Ozarks Transportation Organization
Bicycle & Pedestrian Trail Investment Study

Nixa Area Addendum

June 2018

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CHAPTER ONE: INTRODUCTION

Background and Purpose

Located six miles south of the Springfield and 30 miles north of the Branson, the City of Nixa offers a balance of small-town sense of community with access to big-town services and attractions. As one of the fastest growing communities in Missouri, the City of Nixa prides itself on its pro-active comprehensive and strategic planning efforts, which have resulted in responsible, quality growth and development. Nixa continues to deliver high-quality public services to the community's growing population, which increased by more than 68 percent in the last two decades (from 12,201 in 2000 to an estimated 20,520 in 2016). Excellent public schools, police and fire services, community facilities, commercial services, and employment opportunities reinforce Nixa's reputation as a great place to live, work, and play.

In recent comprehensive and strategic planning efforts, the City has recognized the importance of and need for trails, sidewalks, and bicycle facilities to increase community connectivity, expand recreational opportunities, and support active transportation and recreation. While these planning efforts have resulted in the identification of an on-street bicycle network and locations for new sidewalks, they lack the elements that will connect to and expand on the priority trail network established by the Ozarks Transportation Organization..

In Fall 2017, the Ozarks Transportation Organization, the federally-designated regional transportation planning organization for the Springfield Metropolitan Area, completed the Bicycle & Pedestrian Trail Investment Study. The study analyzed and refined 75 miles of regionally significant trail alignments, developed cost estimates to assist local agencies with programming and project development, and created a sample prioritization process to assign value to trail corridors and assist the OTO in allocating federal funding to trail projects throughout the region. While a number of planned priority trail corridors examined in the Trail Investment Study extended south of the James River and into Christian County, there were no planned priority trails providing a direct connection to the City of Nixa. To address this deficiency in the priority trail network, the OTO, in partnership with the City of Nixa, has commissioned this study to identify trail opportunities connecting the City of Nixa to the regional trail network. This Nixa Area Trails Study will serve as an addendum to the regional Trail Investment Study.

Bicycling and walking are popular activities in Nixa, but the lack of trails, sidewalks and bikeways limit opportunities.

Plan Outline

The plan document consists of seven chapters, outlined below.

Introduction

The Introduction Chapter describes the context and purpose of the Nixa Area Trails Study, its relationship to the 2017 Trail Investment Study, and the contents of the document.

Existing Conditions

The Existing Conditions Chapter examines completed plans and studies and documents current conditions for walking and bicycling in order to identify opportunities and challenges to future trail development. Understanding these conditions is critical to the development of practical, implementable recommendations for future trail development.

Public Engagement

Public participation and input is critical to the planning process. The Public Engagement Chapter documents the outreach activities and input received from community members during the course of the project.

Vision and Goals

The Vision and Goals are based on those of the regional Trail Investment Study and reflect the community's ambitions, values, and needs with respect to trails and active transportation. The Vision and Goals provide the foundation for the plan's recommendations.

Regional Trail Alignment Development

Regional trails will connect the City of Nixa to surrounding amenities, destinations, and future trails and greenways. This chapter of the plan analyzes potential trail corridors and identifies preferred trail alignments for key regional trails.

Recommendations

The Recommendations Chapter identifies key regional trail corridors to connect the City of Nixa to the regional trail network and to surrounding communities and destinations. The chapter will also include general recommendations for the City of Nixa to link local destinations to regional trail facilities and to support walking and bicycling activity.

Prioritization

Using the sample prioritization methodology developed for the Trail Investment Study, the Prioritization Chapter of the Nixa Area Trails Study analyzes the value of the recommended Nixa Area regional trails. The results of this prioritization may be used in coordination with the 75 miles of previously studied regional trails. This will integrate the Nixa Area regional trails into the sample prioritization model and draft prioritization results.

Trails, greenways, and on-street connections recommended in this study will build on the City's network of existing sidewalks, trails and bikeways to make walking and bicycling safe, convenient, and enjoyable ways to travel throughout Nixa. (Bottom picture, courtesy of Shannon Cochran)

CHAPTER TWO: EXISTING CONDITIONS

Introduction

Sidewalks, bicycle lanes, and short trails form the foundation of Nixa's active transportation environment. These walking and bicycling facilities reflect the City's growing interest in supporting walking and bicycling as safe, convenient, and enjoyable ways to travel around the community for both transportation and recreation. However, the lack of longer linear trails and greenways, both within the City of Nixa, and connecting Nixa to adjacent communities, limits bicycling and walking for transportation and recreation. The Existing Conditions Chapter of this plan reviews completed plans and studies pertaining to active transportation and trail development and documents the current state of the environment of bicycling and walking. The focus of this existing conditions examination will be to identify opportunities and challenges to future trail development, particularly regionally-significant trails that connect the City of Nixa to surrounding communities, destinations, and regional amenities.

Local and Regional Planning Context

The Nixa Trails Plan is not the first planning study to address the subject of bicycle and pedestrian facility development in Nixa. Both the City of Nixa and the Ozarks Transportation Organization (OTO), the metropolitan planning organization (MPO) for the Springfield Metropolitan Planning Area, have completed long-range planning studies that incorporate recommendations for bicycle and pedestrian facilities, including sidewalks, trails, and on-street bikeways. These plans and studies are summarized below to identify key information, themes, and recommendations that may impact this planning effort.

Local Plans

Through its local planning efforts, the City of Nixa has established the importance of trails and greenways as a valued component of a diverse program of recreational offerings to Nixa residents and visitors. Adopted plans highlight trails, sidewalks, and on-street bikeways as desirable amenities. While these adopted plans do not identify specific locations for future trail development, the City has begun to look at specific corridors for future trails and sidewalks.

City of Nixa Comprehensive Plan (2006)

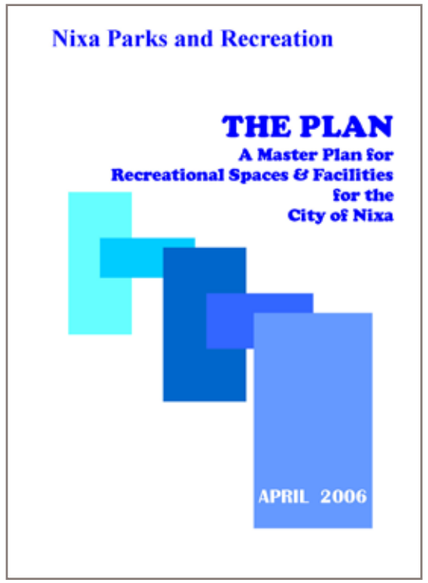
Completed in 2006, the City of Nixa Comprehensive Plan guides the City's growth, development, and provision of infrastructure and services. The plan chapters represent key service areas and include specific goals, objectives, and activities. Multiple service areas and corresponding goals point to the importance of walking and bicycling infrastructure to serve both recreation and transportation needs. While the plan clearly states that vehicular traffic is the dominant mode of transportation within the community, it acknowledges that pedestrian and bicycle infrastructure can and should be incorporated into the transportation system where possible.

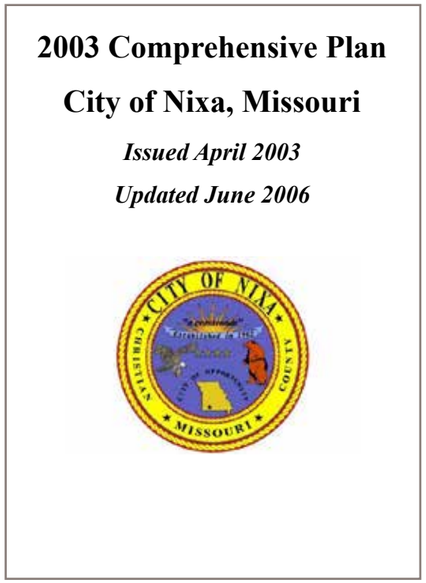
Trails that support walking and bicycling are a critical component of the comprehensive plan and support the City's goal of providing diverse recreational and cultural opportunities in harmony with preserving and improving the natural setting, resources, and habitat. One of the objectives to achieve this goal is the provision of passive recreational opportunities geared towards walking and bicycling. This includes not only completing trail projects already in development, but also working with Ozarks Greenways and other regional organizations to plan and develop a regional trail system.

City of Nixa Parks and Recreation Master Plan (2006)

The City of Nixa's Parks and Recreation Master Plan, formally titled The Plan: A Master Plan for Recreational Spaces & Facilities for the City of Nixa, presents a comprehensive strategy for increasing high quality parks facilities, delivering complete and comprehensive leisure services and programs, and providing non-motorized transportation amenities. The plan's fifth of five goals focuses specifically on bicycling and walking: Provide a comprehensive sidewalk and bikeway system to provide residents with safe and convenient access to parks, schools' play space, and other leisure endeavors and allow ample alternative transportation opportunities.

The bicycle and pedestrian element of the Parks and Recreation Master Plan was drafted by the Ozarks Transportation Organization. The recommended facilities consist primarily of new sidewalks and on-street bikeways that focus on connections to key community destinations like parks and schools. While the plan highlights the importance of preserving greenways for future development of trails, the plan does not identify specific corridors for future trails.





The City's Comprehensive Plan and Parks & Recreation Master Plan support trail development.

Regional Plans

Regional plans completed by the OTO establish a framework for investment in transportation infrastructure that includes bicycle and pedestrian facilities as an integral component of a balanced transportation system. The Plans summarized below highlight efforts to set a course for regional trail network development.

Long-Range Transportation Plan (2017)

In 2017, the Ozarks Transportation Organization, the regional metropolitan planning organization, completed its Long-Range Transportation Plan (LRTP), which will guide federally-funded infrastructure development for the Springfield Metropolitan Area. During the planning process, citizens from across the region voiced their interest in allocating funds to the development of trails and on-street bikeways. When asked how they would allocate $100 dollars to transportation, participants allocated the second largest amount of funding to bicycle lanes and trails, behind only new highway construction.

While the LRTP identifies future trails and on-street bikeways, most of these projects were initially identified at the local level, reflecting previous municipal planning efforts for bicycle and pedestrian facilities. Because the City of Nixa has not previously undertaken planning efforts to identify and prioritize greenways or trails within the community, there are no future trail projects in Nixa included in the LRTP. There are, however, numerous planned trails surrounding Nixa, many of which lead directly to the edge of the City. These include the Finley Creek Greenway, multiple short trail segments connecting the Finley Creek Greenway to the City of Nixa, the OTC Richwood Valley Campus Trail, Wilson's Creek Greenway, the James River Greenway, and the Chadwick Flyer Rail Trail. These planned trail facilities can be seen in Map 1. Some of these trails can be extended into the City of Nixa to increase Nixa's access to the regional trail network. For other trails, like the James River Greenway and the Chadwick Flyer Rail Trail, new trail facilities must be developed to connect Nixa to these regional trail facilities.

In addition to trails and greenways, the Long Range Transportation Plan also identifies priority sidewalk corridors within Nixa and connecting Nixa to adjacent municipalities. These sidewalk corridors are listed in Table 1.

Where feasible and desirable, the installation of sidepaths along these priority sidewalk corridors can be considered as an alternative to sidewalks. Sidepaths can support both pedestrian and bicycle transportation, and their typical level of comfort supports a wide range of bicyclists, from children to seniors. In effect, sidepaths can function as an extension of the trail network, connecting residents to destinations not served by trails and greenways within independent rights-of-way.

Table 1: LRTP Nixa Area Priority Sidewalk Corridors

Trail Corridor	From	To
Highway CC	Highway 13	City of Ozark
Highway 14	Western City Limits	City of Ozark
Main Street	South Street	Highway 13
Tracker Road	Nicholas Road	Cheyenne Road
McCauley Farm Road	Main Street	Cheyenne Road
Northview Road	Gregg Road	Main Street
Ellen Street	Highway 14	Northview Road
Gregg Road	Highway 14	Northview Road
South Street	West Street	Main Street

Trail Investment Study (2017)

Also completed in 2017, the OTO's Trail Investment Study examined 75 miles of planned trails identified as regional priorities for federal funding. The study analyzed existing conditions along the planned priority trails, refined original conceptual alignments based on land use, topographic, environmental, and other critical factors. The study also included a sample prioritization methodology and draft prioritization results to assign value to each trail corridor and to assist the OTO in allocating federal funding to these projects through its competitive Transportation Alternatives Program (TAP). A vision for the region's trail system, along with a series of supporting goals, provided the framework for alignment development and subsequent corridor prioritization.

Of the 75 miles of planned priority trails included in the study, none connect to the City of Nixa, and only three trails are located within or cross into Christian County. This gap in the regional priority trail network was duly noted during the process, and the interest in greenway connections from Nixa to the regional greenway network, as well as to Ozark, were identified as an addition to the investment study process. This Nixa Area Addendum to the Trail Investment Study will support the "downtown-to-downtown" focus of the regional priority trail network and integrate the City of Nixa into future decisions in regional trail investments.

Through its Long Range Transportation Plan, Bicycle & Pedestrian Trail Investment Study, and other efforts, the OTO has been at the forefront of strategic discussions, planning, and funding for trail network development at the regional level.

Existing Trail Facilities

Sidewalks, signed bicycle routes, dedicated bicycle lanes, and shared-use paths (known commonly as trails or multi-purpose trails) comprise the City of Nixa's facilities for walking and bicycling. The existing inventory of walking and bicycling facilities in Nixa is generally oriented to local travel, with the majority of sidewalks and trails located within park properties, school sites, and residential subdivisions. In recent years, the City of Nixa has integrated sidewalks and bicycle lanes into capital improvement projects along collector and arterial roads, which is a clear sign of the City's intention to increase connectivity and safety for walking and bicycling. Each type of walking and bicycle facility is inventoried and described in greater detail below and shown in Map 1 on the following page.

Regional Trails

Regional trails provide a paved surface bicycling, walking, and other non-motorized uses and connect communities within the region. While there are no regional trails in Nixa, there are existing and planned regional trails within close proximity, as previously mentioned. As planned regional trails like the James River Greenway, the Finley Creek Greenway, and the Chadwick Flyer Rail Trail are developed, it will be important for the City of Nixa to provide residents and visitors with access to these valuable recreation and active transportation resources.

Linear Trails

Linear trail facilities provide a path for walking and bicycling between two or more community destinations. Linear trails are often located along riparian corridors like rivers and streams, along utility corridors, and even adjacent to roadways. Linear trails are different than sidewalks because they are intentionally designed to accommodate walking, bicycling, and other forms of non-motorized transportation. There are currently no linear trail facilities in the City of Nixa.

Local Trail Segments

The City of Nixa has a number of short trails that serve as recreational amenities within local parks, on school campuses, and in subdivision common ground and open space. While some of these trails, such as the McCauley Park Trail and the Century Elementary School Trail meet design standards for shared-use paths, most are between five and eight feet wide and intended primarily for walking and jogging. These narrower trails include the Mercy Walking Trail, the Copper Leaf Community Trail, and the Parkmore Heights walking trail.

On-Street Bikeways

In recent years, Nixa has installed a number of bicycle lanes to support active transportation. Dedicated bicycle lanes provide a separate space on the roadway for exclusive use by bicyclists through striping, markings, and signage. Bicycle lanes are located on Butterfield Drive, Main Street, Tracker Road, and Old Castle Road. In total, there are 2.47 miles of bicycle lanes in Nixa. The lack of connectivity between these bike lanes, as well as the lack of other bicycle facilities like signed bicycle routes and shared-use paths, limits their effectiveness to support bicycle transportation. These bike lanes do, however, serve an important function in building awareness for bicycle facilities and the presence of bicyclists on streets throughout the City. In addition, the bike lanes will form the foundation of Nixa's bicycle network, which will continue to grow as Nixa's roadway system is updated to meet its growing population and their desire for more trails and bikeways.

Sidewalks

There are more than 45 miles of existing sidewalks in the City of Nixa. While these sidewalks do provide access to many of the City's schools and parks, the lack of connectivity between sidewalks diminishes their utility and limits the potential of walking to serve as a viable transportation choice for community residents. Most of the City's existing sidewalks are clustered in recently-developed residential subdivisions, including The Columns at Century Park, The Springs, Park Hill Place, Carriage Crossing, Cobble Creek, Walnut Creek, Jacks Place, Dogwood Estates, Woodfield, Rolling Hills, and Forest South. There are some segments of sidewalk along collector and arterial roadways, such as Aldersgate Drive, Gregg Road, Nicholas Road, Old Castle Road, Main Street, and North Street; however, few of these sidewalk segments connect to one another. The two major highways that bisect the City of Nixa, Highway 14 and US Highway 160, divide the community into quadrants and serve as barriers to walking and bicycling. There is a lack of sidewalks and safe crossings along and across both of these corridors.

Recent additions of bicycle lanes and pedestrian crossings with active warning beacons highlight the City's commitment to walking and bicycling.

EXISTING TRAILS, SIDEWALKS, AND BIKEWAYS

NIXA AREA TRAILS STUDY: AN ADDENDUM TO THE OTO TRAIL INVESTMENT STUDY

EXISTING FACILITIES

- Sidewalk
- Park/School Trail
- Bike Lane
- Bike Route
- Share the Road
- Shared Lane

PREVIOUSLY PLANNED FACILITIES

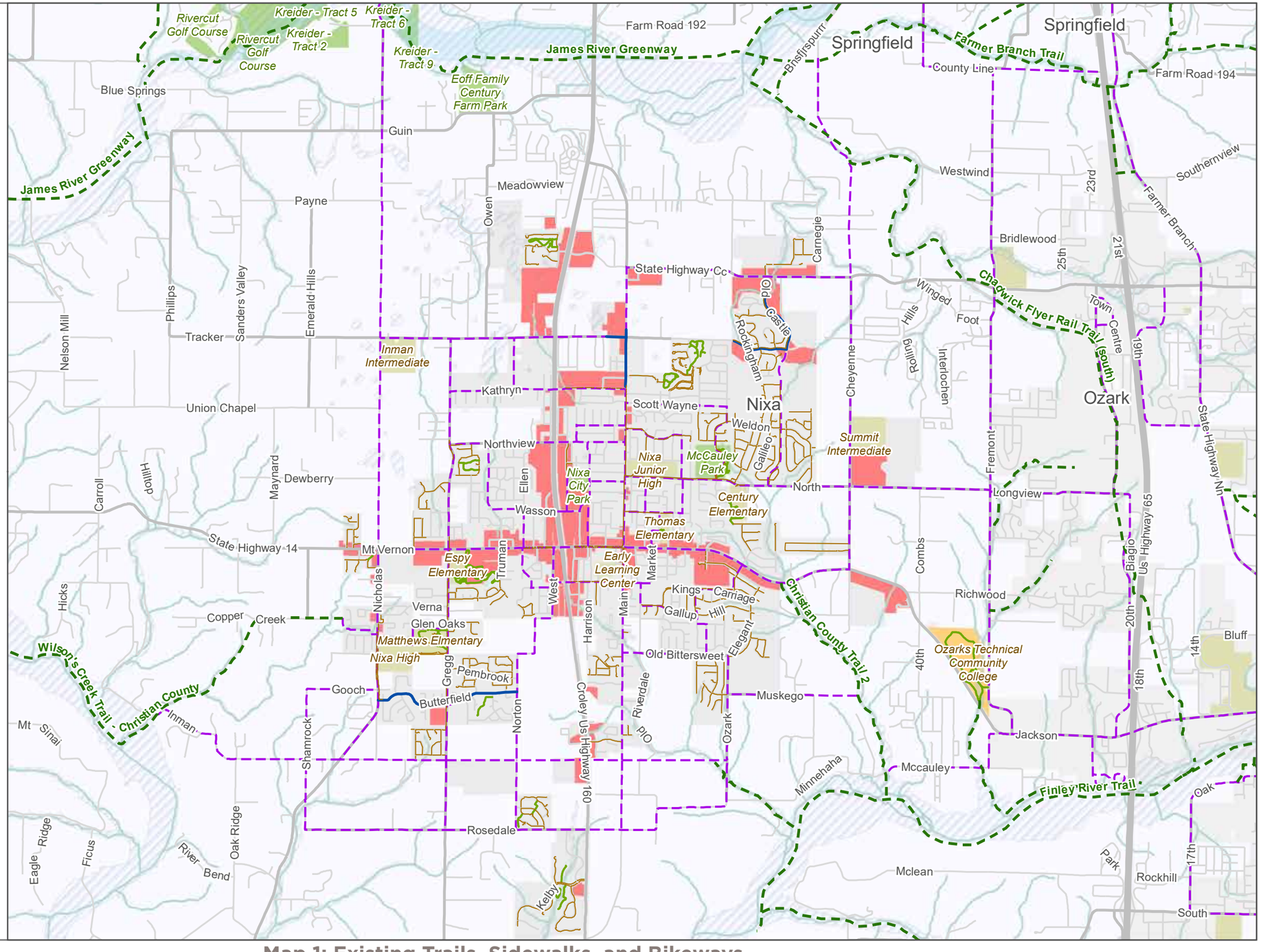
- Planned Regional Trail
- Planned On-Street Bikeway

DESTINATIONS AND BOUNDARIES

- Parks and Open Space
- Schools (K-12)
- Colleges and Universities
- Commercially-Zoned Parcels
- City of Nixa
- Other Municipalities

HYDROLOGY

- Rivers and Streams
- Floodway
- Floodplain (100 YR)



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Data provided by the Ozarks Transportation Organization, City of Nixa.
Map produced March 2018.

