifteen years in the future. The network concept identifies key intersections for attention and the next chapter considers design approaches to address these barriers.

Figure 3.1 presents the overall network diagram and Tables 3.7 through 3.10 describe the components of the Goddard network. The network's routes fall into the following general categories:

Principal Framework Routes. These routes serve the interior parts of the community and provide crosstown access from established Goddard to major destinations and projected growth areas. These routes make extensive use of the existing street network, but are frequently connected into continuous lines through shared use path segments. In some ways, these routes can be compared to transit lines, designed around major destinations and existing and projected population and employment centers.

Shared Use Sidepaths. These components, described more fully below, provide shared use paths along major streets and roads. Typically they are within the right-of-way lines of section line arterials such as 183rd Street, 199th Street, and Kellogg Drive.

Shared Use Trails. These are shared use paths on their own right-of-way separated from roads, although short segments may occasionally run along streets to provide continuity. The Prairie Sunset Trail is a signature example of this kind of facility, although others are proposed by the network plan.

Parkways. These are the key elements of the park and parkway system described above, combining the functions of collector streets that connect neighborhoods, linear parks, active transportation facilities, and overall community amenities.

Intersections and barrier crossings. The network diagram and tables also identify key intersections that should be enhanced to provide improved pedestrian and bicycle access.

The tables identify the name and location of individual routes, their endpoints, the destinations they serve, their individual roles in the overall network, and the types of infrastructure that they feature. The following section of this chapter introduces these infrastructure solutions, which are further detailed in Chapter Four.

Figure 3.2: Key Map: Principal Framework Routes

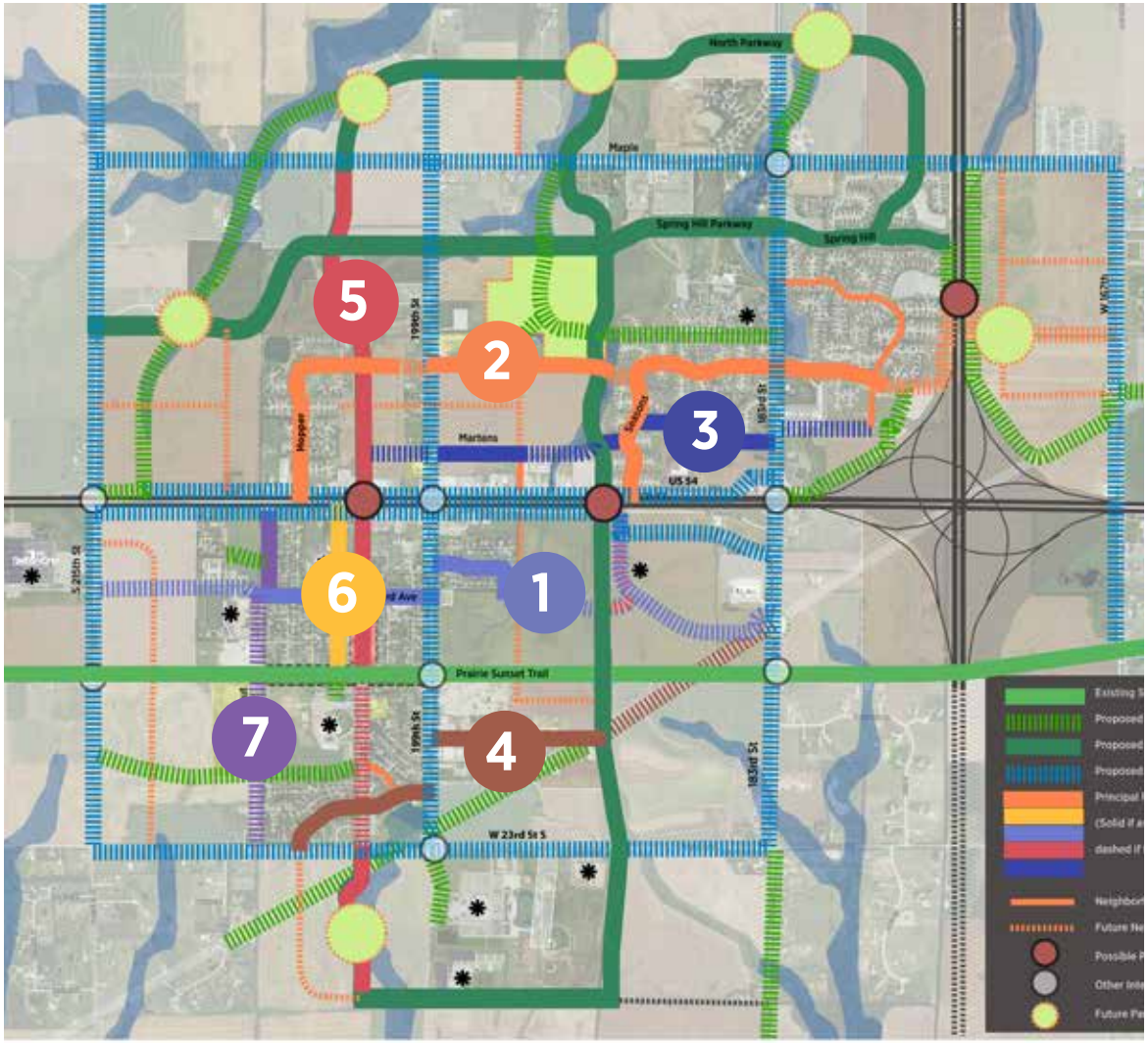


Table 3.7: Principal Framework Routes

MAP LINE	NAME	ENDPOINTS AND ROUTE	MAJOR DESTINATIONS SERVED	HIGHLIGHTS	INFRASTRUCTURE APPROACH
1	3rd Avenue Crosstown	215th Street (W) to 183rd Street (E). Short-term from Challenger campus to Cindy Street	Challenger Intermediate School, Oak Street Elementary, Post Office and Main Street, Star Bond project, Walmart	Major east-west route south of Kellogg with short term service to schools and Main Street corridor in traditional town. Future east extension through the Star Bond site via proposed S. Seasons Street, west to Dillon's Distribution site.	Bicycle boulevard in built-up area. Bicycle boulevard or multi-modal street on east extension. Shared use path on north side of Challenger site with bicycle boulevard west through future development area from school campus to 215th Street, Enhanced crossings at arterial crossings with offset intersection at 199th.
2	Hopper/Seasons/ Sunset	Kellogg Drive (SW) to Eisenhower Campus (E) with underpass with future K-96 project. Short-term from Kellogg to St Andrew	Kellogg corridor, potential Main Street mixed use development, future Central Park on lagoon site, northside subdivisions, Eisenhower campus	Major east-west route north of Kellogg connecting northside subdivisions to each other and to potential major city park on decommissioned lagoon site. Continues along and under future K-96 freeway bypass to link built-up city to new east growth center and Eisenhower campus.	Bicycle boulevard on existing Hopper Drive, Seasons and Sunset Streets with street extensions on future Poplar Street; Parkway on south edge of lagoon parksite and shared use path connection to Seasons Street. In long-term, shared use path and underpass from St. Andrew to 167th Street.
3	Martens/Somerset	Main Street (W) to St Andrew St (E)	Kellogg corridor businesses, Dove Estates, Church of Holy Spirit School	Rear access routes to existing and future businesses along the Kellogg Corridor.	Shared on-road route/neighborhood link.
4	Swanee/Industrial	Walnut Street (W) to 183rd Street (E)	Discovery School, Industrial Park, Prairie Sunset Trail, Walmart and 183rd Street corridor	Southside diagonal connection to industrial park, trail, and Walmart	Bicycle boulevard along Swanee and Industrial Road. Sidepath connection on 199th between Swanee and Industrial. Shared use path on pipeline easement.
5	Main	North Parkway (N) to future 27th Street (S); short term Poplar extension (N) to 23rd Street (S)	Northside mixed use site, Kellogg corridor, Goddard Library, Town Center, Prairie Sunset Trail, Linear Park, Discovery Intermediate School	Major civic route through the center of the city, opening potential mixed use development and connecting northside to traditional town center. Site for possible grade separated crossing at Kellogg Avenue.	Parkway north of US 54. Protected and conventional bike lanes between PST and Kellogg. Shared use sidepath from PST to 23rd Street, with possible trail extension south to 27th with development.
6	Oak	Kellogg (N) to Prairie Spirit Trail (S)	Oak Street Elementary, town center, PST with connections along trail to Challenger and Clark Davidson Schools	Parallel route to Main Street with access to schools and trail.	Bicycle boulevard
7	Walnut	Kellogg (N) to 23rd Street (S)	Challenger Intermediate and Clark Davidson Schools, Prairie Sunset Trail	Important access route to southside school campuses; connection to northside via an improved Main Street crossing	Bicycle boulevard link north of 3rd Avenue; shared use sidepath south

Table 3.8: Principal Shared Use Sidepath Routes

MAP LINE	NAME	ENDPOINTS AND ROUTE	MAJOR DESTINATIONS SERVED	HIGHLIGHTS	INFRASTRUCTURE APPROACH
A	167th Street	Maple Street (N) to Prairie Spirit Trail (S)	Eisenhower Campus, Prairie Spirit Trail	Connection between southside of Goddard and Eisenhower campus via Prairie Sunset Trail. Future neighborhood link to crosstown routes with a future K-96 underpass.	Shared use sidepath. Proposed interchange of K-96 will probably include a grade separated road crossing over Kellogg. Future upgrade to an urban section should include pedestrian refuge medians with beacon protection.
B	183rd Street	Future North Parkway to 23rd Street; short-term endpoints from 23rd Street to Prairie Sunset Trail.	Tanganyika Wildlife Park, Dove Estates, Holy Spirit School, Walmart, Star Bond development, Prairie Sunset Trail	Arterial route that serves as endpoint and connects many parts of the framework system	Shared use sidepath. Major intersection enhancements at Maple, Kellogg, and Prairie Sunset Trail. Short-term action should upgrade ped/bike access for at-grade intersection at Kellogg. Any future Kellogg reconstruction project must include safe and comfortable active transportation accommodation.
C	199th Street	Future North Parkway to Goddard High/ Middle School campus; short-term north endpoint is 23rd Street	Future Central Park, Kellogg Corridor, Prairie Sunset Trail, Goddard High and Middle School	Arterial route that connects many parts of the framework system and serves high school/ middle school campus	Shared use sidepath. Major intersection enhancements at Maple, Kellogg, and Prairie Sunset Trail. Short-term action should upgrade ped/bike access for at-grade intersection at Kellogg. Any future Kellogg reconstruction project must include safe and comfortable active transportation accommodation.
D	215th Street	Maple Street (N) to 23rd Street (S)	Dillon's Distribution Center	Long-term connection along Goddard's west side	Shared use sidepath. Major intersection enhancements at Kellogg, and Prairie Sunset Trail. Any future Kellogg reconstruction project must include safe and comfortable active transportation accommodation.
E	Maple Street	215th Street (W) to 167th Street (E)	Future development areas	Long-term arterial connection across north growth tier. Probably includes grade separation of proposed K-96 bypass.	Shared use sidepath. Intersection enhancement for access at 183rd and Maple.
F	Kellogg Avenue (US 54) North	215th Street (W) to 183rd Street (E)	Commercial corridor, Northside mixed use development, Sacred Heart School	Serves the city's major east-west arterial highway and commercial corridor. Connects northside routes to potential ped/bike grade separated crossings over US 54.	Shared use sidepath, typically on south side of existing Kellogg Drive frontage road because of frequent driveway interruptions on north side. Route could shift to north side east of proposed 191st Street Parkway where driveways are much less frequent. Major intersection improvement projects at 183rd and 199th Street crossings, with possible grade separated crossings at 191st (Star Bond project) and Main Street. Any reconstruction of Kellogg should include continuous sidepath and improved access management.
G	Kellogg Avenue (US 54) South	215th Street (W) to 183rd Street (E)	Commercial corridor, Oak Street School, Star Bond project area	Serves the city's major east-west arterial highway and commercial corridor. Connects southside routes to potential ped/bike grade separated crossings over US 54.	Shared use sidepath, on south side of Kellogg Drive frontage road where the frontage road is present. Major intersection improvement projects at 183rd and 199th Street crossings, with possible grade separated crossings at 191st (Star Bond project) and Main Street. Any reconstruction of Kellogg should include continuous sidepath and improved access management.
H	23rd Street	215th Street (W) to 183rd Street (E)	Clark Davidson and Discovery Intermediate Schools via Walnut and Main links, Goddard High and Middle schools	Arterial connection along Goddard's south growth tier. Provides access to most school campuses on south side.	Shared use sidepath. Intersection enhancement for access at 199th Street.

Figure 3.3: Key Map: Shared Use Sidepaths, Trails, Parkway Streets

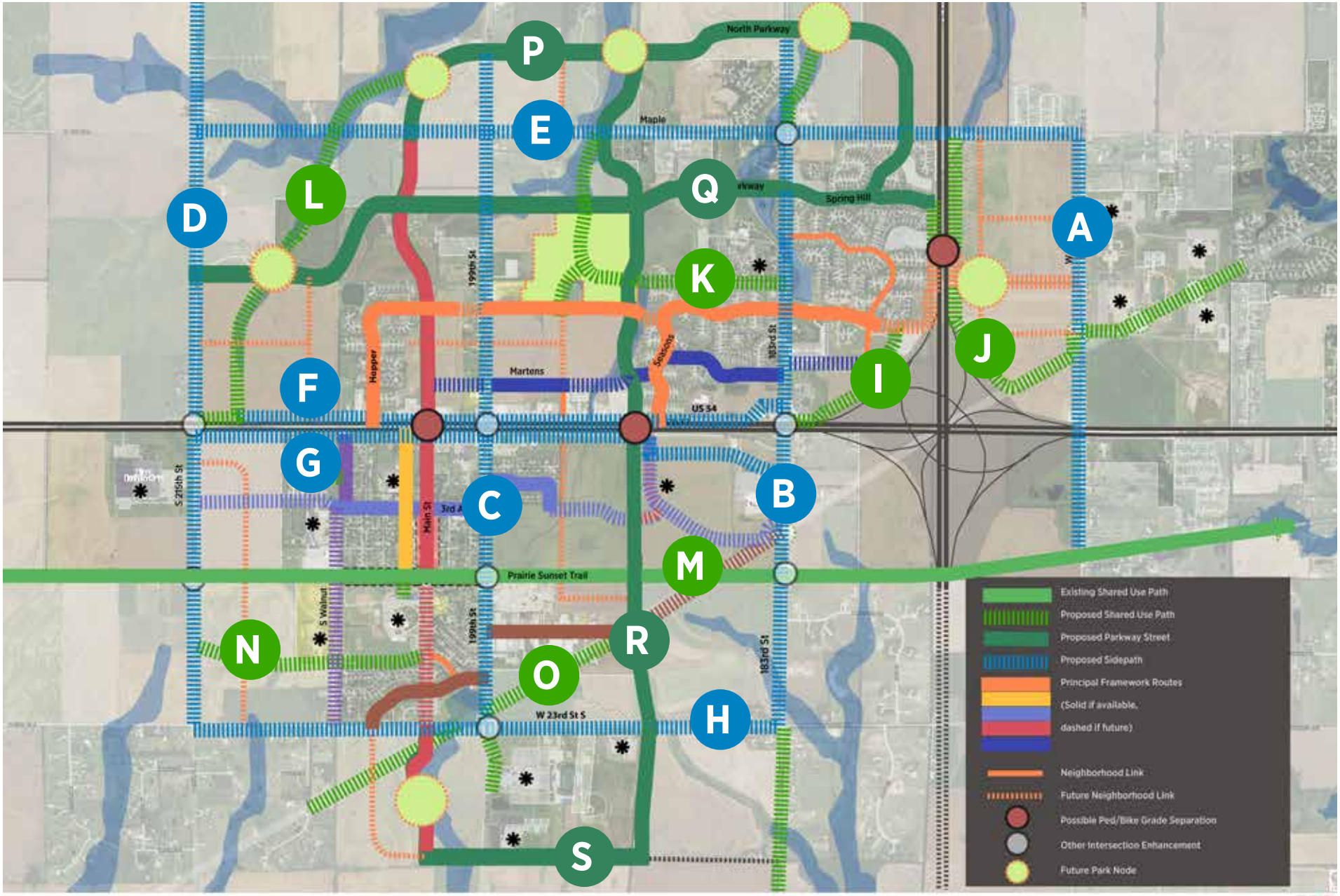


Table 3.9: Trails (Off-Road Shared Use Paths)

