



City of  
**MANSFIELD**  
On-Street Bicycle Plan

MAY 2014

Kimley»Horn

# Mansfield On Street Bike Plan

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May 2014

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# Chapter 1: Introduction

## Executive Summary

The 2014 City of Mansfield On-Street Bicycle Plan establishes a framework for developing a sustainable, multi-modal transportation system and making Mansfield a more bicycle-friendly community. A city's bicycle network is intended to provide transportation alternatives and recreational opportunities for all ages and rider skill levels. The installation of bicycle facilities is the most visible element of a city's multi-modal transportation program. It shows that the community is a welcoming place for bicyclists and supports the safe use of streets by all road users. This document is a vision to lead the City in a direction of providing safer on-street bicycle facilities; however, this vision is anticipated to be modified over time in coordination with City staff and continuous input from the City Council and Mansfield Park Facilities Development Corporation (MPFDC). **In addition, this plan is not a funding document, but does provide a recommended implementation strategy that can be applied as funding is made available and to support growing interest and demand for on-street bicycling.**

The use of bicycles is a transportation choice that benefits personal health, reduces traffic congestion, and enhances quality of life. Interest in bicycling for commuting or recreation is increasing, but many novice riders do not feel comfortable riding on-street with traffic. Concerns about safety, barriers and lack of infrastructure often lead to the use of cars for many typical short trips. The implementation of increased bicycle and pedestrian facility choices not only addresses safety, but enhances long-term community livability, creates welcoming streets and neighborhoods, and strengthens local economic competitiveness.

The On-Street Bicycle Plan provides an understanding of what facility options are available to implement, an overview of how the recommended network was developed, and tools to implement the plan over time. **Chapter 1** discusses why more communities are now planning for bicyclists, explains the typical types of riders and trips that should be expected, and provides an overview of this plan's development process. **Chapter 2** provides a toolbox of the various bicycle facilities identified in the Bicycle Master Plan, including design considerations. **Chapter 3** outlines the Bicycle Master Plan, with recommendations for all appropriate existing and future roadways in the study area. **Chapter 4** provides an implementation strategy for selecting priority short-term projects and integrating long-term projects into future roadway projects.



*West 7th Street Bike Lanes, Fort Worth*

## Planning for Bicyclists

Bicycling is one of the oldest and simplest forms of transportation; however over past decades of transportation planning, it has often been overlooked as a viable alternative to the motor vehicle. However, increased interest in improving mobility choices at the national, state and local levels has led to policies and street design for the accommodation of bicyclists.

Since the early 1990s, the U.S. Department of Transportation (USDOT) has continued to address issues related to bicycling with goals originally outlined in the 1994 *National Bicycling and Walking Study*. With this study and subsequent updates, the USDOT has led an initiative to increase the proportion of trips made by bicycling and to increase safety for all non-motorized transportation options. Given that improving conditions for bicyclists often involves retrofitting city streets and expanding connectivity from neighborhoods to parks, trails and other destinations, the development of a bicycle network typically starts at the local level. With growing attention and funding being directed towards bicycling, national trends show measurable progress toward increased alternative transportation trips. As of 2009, the Federal Highway Administration has seen that the reported number of bicycling trips has more than doubled since 1990.

On March 11, 2010 the United States Department of Transportation issued a federal policy for bicycle accommodations and put an emphasis on bicycle facilities. TxDOT issued a policy statement outlining that for construction projects that involve pavement widening, the project plans should accommodate bicyclists by widening the pavement to either provide a 14-foot wide curb lane for shared use or a 5-foot wide bicycle lane. This policy applies to state roadway and for federally funded projects. As a result to obtain federal money for a roadway facility, bicycle accommodations need to be considered.

## Benefits of Bicycling

Riding a bicycle is a transportation choice that benefits personal health and physical fitness, reduces traffic congestion, and enhances quality of life. The wide range of benefits has been recognized by many local communities and has led to increased desire for a safer environment for active transportation.

### *Physical Health*

With nearby access to Joe Pool Lake, rural roadways, and a developing regional trails network, the City of Mansfield attracts numerous recreational bicyclists. Bicycling for recreation or transportation can be a great way to improve one's overall health. Incorporating increased trips using active transportation supports a healthier lifestyle, and the additional physical activity may result in improved strength and stamina.



*Trail Cycling for Physical Fitness*

### *Quality of Life*

Bicycling can improve quality of life by increasing opportunities for social interaction within the community. An active bicycling population is often considered a measure of livability for a city. Providing enhanced bicycle facility design and transportation options allows residents to stay connected to their community. One recent example of bicycling bringing the community together in the City of Mansfield was the Bike Out Hunger event held on November 9, 2013. In addition, weekly rides begin at the Lifetime Fitness located on Debbie Lane, as well as among other riding groups. Integrating bicycle facilities into existing and future streets can also have a positive effect on attracting business and maintaining property values.