Map 1: Existing Trails, Sidewalks, and Bikeways

Land Development and Infrastructure

Nixa's rapid growth from a small town with rural roots and character to a largely residential suburban community with strong ties to both Springfield and Branson can be seen in the changes in land use and transportation patterns that radiate from the city's center.

Land Use

While generally residential in nature, the City's land use and development patterns highlight the diversity of amenities, services, businesses, and employment opportunities within the community. Commercial uses along Main Street represent the City's historic commercial spine. Many of the businesses and services along Main Street are neighborhood and community oriented. Commercial uses along Highway 14 and US Highway 160 are more auto-oriented. As a whole, these commercial uses provide Nixa residents and visitors with a variety of services, from restaurants and retail to professional and medical services.

Nixa Public Schools are located throughout the City and in future growth areas outside the city limits. Nixa's parks are also dispersed throughout the City but have not kept pace with residential growth. These land uses can be complemented and better supported through an interconnected network of trails, sidewalks, and on-street bikeways, which can support short, non-motorized trips by people walking and bicycling. In December 2017, the City received a donation of more than 50 acres of park land north of Guin Road (Hwy. AA) at Owen Road. This property can support regional trail connectivity between Nixa and the James River Trail. The City of Nixa is also poised to take possession of a property south of Guin Road (Highway AA), west of Owen Road. Both of these locations are in Christian County and are not within the city limits of Nixa. When opened to the public, these facilities will be assets in regional connectivity, local outdoor recreation, and connection to historic assets.

There are larger, undeveloped parcels in parts of the city and surrounding growth area. These parcels, which are likely to be developed in the near future, represent key opportunities to integrate trails, sidewalks, and bikeways into land development patterns and supporting infrastructure, as well as offer an opportunity for regional trail development.

Transportation

Nixa's existing roadway system reflects the community's transformation from a small, rural-oriented community to a growing residential suburb. Linear local streets that characterize traditional, small-town development patterns are centered around the intersection of Main Street and Highway 14. Most of these streets do not have sidewalks or bicycle facilities. Further from the center of Nixa, these traditional development patterns give way to residential subdivision developments, characterized by winding roads, cul-de-sacs, and limited connectivity between adjacent developments. While many of these recent developments include sidewalks, the lack of connectivity can increase walking trip lengths and reduce the attractiveness of walking for activities other than recreation.

Given Nixa's considerable growth rate over the last few decades, many of the City and surrounding area's arterial and collector roads are at capacity and no longer provide an adequate level of service for current motor vehicle traffic. In addition, new roadways have been identified in the Long-Range Transportation Plan to increase connectivity between the City of Nixa and surrounding areas and to accommodate anticipated growth in the area. To address these deficiencies and better accommodate current and future levels of traffic, Nixa has begun to improve these roadways throughout the City. These capital improvement projects provide ideal opportunities for incorporating sidewalks, bicycle lanes, and/or sidepaths to support walking and bicycling activity. Recently completed projects like Tracker Road, Old Castle Road, and Main Street are excellent examples of capital improvement projects that support all modes of transportation.

Utility Corridors

Corridors for utilities such as sewer, water, and electric transmission provide long, often uninterrupted paths that can accommodate shared-use paths. These corridors are often located within public rights-of-way, like the electric transmission corridor parallel to US Highway 160, or within separate rights-of-way or easements through private property.

These aerial images illustrate the changing nature of land development and transportation system improvements in Nixa, as well as the likelihood of continued growth in the near future.

Natural Environment

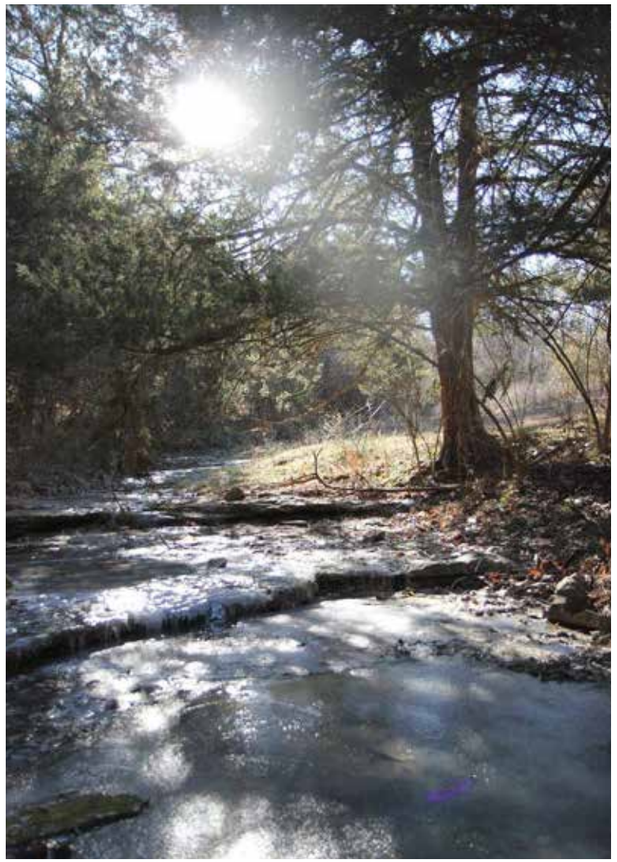
Topography

Situated on the upland Springfield Plateau of the Ozark Mountains, the City of Nixa's topography is characterized by gently rolling hills that give way to steeper slopes at the City's northern and southern edges, which approach the James River and Finley Creek, respectively. While these topographic conditions limit land development and development density, they can be assets for active and passive recreation.

Riparian Corridors

The streams and rivers surrounding the City of Nixa offer unique opportunities for linear trail and greenway development. The City is surrounded on three sides by riparian corridors: the James River to the north and west, and Finley Creek to the south. The James River Greenway is identified in both the Long-Range Transportation Plan and the Trail Investment Study as a corridor for future trail development, and the Finley Creek Greenway is identified in the Long-Range Transportation Plan for future trail development. These riparian corridors are largely undeveloped and showcase the area's rich natural environment, with a diversity of plant and wildlife, and unique karst features like sinkholes, caves, and disappearing streams. Trails and greenways can provide a direct link to these natural features and incorporate learning opportunities to help people better understand and appreciate the importance of preserving the natural environment.

The Eoff Family Century Farm Park, a 50-acre site donated to the City of Nixa in December 2017, offers an ideal access point to the James River and the planned James River Greenway.



The rolling hills, ephemeral streams, and nearby rivers shown above capture the essence of the natural environment in Nixa and the surrounding areas. These three photographs were all taken at the Eoff Family Century Farm, Nixa's most recent addition to the park system. A master planning process in the near future will determine the park's amenities and activities.

Opportunities and Challenges

Conditions are generally favorable for future trail development in the City of Nixa and the surrounding areas. Adapting to the various land use, transportation, and environmental contexts that characterize the community will be critical to the creation of a trail network in the community. In addition, the City must capitalize on opportunities to integrate trails into the fabric of the community and acknowledge the challenges facing this ambitious yet achievable task. The following opportunities and challenges summarize the existing conditions and previous planning efforts, setting the stage for recommendations for trail development in Nixa and the surrounding area.

Opportunities

- Previous planning efforts by the City of Nixa highlight the importance of trails as key recreation and transportation amenities that should be integrated into existing roadways and future land development.
- Regional planning efforts have identified trails and greenways in Christian County that extend to the Nixa city limits.
- Trail facilities, sidewalks, and on-street bikeways can be integrated into future residential development in the City of Nixa and in the surrounding growth areas.
- Roadway improvements along arterial and collector roadways can incorporate trails, sidewalks, and on-street bikeways (where right-of-way is available).
- Riparian corridors to the north and south of Nixa offer potential links to the regional trail network.
- The recent donation of the 50-acre Eoff Family Century Farm Park along the James River provides a potential connection to the planned James River Greenway.
- Development of large land parcels can allow for location of greenways that can serve the development, city and region.

Challenges

- Existing development patterns offer few alternatives for trail development aside from sidepaths adjacent to arterial and collector roadways.
- There are no existing linear trails in the City of Nixa.
- The existing sidewalk system is disjointed and does not provide adequate service to local destinations.
- The existing network of on-street bikeways is still in its infancy, and most facilities are not connected to one another.
- There are few potential corridors for trail alignments within developed areas of the City.
- Presence of sinkholes and other natural features will impact design and implementation of the trail network.

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CHAPTER THREE: PUBLIC ENGAGEMENT

Introduction

Public engagement is critical to the success of the Nixa Trails Study. Input provided by community residents and stakeholders helps align the study's vision, goals and recommendations with the community needs and aspirations. During the course of the study, the City of Nixa and the Ozarks Transportation Organization held two open house meetings and hosted a table at a community event. These activities are documented in this chapter of the study.

Health & Wellness Expo

On Saturday, April 7, 2018, the City of Nixa hosted a booth at the annual Health & Wellness Expo to share information about the Nixa Trail Study and solicit input from attendees. A representative from the City of Nixa Parks Department discussed the study and opportunities for trail development throughout the City with people who stopped by the booth.

Open House #1

On Tuesday, April 17, 2018, the Ozarks Transportation Organization and the City of Nixa hosted the first of two open houses at the Nixa Community Center. The study team provided project information boards, maps, and a study overview handout to explain the purpose of the study and generate input from those in attendance. Fifteen people attended the open house, sharing their input regarding study goals, desired trail types, trail locations, and other opportunities and constraints impacting trail development in and around the community.

Developing an interconnected trail system that connects to local destinations and regional trails and amenities ranked as the highest goal. Attendees identified suburban trails, like off-street trails that wind through subdivision common grounds, open space, and forested areas, and riparian trails, which travel along stream and river corridors, as their preferred trail types.

Open House #2

On Thursday, May 25, 2018, the Ozarks Transportation Organization and the City of Nixa hosted the second open house at the Nixa Community Center. This meeting focused on the draft Nixa Trail Network, which provided an overview of how trails, sidepaths, and on-street walking and bicycling connections can link community destinations and increase opportunities for active transportation and recreation. Also discussed were various opportunities for supporting programs and policies to support the growing trail network by helping to make bicycling and walking safer, easier, and more accessible to people of all ages and abilities.

The twelve people in attendance at the second open house provided supportive comments and shared their excitement for the future of trails in Nixa. The comments forms submitted by attendees are included at the end of the study. The input received during this second open house informed the refinement of the proposed trail network and the recommendations for programs, policies, and implementation.

Attendees at the first open house shared their input by drawing on community maps and voting for their preferred trail types and other improvements on project boards throughout the room.

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CHAPTER FOUR: VISION AND GOALS

Introduction

The Nixa Area Addendum to the OTO Bicycle & Pedestrian Trail Investment Study provides an ambitious blueprint for trails and greenways that link the City of Nixa to the regional trail system. The vision and goals for this study are based on those initially developed for the Trail Investment Study. The vision is both aspirational and ambitious, representing the desired future for trails in Nixa. The study goals are broad, value-based expressions of the community's desires that can guide decision-making and bring the plan vision to life. Goals give direction to the plan and are concerned with the long-term.

Vision

The Nixa Area Addendum to the Bicycle & Pedestrian Trail Investment Study will serve as the City of Nixa and the OTO's guiding document for investments in trails and greenways, enhancing transportation and recreation choices for residents and visitors and connecting Nixa to the regional trail network.

Goals

1. Create an interconnected network of trails and greenways to link Nixa to the regional trail system and to adjacent cities, and to support active transportation to destinations throughout the City.
2. Support economic development.
3. Support healthy, efficient, and attractive connections throughout the City and surrounding area.
4. Strengthen collaborative planning for trails and greenways with community partners and local government agencies.
5. Support diverse and sustainable transportation choices.
6. Prioritize trail investments to generate the greatest impact.
7. Define opportunities, constraints, and project costs.
8. Prepare environmental documentation for future trail development.

The future of bicycling and walking in Nixa is bright (photo sources, left to right: Downtown Nixa, City of Nixa, and Nixa Skate Park Committee).

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CHAPTER FIVE: ALIGNMENT EVALUATION

Introduction

Regional trails connecting the City to adjacent communities, regional amenities, and planned priority trails will be critical to the success of the Nixa Trail Network. Given their importance in both the local and regional trail networks, regional trail corridors identified early in the planning process have been subjected to an additional level of analysis. For each corridor, two or more possible alignments were developed, as discussed in greater detail in the next section of this chapter. These alignment alternatives were then evaluated based on criteria developed by the OTO as part of its 2017 Bicycle and Pedestrian Trail Investment Study. The alignment that received the highest score during this evaluation process was selected as the preferred alignment and include din the recommended trail network. In some cases, segments of other alignments not selected as the preferred alignment have been retained as local trails or on-street connections.

This chapter of the plan documents the alignment evaluation process for three regional corridors:

- **The Eoff Trail Corridor,** connecting Rotary Park in the heart of Nixa to the future Eoff Century Farm Park along the banks of the James River and further north to the planned Rivercut Parkway sidepath.
- **The Northeast Chadwick Flyer Connector Corridor**, which traverses north Nixa from east to west and links the community to the planned Chadwick Flyer Rail Trail, a high-priority regional trail linking Ozark and Springfield.
- **The X Center - Finley River Greenway Connector Corridor**, which provides a connection from McCauley Park and the X Center to the Finley River Greenway, a planned trail that will connect Nixa to Ozark.

These corridors are identified on Map 2 on page 16. The alignment alternatives for the Eoff Trail Corridor are highlighted in coral red, Northeast Chadwick Flyer Connector Corridor in purple, and X Center - Finley River Greenway Corridor in blue.

Alignment Development

Trails can provide a variety of valuable services to the community. Most commonly, trails are considered as recreational amenities. When constructed as linear facilities, trails can connect multiple destinations within a community or region and serve as a transportation corridor for bicycling, walking, and other forms of active transportation. In some cases, trails can serve as a buffer between sensitive environments and adjacent land uses, providing a level of protection from adverse impacts of development. Trails can connect residents and visitors to open spaces and natural areas, enhancing the community's understanding of and appreciation for its natural resources. Trails can also contribute to community health, property values, community character and branding, and overall quality of life. With the potential for trails to provide such a strong, positive impact, it is important that trails are planned and designed in a manner to maximize their benefit to the community.

The development of alignment alternatives for significant regional trails in Nixa incorporated many of the considerations listed above, as well as other critical factors. These include:

- Connections to local and regional destinations, such as parks, schools, shopping, neighborhoods, and civic facilities.
- Environmentally sensitive areas, such as sinkholes, wetlands, floodplains, hazardous substance investigation sites, and hazardous waste and petroleum storage tanks.
- Directness of alignment.
- Ability to provide a unique and attractive trail experience.
- Ability to serve as an asset to surrounding land uses and to enhance community character.
- Property ownership, rights-of-way, and planned transportation and capital improvements within the corridor.