MAP LINE	NAME	ENDPOINTS AND ROUTE	MAJOR DESTINATIONS SERVED	HIGHLIGHTS	INFRASTRUCTURE APPROACH
I	K-96 West Trail	183rd and Kellogg to Spring Hill	Proposed K-96 underpass to east side, St Andrew neighborhood.	Key part of system that links east and west sides of future K-96 bypass. Links routes through St Andrew neighborhood, including major east-west crosstown routes.	Shared use path following edge of Kellogg interchange and K-96 right-of-way. Trail underpass of K-96 bypass north of future Kellogg interchange.
J	K-96 East Trail	Maple Street to Eisenhower campus and 167th Street	East side growth center, Eisenhower school campus	Key part of system that links east and west sides of future K-96 bypass. Serves potential growth areas between K-96 and 167th Street.	Shared use path following edge of Kellogg interchange, K-96 right-of-way, and natural gas easement to and through the Eisenhower campus. Also includes an east-west greenway alignment through east side growth center, between underpass and school campus.
K	Tanganyika/ Central Park Trail	Maple Street (NW) to 183rd Street (E)	Proposed north-central neighborhood park, future central park on lagoon site, Tanganyika Wildlife Park	Serves northside's major open space resources and complements proposed park and parkway system.	Shared use path through drainage/floodplain corridors and east-west green corridor adjacent to Tanganyika between eastern boundary of lagoon and 183rd Street. New trail segment with highest near-term feasibility.
L	Northwest Greenway	North Parkway (N)to Kellogg (S)	Western growth areas north of US 54	Northwest leg of proposed parkway system. Probably a long-term project.	Shared use path
M	Prairie Sunset Trail	Garden Plain (W) to Hoover Road, Wichita (E)	Town centers of Garden Plain and Goddard to Wichita. Within Goddard, 215th (W) to 167th (E)	Major trail resource in Wichita metropolitan area, with both local and regional importance to both recreational and utilitarian pedestrians and bicyclists.	Extension of pavement from 183rd to 215th Street. Short-term completion of low water crossing at Cowskin Creek, with future development of all-weather crossing. Eastward extension into Wichita with rail abandonments. Short-term designation of a commuter bicycle route into central Wichita.
N	Clark Davidson Discovery Trail	N 215th Street (W) to Main Street (E)	Clark Davidson and Discovery Intermediate campuses	Short trail connection providing access through a future neighborhood to adjacent school campuses. Creates recreational walking loop with PST.	Shared use path on south edge of school campuses and through potential southwest growth center.
O	Pipeline Trail	S 208th Street (W) to 183rd Street (E)	Southern growth area, Goddard High and Middle School, Industrial Park, Walmart	Eastern segment part of the Swanee/Industrial route to 183rd Street. Connects southwest part of Goddard to 183rd Street and ultimately to east side of the city	Shared use path. Uses some sidepath segments along streets to avoid diagonal crossings.

Table 3.10: Parkways (not included in other framework routes)

MAP LINE	NAME	ENDPOINTS AND ROUTE	MAJOR DESTINATIONS SERVED	HIGHLIGHTS	INFRASTRUCTURE APPROACH
P	North Parkway	Maple Street and Main Parkway extension (W) to Maple and Spring Hill Drive (E)	North tier neighborhoods and neighborhood parks	Northern tier of parkway system, connecting back to Maple Street sidepath and rest of active network.	Parkway street with landscaped shared use path and multi-use shoulders
Q	Spring Hill Parkway	215th Street (W) to Casey Drive terminus at K-96 and Spring Hill and Maple (E)	Central tier neighborhood park, proposed Central Park, St Andrew neighborhood, K-96 Trail, and trail underpass to east side and Eisenhower campus.	Central collector and crosstown multi-modal parkway corridor south of Maple	Parkway street with landscaped shared use path and multi-use shoulders; bicycle boulevard on Spring Hill and Casey Drives
R	Star (191st Street) Parkway	North Parkway (N) to south edge of Goddard High campus (S)	North Parkway chain of parks, proposed Central Park, Tanganyika, Kellogg corridor, Star Bond project area, Prairie Sunset Trail, Goddard High School campus	Major north-south spine of parkway system, connecting major present and future public investment initiatives. Connection of major path and framework routes.	Parkway street with landscaped shared use path and multi-use shoulders. First priority location for grade separated pedestrian and bicycle crossing of US 54.
S	27th Street	Main (W) to Star Parkway (191st) (E)	Goddard High/Middle School campus	Short segment with some expansion capability connecting two major north south corridors.	Parkway street with landscaped shared use path and multi-use shoulders.

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.

FACILITY VOCABULARY FOR THE GODDARD SYSTEM

An active transportation network is built largely of linear segments and "nodes" (crossings such as street intersections, railroads, bridges, and other potential barriers. The vocabulary of segments is made up of various approaches to infrastructure that are appropriate to a community's street system and other potential opportunities. This section discusses the types of infrastructure that make up the segments in a proposed Goddard network, based on fieldwork and an inventory of the city's street system and development opportunities.

ON-STREET APPROACHES

Some of Goddard's proposed network will use existing or proposed streets and roads. The Goddard facility preference survey, in common with many other communities indicated a preference for low-traffic settings or greater degrees of separation and buffering from motor vehicles. On-street approaches are sometimes grouped together under the heading of "complete streets, designed to include all modes of transportation including bicyclists, pedestrians, motorists, and transit users. Complete streets can take on different forms, based on the character and opportunities presented by individual communities.

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

From, top: Traffic calmer on a bicycle boulevard in Boulder, CO; bicycle boulevard in Topeka

bicyclists position themselves safely on a street away from the “door zone” of adjacent parked cars. Other pavement markings that can help creates 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 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 signs). The entire system will also use a common signage system that incorporates identifying, directional, and wayfinding signs.
- 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

Bike lane types. From left: Standard bike lane with visibility enhancements in Wauwatosa, WI; advisory bike lanes in Chicago; parking protected bike lane in Seattle

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.

In Goddard, potential bicycle boulevards include Seasons and Sunset Street, Spring Hill and Casey Drive, and 3rd Avenue, all with future extensions into new development areas.

NEIGHBORHOOD LINKS

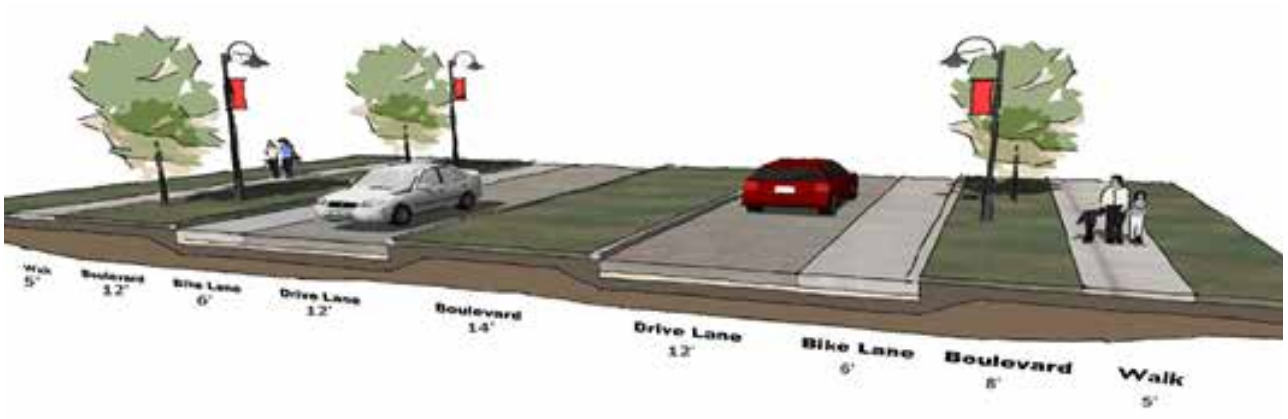
On shared streets in an active network, bicyclists and motor vehicles operate in common right-of-way, with pedestrians typically walking on parallel sidewalks or separated paths. These streets usually have low volumes and speeds and adequate continuity to be useful parts of the system. They link longer system facilities, such as bicycle boulevards and shared use paths, to neighborhoods and off-route destinations not directly served by these elements of the system to destinations. Shared streets may include bike route identification and wayfinding signs. As with bicycle boulevards, neighborhood links also include sidewalks and barrier-free intersection crossings.

Neighborhood links generally exhibit low traffic volumes, low speeds, and off-street parking. Examples in the Goddard network include Swanee Drive, Walnut Street between Kellogg and 3rd Avenue, and Summerwood Street. Links can sometimes grow to bicycle boulevards as new development creates the opportunity for greater continuous route length. Swanee Drive, in the south part of the city, may present such a future possibility.

BICYCLE LANES

Bike lanes provide a designated area within a street channel for operation of bicycles and, sometimes, other types of low-powered mobility devices such as electric scooters, motorized wheelchairs, and similar low-speed use. Bike lanes typically provide for one-way movement in the same direction as motor vehicles. Standard bike lanes, ordinarily demarcated by a white line to the right of travel lanes and by the periodic use of a bike lane symbol and directional arrow, 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). Green paint used in the bike lane in conflict zones, at the beginning of a block, and behind the bike lane symbol, increase visibility and user comfort.

Bike lanes have other potential benefits as well. They help manage traffic speed on wide streets by visually narrowing travel lanes for motorists. They also provide contingency space for motor vehicle breakdowns and passages of wide and emergency vehicles, particularly when configured as "multi-purpose shoulders."



Potential parkway section and illustration

In Goddard, applications of standard bike lanes or multi-use shoulders include:

Main Street north of 2nd Avenue to Kellogg Avenue.

Upgrades of section line arterials such as 183rd and 199th Streets, in combination with off-road shared use sidepaths.

Future parkways, again in combination with shared use sidepaths.

Two other variations of standard bike lanes also have specific applications in Goddard.

- Buffered or protected bike lanes, which have a neutral area or buffer that separates them from motor vehicle travel lanes. These have gained increased popularity in the United States because 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 such as planters, flexible bollards, curbs, or raised medians. In this configuration, the protected bike lane, which can provide either one- or two-way travel, is essentially a bike trail within the street The most appropriate immediate application for a protected bike lane is Main Street from the Prairie Sunset Trail through Downtown to 2nd Avenue, connecting the trail to the town center. They also may be used in new areas with high bicycle use potential, such as along streets or drives within the Star Bond project area.

- 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 may also routinely use the advisory bike lane. This technique has some of the same application as shared lane markings, but is considerably more visible than the routine sharrow.

PARKWAYS

Parkways have a central role in the future network by extending and connecting parks, as well as providing the transportation role of connecting neighborhoods. As such, they are hybrids that cross the barrier between on- and off-road facilities. In the Goddard system, parkways have some of the following features:

- Parkways have both park and transportation elements. They connect people and neighborhoods as both paths and quality of life features.
- They play the role of a collector street, providing local routes that complement but do not require use of the arterial grid. Parkway collectors are designed for low speed vehicular traffic.
- They are landscaped with street trees and include wayfinding signage to community destinations.
- The streetscape environment can be branded to distinguish it from other types of streets in the city; for example, a segment could be named “Ed Seiver Parkway”

Above from top: Shared use trail and underpass under US 36 freeway near Boulder; shared use sidepath in St Louis County, MO

Pedestrian crossings: From left: Right turn bypass provides a generous refuge area between right turning and direct traffic (Boulder); intermediate medians improve comfort of crossing a major arterial (Green Bay)

after the baseball pitcher active 1875-1920. The parkways could include artistic elements at key gateways.

- When practical, a parkway should include a substantial setback to sidewalk or path. This setback, with a desirable minimum of 8 feet, provides space for street trees and pedestrian amenities.
- Each parkway includes a shared use path on one side of the street (with a more conventional sidewalk on the opposite side). These paths should be developed to full shared use path standards. The typical parkway section provides two lanes with occasional medians and may include bike lanes/multi-use shoulders.

OFF-STREET APPROACHES

Off-street shared-use paths are 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 both Europe and America, 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 streets with relatively controlled access such as new arterial roads. They are often retrofitted into commercial or mixed use urban corridors, often in concert with access management initiatives to consolidate and align driveways.

Shared-use trails follow their own right-of-way, typically following waterways, railroads, parks, and other open spaces. The Prairie Sunset Trail through Goddard is an excellent example of such a facility. Shared-use trails are typically paved within communities, as is the PST between 199th and Walnut Streets, and may use either pavement or granulated stone surfaces in rural areas. The various types of shared use paths have a typical minimum width of ten feet, with eight feet being acceptable in constrained areas.

SIDEWALKS AND PEDESTRIAN PATHS

Sidewalk coverage in Goddard is intermittent at best and varies form north to south. In the traditional town between 199th Street (Goddard Road) and Walnut Street from Kellogg to the Prairie Sunset Trail, sidewalks are present in segments on east-west streets on the grid, but lack crosstown continuity on any street. Main and Oak have somewhat better coverage in the north-south direction, but neither street has sidewalks that connect to Kellogg. Walnut Street has a continuous sidewalk between its two school campuses, but again sidewalk coverage ends at 3rd Avenue. Similarly, residential areas south of the trail has some sidewalk coverage west of Main, but these segments do not continue from block to block.

Newer subdivisions like Seasons and St. Andrew Place have sidewalks on neighborhood collector streets like Seasons, Sunset, St. Andrew, Spring Hill, and Hopper north of Autumn Blaze. Sidewalks are not provided on short cul-de-sacs or street segments. This is consistent with current practice that considers very low-volume, short residential street segments to be shared territory for pedestrians and local motor traffic.

Sidewalks or pedestrian facilities are generally lacking on section line arterials, with the exception of recent sidewalk projects that have completed a conventional width sidewalk from Seasons Street to Kellogg. The network concept envisions shared use sidepaths along these arterials, which would require upgrading of this relatively new sidewalk. Kellogg Drive also lacks sidewalks or any form of pedestrian accommodation other than shred use of frontage roads.

It is impractical and probably unaffordable to require each existing street in Goddard to install new sidewalks. Instead, the Goddard active transportation concept proposes a strategic approach, coordinated with other elements of the network that includes:

- Sidewalks or pedestrian paths on all segments identified as bicycle boulevards and neighborhood links. In older parts of the city, these retrofits should provide sidewalk continuity on at least one side of the street. In new subdivisions, sidewalks should be provided on both sides of designated streets.
- Shared use sidepaths on all corridors designated for them, including section line arterials. Any new sidewalk construction projects programmed on these corridors should be built to sidepath standards discussed in Chapter Four.
- Shared use paths on all future parkway corridors.
- Retrofit of Kellogg Avenue to provide multimodal accommodations, including pedestrian access within the corridor but outside of the highway's main line.
- Extending pavement on the Prairie Sunset Trail to at least 183rd Street, with further expansion as adjacent urbanization takes place.

Crossing refuge median, Waukesha, WI

High visibility crosswalk with Rectangular Rapid Flashing Beacon

Table 3.11: Intersection Crossing Techniques

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	199th and Kellogg
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	183rd and Maple
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.	3rd Avenue at 183rd
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.	183rd and 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.	Major street intersections, Kellogg Avenue at-grade crosswalks
Beacons: HAWKS (High Intensity Activated Crosswalk Beacon) and flashing beacons.	Pedestrian actuated signals. HAWK signals often used at mid-block and for trail crossings and include flashing yellow and solid red stop sequence. Flashing beacons, including Rectangular Rapid Flashing Beacons, typically located at intersections and use flashing lights but no red signal.	Trail crossings or mid-block pedestrian crossings

INTERSECTIONS

Goddard has installed beacon protected high visibility intersection crossings at Prairie Sunset Trail crossings at Main and Walnut Streets, 3rd Avenue and Walnut, and 183rd between Kellogg and Somerset. The Goddard network concept identifies other intersection barriers that should be addressed to minimize obstacles to safe and comfortable travel across the city. These key intersection projects include:

- Retrofit of existing the at-grade intersections at 183rd and 199th and Kellogg Drive. These retrofits may involve high visibility crosswalks, the use of right-turn bypass lanes that provide pedestrian refuge areas between right turning and direct traffic streams, and improved pedestrian refuge areas in existing medians.
- Retrofit of pedestrian crossings of Kellogg at Main Street and Walnut Street. These pose significant problems because signalized crossings are probably unwarranted at present. Future plans for the Kellogg corridor must include safe pedestrian and bicycle crossings at these points.
- A grade separated crossing of Kellogg, coordinated with development of the proposed Star Bond project, probably occurring at about 191st Street.
- A beacon protected Prairie Sunset Trail crossing at 183rd Street.
- Improved intersections with high visibility crosswalks at 199th Street and 23rd Avenue and 183rd and Maple.
- A future pedestrian/bicycle underpass incorporated into the future K-96 bypass.