### Transportation Benefits

Streets that experience high daily vehicle volumes and operate at or above their intended capacity can lead to increased commute times, pollution and driver frustration. Designing streets to accommodate all relevant modes of transportation provides the option for people to shift some of their trips to bicycle. The 2009 National Household Travel Survey estimated that 39% of all trips are less than 3 miles, with 17% of trips being less than 1 mile, many of which are still taken using a motor vehicle. These trip distances are comfortable for most bicyclists, and making short bicycle trips more convenient could help reduce overall traffic congestion in the city. Designing a city's infrastructure to safely accommodate these short trips is an essential piece of the overall strategy to encourage more non-motorized travel.

### Types of Riders

A typical community contains a variety of bicyclists with different skill levels and trip purposes. The Mansfield On-Street Bicycle Plan considers all types of bicycle users and aims to provide a network that appeals to a range of experience and comfort levels. Previous ridership studies and bicycle plans have generally categorized riders into four groups: **Strong & Fearless, Enthused & Confident, Interested but Concerned, and No Way No How.** Highly experienced and confident riders may be comfortable riding on most types of streets and in a variety of traffic conditions. However, these types of riders tend to make up a small portion of a community. The average bicyclist tends to have more concerns about on-street safety and less experience with how to interact with traffic.

Improved roadway design, signage and education specifically for bicycles can increase confidence in less experienced riders and encourage greater overall

ridership. Additionally, there are those who do not feel comfortable or have no interest in riding a bicycle on-street, and will continue to make trips via motor vehicle. However, proper bicycle facility design also benefits this group by making travel safer and more predictable for all road users.



*Cities Typically Include a Variety of Bicycle Rider Skill Levels and Trip Types*

### Types of Trips

In addition to the various experience levels, this plan accounts for the different types of trips bicyclists in Mansfield might take, including trips for recreation, errands, socializing and commuting. Recreational trips are those that are taken for exercise, training or personal leisure. These trip distances tend to be longer than other types, and many occur on weekends or outside typical weekday work commute hours. Some riders prefer to make everyday personal trips, such as errands or social visits on bicycle. These trips tend to be shorter than recreational rides and may occur on a variety of street types that have bicycle-oriented destinations. Commuter trips involve cyclists who prefer to travel to school or their place of work on bicycle. These trips can be a variety of lengths and would typically occur during weekday morning and evening peak traffic periods.

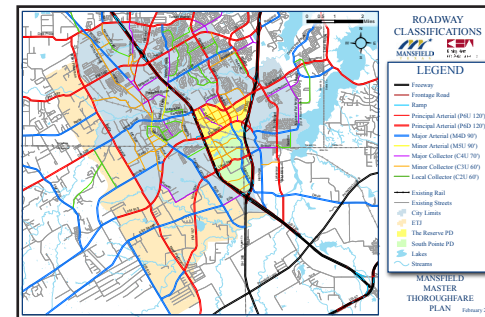
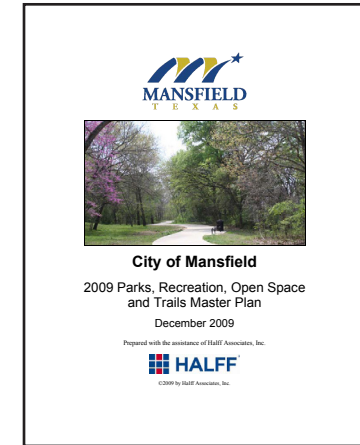
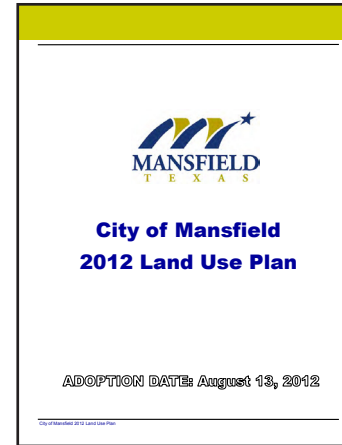
## The Planning Process

The Mansfield On-Street Bicycle Plan is the City's first design and implementation guide for the development of a city-wide on-street bicycle network and first step towards multi-modal thoroughfares. This document provides Mansfield the guidance in implementing bicycle facilities and developing streets that meet the needs of all road users. The recommendations presented in this plan are the result of a thorough planning process involving data analysis, public input and coordination with stakeholders and City of Mansfield staff.

### Previous Planning Efforts

This bicycle plan builds upon a variety of planning documents adopted in recent years that establish goals and policies for the development of Mansfield as the city continues to grow. These documents were reviewed to ensure that the transportation improvements outlined in this plan are consistent with the future vision of the City. The 2012 Land Use Plan provides an updated understanding of the issues facing the City and outlines the goals and strategies to guide decisions related to the City's future development, infrastructure, and community assets over the next ten years. Transportation goals established in this plan that support the need for bicycle infrastructure include:

- Encourage development of well constructed local roadways which promote circulation, interconnectivity, reduce congestion, and ensure the safety and general welfare of neighborhoods.
- Incorporate alternative forms of transportation into future plans and development policies.
- Design and promote links from neighborhoods to nearby activity centers such as parks, amenity centers and commercial areas.