NIXA REGIONAL TRAIL ALTERNATIVES

NIXA AREA TRAILS STUDY: AN ADDENDUM TO THE OTO TRAIL INVESTMENT STUDY

EXISTING FACILITIES

- Sidewalk
- Park/School Trail
- Bike Lane
- Bike Route
- Share the Road
- Shared Lane

REGIONAL TRAIL CORRIDOR ALTERNATIVES

- NE Chadwick Flyer Connector
- Eoff Trail
- X Center - Finley River Connector Trail
- 1/8-Mile Corridor Buffer

PROPOSED NIXA TRAILS

- Proposed Nixa Trails

PREVIOUSLY PLANNED FACILITIES

- OTO Other Planned Trail
- OTO Planned Priority Trail

DESTINATIONS AND BOUNDARIES

- Parks and Open Space
- Schools (K-12)
- Colleges and Universities
- Commercially-Zoned Parcels
- City of Nixa
- Other Municipalities

HYDROLOGY

- Rivers and Streams
- Floodway
- Floodplain (100 YR)

0 0.5 1 MILES

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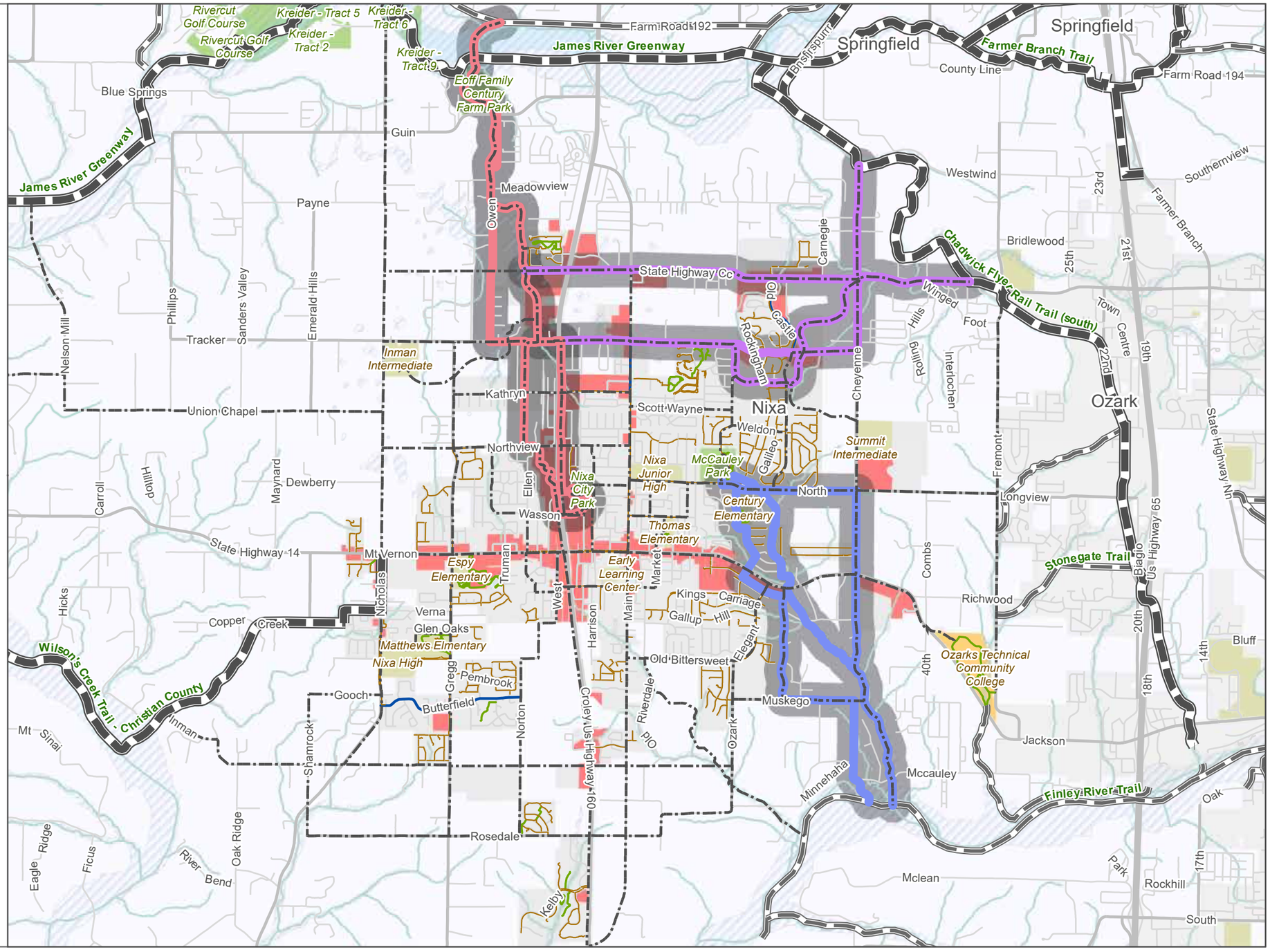
Data provided by the Ozarks Transportation Organization, City of Nixa.
Map produced May 2018.



Map 2: Regional Trail Corridor Alternatives

Evaluation Criteria and Alignment Scoring

For each of the regional trail corridors identified in the Nixa Trail Study, multiple alignments have been developed. In order to identified a preferred alignment, the study utilizes the OTO's data-driven evaluation criteria established for the 2017 Bicycle & Pedestrian Trail Investment Study. These criteria are listed in Table 2.

On the following pages, alternatives for each planned priority trail segment are described, evaluated, and mapped, and the preferred alignment for each segment is identified. The index map and table on the following page identify the section page number for each trail segment.

Table 2: Alignment Scoring

Value	Score	Criteria Description
Highest Community Value		**1: Network Connections**
	○	Least number of active transportation connections (trails, on-street bikeways, etc)
	◑	Moderate number of active transportation connections (trails, on-street bikeways, etc)
	●	Greatest number of active transportation connections (trails, on-street bikeways, etc)
		2: User Experience
	○	Offers little to no scenic qualities, on-site amenities, or unique experiences
	◑	Offers some scenic qualities, on-site amenities, or unique experiences
	●	Offers many scenic qualities, on-site amenities, or unique experiences
		3: Enhances Bicycling and Walking
	○	Does not improve walking and bicycling conditions or safety
	◑	Moderately improves walking and bicycling conditions or safety
	●	Substantially improves walking and bicycling conditions or safety (ie. - no existing facility or alternative)

Alignment Scoring, continued

Value	Score	Criteria Description
Medium Community Value		**4: Logical Segments**
	○	Does not connect to existing trail at either end
	◑	Extends existing trail (connection at one end)
	●	Fills gap in existing trail corridor (existing trails at both ends)
		5: Cultural & Natural Resources
	○	Few to no cultural or natural resources in close proximity
	◑	Some cultural or natural resources in close proximity
	●	Many cultural or natural resources in close proximity
		6: Environmental Conditions
	○	Many limiting environmental factors
	◑	Some limiting environmental factors
	●	Few, if any, limiting environmental factors

Alignment Scoring, continued

Value	Score	Criteria Description
Lowest Community Value		**7: Cost**
	○	Highest number of additional cost elements (over and above basic unit cost)
	◑	Moderate number of additional cost elements (over and above basic unit cost)
	●	Lowest number of additional cost elements (over and above basic unit cost)
		8: Route Directness
	○	Least direct routing alternative
	◑	Moderately direct routing alternative
	●	Most direct routing alternative
		9: Ownership & Right-Of-Way
	○	Greatest need for property acquisition and/or easements
	◑	Moderate need for property acquisition and/or easements
	●	Least need for property acquisition and/or easements

Eoff Trail

Corridor Description

The Eoff Trail provides a valuable link between the City of Nixa and the newest addition to the city's park system, the Eoff Century Farm Park. To enhance connectivity to the OTO priority trail system, the Eoff Trail corridor would also extend north across the James River and connect to either the James River Greenway or the future sidepath along the planned Rivercut Parkway extension. Map 3 on the following page shows the two alignment alternatives for the Eoff Trail corridor, along with many of the environmental, land use, and transportation characteristics that have been considered for alignment development and evaluation.

Environmental conditions along the Eoff Trail corridor are characterized by a more significant presence of identified sinkholes compared to other areas of Nixa and the surrounding area in Christian and Green Counties. These sinkholes and other sensitive karst features may present a challenge to trail development. The Eoff Trail Corridor also crosses the James River north of the future Eoff Century Farm Park. As such, the preferred alignment will traverse the river's floodplain and floodway. While enhancing connectivity to natural resources like the James River is a desired attribute of Nixa's future trail system, flooding events can cause significant damage to trails and greenways located in a floodplain or floodway.

There are also a number of petroleum and hazardous substance storage tanks located along the corridor, particularly in the southern half of the corridor along or close to US 160. These storage tanks are visible on the corridor map on the following page. Additional documentation of environmental, social, cultural, and historical characteristics for the larger study area can be found in the OTO's Bicycle and Pedestrian Trail Investment Study, Planning and Environmental Linkages (PEL) section.

Alignment One (Preferred)

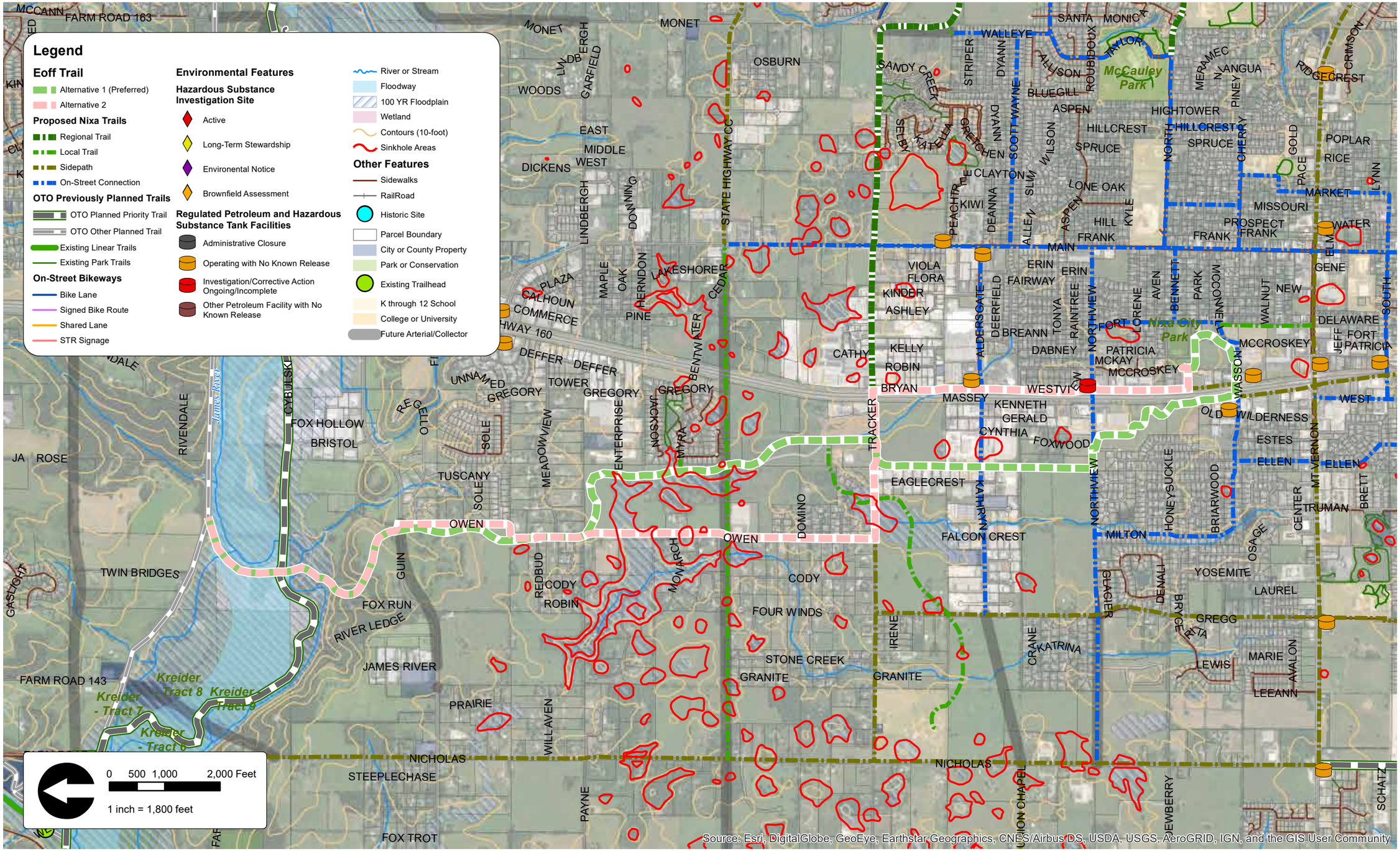
Alignment Alternative One (AA1) begins at the future Rivercut Parkway extension north of the James River and roughly 1,200 feet east of the existing Twin Bridges Lane. The alignment travels southwest and crossings the planned James River Greenway and the James River at the City of Nixa Eoff Farm Century Park. AA1 exits the park at Guin Road and Owen Road, continues south along Owen Road, then travels southeast through undeveloped agricultural parcels before reaching Tracker Road. The alignment crosses Tracker Road and travels along the western edge of the Bass Pro Outdoor World, LLC parcels to Kathryn Road. AA1 continues directly south to Northview Road, then southeast through undeveloped agricultural parcels before reaching the US 160 (Highway 13/Massey Blvd) right-of-way east of Old Wilderness Road. Once at the US 160 right-of-way, the alignment continues south to the Wasson Drive intersection, turns east on Wasson Drive, then north to Nixa City Park.

Alignment Two

Alignment Alternative Two (AA2) begins at the same location as Alignment One and continues on the same course until reaching the intersection of Guin Road and Owen Road. From here, the alignment continues south as a sidepath adjacent to Owen Road until reaching Tracker Road. AA2 then travels east along Tracker Road and crosses US 160 (Highway 13/Massey Blvd). The alignment turns south and travels along the east side of US 160 for nearly 6,000 feet, then travels across the vacant parcel south of the Super 8 Motel and ends at Nixa City Park.

Table 3: Alignment Alternatives Scoring

Score	Priority	AA1	AA2
Network Connections	High	◑	◑
User Experience	High	●	○
Enhances Bicycling & Walking	High	●	◑
Logical Segments	Medium	◑	◑
Cultural & Natural Resources	Medium	◑	◑
Environmental Conditions	Medium	●	◑
Cost	Low	◑	◑
Route Directness	Low	◑	◑
Ownership / Right-of-Way	Low	◑	●



Map 3: Eoff Trail Corridor Alternatives

Northeast Chadwick Flyer Rail Trail Connector

Corridor Description

The Northeast Chadwick Flyer Rail Trail Connector offers Nixa a vital connection to the Chadwick Flyer Rail Trail, an OTO Planned Priority Trail that extends from Lake Springfield southeast to the Ozark Community Center (The OC). By linking to this planned priority trail, Nixa can gain access to the regional trail system, to regional recreational amenities like Lake Springfield, and the neighboring cities of Springfield and Ozark.

Environmental conditions along the Northeast Chadwick Flyer Rail Trail Connector are generally favorable to trail development. There area's topography, consisting of subtle, rolling hills, creates opportunities for scenic viewsheds. There are a number of sinkholes along the corridor, particularly to the west. There are also multiple seasonal and ephemeral streams along the corridor that, while often dry, may be inundated during heavy rainfalls and may be subject to flooding.

Additional documentation of environmental, social, cultural, and historical characteristics for the larger study area can be found in the OTO's Bicycle and Pedestrian Trail Investment Study, Planning and Environmental Linkages (PEL) section.

Alignment One (Preferred)

Alignment Alternative One (AA1) begins at the planned Chadwick Flyer Rail Trail on the north side of Highway CC, roughly 1,250 feet west of Fremont Road. The alignment travels along the north side of Highway CC to Cheyenne Road, then continues southwest through undeveloped agricultural and wooded properties before reaching Old Castle Road north of Striper Road. AA1 continues west along the undeveloped parcel north of Striper Road and across the undeveloped parcel owned by Nixa Public Schools before turning north and joining Tracker Road. At Tracker Road, the trail continues west as a sidepath along the roadway and terminates at the proposed Eoff Trail west of US 160 (Highway 13/Massey Blvd).

Alignment Two

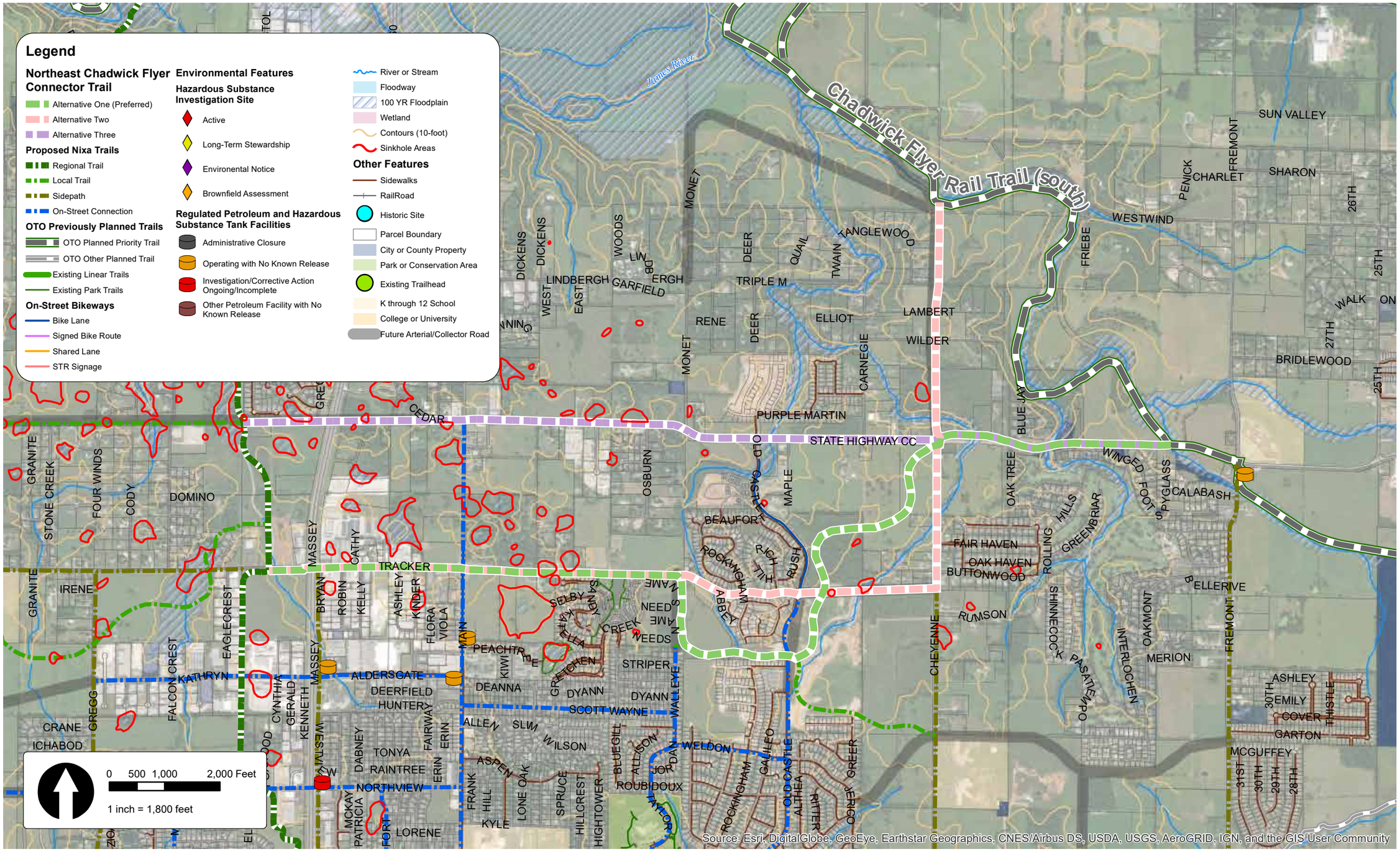
Alignment Alternative Two (AA2) begins at the intersection of the planned Chadwick Flyer Rail Trail and the future Cheyenne Road extension. The alignment travels south alongside the future Cheyenne Road extension and continues south from Highway CC along Cheyenne Road. AA2 turns west at the future Tracker Road extension between Cheyenne Road and Old Castle Road and continues west along Tracker Road until reaching the proposed Eoff Trail. Unlike AA1, AA2 would be a sidepath along existing and planned roadways for its entirety.

Alignment Three

Alignment Alternative Three (AA3) begins at the planned Chadwick Flyer Rail Trail on the north side of Highway CC, roughly 1,250 feet west of Fremont Road. The alignment travels west along Highway CC and the planned Highway CC extension west of Main Street for its entirety, terminating at the proposed Eoff Trail west of US 160 (Highway 13/Massey Blvd). Similar to AA2, AA3 would be a sidepath along existing and planned roadways for its entirety.