APPLYING INFRASTRUCTURE TO THE NETWORK

Figure 3.4 applies these infrastructure types to the Goddard network. This diagram can then be used to guide both cost projections, included for initial phases in Chapter Four, and annual capital programming.

BUILDING THE NETWORK

The proposed Goddard active network will be implemented in phases, and will almost certainly evolve over time. However, this plan establishes both initial phases that guide activity during the next ten years, and a concept for how the network both emerges from that foundation and . The sequencing of phases and specific trails and routes 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 Two and the results of open houses and steering committee discussions have been invaluable in identifying these high demand areas.
- **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 or tie relatively remote neighborhoods to the overall system 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. In some cases, phase one projects include planning to incorporate active transportation accommodations into early project design. An example is the K-96 underpass, which will probably not be constructed in the first phases, but must be planned for in functional documents.
- **Safety enhancement.** High priority projects should increase safety and reduce user discomfort for people of all ages. This makes intersection and barrier crossing

Figure 3.4: Infrastructure Types Applied to Network

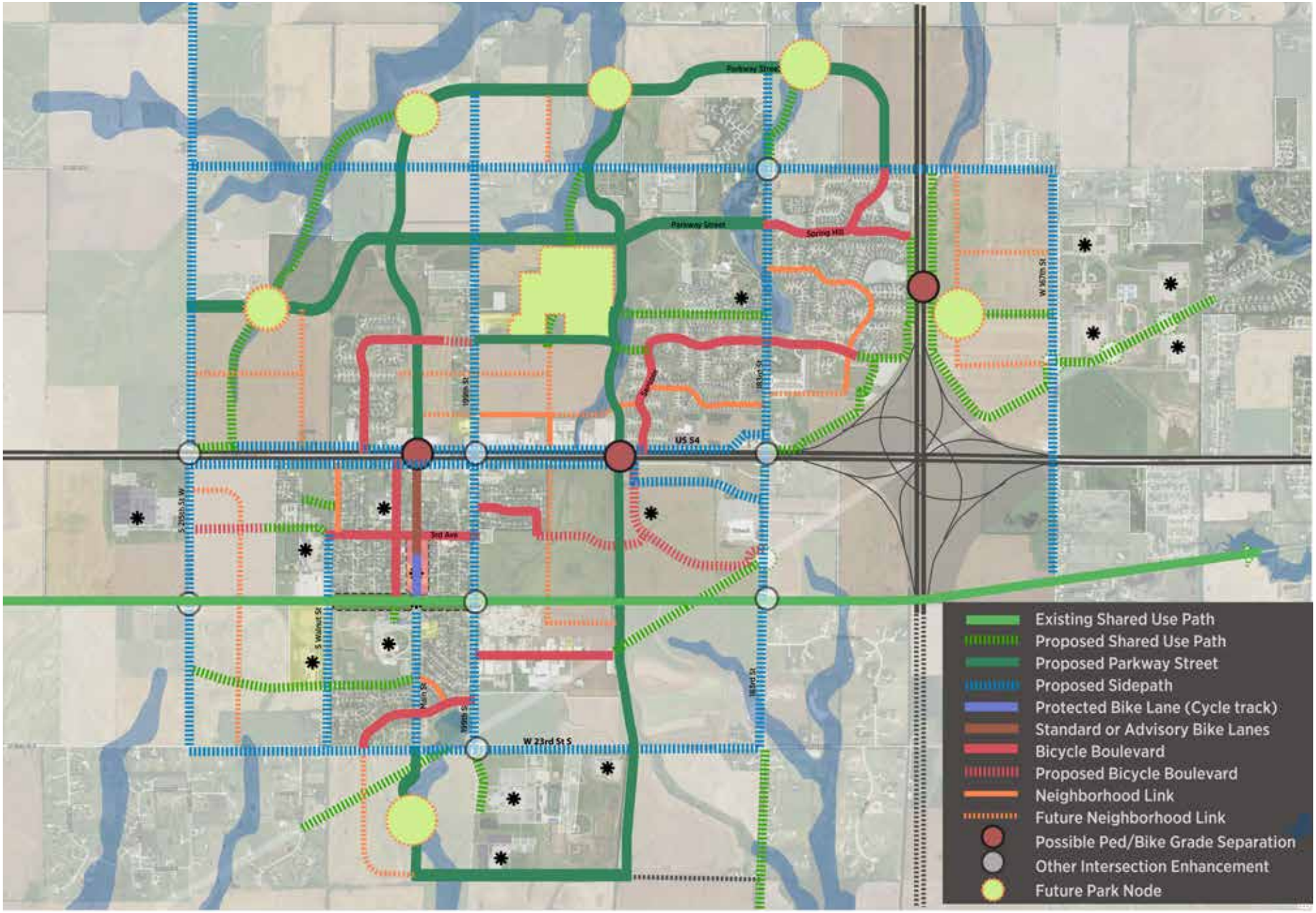


Table 3.12: Summary of Infrastructure Types in the Goddard Network

FACILITY TYPE	DESCRIPTION	EXAMPLES IN NETWORK
Multi-use trails	Separated trails on exclusive right-of-way. Some segments may be sidepaths adjacent to roadways.	Prairie Sunset Trail, proposed trails along parts of south pipeline, Tanganyika Trail concept
Sidepath	Paths separated from but generally parallel to roadways and on public right-of-way	183rd Street, 199th Street
Neighborhood Links	Low-volume, low-speed streets identified by signage, wayfinding, shared use lane pavement markings, but no major infrastructure changes. Often used to connect network to specific destinations. Includes continuous sidewalks.	Somerset, new street connections shown in development areas.
Bicycle boulevards	Low-volume, two-lane mixed traffic streets or groups of streets with direct continuity. May use special identification and wayfinding signage, traffic calming devices, controlled major intersections, continuous sidewalks.	3rd Avenue, Seasons Street, Sunset Street, Swanee Drive
Parkways	Two- or three-lane collector streets that define the basic local circulation system of potential growth areas. Designed as "green streets" with occasional medians for traffic calming, multi-use shoulders or bike lanes, attractive street landscaping and lighting, and a shared use path on one side of the street. Parkways connect future neighborhood parks to each other and to the rest of the active network.	Streets designated as parkways
Advisory bike lanes	Shared roadway that clarify operating positions for bicyclists within shared travel lanes, typically used on segments that need definition of territory for bikes but are not wide enough for conventional bike lanes or multi-use shoulders.	May be used on neighborhood links and bicycle boulevards where standard bike lanes are not required or where space is inadequate.

extremely important.

- **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, Goddard school campuses, the library, the town center, Prairie Sunset Trail, and similar destinations.
- **Relative ease of development.** It is important that the 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. On the other hand, relatively expensive projects like shared use sidepaths and US 54 crossings are key priorities for the community.

SEQUENCING

The sequencing concept uses these guiding criteria to identify a basic network that would provide a high level of service to Goddard even it no further progress were made. The sequence design is divided into:

- *A Basic Network* that provides basic on-street routes and sidewalks, with shared use paths that fill gaps in the street network or create important connections. The Basic Network serves the built-up part of the city, potential infill sites, and short-term growth areas that are adjacent to the city. The Basic Network is further divided into two phases: a phase 1a that serves immediate opportunities and priority needs; and a phase 1b that expands into expands the basic foundation into new areas or improves service along previous streets and corridors.
- *An Ultimate Network* that serves major new growth areas within Goddard's present city limits. The ultimate network includes much of the proposed park and parkway system previously described in this chapter.

THE BASIC NETWORK

The Basic Network implemented over ten years translates to a proposed investment of just under $4.1 million, or $408,210 annually in 2018 dollars. Chapter Four presents details and costs that can be used for specific capital improvement programming. Implementation depends on availability of funding and some large projects or overall efforts could receive federal and state funds that could advance them ahead of others. Thus, the implementation sequence suggested here is a scenario that could change over time.

While the City and the community will determine the order of the projects within each phase, the system must start to emerge with some specific routes and route segments. Phase 1a (Figures 3.5 and 3.6) is the foundation of the ultimate network and focuses on proven destinations and traffic patterns. It features the following key elements:

- Four principal east-west corridors, from south to north: Swanee/Industrial, 3rd/4th Streets, Kellogg, and Hopper/Sunset.
- Five north-south corridors, from west to east: Walnut, Oak, Main Street, 199th, and 183rd.
- New connections to the Prairie Sunset Trail
- Filled gaps in the existing sidewalk network
- New separated paths connecting to schools

The basic system also includes several key intersection and street crossing improvement projects:

- Crossings of Kellogg (US 54) at 183rd, 191st (Star Bond project site), 199th, and Main. The 191st and Main intersection sites might involve eventual grade separations.
- Initial functional design of the K-96 bypass that incorporates a pedestrian/bicycle grade separated crossing (probably an underpass) between Kellogg and Maple.

Phase 1b, the second increment of the Basic Network, completes completes additional links along Kellogg Avenue, establishes a new local route parallel to Kellogg along a completed Martens Avenue, and adds new links on the edges of the built-up city, extending the network into potential nearby growth areas.

Figure 3.5: Phase 1a Route Network

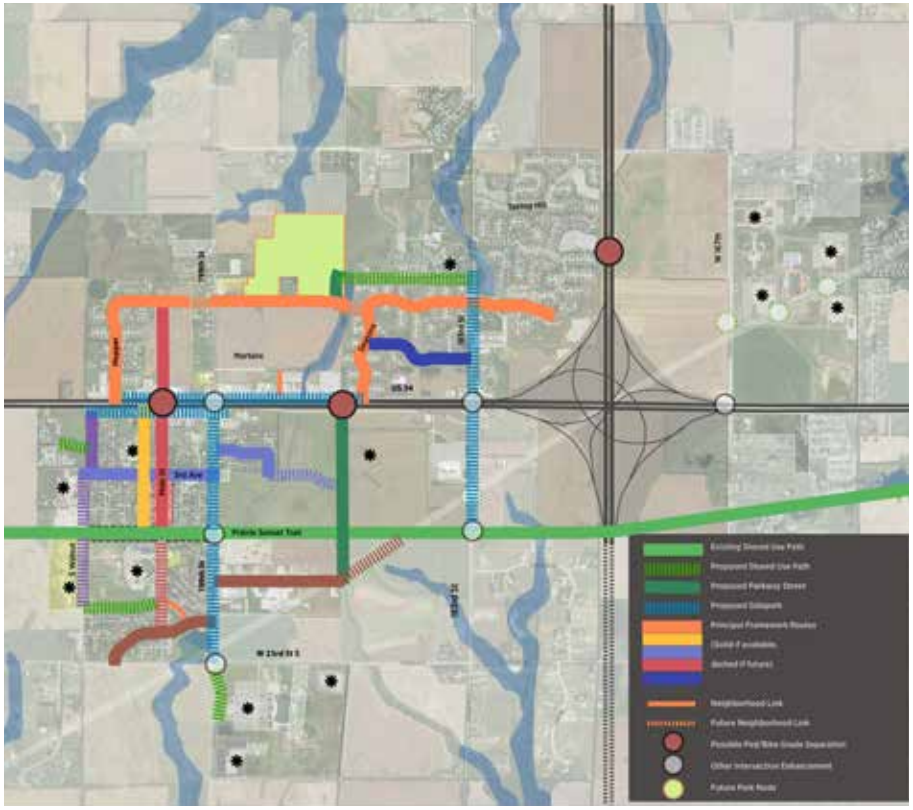
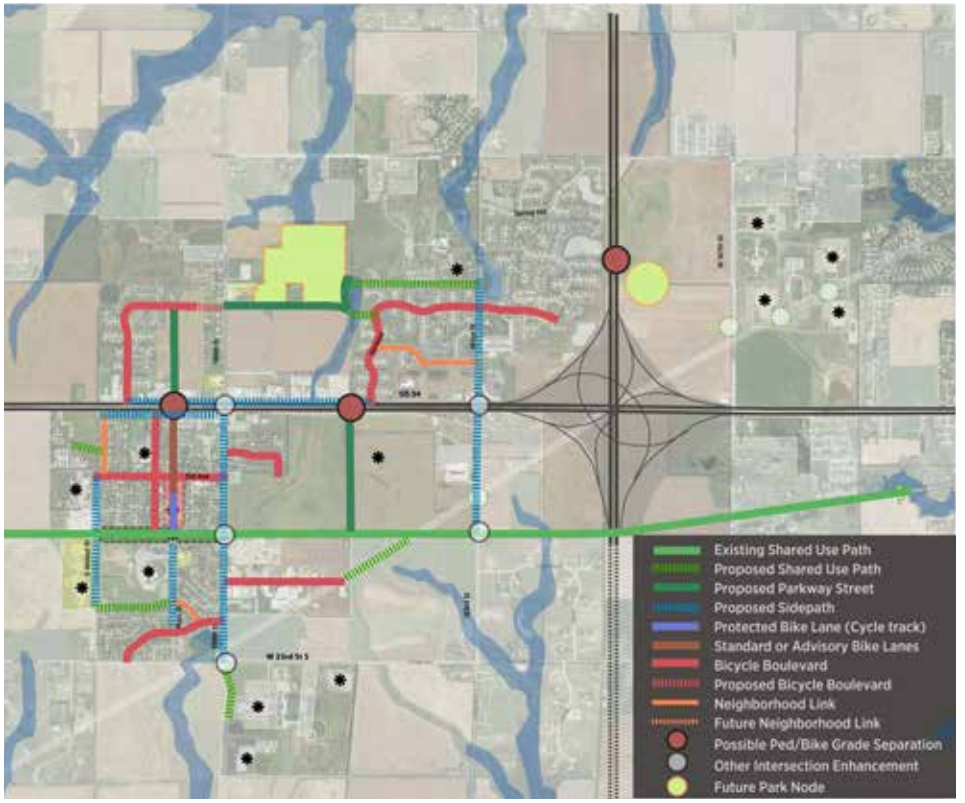


Figure 3.6: Phase 1a Routes by Infrastructure



ULTIMATE NETWORK PHASE 2

The ultimate phase of the system (Figures extends the Basic Network into future development areas and encompasses most of the proposed parkway street system, establishing a public space and collector structure for areas currently undeveloped but within Goddard's corporate limits. These segments will be built incrementally as development occurs, and future subdivisions should be designed around and dedicate these general corridor connections.

- Parkways north and south that connect future neighborhood parks and serve as collector streets for newly developing areas.
- Shared use paths in greenways following drainage corridors. development.
- Neighborhood connectors through future development to connect existing neighborhoods.
- Future park nodes along the proposed parkway system surrounding the community.

Significant barrier improvement projects address conflicts created with future infrastructure construction including: crossings with proposed sidepaths and a grade separated crossing east to west through the future K-96 bypass.