Table 4: Alignment Alternatives Scoring

Score	Priority	AA1	AA2	AA3
Network Connections	High	◑	◑	◑
User Experience	High	●	○	○
Enhances Bicycling & Walking	High	●	◑	◑
Logical Segments	Medium	◑	◑	◑
Cultural & Natural Resources	Medium	◑	○	○
Environmental Conditions	Medium	◑	◑	◑
Cost	Low	○	◑	◑
Route Directness	Low	○	◑	●
Ownership / Right-of-Way	Low	○	◑	◑



Map 4: Northeast Chadwick Flyer Connector Corridor Alternatives

X Center to Finley River Greenway Trail

Corridor Description

The X Center to Finley River Greenway Trail Corridor stretches from McCauley Park southeast to the OTO-planned Finley River Greenway, providing a scenic link between Nixa and Ozark. Upon completion of both the X Center to Finley River Greenway Trail and the Finley River Greenway, the community centers of these two communities will be connected by a high-quality bicycle and pedestrian connection.

Environmental conditions along the Northeast Chadwick Flyer Rail Trail Connector are generally favorable to trail development, but existing residential developments present some challenges to trail routing. The gentle, rolling hills slope downward towards Finley River to the south, and some open space and wooded areas have been preserved between residential developments and along riparian corridors. There are no significant sinkholes along the trail corridor. A small stream leads directly from McCauley Park south to the Finley River. While often dry, the stream may become inundated during heavy rainfalls and may be subject to flooding.

Additional documentation of environmental, social, cultural, and historical characteristics for the larger study area can be found in the OTO's Bicycle and Pedestrian Trail Investment Study, Planning and Environmental Linkages (PEL) section.

Alignment Alternative One

Alignment Alternative One (AA1) begins at McCauley park and extends eastward through Maplewood Hills Homeowners Association common ground before crossing North Road immediately east of Century Elementary School. The alignment travels south from North Road along the unnamed creek, following parcel boundaries until reaching Peach Brook at Brook Forest. At the southern cul-de-sac of Peach Brook the alignment traverses multiple residential parcels before reaching Highway 14 (Mt. Vernon Street). From Highway 14, the trail continues along the unnamed creek through large-lot residential, agricultural, and wooded parcels until reaching Finley River and the planned Finley River Greenway.

Alignment Alternative Two

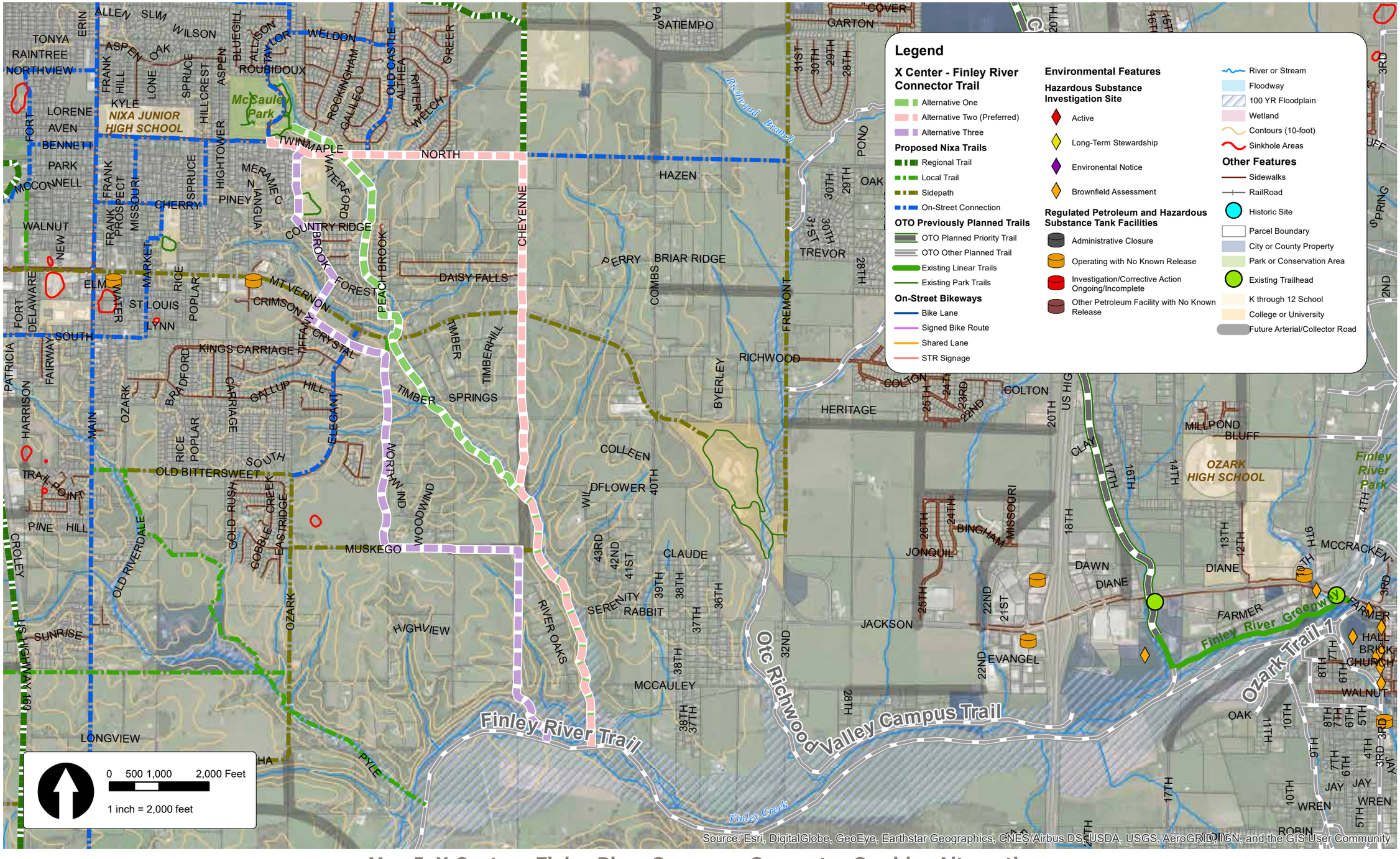
Alignment Alternative Two (AA2) acknowledges the difficulties in acquiring property and easements for trail development through developed residential neighborhoods. AA2 travels east along the south side North Road from McCauley Park in the form of a sidepath. At Cheyenne Road, AA2 turns south and continues to the southern terminus of Cheyenne Road, south of Highway 14 (Mt. Vernon Street). From there, AA2 continues south as a shared-use path (or as a sidepath along the future Cheyenne Road Extension south to Muskego Road) until reaching the unnamed creek corridor, at which point the alignment follows the same path as AA1 already described.

Alignment Alternative Three

Alignment Alternative Three (AA3) alignment also acknowledges the difficulties of property and easement acquisition, but takes a less direct route than AA2. The alignment begins at McCauley Park and crosses to the south side of North Road, continuing east to the entrance drive at Century Elementary School. AA3 then travels south along the western side of the school parcel and reaches East Country Ridge Street by way of the sidewalk at the cul-de-sac. The alignment continues south along Brook Forest in the form of an on-street bikeway and accompanying sidewalk, then turns south on Majestic Oak to Highway 14 (Mt. Vernon Street). AA3 crosses Highway 14, turns from Tiffany Blvd to Crimson Avenue, traveling east past Elegant Drive along the north edge of an undeveloped Eoff parcel at 901 E Timber Springs Road. The alignment then turns south along the edge of the parcel line until reaching Musekgo Road, travels east past the current eastern terminus of Muskego Road, which is slated for an extension. Upon reaching the future Cheyenne Road southern extension, AA3 turns south and travels along a utility transmission line, crosses East Minnehaha Road, then continues south and east to connect to the Finley River and planned Finley River Greenway.

Table 5: Alignment Alternatives Scoring

Score	Priority	AA1	AA2	AA3
Network Connections	High	◑	◑	◑
User Experience	High	●	◑	○
Enhances Bicycling & Walking	High	◑	◑	◑
Logical Segments	Medium	○	○	○
Cultural & Natural Resources	Medium	◑	◑	◑
Environmental Conditions	Medium	○	●	◑
Cost	Low	○	●	◑
Route Directness	Low	●	○	◑
Ownership / Right-of-Way	Low	○	●	◑



Map 5: X Center - Finley River Greenway Connector Corridor Alternatives

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CHAPTER SIX: RECOMMENDATIONS

Introduction

Building on an understanding of existing conditions and public input gathered during the course of the planning process, this chapter provides a comprehensive set of recommendations to increase bicycle and pedestrian transportation and recreation throughout the City of Nixa. Recommendations consist of infrastructure improvements like new trails and on-street bikeways, programs to support trail use and increase physical activity, and policies to incorporate bicycling and walking into capital improvements and private development. The chapter begins by presenting the proposed trail network and describing the various trail facility types and supporting infrastructure that will comprise the network. This is followed by programming and policy recommendations that provide a diverse and comprehensive strategy to activate the trail system and increase walking and bicycling across Nixa.

Proposed Trail Network

The City of Nixa's inventory of trails, sidewalks, and on-street bikeways has grown substantially in recent years. From sidewalks installed concurrently with residential developments to on-street bikeways added to existing roads through striping projects and capital improvements, efforts to increase bicycling and walking are visible across the City. However, there is a notable lack of connectivity among these facilities, and residents and visitors alike have difficulties accessing key destinations like parks, schools, shopping, restaurants, and employment destinations.

The proposed trail network directly addresses this lack of connectivity by presenting the ultimate vision for a safe, accessible, and interconnected network of bicycling and walking facilities that link neighborhoods and destinations throughout Nixa. In addition, the proposed trail network provides multiple links to the growing regional trail network. In total, there are more than seventy-five miles of proposed facilities that provide coverage across the entire City and future growth area. The recommendations include connections to the OTO Priority Trail Network and other OTO planned trails through a hierarchy of regional, local, and on-street connections. These proposed trail facilities are based an analysis of existing conditions; an inventory of planned improvements and programmed capital projects; an evaluation of alignment opportunities for regional trails; and input from community residents.

Constructing the proposed network of trail facilities is a long-term endeavor will require defining priorities, funding, and coordination for regional connectivity. The City of Nixa must employ multiple strategies to develop the trail network, including resource allocation through annual capital budgeting, impact fees from impact-generating land development, and coordination with partnering agencies like MoDOT, Christian County, and the City of Ozark. These implementation strategies are discussed in greater detail in the following chapter.

Creating the Nixa Trail Network will require strategic use of existing public rights-of-way and careful planning and acquisition of undeveloped parcels and easements.

Trail Types

The proposed trail network consists of three general types of trail facilities: regional trails, local trails, and on-street connections. These trail types are described below and depicted as the building blocks of the Proposed Nixa Trail Network in the map on the following page.

Regional Trails

Regional trails serve as the major arteries of the Nixa trail system and link the City to the regional trail network. These trails will take the form of a shared-use path, located either in an exclusive right-of-way or easement, or within a roadway right-of-way. Given the importance and intended prominence of these regional trails as the primary means of access between Nixa and adjacent communities and recreational amenities, these trails should be designed to accommodate moderate to heavy volumes of use. There is a total of 12.03 miles of proposed regional trails.

Local Trails

Local trails enhance connectivity between the proposed regional trails and local destinations, and support bicycle and pedestrian mobility along arterial and collector roadways throughout Nixa. Local trails will also take the form of a shared-use path and will be located primarily in an exclusive right-of-way or easement. There is a total of 10.83 miles of proposed local trails.

Sidepaths

Sidepaths provide an additional layer of network connectivity in the form of a shared-use path within an existing roadway right-of-way. Sidepaths are wider than sidewalks and are designed to support people walking, bicycling, and other forms of active transportation. There is a total of 41.71 miles of proposed sidepaths.

On-Street Connections

On-Street Connections consist of sidewalks, on-street bicycle facilities, and wayfinding signage that provide a finer grain of connectivity through existing neighborhoods. These on-street connections link neighborhoods to nearby schools, parks, trails, and other local destinations. On-street connections take into account previous planning efforts and will connect to proposed regional and local trails. The appropriate type of on-street bikeway for each recommended on-street connection will require further study, taking into account available right-of-way and curb-to-curb widths, average daily motor vehicle traffic volumes, posted speed limits, and other characteristics. There is a total of 19.93 miles of proposed on-street connections.

NIXA PROPOSED TRAIL NETWORK

NIXA AREA TRAILS STUDY: AN ADDENDUM TO THE OTO TRAIL INVESTMENT STUDY

EXISTING FACILITIES

- Sidewalk
- Park/School Trail
- Bike Lane
- Bike Route
- Share the Road
- Shared Lane

PROPOSED NIXA TRAILS

- Regional Trail
- Local Trail
- Sidepath
- On-Street Connection

PREVIOUSLY PLANNED FACILITIES

- OTO Other Planned Trail
- OTO Planned Priority Trail

DESTINATIONS AND BOUNDARIES

- Parks and Open Space
- Schools (K-12)
- Colleges and Universities
- Commercially-Zoned Parcels
- City of Nixa
- Other Municipalities

HYDROLOGY

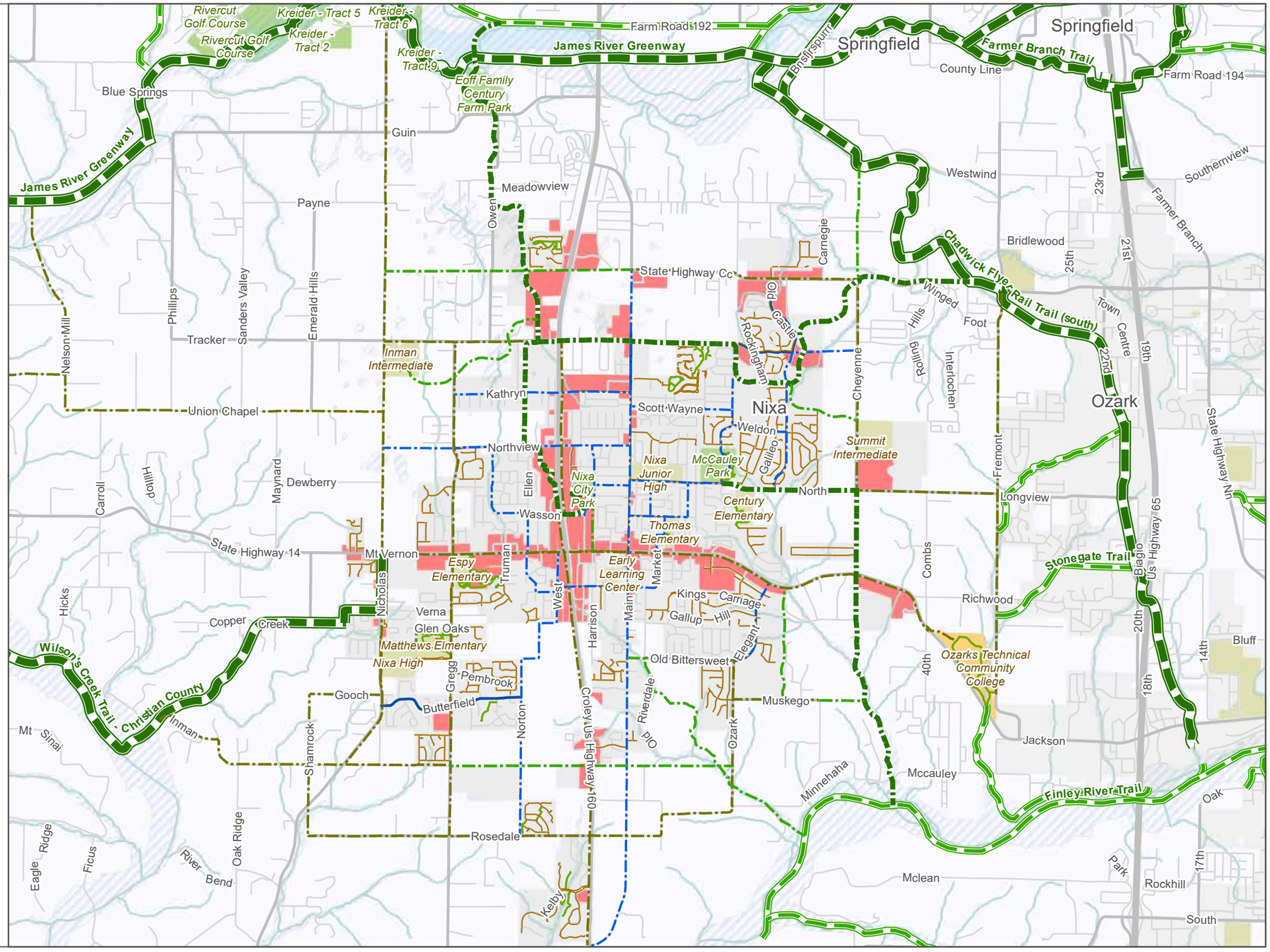
- Rivers and Streams
- Floodway
- Floodplain (100 YR)

0 0.55 1.1 MILES

N

alta PLANNING + DESIGN

Data provided by the Ozarks Transportation Organization, City of Nixa.
Map produced June 2018.



Map 6: Nixa Proposed Trail Network

Supporting Infrastructure

While trails, sidewalks, and on-street bikeways form the foundation of the trail network in Nixa, the City must also focus on supporting infrastructure that will enhance the trail network's accessibility, visibility, and functionality. The following supporting infrastructure should be installed in strategic locations throughout Nixa to encourage trail use.

Trailheads

Trailheads function like gateways to the trail system, providing visible and welcoming access points for those arriving at the trail system by car, transit, bicycle or other modes. In addition to trail access, trailheads often include additional include information and amenities for trail user comfort. Trailheads and trail access points can be located at the beginning or end of a trail, periodically along the length of a trail, or at the intersection of two or more trails. For the purposes of this study, trailheads and trail access points are divided into three categories that correspond to the level of amenities provided and their context within both the trail corridor they serve and the larger trail network.

MAJOR TRAILHEADS

Major Trailheads are highly visible, easily accessible, and amenity-rich destinations along the trail system. While their primary purpose is to serve as a beginning, ending, or access point for trail users, they contribute to the character and sense of place of the trail itself by providing trail users with a variety of amenities, from vehicle parking, bicycle parking, wayfinding maps, and information kiosks to restrooms, shelters, drinking fountains, and picnic tables. The recently constructed Tal's Trailhead on the Wilson's Creek Greenway is an example of local Major Trailhead.

Major Trailheads can be co-located in parks or next to commercial developments, transit centers, or other popular destinations to increase their visibility and take advantage of high volumes of traffic generated by adjacent sites. Major Trailheads should also be designed to provide emergency and maintenance vehicle access and turnaround. Accessible parking spaces should be provided at a rate of one accessible space per 25 standard spaces.