DEVELOPMENT PHASES

Figures 3.5 through 3.9 illustrate proposed route development phases for the Goddard network based on these criteria. Figures 3.10 through 3.14 show the same phasing translated to infrastructure types in order to calculate

Figure 3.7: Phase 1b Route Increment

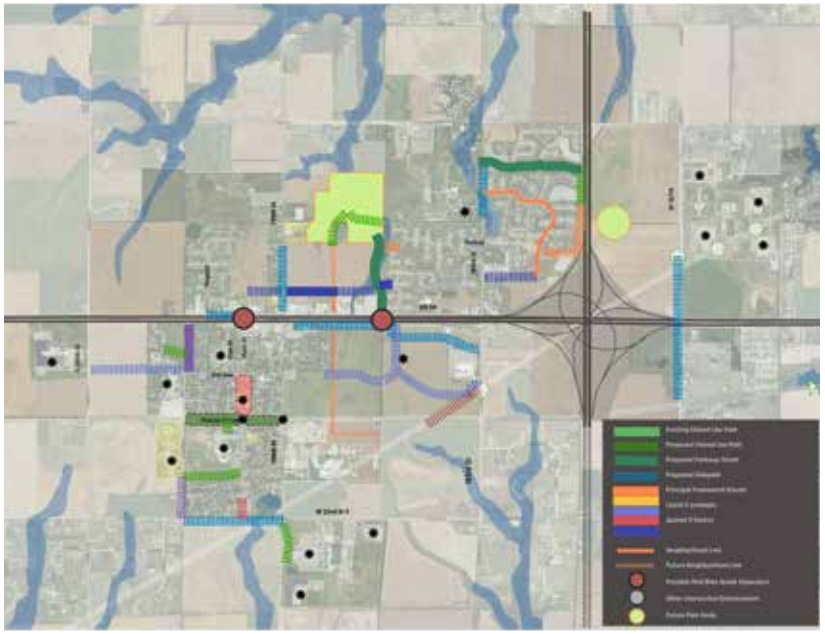


Figure 3.8: Phase 1b Increment by Infrastructure

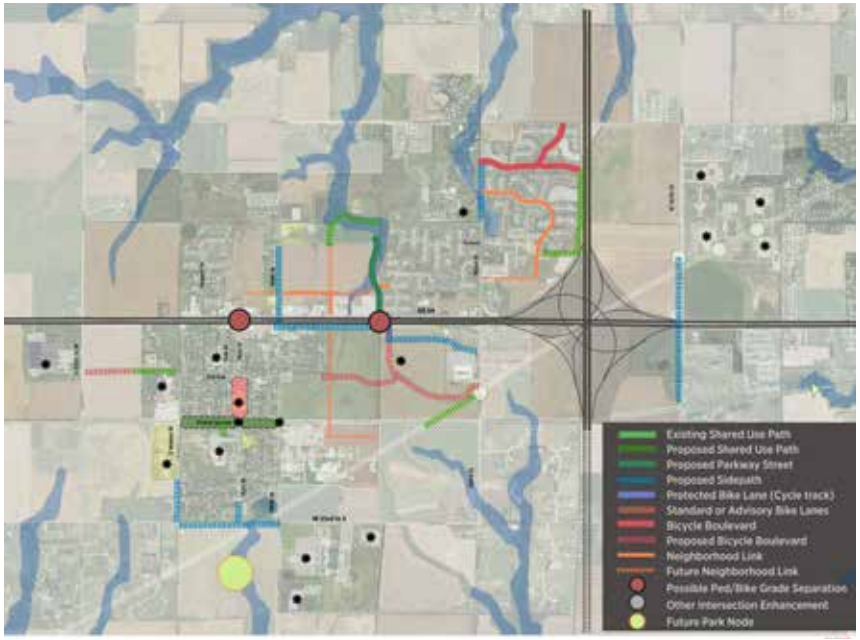


Figure 3.9: Completed Basic Network (1a plus 1b)

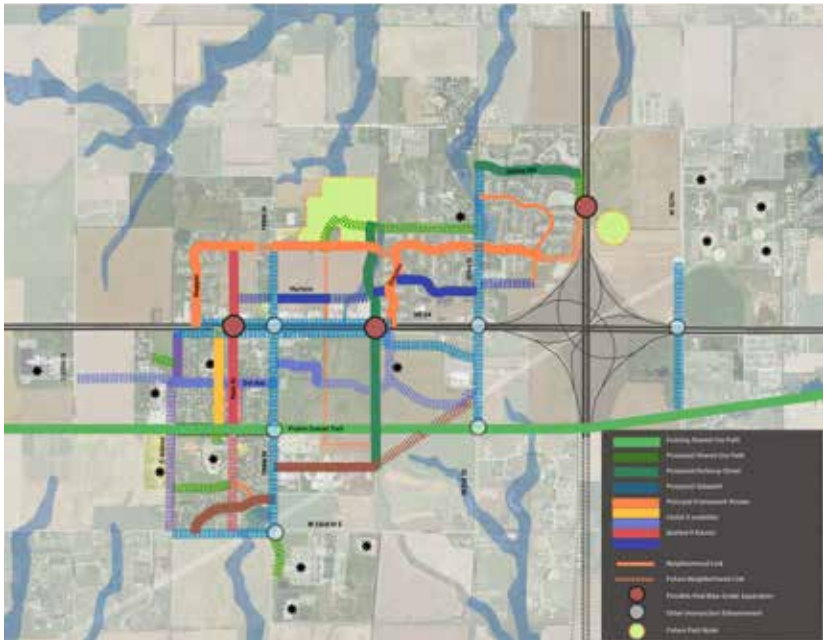


Figure 3.10: Completed Basic Network by Infrastructure Type

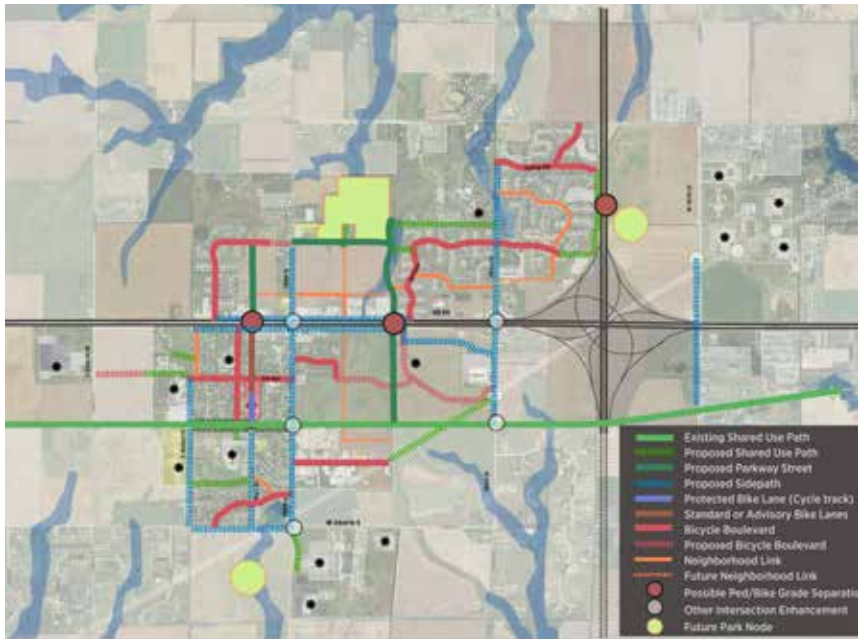


Figure 3.9: Basic Network Routes (Phases 1a and 1b)

Figure 3.10: Basic Netwo

Figure 3.11: Ultimate Phase Route Increment

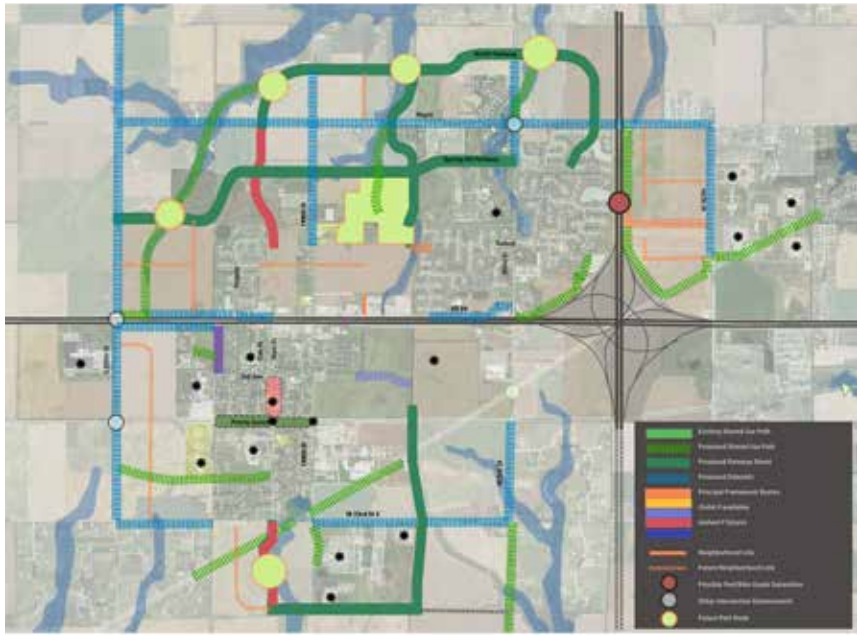


Figure 3.12: Ultimate Phase Routes by Infrastructure

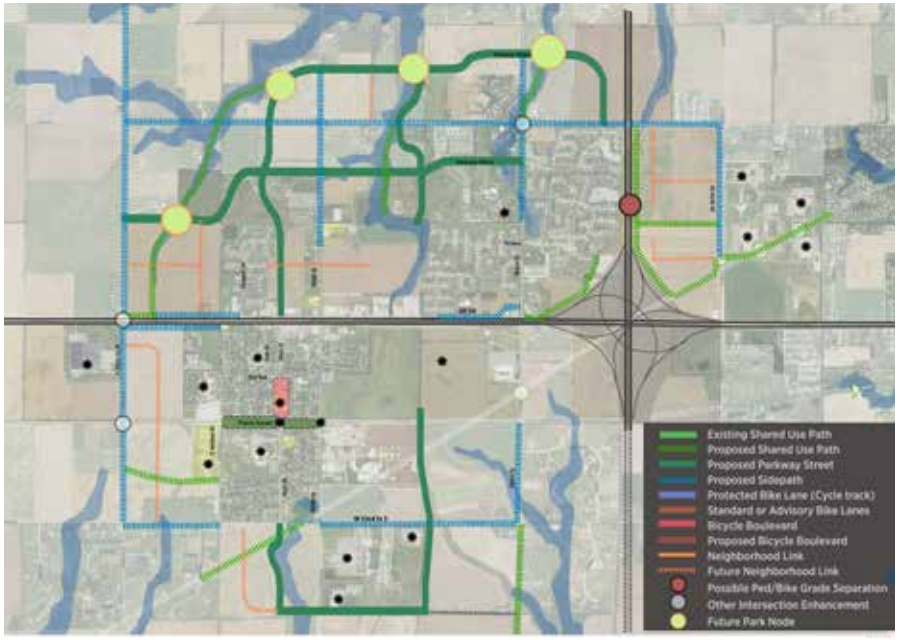


Figure 3.13: Ultimate Network Routes

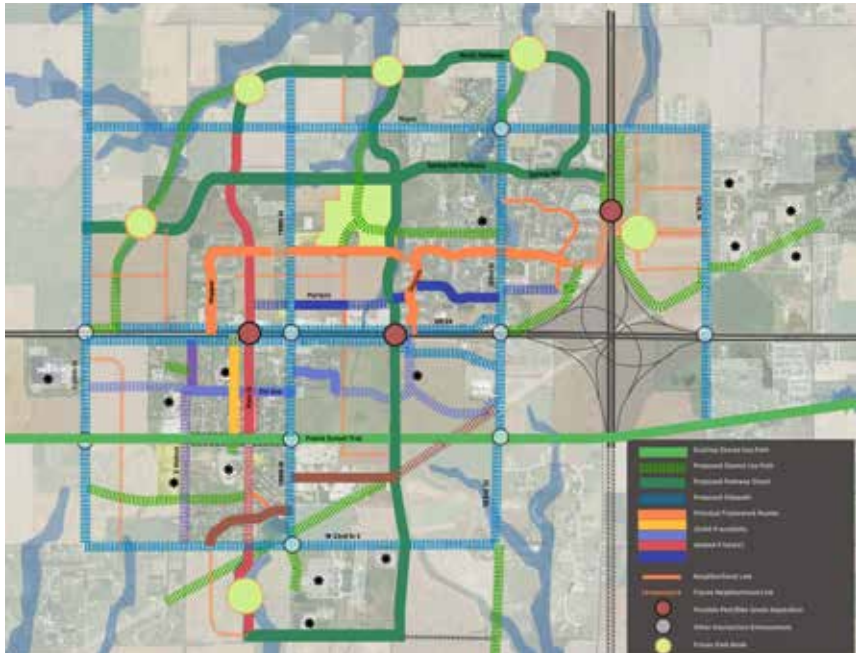
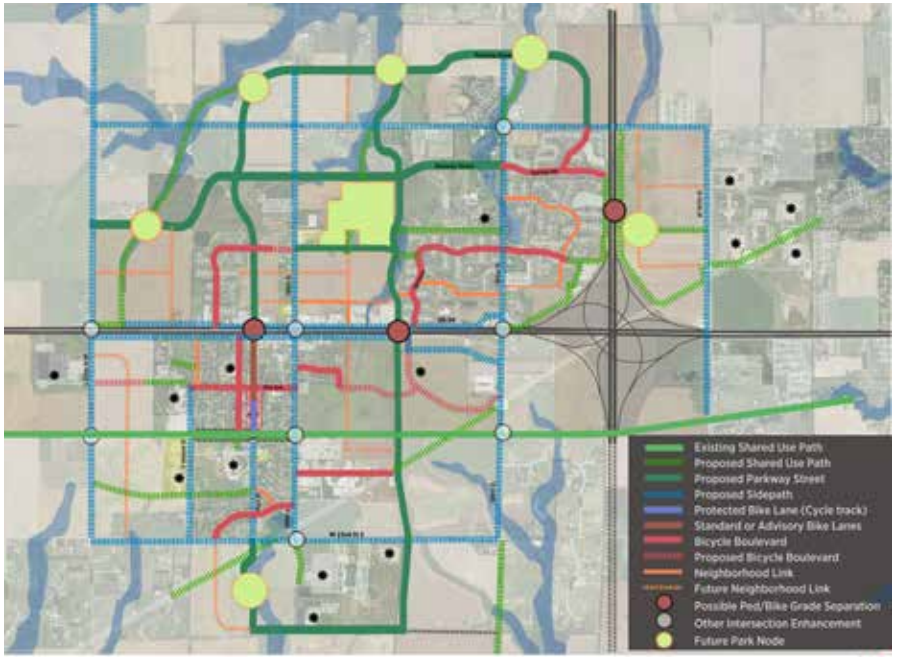


Figure 3.14: Ultimate Network by Infrastructure Types



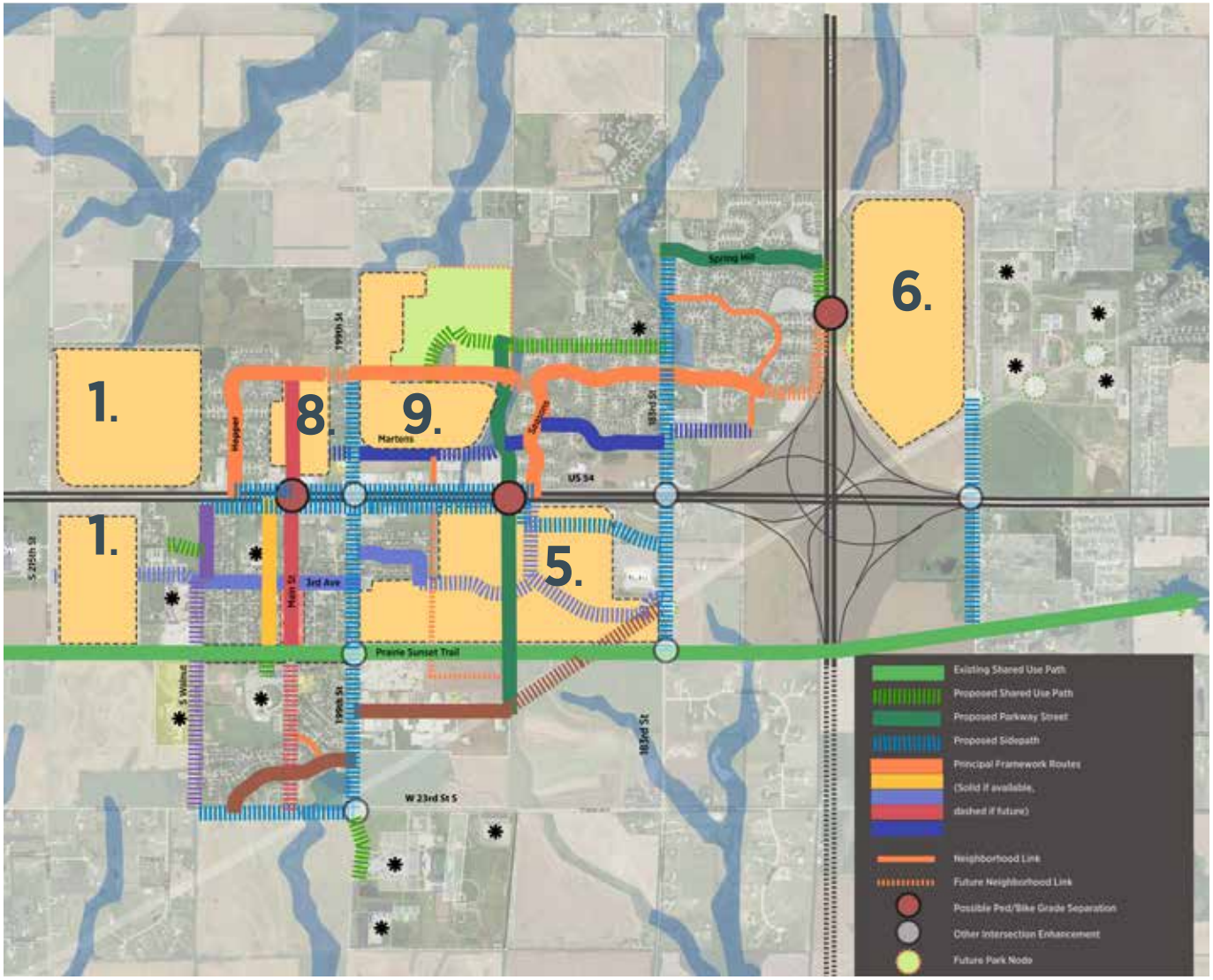
ork Infrastructure (Phases 1a and 1b)

GROWTH CENTERS

A central concept of this plan is the use of a park and parkway system, which includes an active transportation framework, to make Goddard a special place in the Wichita metropolitan area as the city grows. Figures 3.15 through 3.17 show how predefining a development framework of these powerful influencer's can produce a connected city rather than a disconnected aggregation of individual subdivisions. This park and parkway system, combining active transportation, collector streets, and open space into a unified whole, would keep the city connected as it grows. Growth centers include:

1. Northwest of 199th and U.S. 54
2. Southwest of Walnut and U.S. 54
3. South of 23rd Street
4. South of Trail, North of Pawnee
5. STAR Bond Project
6. Southeast of Maple and K-96 Bypass
7. North of Maple Street
8. North side mixed use center
9. South of existing lagoons, north of Martens

Figure 3.15: Potential City Development and Basic Network



NOTES:

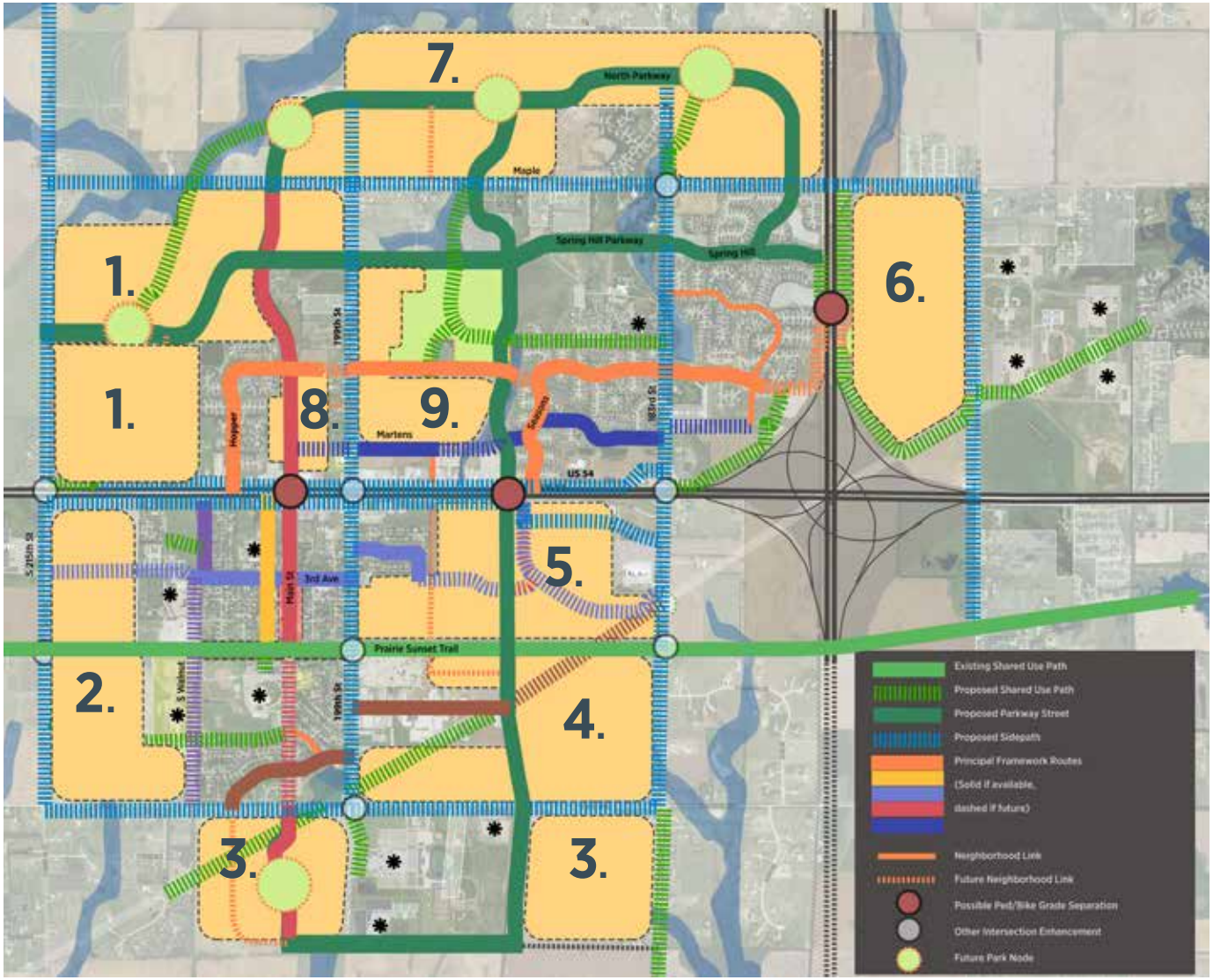
GENERALIZED MAP

The development concept should be interpreted generally and is not intended to provide the specificity of a zoning map or a planned road design. The map should provide guidance for the City's decisions regarding land development and municipal projects such as roads, trails, and park amenities.

PROPERTY OWNERS DECIDE

The concept depicts improvements on private property including land development, roads, and trails. These recommendations should be viewed through a 20 to 30-year lens in which many things can and will change. Therefore, the recommendations of the concept should occur incrementally as owners decide to develop or sell their land for development.

Figure 3.16: The City and Ultimate Network



Figures 3.16 and 3.17 show incremental growth stages that relate the individual stages of the active network to potential community growth, The Phase One network projects conversion of the city lagoons to a major northside community park with development infilling from that facility back toward the US 54 corridor. It also suggests some westward development toward 215th Street and east adjacent to the Eisenhower campus on what will be the east side of the K-96 bypass. Phase 1a projects full completion of the Star Bond project and connections related to that ambitious project.

CHAPTER FOUR:
The Network Developed

INTRODUCTION

While Chapter Three explained the goals, guiding principles, and overall framework of the proposed active network for Goddard, this chapter provides a guide for the network's gradual development.

ROUTE DETAILS

This chapter divides the network grid into north-south and east-west components. It provides a proposed solution for each route, illustrated on a strip map each street or pathway segment, key destinations along the way and intersecting routes. These maps are divided into keyed segments, corresponding to key dividing points, milestones, or changes in infrastructure treatment. The number key for each segment corresponds to a row in the accompanying table.

The tables display:

- **The endpoints and length of each segment.**
- **The nature of the existing facility.** Information also includes number of lanes and approximate width of the street channel, aerial photography, and field measurements.
- **Sidewalk coverage.** Streets included in the active network should provide sidewalk continuity on at least one side.
- **Recommended infrastructure.** This presents the recommended infrastructure treatment and other ideas for adapting a segment for safer and more comfortable bicycle and pedestrian use. On-street treatments like marked routes and bicycle boulevards typically use pavement markings and signage. In some cases, path or trail segments fill gaps in continuity. All recommendations are preliminary and may change with detailed design. Projects should be reviewed and approved by the City Engineer when funding becomes available and may require additional engineering evaluation, including traffic studies where relevant.
- **Planning level opinions of probable costs.** While these are not based on detailed design, they give an idea of relative costs for planning purposes. Cost factors used for these estimates are shown in Figure 4.1. These costs do not include right-of-way acquisition, contingencies, design and engineering fees, major drainage structures, or extraordinary grading expenses.
- **These recommendations should be refined further as individual projects are implemented.** However, they provide a starting point for the more detailed design process, and provide guidance in determining priorities and costs of various improvements.

These details focus on the Basic Network, those facilities most likely to be developed within the next two probable capital funding cycles. The later discussion of funding mechanisms will consider possible financing options for the long-term elements that make up the ultimate network.

COST ESTIMATE RANGES FOR NEW PROJECTS

This section includes opinions of estimated costs the estimated implementation costs for pedestrian and bicycle facilities in the Basic Network. These assumptions and unit cost rules guide the cost calculations for each proposed network element described in the subsequent tables.

The most cost-effective method for implementation is to include active transportation elements in street projects already programmed in the Goddard capital improvements plan or the Kansas Department of Transportation. These include overlay, chip and sealing road reconstruction, and traffic signal replacement projects. This strategy eliminates additional costs for bikeway project implementation such as pavement marking eradication, pavement removals, and pedestrian ramp replacements, since they are already included in the CIP project.

As future street repair projects are added to these programs, bicycle projects should be coordinated to seek out further efficiencies. Development of a comprehensive bikeway system is an incremental process, and may take a period of time to complete. Clear communication to the public on how plans will emerge over time will help explain this process as steady progress is made.

Planning-level cost estimates have been developed for each facility type and are shown in Figure 4.1. Note that updated engineering cost estimates will need to be developed for each project during detailed design.

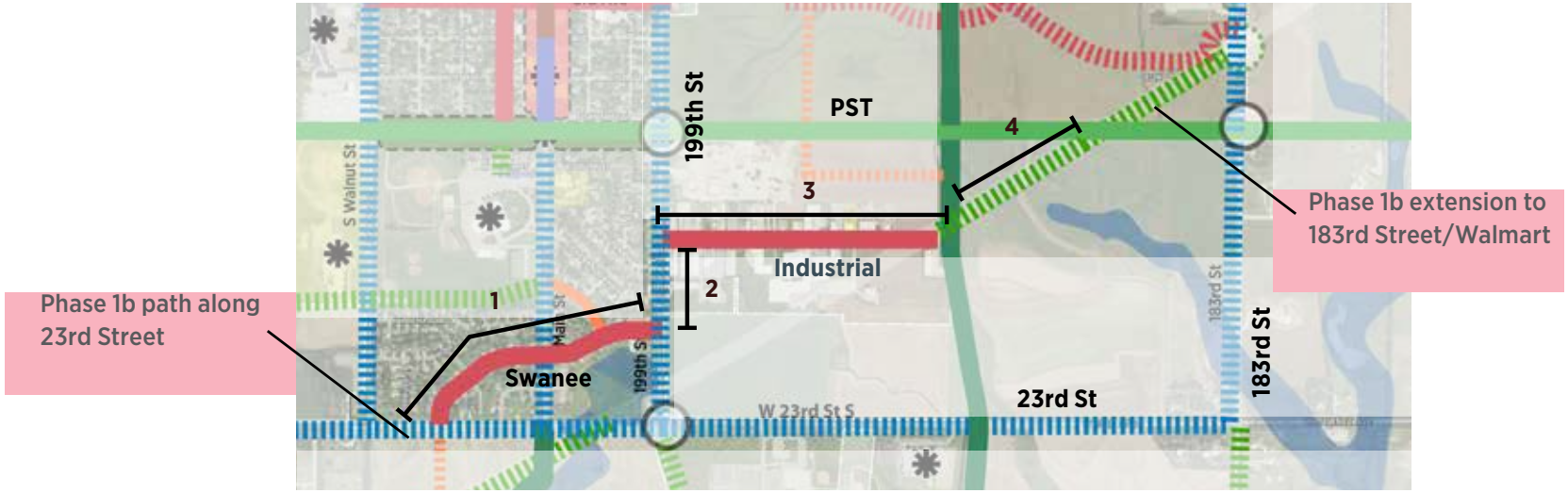
Table 4.1: Probable Cost Factors for Infrastructure Types

INFRASTRUCTURE TYPE	COST/MILE	TYPICAL FEATURES
Marked and signed route	$17,000	Signage, shared lane markings
Bicycle boulevard	$40,000-50,000	Signage, shared lane markings, routine intersection enhancements such as crosswalks, stop control modifications, occasional traffic calming features
Multi-use shoulders	$60,000	Signage, single white line dividing shoulder from travel lane
Bicycle boulevard with multi-use shoulders.	$80,000	Bicycle boulevards that also include multi-use shoulders or advisory bike lanes, appropriate on wider streets
Conventional bike lanes	$102,000	Lanes defined by white lines in both directions on a street
Protected bike lanes	$64,000 one-way $115,200 two way	Painted bike lanes with cross-hatched buffer area between bike lane and travel lane.
Sidepath	$400,000-600,000	10 foot paved roadside shared use path without major earthwork or modifications
Trails (or shared use paths)	$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.
Trails (gravel)	$100,000	Gravel on separated right-of-way or parallel to a roadway
Sidewalk	$175,000	5 foot wide sidewalk with ramps
Intersections or Barriers (Generic cost points)		
Type A: Major Intersection Construction	$300,000-500,000	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, bump-outs, 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

SWANEE/INDUSTRIAL

Southside diagonal route connecting southside residential areas to Goddard Industrial Park and Prairie Sunset Trail, with Phase 1b extension to Walmart. Employs bicycle boulevard design with short shared use path segments along 199th to connect Swanee and Industrial; and along the diagonal natural gas easement eventually to 183rd.

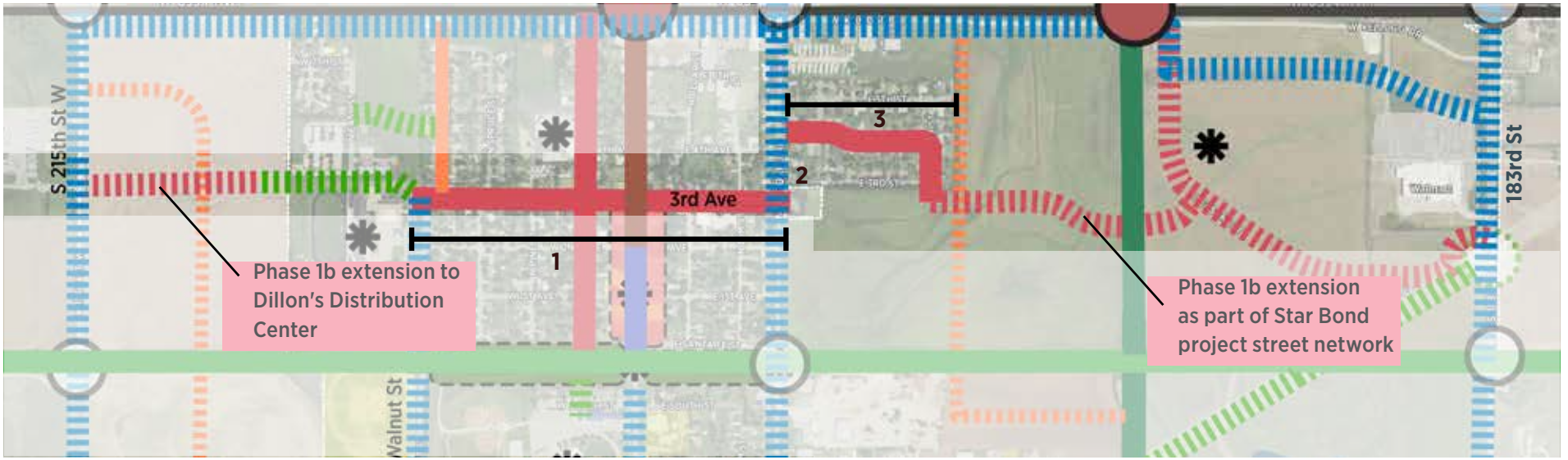
Route Project	Segment	Segment Length (Miles)	Bikeway Facility Treatment	Cost/Mile or unit	Street Channel or Path Cost	Required Sidewalk Length (Miles)	Cost/Mile Required Sidewalk Length (Feet)	Sidewalk Cost	Total Projected Cost
Swanee/ Industrial	1. Swanee, 23rd St to 199th	0.44	Bicycle boulevard	$40,000	$17,600	.06	$175,000	$10,500	$28,100
	2. 199th Crossing and Sidepath, Swanee to Industrial	LS	High visibility crosswalk, sidepath included in 199th Street table	$20,000	$20,000	0	-	0	$20,000
	3. Industrial, 199th to pipeline	0.50	Bicycle boulevard	$40,000	$20,000	.50	$175,000	$87,500	$107,500
	4. Pipeline easement, Industrial to PST	0.34	Shared use path	$600,000	$204,000	0	-	0	$204,000



THIRD/FOURTH AVENUE CROSSTOWN

Major east-west route south of Kellogg with short term service to schools and Main Street corridor in traditional town. This route is an on-street bicycle boulevard with sidewalk, with a short sidepath connection along 199th between 3rd and 4th. Phase 1b extensions continue east east extension through the Star Bond site via proposed S. Seasons Street and Walmart at 183rd Street; and west to Dillon's Distribution site at 215th Street.