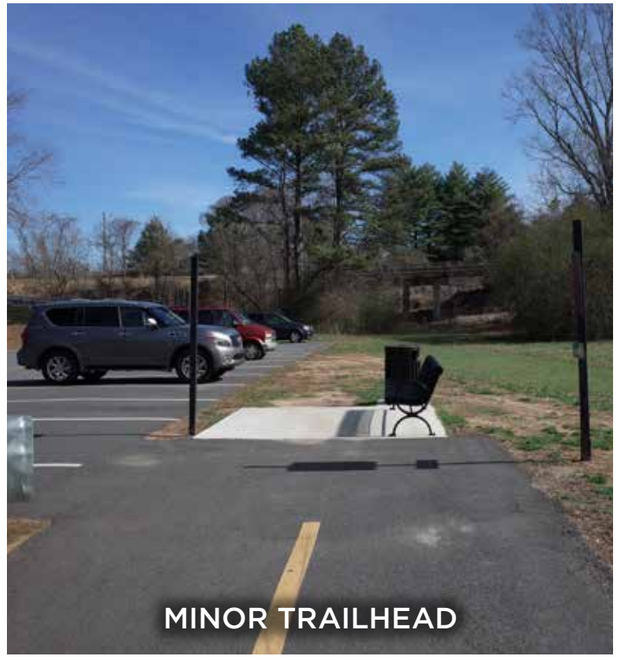
MINOR TRAILHEADS

Similar to Major Trailheads, Minor Trailheads serve a vital function of providing access to and information about the trail or trail system they serve, while also enhancing the trail's character and identity. Minor Trailheads are smaller in scale and often less visible than Major Trailheads. They are often located at locally known spots, such as parks and residential developments. Typical design features at a Minor Trailhead include a small parking lot for up to ten passenger vehicles, an information and map kiosk, benches, trash receptacles, and bicycle parking.

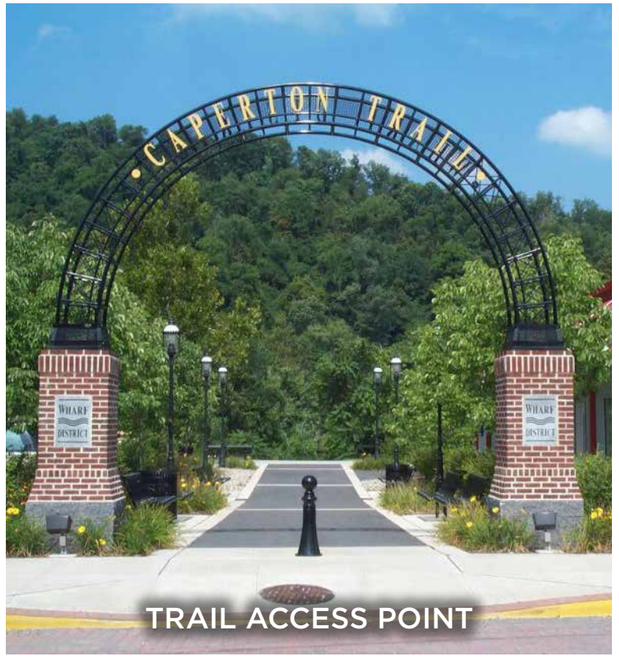
TRAIL ACCESS POINTS

Trail access points provide residents and visitors entry to the trail from public rights-of-way or even private developments. Typical locations include roadway crossings, residential neighborhood access points, and access points from adjacent commercial developments. Unlike trailheads, trail access points usually provide little to no amenities except for trail identification signage and possibly wayfinding signage to destinations along the trail. In some cases, trail access points can be complemented with additional gateway features or branding to highlight the trail it serves, particularly at major road crossings and other high-visibility areas.

MAJOR TRAILHEAD



MINOR TRAILHEAD



TRAIL ACCESS POINT

Bicycle Parking

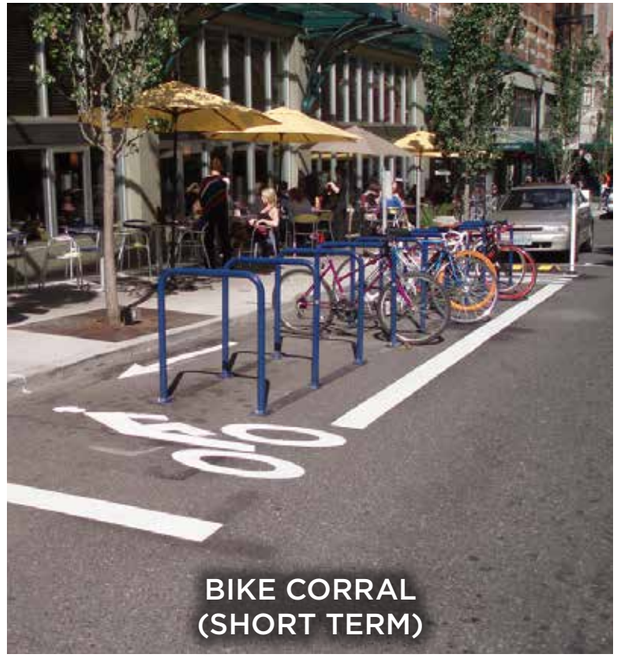
Bicycle parking is an integral component of a successful, functional trail network. Without secure, accessible, and convenient bicycle parking, people are less likely to choose to ride a bicycle. The City of Nixa should continue to increase bicycle parking supply with secure, attractive, and highly visible bicycle parking facilities, including short-term bicycle parking solutions like racks and corrals, and long-term solutions like lockers and secure parking areas. Providing context-appropriate facilities to enhance Nixa's trail network could be as simple as providing short-term bicycle parking outside popular destinations like parks and schools, and secure bicycle parking at the X Center and City Hall. Policies requiring secure long-term bicycle parking in new residential and commercial buildings, or the retrofit of older buildings with secure bicycle parking and shower/changing rooms in large employment centers, will make it easier to make bicycling a habit for future building users. Table 6 shows the general characteristics of short-term and long-term bicycle parking.

Policies and programs to increase bicycle parking are described in greater detail later in this chapter.

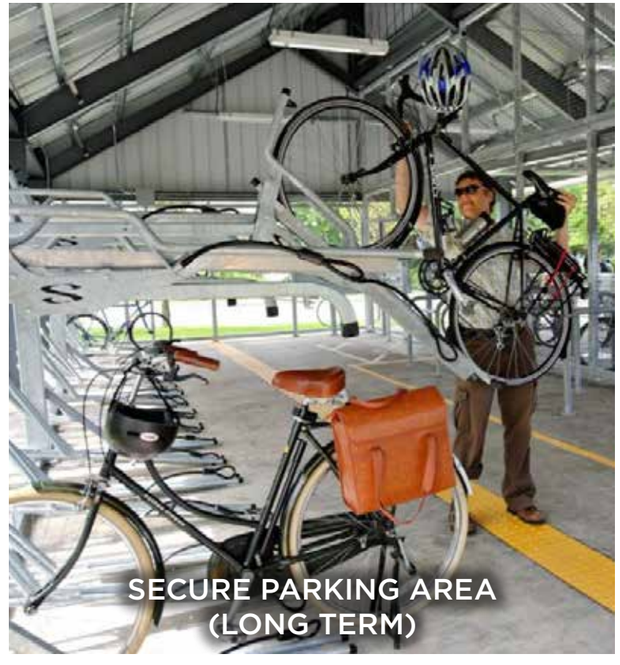
Table 6: Characteristics of Short-Term and Long-Term Bicycle Parking

Criteria	Short-Term Bicycle Parking	Long-Term Bicycle Parking
Parking Duration	Less than two hours	More than two hours
Typical Fixture Types	Bicycle racks and on-street corrals	Lockers or secure bicycle parking (racks provided in a secured area)
Weather Protection	Unsheltered or sheltered	Sheltered or enclosed
Security	High reliance on personal locking devices and passive surveillance (e.g., eyes on the street)	Restricted access and/or active supervision Unsupervised: • "Individual-secure," e.g., bicycle lockers • "Shared-secure," e.g., bicycle room or locked enclosure • Supervised: • Valet bicycle parking • Video, closed circuit television, or other surveillance
Typical Land Uses	Commercial or retail, medical/ healthcare, parks and recreation areas, community centers, libraries	Multi-family residential, workplace, transit, schools

BIKE PARKING RACKS (SHORT TERM)



BIKE CORRAL (SHORT TERM)



SECURE PARKING AREA (LONG TERM)

Bicycle Repair Stations (Cycle Aid Stations)

Minor bicycle repairs, like changing a tire or adjusting brakes and derailleurs, can be difficult without access to a bike stand, an air pump, and other tools. Many bicyclists may find the need to make repairs like these while on the move or unloading their bikes at a trailhead, but may not carry the appropriate tools. Cities across the country have begun to address this need by installing bicycle repair stations in high-traffic locations. In neighboring Springfield, bike repair stations, also called cycle aid stations, can be found along The LINK, Springfield's major on-street north-south bicycle corridor.

The City of Nixa should install bicycle repair stations at locations across the City with high volumes of bicycle activity. These locations may include parks, trailheads, the X Center, and City Hall. It is important that the City target locations of existing bicycle infrastructure or install repair stations in tandem with bicycle infrastructure development in order to maximize the repair stations' value and use.

Bicycle & Pedestrian Wayfinding

Landmarks, destinations, neighborhood business districts, natural features and other visual cues help residents and visitors travel through Nixa. However, many of the recommended trails and on-street connections utilize less familiar, lower-volume roadways and proposed trail alignments that may not be as familiar to many people. The placement of wayfinding signs along the proposed trail network will indicate to trail users their direction of travel, the location of popular destinations, and the distance to those destinations. This will in turn increase the comfort, convenience and utility of the trail network. Wayfinding signs also provide a branding element to raise the visibility of Nixa's growing active transportation network.

Signage can serve both wayfinding and safety purposes, including:

- Helping to familiarize users with the bikeway system
- Helping users identify the best routes to destinations
- Helping to address commonly-held perceptions about travel time and distance
- Creating seamless transitions between on-street and off-street bikeways
- Helping overcome a "barrier to entry" for people who do not bicycle often and who fear becoming lost
- Alerting motorists that they are driving along a bicycle route and should use caution

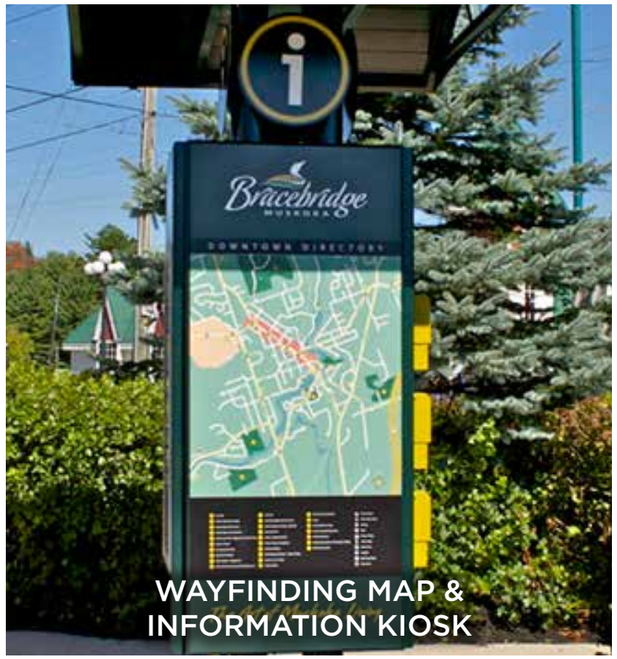
Signs are typically placed at key locations leading to and along bicycle routes, including the intersection of multiple routes. The City of Nixa should develop a community-wide Trail Wayfinding Signage Plan that identifies:

- Sign locations along existing and planned bicycle routes
- Sign type—what information should be included and what is the sign design
- Destinations to be highlighted on each sign—key destinations for bicyclists
- Approximate distance and riding time to each destination

General cost estimates for wayfinding signage range from standard Manual of Uniform Traffic Control Devices (MUTCD) signage to customized signage with branded elements and posts. Costs of wayfinding signage will depend on the type of signing and materials chosen for fabrication of the signs.

BICYCLE REPAIR STATION

BICYCLE WAYFINDING



WAYFINDING MAP & INFORMATION KIOSK

Supporting Programs and Policies

The City of Nixa should establish a variety of supporting programs and policies to assist in the development of the proposed trail network and increase bicycle and pedestrian activity for transportation and recreation. The program and policy recommendations included in this section of the study are intended to cover the breadth of the Six E's of a bikeable and walkable community: engineering, education, encouragement, enforcement, evaluation and equity. Some recommendations may touch on more than one of these categories, while others focus on just a single category. The City of Nixa and its community partners should explore opportunities to implement these programs as staff and financial capacity permits.

Complete Streets Ordinance

A Complete Streets ordinance codifies a jurisdiction's desire and intent to plan, design, operate, and maintain streets in order to enable safe, comfortable and convenient travel for users of all ages and abilities, regardless of their mode of transportation. As of May 2018, 39 communities in Missouri have endorsed Complete Streets through policy statements, ordinances, resolutions, or adopted plans. In addition, the Missouri General Assembly passed resolution HCR 23 supporting state, regional, and local agencies' efforts to adopt Complete Streets policies. Unlike resolutions and policy statements, an ordinance provides greater strength and accountability, ensuring that the adopting agency has clear procedures to address and incorporate all modes of transportation in roadway projects.

The City of Nixa should develop and adopt a Complete Streets Ordinance to reaffirm its commitment to supporting walking, bicycling, and all modes of transportation. The resources listed below offer sample ordinances and other tips and tools for developing a municipal Complete Streets ordinance.

Resources

Missouri Bicycle and Pedestrian Federation Complete Streets Resources: http://mobikefed.org/CompleteStreets

Complete Streets Local Policy Workbook, National Complete Streets Coalition (Smart Growth America): https://smartgrowthamerica.org/resources/complete-streets-local-policy-workbook/

Bicycle & Pedestrian Count Program

Many local, regional, and state agencies in Missouri conduct traffic counts to understand traffic patterns and plan for future investments in transportation infrastructure. However, people bicycling and walking are often left out of these counts, which often focus solely on motor vehicles. Counts of bicycle and pedestrian activity are very important to understanding how people get around on bike and foot. By measuring bicycle and pedestrian activity year-over-year, the City of Nixa can understand changes in activity and how new trails and facilities impact activity.

The City of Nixa should develop a bicycle and pedestrian count program to document bicycling and walking activity and to measure before-and-after changes along recommended project corridors. These counts can help measure changes in activity and can help to justify expenditures for bicycle and pedestrian infrastructure. Counts can be conducted manually by City Staff or volunteers, or by automatic counting devices. Nixa should consider using both counting methods as appropriate.

Resources

National Bicycle and Pedestrian Documentation Project: http://bikepeddocumentation.org/

Bicycle and pedestrian counts are an effective way to measure active transportation and trail usage.

Bicycle Parking Ordinance

Zoning regulations dictate the character and quality of development within the City. As future growth and development occur in Nixa, it is important that appropriate ordinances are in place to support bicycle transportation. The City of Nixa should consider adopting a bicycle parking ordinance to ensure that bicycle parking is integrated into future developments. Such an ordinance would dictate the number of bicycle parking spaces required based on land use and development size. Additional parking design and siting details can be integrated into the bicycle parking ordinance to guarantee both quality and visibility of parking facilities. The resource links below include a sample bicycle parking ordinance that can serve as a starting point for the development of a local bicycle parking ordinance, and the Association of Pedestrian and Bicycle Professionals'' (APBP) Essentials of Bicycle Parking: Selecting and Installing Bicycle Parking That Works (2015). The Essentials of Bicycle Parking is a detailed guide that can assist the City of Nixa, community partners, and local businesses in choosing the right bicycle parking facilities and placing them in the right location.

Resources

Model Bicycle Parking Ordinance, ChangeLab Solutions: https://www.changelabsolutions.org/publications/bike-parking

Essentials of Bicycle Parking: Selecting and Installing Bicycle Parking that Works, Association of Pedestrian and Bicycle Professionals (2015): http://www.apbp.org/?page=publications

Bicycle Parking Program

Many local businesses and community organizations share the City of Nixa's desire to make bicycling more convenient but may not know how to best contribute. The City of Nixa should establish a bicycle parking program to encourage local businesses and community organizations to support bicycling by installing bicycle parking racks. There are multiple benefits to a City-run bicycle parking program. By buying the racks in bulk, the City can achieve an economy of scale and offer the racks to community partners at a lower cost. The City can also have control over parking design, siting, and installation, ensuring that high-quality bicycle racks are properly installed in visible, easy-to-reach locations. Like many local agencies with bicycle parking programs, Nixa can incorporate City branding elements into the bicycle rack to increase the visibility of the bicycle parking program.

Resources

Bike Rack Purchase and Installation Program, City of St. Louis, MO: https://www.stlouis-mo.gov/government/departments/street/streets-sidewalks-traffic/permits-inspections/bike-rack-installation.cfm

Bike Rack Program, City of Fort Collins, CO: https://www.fcgov.com/bicycling/parking.php

Safe Routes to School

In the City of Nixa, many children live within walking or bicycling distance to school, yet walking and bicycling represent only a small percentage of trips to school. A Safe Routes to School program can be an effective method of increasing physical activity for children and families by encouraging more kids to walk and bike to school. Through various activities like Walking School Buses, Bike Trains, Bicycle Rodeos, National Walk to School Day, and walking maps, Safe Routes to School programs have proven to be effective in their purpose of increasing physical activity.

The City of Nixa should partner with Nixa Public Schools to explore opportunities for the development of a Safe Routes to School program.

Parents, teachers, and school resource officers can all play a role in Safe Routes to School.

Resources

Safe Routes to School National Partnership: https://www.saferoutespartnership.org/

National Center for Safe Routes to School: http://www.saferoutesinfo.org/

Missouri Department of Transportation Safe Routes to School Grant Program: http://www.modot.org/safety/SRTSGrants.htm

Adult Bicycle Safety & Maintenance Workshops

Classes and workshops provide education and skills training to bicyclists of varying confidence levels. Training classes and workshops offer many benefits: they enhance understanding, confidence, and independence related to bicycling for transportation and provide a supportive learning environment where participants can ask questions or express concerns. Furthermore, classes can be tailored to a variety of topics and demographics, such as:

- **General Classes:**
- Basic bike maintenance

Bicycle safety and skills classes build confidence and encourage people to take to the streets on two wheels.

- How to change a tire
- Safe riding and traffic skills training
- Shopping by bike
- Commuting 101
- Bicycle legal clinic
- No car needed: how to get around without driving
- **Demographic Specific:**
- Women's maintenance 101
- Youth safety and skills training
- Families on bike
- Bicycling for seniors

The City of Nixa should partner with local bike shops, advocacy groups, or community members to host workshops and classes. The presenter of the workshop should be confirmed at least a month in advance of the workshop to give adequate preparation time. Workshops should be held at lunch time, or in the evening or weekends to accommodate work and school schedules.

Youth Bicycle Safety Education

Instilling a love for bicycling in children and young adults can support long-term gains in cultural acceptance of and support for bicycling activity. While many children learn bicycling at a young age, it is not a part of physical education curriculums in most schools in Nixa and across the country, partially due to the lack of access to resources. Some school districts, however, have begun to incorporate basic bicycling safety and skills into physical education curriculums with great success, often partnering with local police departments, non-profits, and certified bicycling instructors to provide bicycles for students and offer effective instructions to encourage safe riding practices and a basic understanding of rules and responsibilities when riding around motor vehicle traffic. The City of Nixa should coordinate with the Nixa Public Schools to explore opportunities to teach basic bicycling skills to younger students.