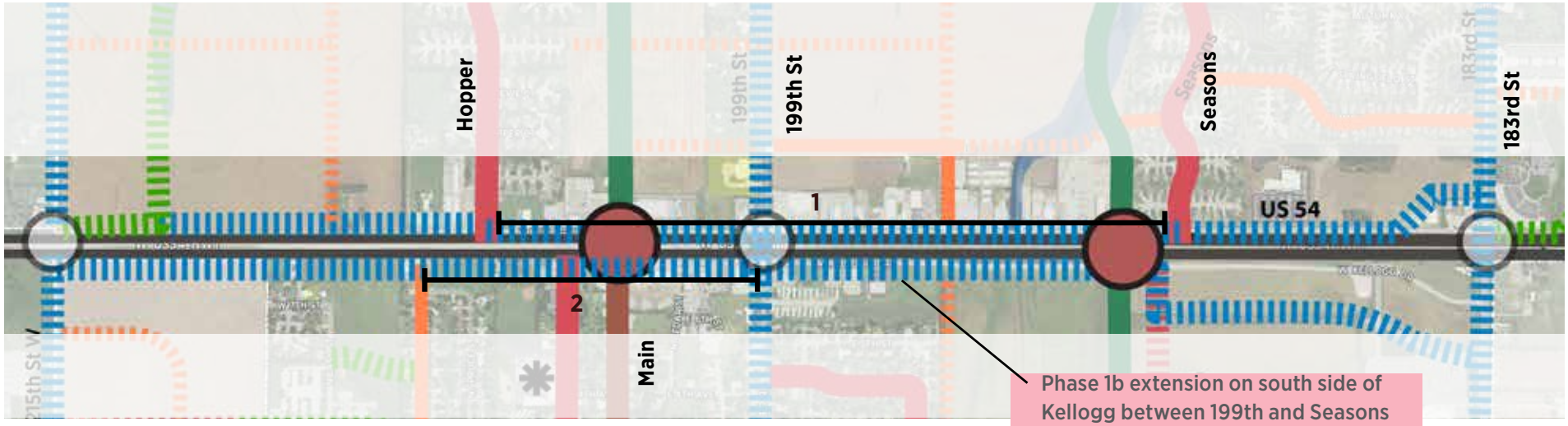
Route Project	Segment	Segment Length (Miles)	Bikeway Facility Treatment	Cost/Mile or unit	Street Channel or Path Cost	Required Sidewalk Length (Miles)	Cost/Mile Required Sidewalk Length (Feet)	Sidewalk Cost	Total Projected Cost
3rd/4th Avenue, Oak to Cindy	1. Walnut to 199th	0.51	Bicycle boulevard	$50,000	$25,500	.30	$175,000	$52,500	$78,000
	2. 199th Crossing, 3rd to 4th	LS	High visibility crosswalk with RRFB, sidepath included in 199th Street table	$40,000	$40,000	NA	NA	NA	$40,000
	3. 4th and Cindy, 199th to 3rd	0.28	Bicycle boulevard	$30,000	$30,000	.28	$175,000	$49,000	$79,000
	Total	**0.79**			**$73,900**	**.58**		**$101,500**	**$197,000**



KELLOGG AVENUE (US 54)

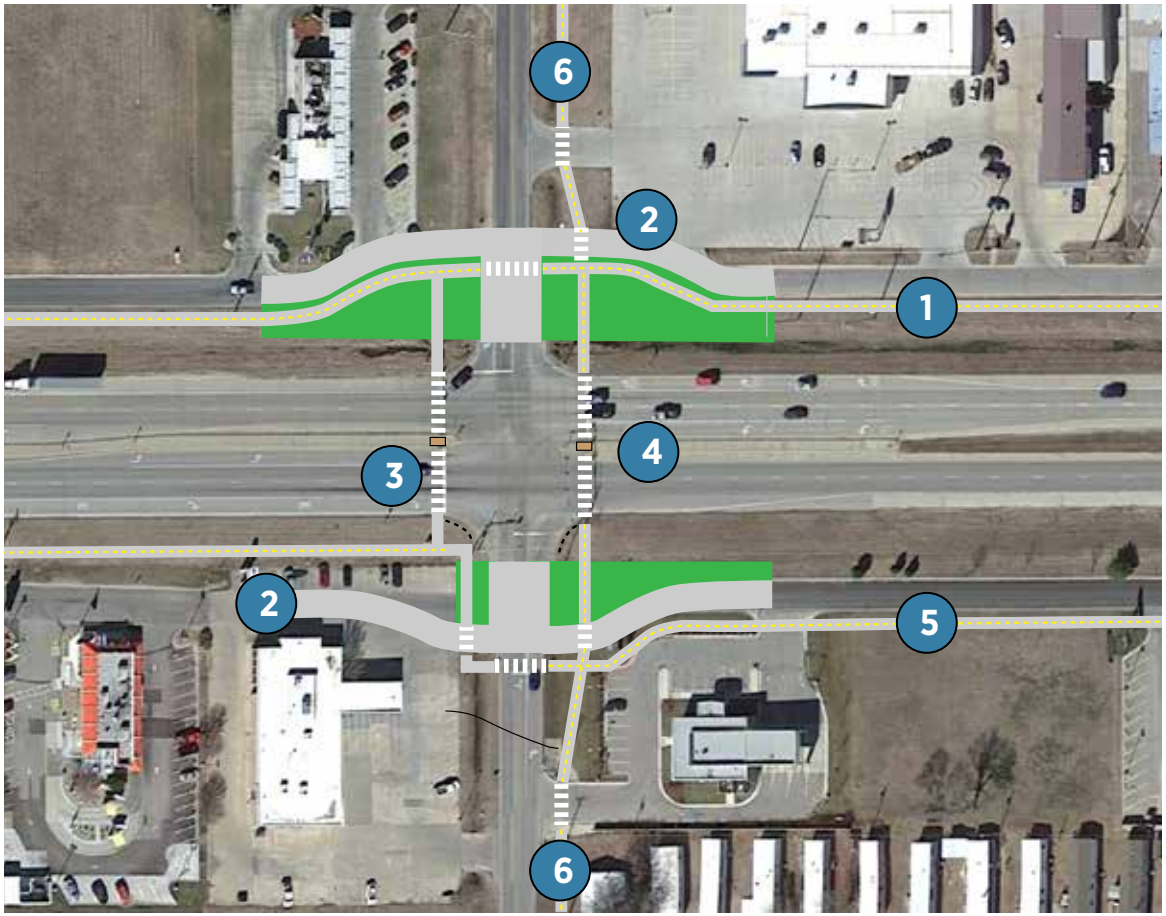
Sidepaths along the city's major east-west arterial corridor will serve major commercial and other community destinations. The Kellogg corridor currently lacks any provision for active transportation other than parallel frontage roads. As significant as paths along Kellogg are key crossings of the corridor. Crossing the Kellogg corridor may involve a two step process – initial at-grade crossings that provide the best accommodation possible within existing constraints, with future grade separated crossings. Intersections at 199th and 191st (South Sessions) are considered here. The Main Street intersection is considered as part of the Main Street corridor on page __.

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
Kellogg	1. Hopper to Seasons	1.00	Shared use sidepath	$600,000	$600,000	0	-	0	$600,000
	2. Walnut to 199th	0.47	Shared use sidepath	$600,000	$282,000	0	-	0	$282,000
	Total	**1.47**			**882,000**	**0**		**0**	**882,000**



KELLOGG: 199th Street Intersection

The signalized 199th and Kellogg intersection is a key crossing point that will remain an at-grade pedestrian/bicycle crossing unless a future major reconstruction project grade separates US 54 through Goddard. The concept illustrated below attempts to maximize the distance between the mainline and local service roads, increase the visibility of crosswalks, and provide a pedestrian refuge in the median. Countdown walk signals should be provided with adequate time for the typical pedestrian to cross the highway. This concept will also generally apply to the 183rd Street crossing.



1. Shared use sidepath along the Kellogg Drive frontage road. On the north side of US 54, this sidepath is proposed in the space between the highway main line and the service road because of frequent driveway cuts. That location should shift to the north side of the frontage road east of 191st Street where driveway access is more controlled.

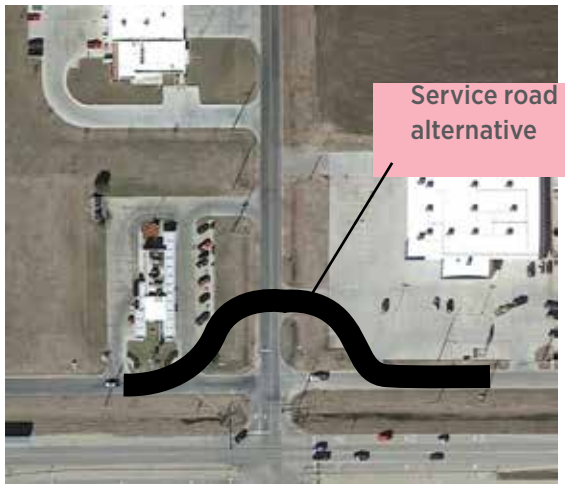
2. Relocation of the frontage road outlets to 199th Street. The illustration shows a moderate realignment to increase the distance between the with minimum impact on adjacent property. However, increasing the separation between the two roads increases safety (see alternative below)

3. High visibility crosswalks across US 54, Kellogg Drive, and intervening driveways.

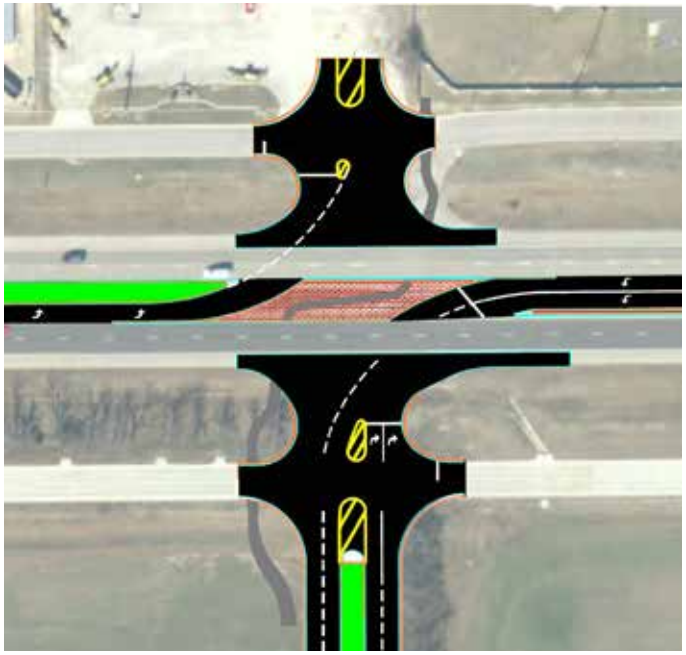
4. Modification of median "noses" to provide pedestrian refuge areas.

5. Shared use sidepath on south side of corridor. East of 199th, this would be located on the south side of the service road.

6. Shared use sidepath along 199th Street.



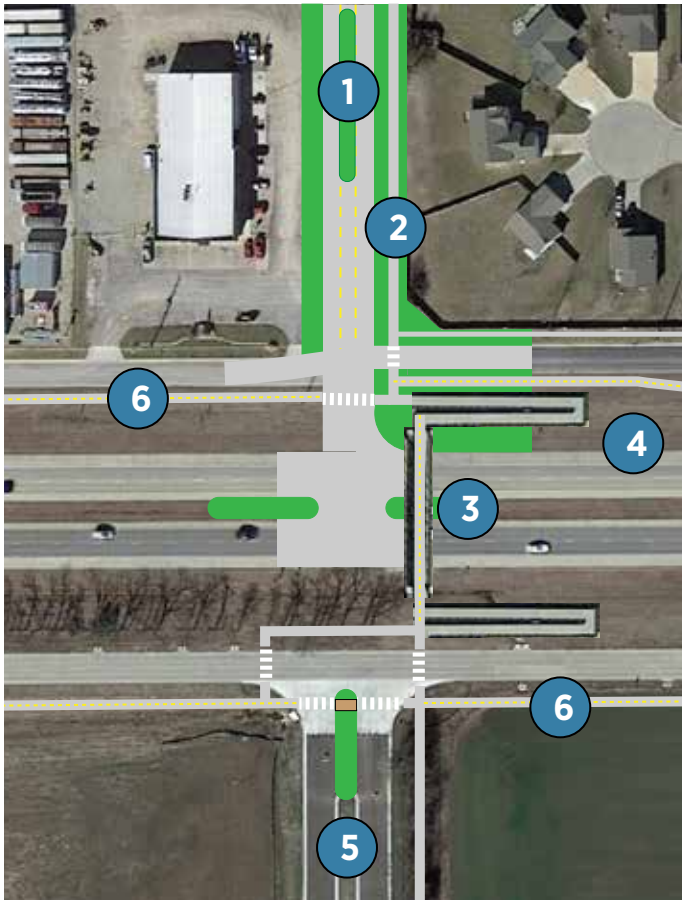
KELLOGG: Barber Street (191st Street) Intersection



Source: TransSystems, STAR Bond Development Traffic Impact Study

The proposed STAR Bond project with a combination of mixed use development and major community and recreation facilities will make Barber (191st Street) a strategic location for an enhanced pedestrian/bicycle crossing. The ultimate network concept identifies the intersecting north-south corridor as a key trail and parkway route. The STAR Bond project Traffic Impact Study proposes an effective short-term solution that uses a pedestrian median that prevent through vehicular movements but preserves left turns off US 54 and provides a two-stage pedestrian crossing with the center refuge. (Illustration above) Ultimately a grade separated crossing should be provided, with one concept illustrated at right. An overpass should be designed to invite use and can be enhanced as a signature landmark for the city along the metropolitan area's east-west spine.

1. North Barber (191st Street)
2. North Barber shared use path
3. Pedestrian/bicycle overpass
4. 5% grade ramps
5. South Barber Parkway
6. Kellogg shared use paths

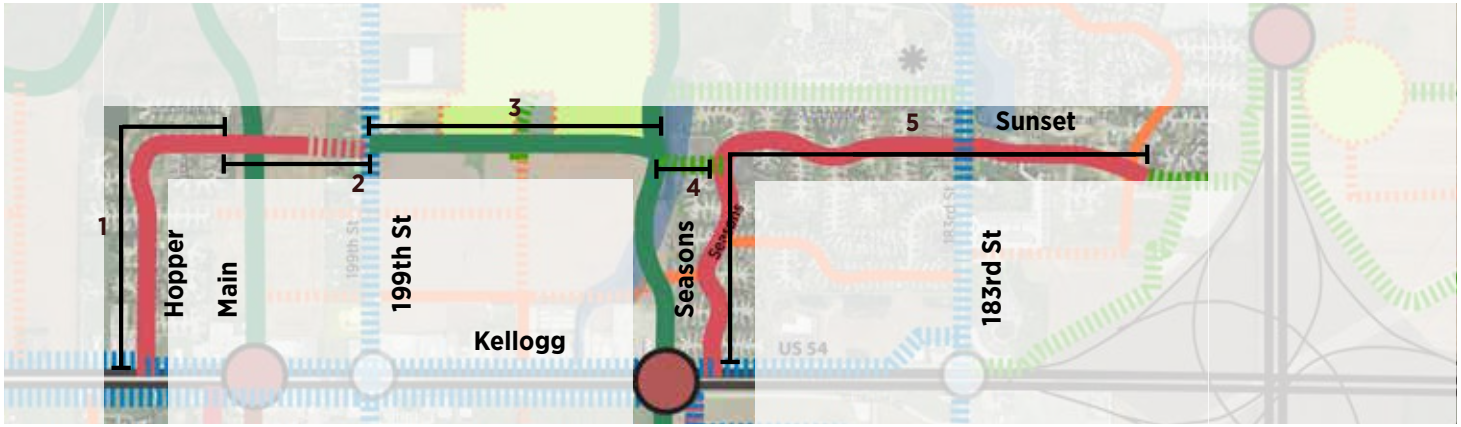


Signature bridges. Top: North Freeway pedestrian bridge, Omaha. Middle two: US 75 bridge concept on Flint Hills Nature Trail near Lyndon, KS; High Trestle Trail near Madrid, IA

HOPPER/SUNSET CROSSTOWN

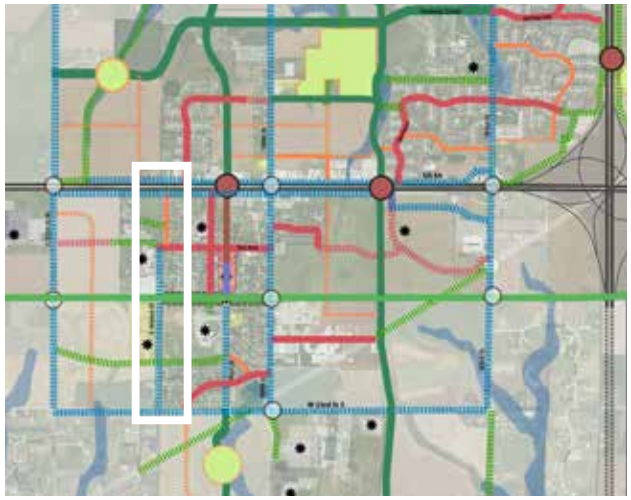
Major east-west route north of Kellogg that connects separated residential districts on the north side of the highway to each other and to a possible major city park on the decommissioned wastewater lagoon site. This route is an on-street bicycle boulevard with sidewalk, with a shared use path segment adjacent to the park site and Tanganyika wildlife park. Ultimately, this route would be extended east under the K-96 bypass and link northside neighborhoods to the Eisenhower educational campus.

Route Project	Segment	Segment Length (Miles)	Bikeway 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
Hopper/ Sunset Crosstown	1. Hopper/Poplar, Kellogg to Oak	0.53	Bicycle boulevard	$40,000	$21,200	.22	$175,000	$38,500	$59,700
	2. Poplar Extension, Oak to 199th	0.23	New street with development, bicycle boulevard features with privately financed street	$50,000	$11,500	.22	$175,000	$38,500	$50,000
	3. Central Parkway	0.50	Shared use path, with future parkway completed with park development	$500,000	$250,000	0	-	0	$250,000
	4. Connection to Seasons St	0.11	Shared use path on edge of retention basin	$500,000	$55,000	0	-	0	$55,000
	5. Seasons/Sunset, Kellogg to St Andrew	1.07	Bicycle boulevard	$50,000	$53,500	0	-	0	$53,500
	Total	**2.44**			**391,200**	**.44**			



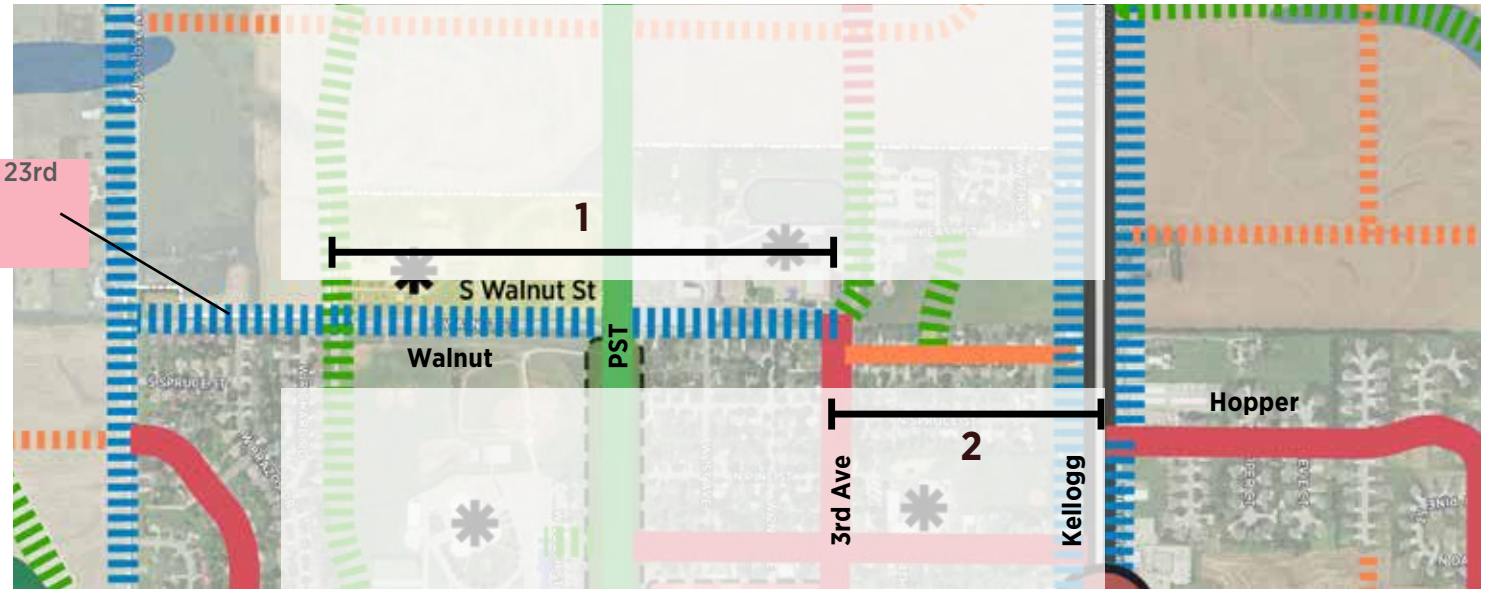
WALNUT

Important north-south route on the western edge of the built-up town, providing needed trail access to Clark-Davidson and Challenger Schools. This route connects three major east-west routes (3rd Avenue, the Prairie Sunset Trail, and a future 23rd Street shared use sidepath) to this school corridor.



Route Project	Segment	Segment Length (Miles)	Bikeway 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
Walnut, Kellogg to Clark Davidson	1. Kellogg to 3rd Ave	0.28	Standard bike lanes	$40,000	$11,200	.25	$175,000	$43,750	$54,950
	2. 3rd Avenue to Clark Davidson Elementary School	0.55	Sidepath	$400,000	$220,000	0	0	0	$220,000
	Total	**0.83**			**$231,200**	**.25**		**$43,750**	**$274,950**

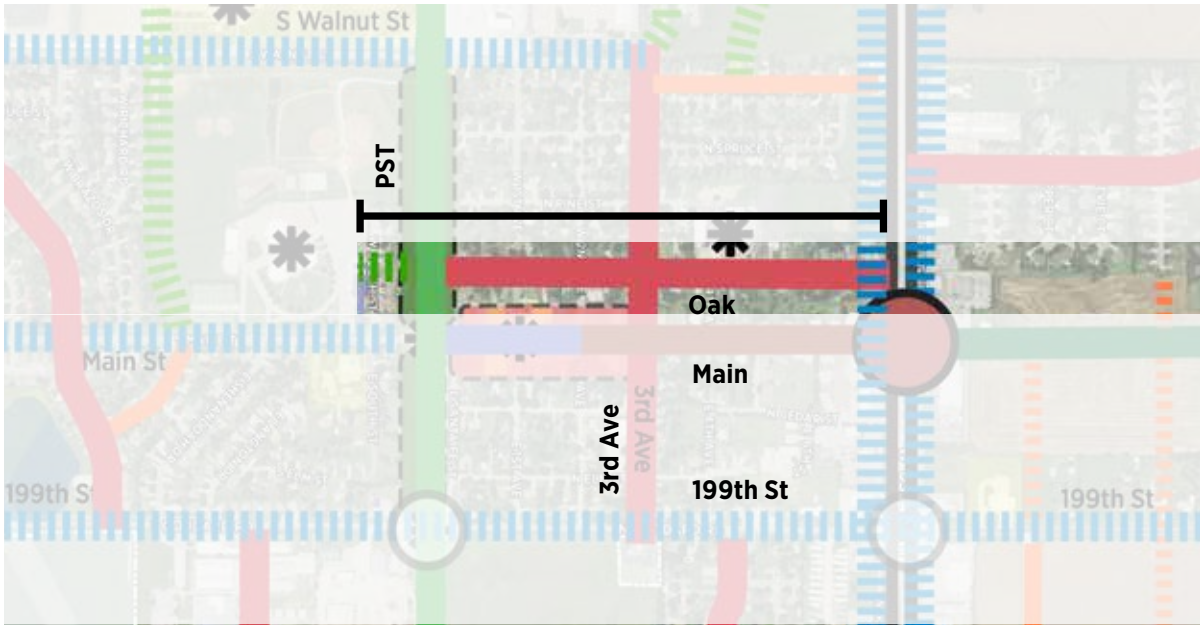
Phase 1b extension to proposed 23rd Street shared use sidepath.



OAK

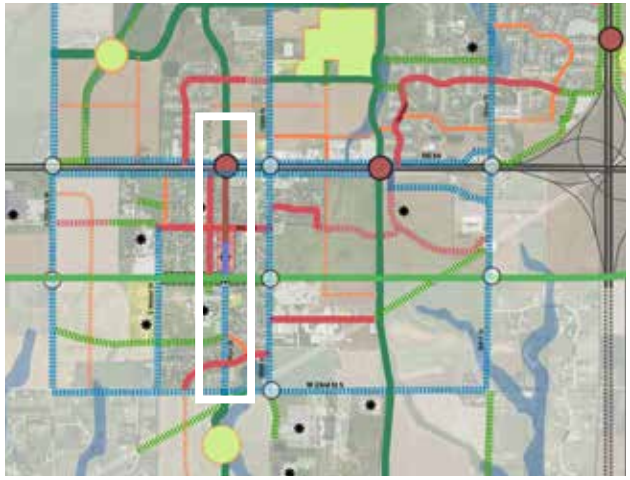
This relatively short "bicycle boulevard" segment with sidewalk has the primary purpose of providing safe pedestrian and bicycle access to Oak Street Elementary School.

Route Project	Segment	Segment Length (Miles)	Bikeway 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
Oak Street	Kellogg to Trail	0.50	Bicycle boulevard	$40,000	$20,000	.12	$175,000	$21,000	$41,000
	Total	**0.50**			**$20,000**	**.12**		**$21,000**	**$41,000**

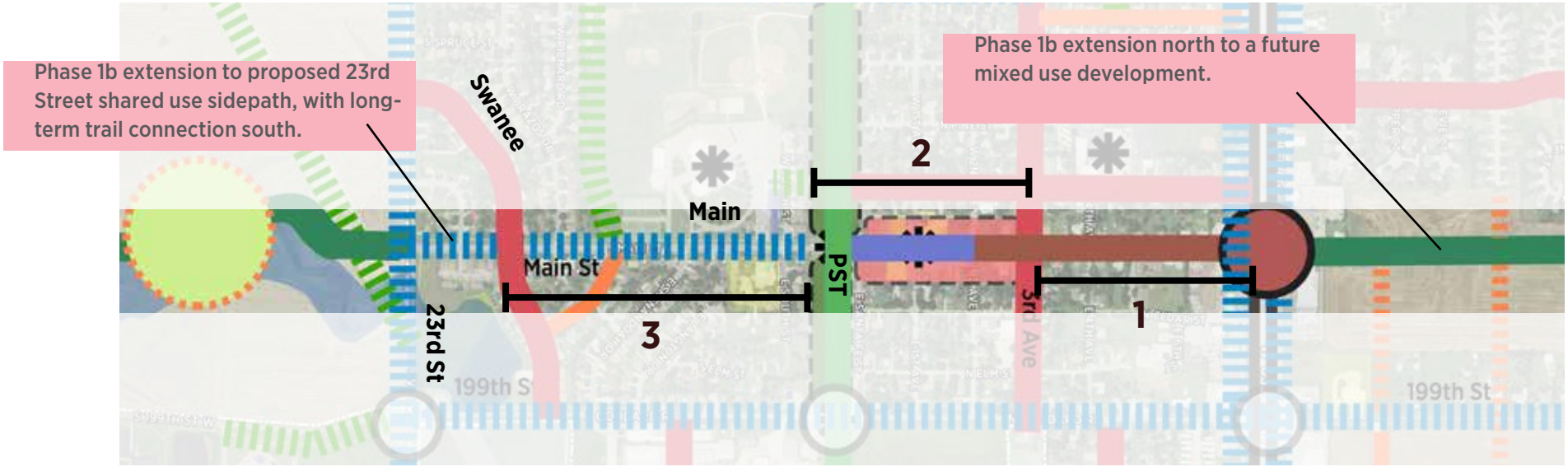


MAIN

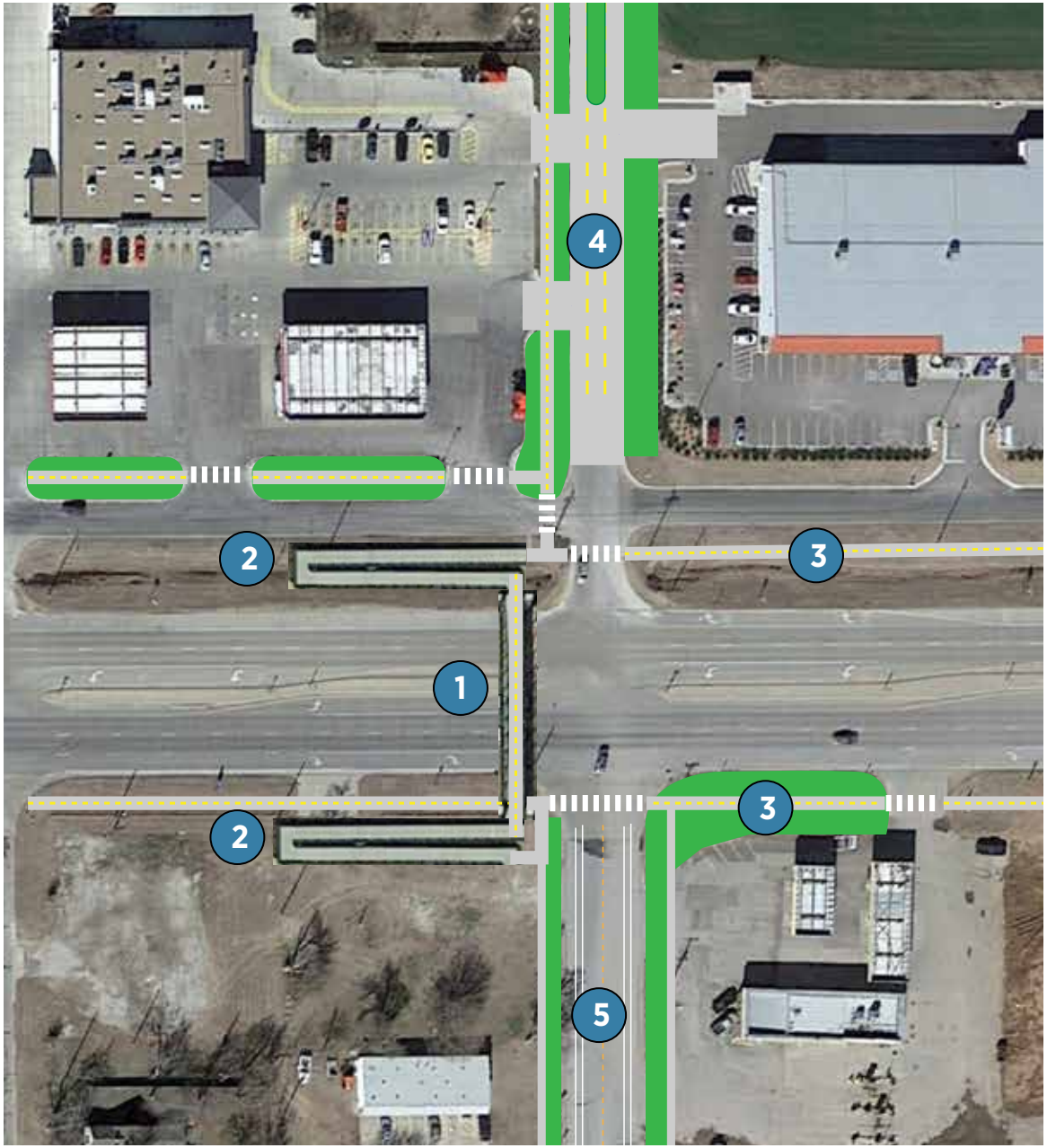
Major civic route through the center of the city, connecting Linear Park and the Prairie Sunset Trail with Downtown, the city's civic corridor, and the US 54 commercial corridor. Extended north as a parkway, it serves a potential mixed use development and connects the northside to the traditional town center. The width of Main between the trail and 3rd Avenue accommodates a two-way protected bike/low-power mode lane, effectively providing a reserved but low cost trail connection to the Prairie Sunset (see photograph at left). Kellogg is a major obstacle to north-south connectivity because a signalized crossing this close to 199th Street is unlikely. An eventual grade separated crossing is advisable here.