Resources

SHAPE America (Society of Health and Physical Educators) Bicycle Safety Curriculum: http://www.shapeamerica.org/publications/resources/teachingtools/qualitype/bicycle_curriculum.cfm

League of American Bicyclists Bicycling Skills 123 Youth and Safe Routes to Schools courses:

http://www.bikeleague.org/content/find-take-class

Safe Routes to School National Partnership Traffic Safety Training Resources:

http://www.saferoutespartnership.org/state/bestpractices/curriculum

Earn-A-Bike Program

Some children in Nixa may lack access to quality bicycles and bicycle maintenance training and tools. In order to address this lack of access, the City and its community partners should develop an Earn-A-Bike. An Earn-A-Bike program typically involves multiple classes to teach children the basics of bicycle maintenance, safety, and maneuvering. Students who complete the program will receive a refurbished bike along with a helmet, bike lock, and bike lights.

Should there be a need, the City can expand the program to include adults as well. A number of communities in Missouri have established Earn-A-Bike programs for both children and adults.

Bicycle maintenance classes give people the know-how to complete basic bicycle repairs, like changing a tire.

Bicycle safety and skills classes can be part of a well-rounded physical education curriculum.

Children learn basic bicycle maintenance and safety skills as part of an Earn-A-Bike program in St. Louis (Source: STL Bike Works)

Resources

Earn-A-Bike Program, St. Louis Bicycle Works (St. Louis, MO): http://www.bworks.org/bikeworks/earn-a-bike/

Earn-A-Bike Program, RevolveKC (Kansas City, MO): http://revolvekc.org/earn-a-bike/

Earn-A-Bike Program, CoMo Bike Co-Op (Columbia, MO): https://www.como.gov/parksandrec/facilities/como-bike-co-op/

Themed Group Bicycle Rides

Organized bicycle rides offer people a comfortable and fun way to explore Nixa's trails and bicycle routes in a group setting. For many, these types of events build participants' confidence and knowledge of the trail network, giving them the tools necessary to choose bicycling for trips around town. Target audiences for these organized bicycle rides should reflect the diversity of the community and include children, seniors, families, low-income residents, minority residents.

Smaller group rides with capped attendance can capitalize on cultural assets and amenities like historic monuments and buildings, city parks, business districts, and other unique locations. In St. Louis, Missouri, Trailnet's free weekly Community Rides center around the city's history and culture, with themes ranging from museums, breweries, jazz, prohibition, greenways, and the Underground Railroad. Many of these rides are organized and led by local historians and civic enthusiasts.

Larger group rides called cruiser rides that offer family-friendly environment have become mainstays in communities across the country. The Denver Cruiser Ride, the Slow Roll in Detroit, and Freewheel in Memphis attract hundreds to thousands of participants, move at a leisurely pace, and welcome people of all ages and abilities.

The City should coordinate with local advocacy organizations and other community partners to explore opportunities develop group bicycle rides as an essential tool to encourage bicycling activity and trail use in Nixa.

Resources

Trailnet (St. Louis, MO) Community Rides: http://trailnet.org/tag/community-rides/

Slow Roll (Detroit, MI): http://slowroll.bike/

Denver Cruiser Ride: http://denvercruiserride.com/

People for Bikes, How to Start a Cruiser Ride: http://pfb.peopleforbikes.org/take-a-brake/how-to-start-a-cruiser-ride/

Community Walking & Biking Maps

In order to encourage biking and walking, the City of Nixa should develop bicycling and walking maps that provide route and facility information and highlight local destinations and amenities.

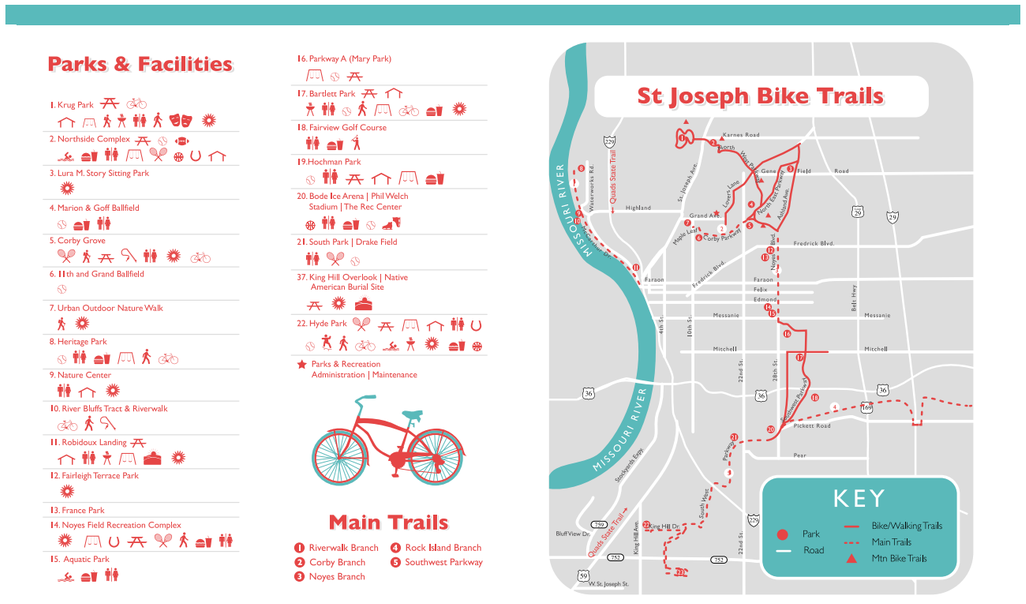
One of the most effective ways of encouraging people to bike is through the use of maps and guides to show that the infrastructure exists, to demonstrate how easy it is to access different parts of the city by bike, and to highlight unique areas, shopping districts or recreational areas. Maps can be citywide, district-specific, or neighborhood/family-friendly and can be printed on paper or made available online as interactive maps.

Sample Resources

Online Biking and Trail Map, City of Columbia, MO: https://www.como.gov/publicworks/biking/

Biking and Trail Map, City of St. Joseph, MO: https://stjomo.com/wp-content/uploads/2016/03/bike-map.pdf

In St. Louis, Missouri, Trailnet's community rides series takes people on themed bicycle rides that explore the city's history and culture (Source: Trailnet).



St. Joseph, Missouri's Bike Trails Map provides a colorful and informative guide to local trails, parks, and other community destinations.

Targeted Law Enforcement Activities

Targeted enforcement is an effective way of encouraging lawful travel behavior and instilling respect for other road users. Enforcement activities may include deployment of speed reader boards, police "sting" operations at high crash intersections, wrong-way riding enforcement, bike light enforcement, and even distribution of safety literature along corridors with high volumes of bicycle activity. In the City of Chicago, police officers partner with the City's Bicycling Ambassadors educate road users.

The Nixa Police Department should explore opportunities for regularly-scheduled enforcement activities at strategic locations around the community to support bicycling activity and create safer environments for all road users.

Resources

City of Chicago Targeted Enforcement (Chicago, IL): http://chicagocompletestreets.org/safety/targetedenforcement/

The City of Chicago's Crosswalk Enforcement Program encourages safe, responsible travel for all road users.

Bicycle Facility Fact Sheets

As the City of Nixa develops its trail network, many residents may be unfamiliar with trails, bicycle lanes, and travel lanes with shared lane markings. Driving alongside people bicycling on these new facilities may be uncomfortable or challenging for some, and the City of Nixa can address this lack of knowledge by providing bicycle facility fact sheets and other information to help drivers understand how to operate a motor vehicle next to a bicycle lane or in a shared travel lane.

A great resource to draw from is A Driver's Guide to Active Transportation, a document developed by the Missouri Bicycle and Pedestrian Federation in 2016 to support local communities and advocacy organizations across the state. The document explains various signs and roadway markings, providing constructive information about how to interact with other road users. The City of Nixa consider this document as a starting point for developing bicycle facility fact sheets specific to new infrastructure installed in the City.

Resources

A Driver's Guide to Active Transportation, Missouri Bicycle and Pedestrian Federation: https://trailnet.org/files/2016/05/DriversGuideToActiveTransportationReduced.pdf

Project Outreach

The City of Nixa uses multi-pronged outreach efforts for many capital projects in order to actively engage and educate residents about changes to public infrastructure. As bicycle facility projects are developed and installed, it will be important to continue these outreach efforts and inform residents along project corridors about how to interact with these new bicycle facilities and the likely increase in bicycle activity that will result. By using online videos, temporary signs, updates through social media, neighborhood meetings, and other outlets, the City of Nixa can build awareness and support for these new facilities as important elements of the transportation system. Examples of project outreach via community meetings and an online presence are listed below.

Resources

Seattle DOT Bicycle Program Projects (Seattle, WA): http://www.seattle.gov/transportation/bikeprojects.htm

Cincinnati Bicycle Transportation Plan Current Projects (Cincinnati, OH): http://www.cincinnati-oh.gov/bikes/bike-projects/

Denver City and County Current Projects (Denver, CO): https://www.denvergov.org/content/denvergov/en/bicycling-in-denver/infrastructure.html

Seattle DOT's project handouts provide valuable information about current projects, keeping everyone informed.

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CHAPTER SEVEN: IMPLEMENTATION

Introduction

Constructing the proposed trail network and implementing the programs and policies recommended in this study is a long-term, incremental endeavor. Projects must be pursued in a strategic manner in order to maximize the City's investment, leverage local resources, and sustain community support over time,

The Implementation Chapter provide the City of Nixa and the Ozarks Transportation Organization with a blueprint to begin the implementation process and monitor progress over time. The chapter includes five key elements: early action steps; regional trail prioritization; potential funding sources; measuring plan performance; and ongoing system maintenance.

Early Action Steps

The following early action steps are designed to initiate implementation, sustain momentum generated during the planning process, and set the foundation for future progress. Six early action items, which represent a mix of policy, procedures, capital projects, and programs, provide early opportunities to engage community partners and establish strong and lasting relationships on which successful implementation efforts will depend.

Step 1: Adopt the Trail Study

Adopting the Plan is an important step, not just for its symbolic value representing the City's and the Ozarks Transportation Organization's commitment to bicycling and walking, but also for its policy value as a guiding document for future capital investments and transportation decisions.

The adoption process varies from community to community, depending on existing policies and procedures. Whether the City of Nixa should undertake a formal adoption process and incorporate this study as a supplemental document supporting the Comprehensive Plan, or choose to draft a resolution in support of the study, it is important that this study be acknowledged for its potential to increase walking and bicycling and be used as a guide for future decision-making and investments. The major advantage of adopting the study as an addendum to the Comprehensive Plan is added weight the recommended network will carry as an official planning document. Whether applying for external funding or discussing development impacts with prospective developers, having an official study to reference is a valuable asset.

Step 2: Identify and Implement a Low-Cost Project

Immediate investments in bicycle, pedestrian, and trail facilities demonstrate the City of Nixa's commitment to implementing the recommendations of the study and achieving the long-term vision of a complete, interconnected trail network. The City of Nixa should identify a low-cost project to complete within one year of plan completion. Potential projects should be selected from the recommended on-street connections. On-street connections, particularly on local and low-volume collector roadways, may consist of relatively lower-cost improvements, such as sidewalk infill, crosswalk markings, shared lane markings, bicycle wayfinding signage, and minor traffic calming improvements (if necessary). This project can sustain momentum generated during the planning process and generate excitement and support within the community.

Step 3: Integrate Proposed Trail Network Recommendations into Capital Improvements Plan

The Capital Improvements Plan (CIP) guides the City's investments in transportation, facilities, and other capital improvements over a five-year period. The CIP is updated regularly and incorporated into the City's annual budget. In order to allocate funding for trail, sidepath, on-street bikeway, and sidewalk projects, the City of Nixa should incorporate recommended trail segments into the CIP. Recommendations for sidewalks, on-street bikeways, and sidepaths can be incorporated into previously identified roadway projects, while off-street trail projects may require insertion into the CIP as separate, new line items.

Step 4: Organize and Host a Community Bicycle Ride

Building a community culture that values bicycling takes more than trails and bikeways. To encourage bicycling and demonstrate the City's support for active transportation, Nixa should develop an all-ages, family-friendly organized bike ride (or series of bike rides). By routing the event along existing and proposed bikeways and connecting to key destinations throughout the City, participants can explore bike routes in a low-stress environment, building their ability and confidence to bicycle on local streets and access local destinations.

Step 5: Adopt a Complete Streets Policy

Complete Streets are planned, designed, constructed and maintained to accommodate all street users - pedestrians, bicyclists, transit users, and motor vehicle drivers. The Ozarks Transportation Organization has incorporated Complete Streets elements in its Plan 2040 Long Range Transportation Plan in order to provide regional leadership and to tie Complete Streets policies and elements to the selection and awarding of federal funds for the planning, design, right-of-way acquisition, engineering, and construction of roadways and other transportation facilities.

The City of Nixa should coordinate with the Ozarks Transportation Organization to draft and adopt a Complete Streets ordinance or resolution to integrate all modes of transportation into roadway funding, design, construction, operations and maintenance. Establishing a municipal policy will delegate roles and responsibilities and create a system through which all transportation projects can be evaluated. The policy will support implementation of proposed trail network segments by incorporating them into future roadway projects.

Cost Estimates

Cost estimates are an essential planning tool used for programming capital improvements and drafting applications for external funding sources. For this study, planning-level cost estimates have been developed for all recommended projects, and detailed cost estimates have been developed for the three regional trails for which refined alignments were determined in Chapter Four.

Planning-Level Cost Estimates

Cost estimates have been developed for each project based on initial planning-level examples of similar constructed projects and industry averages. These costs were then refined with the assistance of City and Ozarks Transportation Organization staff based on local experience. All facility designs and associated cost estimates proposed in this plan are conceptual in nature and must undergo final engineering design and review through coordination between all concerned departments in order to arrive at detailed project costs. These costs are provided in 2018 dollars and include a 20 percent contingency. Inflation should be included in costs in future years when bikeway improvements are programmed.

The cost estimates do not include costs for corridor planning, public engagement, surveying, engineering design, right-of-way acquisition, and other work required to implement a project, since these are planning-level costs. Based on city experiences, these elements can and should be added as these projects are programmed into the CIP. Depending on the type of improvement, these additional costs can generally be estimated at up to 25 percent of the facility construction cost, in the case of a shared use path design or a two-way cycle track. Construction costs will vary based on the ultimate project scope (i.e., combination with other projects) and economic conditions at the time of construction. When combined with larger roadway projects, the city can achieve economies of scale and maximize the value of every dollar spent on transportation infrastructure.

Cost estimates for each type of recommended linear facility are listed in Table 7. A complete list of cost estimates for each individual project is shown in Table 8 on the following page. For On-Street Connections, the study utilizes cost ranges rather than a single cost estimate to acknowledge variables that must be analyzed in greater detail in order to provide more accurate cost estimates. These facilities range may range from sidewalks, shared lane markings, and wayfinding signage to sidewalks and separated bike lanes. It should also be noted that facility cost estimates for on-street connections only take into account the bicycle facility and related wayfinding and other signage, not pedestrian facilities like sidewalks or crosswalks. In order to determine the appropriate facility type and associated cost, additional study will be required.

Table 7: Cost Estimates by Facility Type

Facility Type	Cost Per Mile	Recommended Miles
Regional Trail	$1,300,000*	12.03
Local Trail	$1,300,000*	10.83
Sidepath	$1,00,000**	41.71
On-Street Connection	$3,700 - $198,000***	19.93
Total		**84.50**

*The cost per mile estimate used for regional and local trails represents the “Suburban Trail Type”. This trail type cost estimate was initially developed for the OTO Bicycle & Pedestrian Trail Investment Study and used to generate planning-level cost estimates for the region’s planned priority trails.

**The cost per mile estimate used for sidepaths represents a combination of the “Rural Trail Type” and “Suburban Trail Type” from the OTO Bicycle & Pedestrian Trail Investment Study.

***On-street connections range from shared lane markings and wayfinding signage to buffered bicycle lanes. On-street connections do not include costs for sidewalks, which are standard design elements in the City of Nixa’s

Table 8: Cost Estimates for Individual Project Recommendations

Recommended Facility	Limit From	Limit To	Project Length (Miles)	Planning Level Cost Estimate
Regional Trails				
Eoff Trail	Northview Drive	Future Rivercut Parkway	4.77	$6,195,843
Finley River Connector Trail	Finley Creek Greenway	McCauley Park	3.32	$4,317,338
NE Chadwick Flyer Connector	Eoff Trail	Chadwick Flyer Trail at Hwy CC	3.94	$5,117,925
Local Trails				
Cheyenne Road Extension (North)	Highway CC	Chadwick Flyer Rail Trail	0.81	$1,054,486
Fort Road Trail Connector	Highway 14	McConnell Road	0.32	$412,471
Highway CC Extension	Nicholas Road	Main Street	1.77	$2,297,817
Inman Trail	Inman Intermediate	Eoff Trail	1.33	$1,722,663
Muskego Road Extension (East)	Muskego Road	SE Finley Creek Connector	0.33	$1,221,559
Muskego-Mt Vernon Connector	Muskego Road	Highway 14	0.81	$1,057,955
Myra-Eoff Trail Connector	Eoff Trail	Myra Drive	0.05	$60,463
Nixa High - Matthews Elementary Connector	Nicholas Road	Gregg Road	0.62	$808,581
SE Finley Creek Connector Alternative 3	Finley Creek Greenway	Main Street	2.09	$2,719,372
South Nixa East-West Trail	Inman Road	Ozark Road	2.03	$2,632,734
Summit Connector	Cheyenne Road	Chad Flyer Conn at Old Castle	0.64	$834,942
Walleye Connector Trail	Walleye Street	NE Chadwick Flyer Connector	0.03	$43,104
Sidepaths				
Cheyenne Road Sidepath	Highway CC	North Road	1.49	$1,494,040
Delaware Town Road	Wilson's Creek Trail	Landers Road	1.27	$1,272,000
Fremont Road	OTC Richwoods Campus	Highway CC	2.89	$2,885,200
Gooch Road	Shamrock Road	Nicholas Road	0.51	$512,343
Gregg Road	Rosedale Road	Tracker Rd	3.56	$3,563,880
Highway 14 Sidepath	NIcholas Road	Ozark Community College	4.42	$4,416,700
Highway CC Sidepath	Main Street	Cheyenne Road	1.64	$1,644,730
Inman Road	Wilsons Crk Trl - Christian Co	Inman Road	2.27	$2,271,510
Landers Road	Deleware Town Road	Nelson Mill Road	1.54	$1,539,380
Minnehaha Road	Rosedale Road	Ozark Road	0.52	$522,401
Muskego Road	Ozark Road	Muskego Road (90 Degree Turn)	0.61	$612,269
Nelson Mill Road	Union Chapel Road	James River Greenway	1.54	$1,537,140
Nicholas Road	Highway 14	James River Greenway	4.19	$4,190,330
Nicholas Road	Inman Road	Vintage Road	1.20	$1,199,020
North Street Bike/Walk Corridor	City Park	Fremont Road	1.01	$1,007,090
Old Bittersweet Road	Old Riverdale Road	Ozark Road	0.64	$635,202
Ozark Road	Minnehaha Road	Old Bittersweet Road	1.05	$1,047,800
Rosedale Road	Shamrock Road	Minnehaha Road	2.69	$2,685,930
Shamrock Road	Rosedale Road	Gooch Road	1.02	$1,015,990
Tracker Road	Nicholas Road	Eoff Trail	1.04	$1,043,390
Union Chapel Road	Nelson Mill Road	Nicholas Road	2.27	$2,272,400
US 160	South Main Street	Wasson Road	3.10	$3,098,810
US 160	Wasson Road	Tracker Road	1.24	$1,244,830

Table 8: Cost Estimates by Facility Type, Continued

Recommended Facility	Limit From	Limit To	Project Length (Miles)	Planning Level Cost Estimate
On-Street Connections				
Aldersgate Road	US 160	Main Street	0.51	$1,900.80 - $101,718.74
Bryant Street	Ellen Street	West Street	0.16	$576.59 - $30,855.52
Cherry Street	Main Street	Hillcrest Road	0.42	$1,549.73 - $82,931.76
Elegant Drive	Old Bittersweet Road	Highway 14	0.68	$2,511.20 - $134,383.37
Ellen Street	Bryant Street	Highway 14	0.31	$1,155.99 - $61,861.33
Ellen Street	Highway 14	Wasson Drive	0.27	$1,013.32 - $54,226.19
Fort Avenue	McConnell Road	Northview Road	0.45	$1,654.58 - $88,542.44
Hillcrest Road	Cherry Street	North Street	0.25	$915.43 - $48,987.97
Kathryn Road	Gregg Road	US 160	0.75	$2,788.45 - $149,219.68
Main Street Bike/Walk Corridor	Hwy 160	Hwy CC	4.94	$18,269.42 - $977,661.07
Market Street	South Road	Cherry Street	0.56	$2,066.07 - $110,562.42
Milton Drive	Wasson Drive	Northview Road	0.48	$1,789.91 - $95,784.37
Missouri Avenue	Cherry Street	North Street	0.25	$926.67 - $49,589.52
North Road	Rosedale Road	West Road	1.64	$6,073.35 - $325,006.05
North Street Bike/Walk Corridor	Rotary Park	Taylor Way	0.94	$3,482.57 - $186,364.81
Northview Drive Bike/Walk Corridor	Nicholas Road	Main Street	1.77	$6,564.48 - $351,288.29
Old Castle Road	North Street	Tracker Road	1.03	$3,804.07 - $203,569.28
Scott Wayne Drive	Main Street	Walleye Street	0.73	$2,709.57 - $144,998.51
South Road	West Road	Market Street	0.71	$2,609.07 - $139,620.35
Taylor Way	North Street	Walleye Street	0.51	$1,902.19 - $101,793.09
Tracker (Future Road Construction	Old Castle Road	Cheyenne Road	0.46	$1,717.23 - $91,894.98
Walleye Street	Taylor Way	N/O Striper Drive	0.34	$1,249.13 - $66,845.29
Wasson Drive	Milton Drive	Fort Avenue	0.74	$2,744.17 - $146,850.43
Weldon Drive	Walleye Street	Old Castle Road	0.40	$1,461.97 - $78,234.97
West Road	North Road	Highway 14	0.63	$2,325.33 - $124,436.40

Detailed Cost Estimates

The detailed estimates developed for each preferred alignment described in the previous chapter of the study incorporate an extensive list of cost factors to provide accurate estimates, including clearing, grading, base, surface, structures, culverts, signage, lighting, signalization, pavement markings, seeding, mulching, temporary traffic control. Additional cost factors, including engineering and surveying, easements and rights-of-way, and construction administration and inspection, have been added to the total cost as percentages.

Table 9: Eoff Trail Opinion of Probable Cost, 10ft Paved Path with 12ft Bridges

ITEM		QTY.	UNIT	UNIT COST	COST($)
Clearing & Grubbing		3	AC	$7,500.00	$22,500.00
Linear Grading Class 1		252	STA	$3,000.00	$756,000.00
Compacting Subgrade		28,989	SY	$2.00	$57,978.00
4" Aggregate Base		28,989	SY	$9.00	$260,901.00
6" Concrete Pavement		27,989	SY	$85.00	$2,379,065.00
7" Non-reinforced Concrete (Road Base Pvmt)		225	SY	$85.00	$19,125.00
Bituminous Pavement Mix PG64-22 BP-1 (2")		25	TON	$95.00	$2,375.00
Tack Coat (0.10 GAL/SY)		225	GAL	$5.00	$1,125.00
Driveway Repairs & Reconstruction		325	SY	$90.00	$29,250.00
Curb Ramps		450	SY	$135.00	$60,750.00
Truncated Domes		360	SF	$30.00	$10,800.00
Concrete Curb		360	LF	$35.00	$12,600.00
Wayfinding Signage (1 per 0.25 MI of Trail)		20	EA	$1,000.00	$20,000.00
Rock Lining (100 CY per bridge abutment)		200	CY	$85.00	$17,000.00
24" White Stop Bars		84	LF	$15.00	$1,260.00
24" White Yield Markings		36	EA	$50.00	$1,800.00
30" White High Visibility Markings		540	LF	$20.00	$10,800.00
Trail Signage & Posts (2 signs per 500')		101	EA	$350.00	$35,350.00
Roadway Signage & Posts (4 signs per Crossing)		36	EA	$350.00	$12,600.00
RRFB		6	EA	$10,000.00	$60,000.00
Signal Modification (Pedestrian-Cyclist Upgrades)		1	EA	$50,000.00	$50,000.00
Seed, mulch, etc		10	ACRE	$5,000.00	$50,000.00
Temporary Silt Fence		25,190	LF	$3.00	$75,570.00
Ditch Checks		252	EA	$225.00	$56,677.50
Sediment Removal		504	CY	$40.00	$20,152.00
Pedestrian Bridge (12' wide)		1,860	SF	$300.00	$558,000.00
Decorative Pedestrian Guardrail		100	LF	$120.00	$12,000.00
Contractor Construction Staking (1%)		1	LSUM	$45,936.79	$45,936.79
Site Furnishings (1.5%)		1	LSUM	$68,905.18	$68,905.18
Removal of Improvements (3%)		1	LSUM	$137,810.36	$137,810.36
Temporary Traffic Control (3%)		1	LSUM	$137,810.36	$137,810.36
Drainage Improvements (5%)		1	LSUM	$229,683.93	$229,683.93
Landscaping (5%)		1	LSUM	$229,683.93	$229,683.93
Utility Relocations (5%)		1	LSUM	$229,683.93	$229,683.93
Mobilization (10%)		1	LSUM	$459,367.85	$459,367.85
Subtotal					**$6,132,561**
Contingency 25%					$1,533,140
Total					**$7,665,701**
Engineering & Surveying Costs 15%					$1,149,855
Construction Administration & Inspection Costs 10%					$766,570
Easement & Right-of-Way Costs 5%					$383,285
Grand Total					**$9,965,411**
Costs Based on 2018 prices. Should include Inflation for each year beyond 2018					

Table 10: Northeast Chadwick Flyer Connector Trail Opinion of Probable Cost, 10ft Paved Path with 12ft Bridges

ITEM	QTY.	UNIT	UNIT COST	COST($)
Clearing & Grubbing	2	AC	$7,500.00	$15,000.00
Linear Grading Class 1	208	STA	$3,000.00	$624,000.00
Compacting Subgrade	24,744	SY	$2.00	$49,488.00
4" Aggregate Base	24,744	SY	$9.00	$222,696.00
6" Concrete Pavement	23,089	SY	$85.00	$1,962,565.00
7" Non-reinforced Concrete (Road Base Pvmt)	400	SY	$85.00	$34,000.00
Bituminous Pavement Mix PG64-22 BP-1 (2")	44	TON	$95.00	$4,222.22
Tack Coat (0.10 GAL/SY)	400	GAL	$5.00	$2,000.00
Driveway Repairs & Reconstruction	455	SY	$90.00	$40,950.00
Curb Ramps	800	SY	$135.00	$108,000.00
Truncated Domes	640	SF	$30.00	$19,200.00
Concrete Curb	640	LF	$35.00	$22,400.00
Wayfinding Signage (1 per 0.25 MI of Trail)	16	EA	$1,000.00	$16,000.00
Rock Lining (100 CY per bridge abutment)	0	CY	$85.00	$0.00
24" White Stop Bars	210	LF	$15.00	$3,150.00
24" White Yield Markings	12	EA	$50.00	$600.00
30" White High Visibility Markings	960	LF	$20.00	$19,200.00
Trail Signage & Posts (2 signs per 500')	84	EA	$350.00	$29,400.00
Roadway Signage & Posts (4 signs per Crossing)	64	EA	$350.00	$22,400.00
RRFB	2	EA	$10,000.00	$20,000.00
Signal Modification (Pedestrian-Cyclist Upgrades)	3	EA	$50,000.00	$150,000.00
Seed, mulch, etc	8	ACRE	$5,000.00	$40,000.00
Temporary Silt Fence	20,780	LF	$3.00	$62,340.00
Ditch Checks	208	EA	$225.00	$46,755.00
Sediment Removal	416	CY	$40.00	$16,624.00
Pedestrian Bridge (12' wide)	0	SF	$300.00	$0.00
Decorative Pedestrian Guardrail	0	LF	$120.00	$0.00
Contractor Construction Staking (1%)	1	LSUM	$35,309.90	$35,309.90
Site Furnishings (1.5%)	1	LSUM	$52,964.85	$52,964.85
Removal of Improvements (3%)	1	LSUM	$105,929.71	$105,929.71
Temporary Traffic Control (3%)	1	LSUM	$105,929.71	$105,929.71
Drainage Improvements (5%)	1	LSUM	$176,549.51	$176,549.51
Landscaping (5%)	1	LSUM	$176,549.51	$176,549.51
Utility Relocations (5%)	1	LSUM	$176,549.51	$176,549.51
Mobilization (10%)	1	LSUM	$353,099.02	$353,099.02
Subtotal				**$4,713,872**
Contingency 25%				$1,178,468
Total				**$5,892,340**
Engineering & Surveying Costs 15%				$883,851
Construction Administration & Inspection Costs 10%				$589,234
Easement & Right-of-Way Costs 5%				$294,617
Grand Total				**$7,660,042**
Costs Based on 2018 prices. Should include Inflation for each year beyond 2018				

Table 11: X Center to Finley River Greenway Connector Trail Opinion of Probable Cost, 10ft Paved Path with 12ft Bridges

ITEM	QTY.	UNIT	UNIT COST	COST($)
Clearing & Grubbing	4	AC	$7,500.00	$30,000.00
Linear Grading Class 1	185	STA	$3,000.00	$555,000.00
Compacting Subgrade	21,449	SY	$2.00	$42,898.00
4" Aggregate Base	21,449	SY	$9.00	$193,041.00
6" Concrete Pavement	20,479	SY	$85.00	$1,740,715.00
7" Non-reinforced Concrete (Road Base Pvmt)	150	SY	$85.00	$12,750.00
Bituminous Pavement Mix PG64-22 BP-1 (2")	17	TON	$95.00	$1,583.33
Tack Coat (0.10 GAL/SY)	150	GAL	$5.00	$750.00
Driveway Repairs & Reconstruction	520	SY	$90.00	$46,800.00
Curb Ramps	300	SY	$135.00	$40,500.00
Truncated Domes	240	SF	$30.00	$7,200.00
Concrete Curb	240	LF	$35.00	$8,400.00
Wayfinding Signage (1 per 0.25 MI of Trail)	14	EA	$1,000.00	$14,000.00
Rock Lining (100 CY per bridge abutment)	400	CY	$85.00	$34,000.00
24" White Stop Bars	70	LF	$15.00	$1,050.00
24" White Yield Markings	12	EA	$50.00	$600.00
30" White High Visibility Markings	360	LF	$20.00	$7,200.00
Trail Signage & Posts (2 signs per 500')	74	EA	$350.00	$25,900.00
Roadway Signage & Posts (4 signs per Crossing)	24	EA	$350.00	$8,400.00
RRFB	2	EA	$10,000.00	$20,000.00
Signal Modification (Pedestrian-Cyclist Upgrades)	1	EA	$50,000.00	$50,000.00
Seed, mulch, etc	7	ACRE	$5,000.00	$35,000.00
Temporary Silt Fence	18,431	LF	$3.00	$55,293.00
Ditch Checks	184	EA	$225.00	$41,469.75
Sediment Removal	369	CY	$40.00	$14,744.80
Pedestrian Bridge (12' wide)	2,520	SF	$300.00	$756,000.00
Decorative Pedestrian Guardrail	200	LF	$120.00	$24,000.00
Contractor Construction Staking (1%)	1	LSUM	$37,672.95	$37,672.95
Site Furnishings (1.5%)	1	LSUM	$56,509.42	$56,509.42
Removal of Improvements (3%)	1	LSUM	$113,018.85	$113,018.85
Temporary Traffic Control (3%)	1	LSUM	$113,018.85	$113,018.85
Drainage Improvements (5%)	1	LSUM	$188,364.74	$188,364.74
Landscaping (5%)	1	LSUM	$188,364.74	$188,364.74
Utility Relocations (5%)	1	LSUM	$188,364.74	$188,364.74
Mobilization (10%)	1	LSUM	$376,729.49	$376,729.49
Subtotal				**$5,029,339**
Contingency 25%				$1,257,335
Total				**$6,286,673**
Engineering & Surveying Costs 15%				$943,001
Construction Administration & Inspection Costs 10%				$628,667
Easement & Right-of-Way Costs 5%				$314,334
Grand Total				**$8,172,675**
Costs Based on 2018 prices. Should include Inflation for each year beyond 2018				

Funding Sources

Funding bicycle and pedestrian infrastructure projects and supporting programs requires a diversified strategy and a creative approach. Local funding in particular will be critical to the implementation of the plan, whether used as local match for external funding sources or for projects and ongoing maintenance for locally-funded projects. The City of Nixa should determine an annual budget commitment to the implementation of bicycle, pedestrian and trail projects based on the needs identified in this plan. When possible, this budget line item should be leveraged as local match for external funding in order to maximize the City's return on investment. In addition, the City of Nixa must be flexible and spontaneous enough to capitalize on partnerships, in-kind matches, and other non-traditional funding opportunities when possible. The following section of this chapter provides an overview of funding sources that can be utilized to build the Nixa trail network.

Local Funding Sources

Because external funding sources for bicycle and pedestrian projects and programs continue to be in short supply and high demand, local funds are often the most reliable funding source for infrastructure projects and encouragement and education programs. In addition, local funding is often required as match for external funding sources. With this in mind, it is imperative that the City of Nixa explore, identify, and pursue one or more of these local funding strategies as a means of implementing the plan.

Capital Improvement Plan Set-Aside

As with most communities, the City of Nixa has limited funds with which to implement active transportation projects and programs. By creating a dedicated set-aside in the Capital Improvement Program, the City can prioritize and plan for capital expenditures for trails, on-street bikeways, sidewalks, and other projects that improve conditions for walking and bicycling. This set-aside may also be used as a local match for external funding sources, or as contribution towards bicycle and pedestrian elements of larger projects.

LOCAL OPTION SALES TAX

A Local Option Sales Tax is a special-purpose tax implemented and levied at the city or county level. A local option sales tax is often used as a means of raising funds for specific local or area projects, such as improving area streets and roads, or refurbishing a community's downtown area. Special Improvement Districts are often created to define a sales tax area and administer the collection and expenditures of generated tax.

GENERAL OBLIGATION BOND

General obligation bonds offer local agencies the opportunity to acquire necessary finances for capital improvements and remit payment over time. These general obligation bonds are among the most common form of capital project financing and can cover everything from stormwater and sanitary sewers to streets, sidewalks, and trails. General obligation bonds require majority approval of a popular vote for passage.

DEVELOPMENT IMPACT FEES

The Nixa Municipal Code allows the City to exact development impact fees for new development that generates an impact on municipal infrastructure and services, as outlined in Chapter 109: Impact Fees and Capacity Fees. To the extent that future development generates an impact on the City's transportation, recreation, and other infrastructure, these developments can be required to pay a fee to defray all or a portion of the costs required to accommodate new developments at level-of-service standards. Parks, park facilities, park land acquisition, pedestrian access, planning and design of park facilities, and other related costs may be applicable uses of impact fees if so determined by an impact fee assessment.

Federal and State Funding Sources

The federal government has numerous programs and funding mechanisms to support bicycle and pedestrian projects, most of which are allocated by the US Department of Transportation to state, regional, and local entities. In many cases, state and regional entities administer these funds to local agencies through competitive grant programs.

Fixing America's Surface Transportation (FAST) Act

In 2015, the FAST Act was signed into law, authorizing $305 billion in transportation infrastructure planning and investment for a five-year period from 2016-2020. Multiple programs have been carried over from the previous transportation bill, Moving Ahead for Progress in the 21st Century, or MAP-21. Funding for FAST Act programs available to the City of Nixa is administered by the Ozarks Transportation Organization and allocated through a competitive application process. The following four FAST Act programs commonly used to fund bicycle and pedestrian projects are described in this section:

Surface Transportation Program

Transportation Alternatives Program

Highway Safety Improvement Program

Section 402 Highway Safety Grant Program

SURFACE TRANSPORTATION PROGRAM (STP)

The STP provides funding that may be used by States and localities for projects to preserve and improve the conditions on any Federal-aid highway, bridge and tunnel projects, public road projects, pedestrian and bicycle infrastructure, and transit capital projects. Bicycle and pedestrian infrastructure projects include ADA sidewalk modification, recreational trails, bicycle transportation, on- and off-road trail facilities for non-motorized transportation, and infrastructure projects and systems that will provide safe routes for non-drivers, including children, older adults and individuals with disabilities to access daily needs.

TRANSPORTATION ALTERNATIVES PROGRAM (TAP)

The Transportation Alternatives Program (TAP) was authorized by the Moving Ahead for Progress in the 21st Century Act (MAP-21) in 2012 and has been continued by the Fixing America's Surface Transportation (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 pre-MAP-21 programs, including the Transportation Enhancement Program, the Safe Routes to School Program, and the National Scenic Byways Program.

HIGHWAY SAFETY IMPROVEMENT PROGRAM (HSIP)

The Highway Safety Improvement Program (HSIP) is intended to achieve significant reduction in traffic fatalities and serious injuries on all public roads by funding projects, strategies and activities consistent with a state's Strategic Highway Safety Plan (SHSP).

Section 402 State and Community Highway Safety Grant Program

Section 402 funds can be used to develop education, enforcement and research programs designed to reduce traffic crashes, deaths, severity of crashes, and property damage. Eligible program areas include reducing impaired driving, reducing speeding, encouraging the use of occupant protection, improving motorcycle safety, and improving bicycle and pedestrian safety. Examples of bicycle and pedestrian safety programs funded by Section 402 are comprehensive school-based pedestrian and bike safety education programs, helmet distribution programs, pedestrian safety programs for older adults, and general community information and awareness programs.