Route Project	Segment	Segment Length (Miles)	Bikeway 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
Main, US 54 to Swanee Dr	1. Kellogg to 3rd Avenue	0.28	Standard bike lanes	$102,000	$28,560	.04	$175,000	$7,000	$35,560
	2. 3rd Avenue to Prairie Sunset Trail	0.24	Protected bike lane	$115,200	$27,648	0	0	0	$27,648
	3. Trail to Swanee	0.39	Shared use sidepath	$400,000	$156,000	0	0	0	$156,000
	Total	**0.91**			**$212,208**	**.04**		**$7,000**	**$219,208**



MAIN AND KELLOGG INTERSECTION

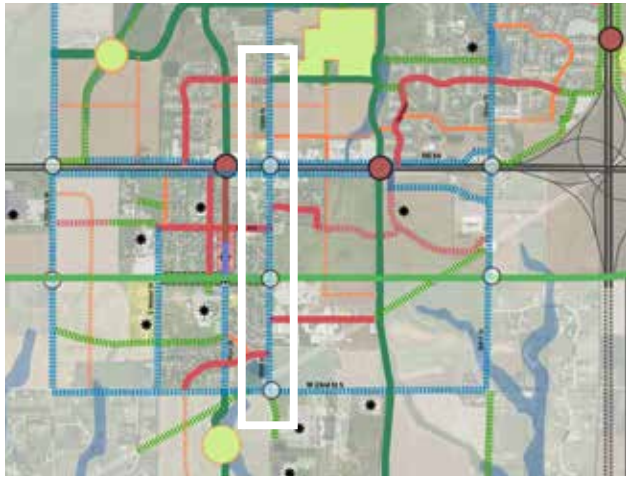


While Main Street is an important crossing point at Kellogg, its nearness to the already signalized 199th Street intersection probably precludes another traffic signal. Major retail destinations and future high-density land development possibilities on the north side of the highway will make this an even more important crossing for pedestrians, bicyclists, and other active users. This will probably require a future grade separation. The illustration at left shows an overpass, but an underpass should also be considered.

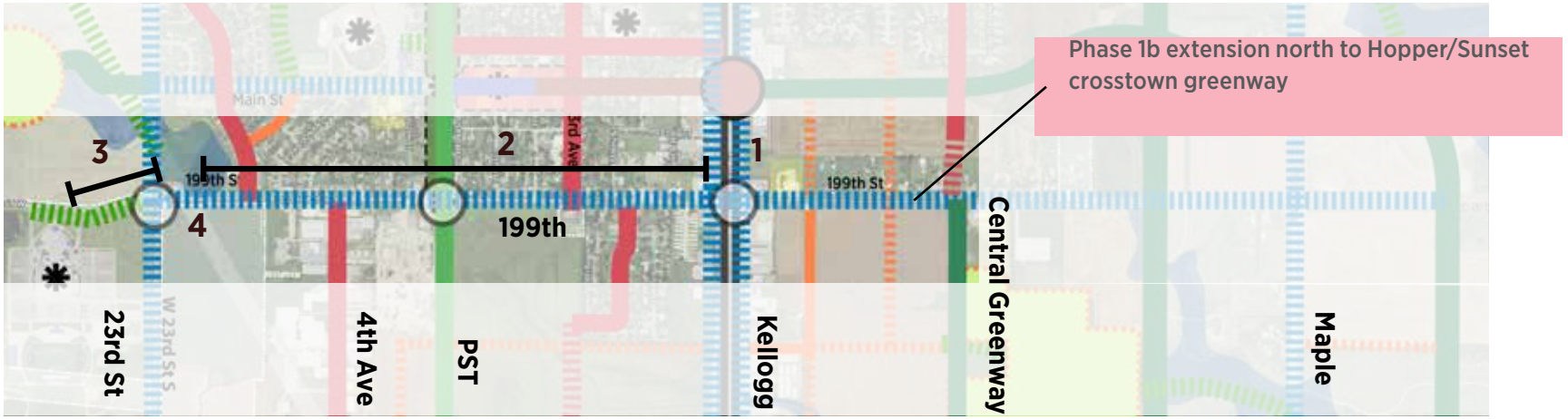
1. Kellogg Avenue overpass span
2. Ramps at 5% grade. These ramps are 10 feet wide and are positioned in the separation between the US 54 main line and the Kellogg Drive frontage roads. If a future full grade separation of the highway is executed in the future, the bridge should be designed in modules that can be reused at a different location.
3. Shared use sidepaths along Kellogg.
4. Future Main Parkway with three-lane section, tree lawns, and a shared use path.
5. Main Street north of 3rd Avenue with conventional bike.low-power mode lanes and sidewalks.

199th STREET

Major arterial route that connects many parts of the framework system and serves the high school/middle school campus. This shared use sidepath also important to the continuity of two east-west active corridors: Swanee/ Industrial and 3rd/4th, and provides access to the edge of the STAR Bond recreation area. The currently signalized Kellogg intersection is a major obstacle to north-south connectivity. Intersection redesign is addressed earlier as part of the Kellogg corridor discussion.

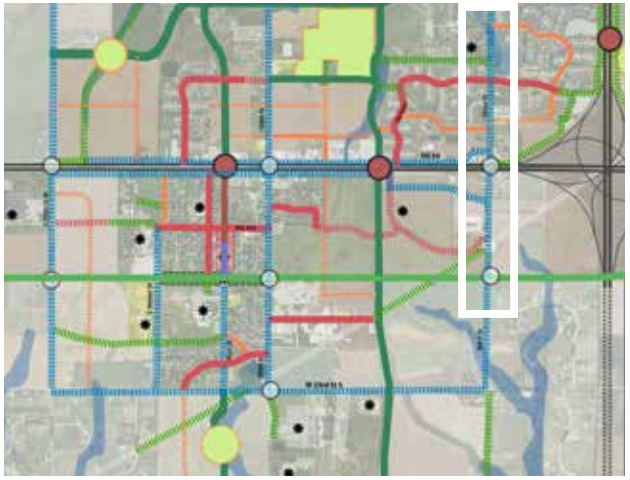


Route Project	Segment	Segment Length (Miles)	Bikeway Facility Treatment	Cost/Mile or unit	Street Channel or Path Cost	Required Sidewalk Length (Miles)	Cost/Mile Required Sidewalk Length (Feet)	Sidewalk Cost	Total Projected Cost
199th Street, Kellogg to 23rd St	1. 199th and US 54	LS	Major intersection upgrade for bike/ped access	$500,000	$500,000	0	-	0	$500,000
	2. Kellogg to 23rd	1.00	Shared use sidepath	$500,000	$500,000	0	-	0	$500,000
	3. 23rd to High School	0.20	Shared use path	$400,000	$80,000	0	-	0	$80,000
	4. 23rd and 199th intersection enhancement	LS	High visibility crosswalks	$30,000	$30,000	0	-	0	$30,000
	Total	**1.20**			**1,110,000**	**0**		**0**	**1,110,000**

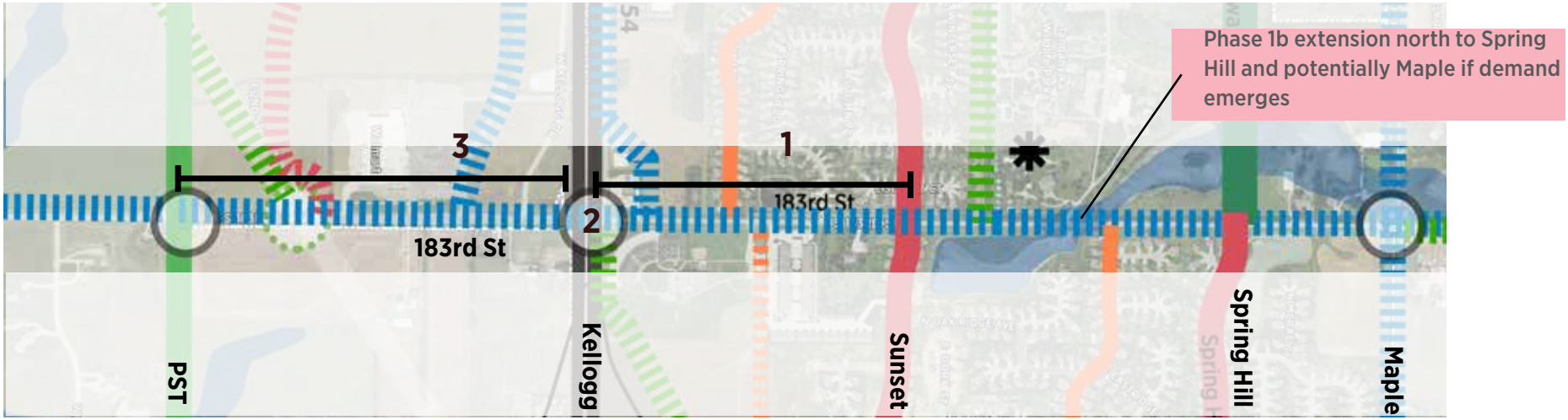


183rd STREET

Like 199th Street, a major arterial route that connects many parts of the framework system. It serves Walmart and other potential commercial development around the Kellogg intersection as well as the Prairie Spirit Trail and the future STAR Bond project. A 4-foot sidewalk has previously been installed on much of the north part of this segment, and this should be upgraded to shared use sidepath standards by adding width. The currently signalized Kellogg intersection is a major obstacle to north-south connectivity. Intersection redesign will be similar to that presented above for the 199th Street intersection.



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
183rd Street, Sunset to PST	1. Sunset/Seasons to US 54	1.00	Shared use sidepath	$400,000	$400,000	0	-	0	$400,000
	2. Kellogg intersection	LS	Major grade intersection retrofit	$300,000	$300,000	0	-	0	$300,000
	3. Kellogg to PST	0.50	Shared use sidepath	$400,000	$200,000	0	-	0	$200,000
	Total	**1.50**			**900,000**	**0**		**0**	**900,000**



OPINION OF PROBABLE COST

Table 4.2 summarizes planning level opinions of probable construction costs for the Basic Network (Phase 1a and 1b) of the Goddard active system. These calculations and concepts provide decision makers with information that can evaluate and sequence segments of the network in relation to available resources and specific future projects that most appropriately meet community needs. The cost of the Phase 1a network is about $4.1 million, most of which is accounted for by shared use sidepaths on major arterials and intersection crossings of Kellogg Avenue. This table does not include the cost of pedestrian overpasses or other grade separations of US 54. These may be incorporated into an overall corridor improvement project or other special project funding. Final cost also depends on the level of bridge enhancements such as public art or lighting. Recent construction experience with overpasses with a similar span suggests a typical cost in current dollars of about $2.5 to $3 million.

Table 4.2: Opinion of Probable Costs Basic Network

ROUTES	OPINION OF PROBABLE COST	
ON-STREET NETWORK	Total	Basic Phase 1a
3rd Avenue	73,900	73,900
Main	212,208	212,208
Oak	20,000	20,000
Walnut	231,200	231,200
Swanee/Industrial	261,200	261,200
Hopper/Sunset	381,200	381,200
199th Sidepath	1,100,000	1,100,000
183rd Sidepath	900,000	900,000
Kellogg Sidepath	882,000	882,000
TOTAL	**$4,082,108**	**$4,082,108**

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

Pedestrian bridge in Papillion, Nebraska. This bridge has a span approximately equivalent to that of Kellogg Avenue at a construction cost (excluding design, testing, and other costs) of about $1.8 million.

Table 4.3: Opinion of Probable 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
Sidepath	$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

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 with receiving and filing of the plan

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.

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

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 4.3 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.

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. 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, 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.

CITY OPERATING BUDGET

The operating budget of Goddard is already a source of funding for the network. Parks were proposed throughout the network, one of which is already budgeted for sometime in 2023 or later. With the park construction, funds should also be devoted to building the sidewalk and bike network that will provide access.

Additionally, funding for the Police Department has a direct impact on bicycle rodeos, patrols, and enforcement. Each year, the City should consider how the current annual operating budget impacts bicycling and pedestrians, with an eye toward incremental and practical improvements for the future.

CAPITAL IMPROVEMENT FUND

The City has already funded sidewalk construction through the Capital Improvement Plan (CIP), and to continue improving walking as well as bicycling in Goddard, the City should continue to dedicate funding to projects that enhance the non-motorist experience. The CIP includes a list of projects, costs and the year of funding. For pedestrians the major project for 2017-2018 was the 183rd Street reconstruction south of Kellogg. Additional funding is allocated for 2021 to complete sidewalk between Kellogg and Maple on the east side of the road. No bicycle infrastructure projects are proposed in the 2017-2022 fund.

KANSAS DEPARTMENT OF TRANSPORTATION

The Kansas Department of Transportation (DOT) provides annual funding for bicycle and pedestrian projects through their Transportation Alternatives (TA) Program. Call for projects usually occurs mid-summer for awards two years out. This program is federally funded, most recently through the Surface Transportation Block Grant Program (STBGP), therefore it may not be a reliable source of funding depending on federal budget allocations. Programs covered under the TA funding pool include Safe Routes to School and the Recreational Trail Program.

The Comprehensive Transportation Program (CTP) was established in 1999 to provide innovative financing for Kansas communities. The program is currently under review by KDOT, but could be a potential funding source.

KANSAS DEPARTMENT OF HEALTH AND ENVIRONMENT

Funding for Chronic Disease Risk Reduction is available for fiscal year 2020 with the application process beginning in January 2019 through the Aid to Local (ATL) grant program. Applicable programs in the funding pool include Bike Walk Committees, Active Transportation, and Improving Public Spaces.

PEOPLE FOR BIKES

People for Bikes is a charitable foundation sponsored by the bicycle industry. The organization runs a community grant program, funding projects such as shared-use paths, mountain bike trails, bicycle parking, and Open Streets events. Grants of $10,000 are awarded and must be matched with local funding of at least 50 percent. Grant cycles occur one to two times annually.


the Neighborhood

CHAPTER FIVE:
Support Systems

CREATING AN ACTIVE NETWORK

Too often active transportation plans rely heavily on providing engineering solutions rather than initiatives that will build a culture supportive of active transportation. Without daily users, project investments will not see the needed rate of return to make them worth funding. The League of American Bicyclists have a model approach that is effective for creating a culture of walking and bicycling. The approach outlines five essential elements of an active transportation program:

- **Engineering.** The most obvious element of the approach are the trails, sidewalks, and bicycle lanes installed on and along our city streets. While an essential element - evident by the share of this plan 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.
- **Education.** Education is about showing and teaching people about 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 programs often include programs conducted by the schools and the city government such as bike rodeos which Goddard has already championed, or group walks/bike-rides.
- **Encouragement.** Encouragement is about making a concerted effort to demonstrate to residents that Goddard should be a place where people feel comfortable walking and riding their bikes around town. Encouragement initiatives include activities like bike rodeos, walking school buses, and fun community events oriented around walking and biking.
- **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.
- **Evaluation.** Evaluation is about setting goals, keeping track of performance, and using these to make decisions about future initiatives. For example, it might make sense to track bicycle and pedestrian use to quantify the value of the improvements made as a quality of life amenity or the potential economic value that users could bring to Goddard businesses. By understanding these trends and articulating goals, Goddard can create incremental improvements to eventually implement a comprehensive active transportation system including elements of Engineering, Education, Encouragement, and Enforcement.
- **Equity.** A truly functional transportation system provides access to all residents, regardless of where they reside, their income levels, or their heritage. The overall system should allow anyone, regardless of their background, to utilize a safe and connected alternative transportation system.

SUPPORT SYSTEMS

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. 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 3rd/4th Street or Seasons Street, a special street sign may be used to help provide additional notification to motorists and wayfinding information to bicyclists.
- Motorist advisory signs**.** The R4-11 Bicycles May Use Full Lane is usually the preferred sign on shared routes.

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

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

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).

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

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 schools, City Hall, the Public Library, Linear Park, both existing city parks, Walmart and other shopping, the STAR bond project, and the Prairie Sunset Trail. 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.

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 serve the Goddard/Garden Plain 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 Goddard 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 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.

Events

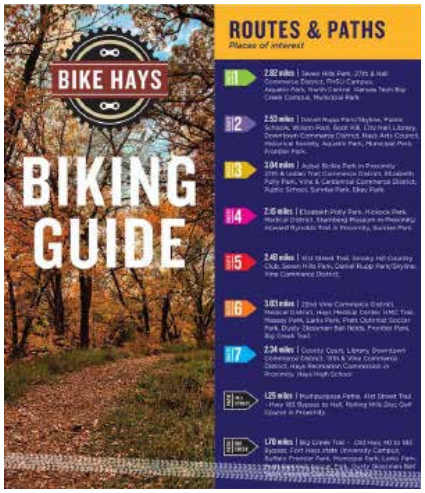
Expand participation in pedestrian and bicycle transportation through programs that engage corporations in competitions and fun. These programs track participation by numb of trips and miles traveled during a multiple-month period, and give awards to winners at an event at the end of the period.

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.

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.



The Bike Hays program included publication of an excellent guide to biking in the city and includes a map with safety advice and other information.

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 Goddard where kids walking to school often must cross Kellogg Avenue

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.

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.

Goddard and Garden Plain map find major mutual benefits in establishing a unified program. Like Goddard, Garden Plain has developed 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 Goddard nd the surrounding area.