BUILD Transportation Grants Program

The US Department of Transportation's Better Utilizing Investments to Leverage Development (BUILD) Discretionary Grants Program replaces the TIGER Discretionary Grants Program and retains the same purpose of funding road, rail, transit and port projects that achieve critical national objectives, including livability, economic competitiveness, environmental sustainability, and safety. Forty projects were awarded funding in FY2016 for a combined total of nearly $500M, and fifteen of the forty projects directly benefit bicycling through the provision of dedicated and often protected bicycle facilities. Examples include a $21M in complete streets projects in Mobile, Alabama, $22M in bridge reconstruction and rehabilitation in Des Moines, Iowa, and $40M in roadway reconstruction and multi-modal improvements in Flint, Michigan that will occur in tandem with water transmission line replacement. Given the scale of most successful BUILD projects, this grant is only likely to fund recommendations in the Master Bicycle and Pedestrian Plan if they are combined with other projects as part of a larger area-wide initiative.

https://www.transportation.gov/BUILDgrants

Recreational Trails Program (RTP)

The Missouri Department of Natural Resources (MODNR) maintains and awards federal funding through the Federal Recreational Trails Program (RTP). The program was originally established as part of the Inter-modal Surface Transportation Efficiency Act (ISTEA) in 1991 and has been incorporated into all subsequent transportation bills, even if under different titles. Trail projects can include hiking and walking, bicycling, cross-country skiing, snowmobiling, horseback riding, canoeing, and off-highway vehicles. Missouri receives between $1 and $1.5 million annually for the RTP program and caps trail project awards at $250,000.

https://mostateparks.com/page/61220/recreational-trails-program-rtp-grants

Land and Water Conservation Fund (LWCF)

The goal of the Land and Water Conservation Fund is the creation and maintenance of high quality recreation resources through the acquisition and development of public outdoor recreation areas and facilities. The program, operated by MODNR, requires a 50 percent match from the project sponsor. After the funding is awarded and the project is completed, the local agency receives a reimbursement of 50 percent of the actual project costs. The maximum award for LWCF projects is $250,000.

https://mostateparks.com/page/61215/land-and-water-conservation-fund-lwcf-grants

Other Funding

People for Bikes Community Grants Program

People for Bikes, formerly known as Bikes Belong, is a national organization working to make bicycling better throughout the United States through programs and advocacy work. Eligible projects and activities include the following:

- Bike paths, lanes, trails, and bridges
- Mountain bike facilities
- Bike parks and pump tracks
- BMX facilities
- Bicycle parking, repair stations, and bike storage
- Ciclovias and open streets events
- Campaigns to increase investments in bike infrastructure

People for Bikes has funded hundreds of infrastructure projects and education and encouragement programs since it first launched in 1999, including five projects in the State of Missouri. In 2016, TrailSpring received a $5,000 grant to fund the Connection, a project to connect two greenways in Springfield that were separated by a freeway.

https://peopleforbikes.org/get-local/#state-MO

Community Foundations

Community and corporate foundations can play an important role in funding bicycle and pedestrian infrastructure and programs. With a growing evidence base highlighting the connection between the built environment and community health outcomes, health foundations throughout the country have joined environmental foundations to support infrastructure projects that increase opportunities for walking, bicycling and physical activity. Foundations like the Surdna Foundation, Robert Woods Johnson Foundation, the Conservation Fund and the Missouri Foundation for Health have provided funding for greenways, trails and related infrastructure projects, as well as education and outreach programming.

Volunteer Assistance

Support for plan implementation – facility development, maintenance and operations, programs, etc. – can and should come in all shapes and sizes. By soliciting volunteer assistance and partnering with local non-profits and community organizations, the City of Nixa can provide opportunities for area residents to play a role in making these cities better places to walk and bike. Adopt-A-Trail programs provide an opportunity for area residents, Boy and Girl Scout Troops, and other civic groups to support maintenance efforts on area trails. Group bike rides and walks can be a great opportunity to engage local historians, the Christian County Historical Society, or even faculty and students at the nearby universities. Local high school students at Nixa High School can assist municipal parks departments and partnering agencies in the delivery of education and encouragement programming.

Ongoing Maintenance and Operations

Facility maintenance is important to the overall quality and condition of the trail network and supports safe and comfortable travel. Different facility types require different maintenance activities, from trail sweeping and snow clearance to bike lane restriping and sign replacement. The City of Nixa should develop a maintenance schedule and program to delegate maintenance roles and responsibilities, create maintenance funding projections, and provide the budget for long-term sustainability of the system. Maintenance can be separated into two categories: routine maintenance and remedial maintenance.

Routine Maintenance

Routine maintenance refers to the regularly-scheduled and day-to-day activities to keep the greenways, trails, sidewalks, and on-street bikeways in a functional and orderly condition. These activities, which can be incorporated in normal routine maintenance by operations staff, include trash and debris removal, landscaping, weed and dust control, trail and street sweeping, snow removal, shoulder mowing, and tree and shrub trimming. Spot maintenance such as sealing cracks, spot replacement of small sections of sidewalk, filling potholes, and replacing damaged or worn signs also fall under this category.

Remedial Maintenance

Remedial maintenance refers to the correcting of significant facility defects and the repairing, replacing and restoring of major facility components. Remedial maintenance activities include periodic repairs like crack sealing or micro surfacing asphalt pavement; restriping of bike lanes; replacement of wayfinding and other signs; repainting, replacement of trail amenities and furnishings (benches, bike racks, lighting, etc.); and more substantial projects like hillside stabilization, bridge replacement, trail or street surface repaving; and trail repairs due to washout and flooding. Pavement markings and striping maintenance will depend on anticipated and actual product life cycle, which can range from one to ten years, depending on material type. Minor remedial maintenance for trails and greenways can be completed on a five to ten-year cycle, while larger projects should be budgeted on an as-needed or anticipated basis.

Maintenance Cost Estimates

Maintenance costs vary depending on the quality and durability of materials, expected life cycle, use and wear, climate, weather, and other external factors. Conservative planning-level maintenance cost estimates are provided below in Table 12 to assist in the development of maintenance budgets and resource allocation. These are conservative estimates based upon the best information available at the time of this plan. They should be used as a guide for allocation of resources and should be refined as the City of Nixa gains more experience with maintaining various types of trail and bicycle facilities.

Table 12: Planning-Level Maintenance Costs

Facility Type	Annualized Cost Per Mile	Typical Maintenance Tasks
Shared-Use Path	$10,000	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.
Separated/ Protected Bike Lanes	$4,000	Debris removal/sweeping, repainting stripes and stencils, sign replacement, replacing damaged barriers.
Bike Lane/ Advisory Bike Lane	$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.

Network Stewardship and Enhancement

An important element of on-going maintenance activities is stewardship, which refers to the long-term care and oversight of Nixa's trail network as a resource that adds value to the community and enhances the quality of life for citizens of the region. The trail and bicycle network will require active stewardship by those who operate the facilities (and those who benefit from it) to ensure this valuable recreation and transportation infrastructure can provide a high level of service and a quality user experience for Nixa residents and visitors. This will require coordination among all agencies involved in the care and maintenance of the trails, bikeways, sidewalks, and their surroundings; protection of these resources from external factors that may reduce their value and utility; and encouragement of community participation in the upkeep and enhancement of the network as a valuable community asset. Community participation through Adopt-A-Trail and Adopt-A-Street programs, annual trash cleanup events, and educational programming activities along trails and greenways can heighten community awareness of bicycling facilities as valuable community assets. The City of Nixa should explore partnership opportunities with local and regional agencies and organizations like Ozark Greenways to actively manage the trail system as a valued community asset.

Sample Regional Trail Prioritization

The prioritization of planned priority trail corridors is essential to rational and orderly growth of the local and regional trail systems. In order to integrate key regional trails recommended in this trail study into the regional planned priority trails, this prioritization process utilizes the data-driven, value-based scoring system outlined in the the OTO's Bicycle & Pedestrian Trail Investment Study's sample prioritization methodology. The scoring system reflects the needs and aspirations of the community as expressed through the public engagement process and includes additional factors critical to project phasing and network development, such as availability of public lands, maintenance resources and capacities, and planned infrastructure investments.

Data-Driven Corridor Scoring

The data-driven scoring process applies 20 criteria to all 21 priority trail corridors (including the three Nixa regional trail corridors proposed in this study) to capture the full value of each corridor based on eight important themes, which include safe connections, regional coordination/impact, connectivity, and project readiness. This process is objective in nature and is dependent on spatial analysis of GIS-based data to assign value to each corridor. The methodology for this data-driven, value-based scoring process is described below.

1. Safe Connections

1.1. GAP CLOSURE

This sample prioritization criterion reflects the ability of a corridor to address trail system gaps.

1.1: Gap Closure Scoring

- ○ Does not connect to any existing trail segments
- ◑ Connects to one existing trail segment, but does not link two existing/separate segments
- ● Connects to two or more separate trail segments and closes a gap in the regional trail system

1.2. NEED FOR CROSSING IMPROVEMENTS

This sample prioritization criterion is based on required number of at-grade intersection and mid-block crossings. Fewer at-grade crossings of roadways creates fewer conflict points between trail users and motor vehicles. Scores are calculated on a per-mile basis.

1.2: Need for Crossing Improvements Scoring

- ○ More than 1.5 crossings per mile
- ◑ Between 1 and 1.5 crossings per mile
- ● Less than 1 crossing per mile

2. Regional Coordination/Regional Impact

2.1. CONNECTING COMMUNITIES

This category highlights the importance of connecting local communities throughout the region and is calculated based on the number of municipalities and/or counties through which a trail corridor passes. This category is weighted more heavily than others, reflecting the importance of regional connectivity as communicated by area residents and stakeholders.

2.1: Connecting Communities Scoring

- ○ Trail is entirely within a single jurisdiction
- ◑ Trail is extends outside of a single municipality and into unincorporated county/counties
- ● Trail extends into two or more municipalities

2.2. POPULATION SERVED

Population density within 1/2-mile of the trail corridor provides a relative scoring system to measure the number of people that can benefit from nearby access to trails.

2.2: Population Served Scoring

- ○ Less than one person per acre
- ◑ Between one and three persons per acre
- ● More than three persons per acre

3. Connectivity

3.1. PROXIMITY TO PARKS

For people bicycling and walking, trails can serve as vital connectors to and between local and regional parks. This scoring category measures the acres of parks that intersect a 1/2-mile buffer around the trail corridor (not limited only to park land within the half-mile buffer) and groups them into three categories as shown below.

3.1: Proximity to Parks Scoring

- ○ Less than 5 acres per mile
- ◑ 5 to 100 acres per mile
- ● More than 100 acres per mile

3.2. PROXIMITY TO SCHOOLS

Trails can also provide needed access to schools for children and families. This category measures the number of K-12 schools, colleges, and universities within 1/2-mile of each trail corridor. The scores are calculated on a per-mile basis in order to account for the varying lengths of the corridors.

3.2: Proximity to Schools Scoring

- ○ Zero schools per mile
- ◑ Between zero and two schools per mile
- ● More than two schools per mile

3.3. CONNECTIVITY TO OTHER TRANSPORTATION MODES

Trails can serve as valuable transportation corridors to access nearby and regional destinations. On-street bike routes and transit can increase trail users' ability to bike and walk for transportation purposes. This trail prioritization category measures the number of intersecting bike and transit routes within 1/2-mile of each trail corridor, calculated on a per-mile basis.

3.3: Connectivity to Other Transportation Modes Scoring

- ○ Less than one on-street bike route or transit route per mile
- ◑ One to two routes per mile
- ● More than two routes per mile

4. Project Readiness

4.1. COST

Cost can be a major factor for the development of trail projects. This category rates each corridor based on estimated cost.

4.1: Corridor Cost Scoring

- ○ More than $1.5M
- ◑ $1.0M - $1.5M
- ● Less than $1.0M

4.2. AVAILABLE PUBLIC LANDS

The availability of public lands may lessen the need to acquire additional property or easements for future trail development. This scoring category measures the percentage of a corridor alignment located within public road right-of-way or publicly-owned land

4.2: Available Public Lands Scoring

- ○ Less than 20% of corridor within public road right-of-way or publicly-owned land
- ◑ Between 20% and 60% of corridor
- ● 60% or more

5. Scenic / Historic Value

5.1. PROXIMITY TO NATURAL RESOURCES

Through the public input process, community members expressed their desire for trail types that provided access to natural resources, in particular riparian (stream/river) corridors, which support biodiversity. This category uses proximity to streams and rivers to develop a natural resources score for each trail corridor.

5.1: Proximity to Natural Resources Scoring

- ○ No creeks, streams, or rivers within 1/2-mile of trail corridor
- ◑ Trail corridor intersects one to two creeks, streams, or rivers
- ● Trail corridor intersects more than two creeks, streams, or rivers, or parallels riparian corridor

5.2. ACCESS TO HISTORIC DISTRICTS AND SITES

This category measures the number of historic districts and sites within 1/2-mile of each trail corridor and calculates scores on a per-mile basis. If the entire corridor is an historic byway, road or trail, then it receives the highest possible score.

5.2: Access to Historic Districts and Sites Scoring

- ○ No historic districts and sites within 1/2-mile of trail corridor
- ◑ Less than one per mile
- ● More than one per mile, or if the corridor is on a historic byway, road or trail

6. Environmental Impacts

6.1. WETLANDS

While wetlands can provide a unique user experience, trail development can have lasting impacts on these sensitive natural resources. This category scores each trail corridor based on the number of acres of wetlands per mile within 50 feet of the corridor.

6.1: Wetlands Scoring

- ○ More than 1 acres of wetlands per mile
- ◑ 1/2 to 1 acres of wetlands per mile
- ● Less than 1/2 acres of wetlands per mile

6.2. 100-YEAR FLOODPLAIN

Similar to wetlands, floodplains serve a vital environmental function. Trail development through floodplains requires extra documentation and permitting to ensure the floodplain's continued functionality as a buffer between riparian corridors and adjacent land and buildings.

6.2: Floodplains Scoring

- ○ More than 50% of trail corridor within 100-year floodplain
- ◑ Less than 50% of trail corridor within 100-year floodplain
- ● 0% of trail corridor within 100-year floodplain

7. Community Value

7.1. TRAIL ACCESS

Trailheads and access points increase the permeability of trails and provide multiple locations for adjacent residents, ,nearby employees, and area visitors to get on and off the trail. This category measures the number of existing and future trailheads, potential trail access points, and parking facilities, calculated on a per-mile basis.

7.1: Trail Access Scoring

- ○ Less than one trailhead or access point per mile
- ◑ One to two trailheads or trail access points per mile
- ● More than two trailheads or trail access points per mile

7.2. PUBLIC SUPPORT

This prioritization criterion scores each corridor based on feedback from community residents during the course of the study by measuring the number of comments in support of each trail corridor received through online mapping and comment forms, and at open house meetings.

3.1: Public Support Scoring

- ○ No public support
- ◑ Some public support (1-3 supportive comments)
- ● Most public support (4 or more supportive comments)

8. Economic Impact Potential

8.1. EMPLOYMENT CENTERS

Connecting trails to employment centers can create opportunities for walking and bicycling to work, as well as provide adjacent businesses and employees with healthy, accessible recreation options. This prioritization criterion measures the number of employees within 1/2-mile of each trail corridor, calculated on a per-mile basis.

8.1: Employment Centers Scoring

- ○ Less than 300 employees per mile of trail corridor
- ◑ 300 to 1500 employees per mile of trail corridor
- ● More than 1500 employees per mile of trail corridor

8.2. PROXIMITY TO COMMERCIAL DISTRICTS

By connecting trails to commercial districts, people can choose to walk and bike to local businesses. For many commercial areas, trail development can serve as an economic booster by providing a valuable amenity that attracts people to the area. This prioritization criterion measures the number of commercial districts within 1/2-mile of each trail corridor, calculated on a per-mile basis.

8.1: Proximity to Commercial Districts Scoring

- ○ No business districts within 1/2-mile of trail corridor
- ◑ Less than one business district per two miles of trail corridor
- ● More than one business district per two miles of trail corridor

Sample Scoring Results

Table 13 incorporates the three Nixa regional trails into the results of the scoring process completed in October, 2017. The Nixa regional trails are highlighted in yellow.

This sample prioritization is indicative of a process that might be used as a starting process in scoring project proposals.

Based on the scoring results, none of the three Nixa regional trail projects rank among the top ten planned priority trail projects, which were targeted in the OTO Bicycle & Pedestrian Trail Investment Study for development within the next five years. Regardless, these projects still offer tremendous value to the City of Nixa, its residents, its businesses, and its visitors. As such, the City of Nixa should explore and pursue opportunities to develop these regional trails as signature projects that will build the foundation for a local trail network and establish connections to the regional trail system.

Table 13: Sample Data-Driven Scoring Results with Potential Nixa-Area Regional Priority Trails

Trail Corridor	Total Score	Ranking	Safe Connections		Regional Coordination / Impact		Connectivity			Project Readiness		Scenic/ Historic Value		Environ-mental Impacts		Equity & Community Value		Economic Impact Potential	
			1.1	1.2	2.1	2.2	3.1	3.2	3.3	4.1	4.2	5.1	5.2	6.1	6.2	7.1	7.2	8.1	8.2
Maximum Possible Score	**37**	**N/A**	**2**	**2**	**5**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**
Trail of Tears	**27**	**1**	2	0	5	2	1	2	1	2	1	0	2	2	1	2	1	1	2
North Jordan	**24**	**2**	1	1	0	1	1	1	2	1	2	2	2	2	1	2	1	2	2
Ward Branch	**24**	**2**	1	2	3	1	2	1	1	0	1	2	0	2	1	2	1	2	2
Fassnight	**23**	**3**	2	0	0	2	1	2	2	2	1	2	0	1	1	2	1	2	2
Chadwick North	**22**	**4**	2	0	0	2	1	1	2	0	0	1	2	2	1	2	2	2	2
Chadwick South	**22**	**4**	1	2	5	0	0	1	0	1	1	1	1	2	1	1	2	1	2
Fort Scott	**22**	**4**	1	0	3	1	1	1	2	0	1	0	2	2	1	2	1	2	2
Lower Jordan	**22**	**4**	2	0	0	2	1	2	2	0	2	2	2	0	0	2	1	2	2
Wilson's Creek-Battlefield	**21**	**5**	1	1	5	0	2	1	0	0	2	1	1	2	1	1	2	0	1
Route 66	**20**	**7**	0	1	5	0	0	1	0	1	2	0	2	2	1	1	2	1	1
South Jordan	**20**	**7**	1	0	0	1	1	1	1	0	2	1	2	2	1	2	1	2	2
Wilson's Creek	**20**	**6**	2	2	3	1	2	0	1	0	1	2	0	0	0	1	2	1	2
Republic-Battlefield	**19**	**8**	1	1	3	1	2	0	0	1	2	1	1	2	1	1	2	0	0
South Creek	**19**	**8**	2	2	3	1	0	0	2	1	0	2	0	2	0	2	2	0	0
Eoff Trail	**17**	**9**	0	1	3	1	1	1	0	0	1	1	0	2	1	1	1	1	2
Farmers Branch	**17**	**9**	0	1	5	0	0	0	0	2	1	2	0	2	1	1	0	0	2
I-44	**17**	**9**	1	1	3	0	0	0	0	1	2	0	0	2	2	1	2	1	1
Northeast Chadwick Flyer Connector	**15**	**10**	0	0	3	1	1	1	0	0	1	1	0	2	1	1	1	1	1
X Center to Finley River Connector	**13**	**11**	0	1	3	0	1	1	0	0	1	1	0	1	1	1	1	0	1
James River	**12**	**12**	0	2	3	0	1	0	0	1	1	2	0	0	0	0	1	0	1
West Wilson's Creek	**10**	**13**	1	1	0	0	2	0	0	0	1	2	0	1	0	1	1	0	0