*Previously Adopted Plans:  
2012 Land Use Plan,  
2009 Parks, Recreation, Open  
Space and Trails Master Plan,  
2010 Master Thoroughfare Plan*

The City's Master Thoroughfare Plan (MTP) establishes the future roadway network and was used as the framework for identifying potential major and minor multi-modal corridors. As this on-street bicycle plan is implemented, the MTP will need to be updated to complement this document.

This plan consulted the 2009 Parks, Recreation, Open Space and Trails Master Plan which developed a comprehensive network of recommended trails, sidewalks and bikeways to support recreation and active transportation throughout the City. The ultimate goal of the City's Trails Plan is to create



an “interconnected network that allows travel across all of Mansfield.” The City’s Trails Plan uses a combination of enhanced sidewalks and bike routes to establish on-street bikeways. The On-Street Bicycle Plan helps to fulfill this goal by guiding the City on ways to improve the design of streets to safely connect bicyclists between off-street bikeways, neighborhoods, parks and other key destinations – and provide further detail than the City’s Trails Plan.

## Data Collection

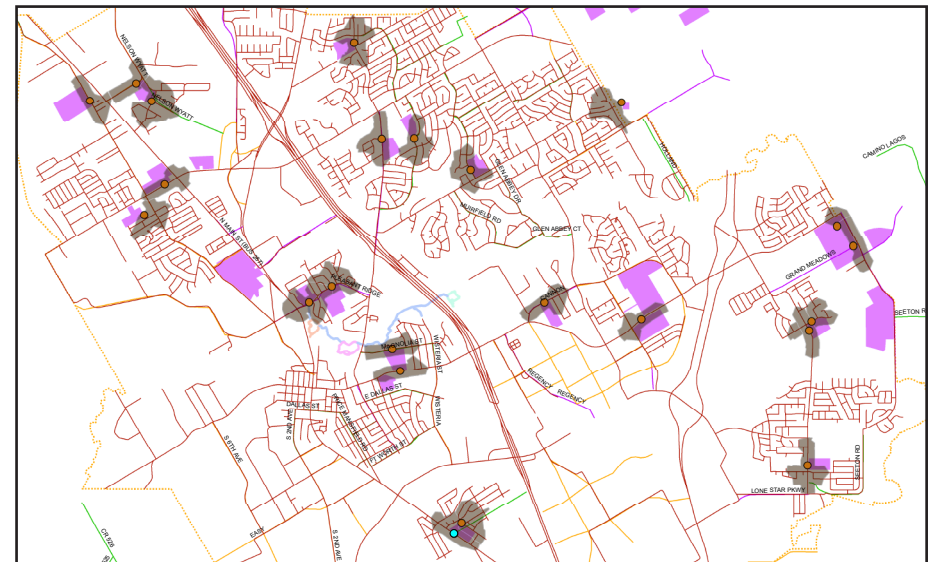
As part of this study, the planning team conducted a thorough evaluation of the existing roadways throughout the City. Data was compiled to analyze the appropriateness of all potential on-street bicycle routes. This data included:

- Existing pavement width
- Existing and proposed right-of-way
- Number and width of travel lanes
- Posted speed limits
- Traffic volumes
- Existing on-street parking conditions
- Existing trails
- Existing and proposed land use
- Locations of parks, schools and other public facilities
- Planned bicycle facilities in neighboring communities



*The Reserve and Soute Pointe Street Framework Plan*

This plan also reviewed the City’s various small area plans including the 2012 Downtown and Main Street study and the planned development regulations for The Reserve and South Pointe. These planned areas are designed to promote a pattern of development that mixes housing with employment, retail and other compatible uses with design standards that encourage a bicycle and pedestrian-friendly environment. Much of this area of the City is early in the development stages, and this plan provides guidance for designing appropriate bicycle facilities that reflect the livability envisioned for these future neighborhoods.



*Mansfield Schools and 1/4 Mile Travel Areas*

## Public Involvement

Citizen input was critical to understanding the concerns and needs of Mansfield's bicycling community. In order to provide a bicycle network plan that encourages cycling among a wide range of skill levels, it was important to engage a broad set of existing and potential bicyclists. This not only includes active and confident bicyclists, but also infrequent and inexperienced riders. The first round of public input began in October 2013 to gather information about existing and potential bicycle-oriented travel throughout the city, and builds upon the framework for on-street bicycle connections established in the 2009 Parks, Recreation, Open Space and Trails Master Plan. This included feedback activities to evaluate origins, destinations and safety issues. In coordination with City staff, a bicyclist focus group of experienced local bicycle riders was selected to guide the initial stage of public input. This group was essential in providing knowledge about the existing conditions for bicycling throughout the City. In addition, two city-wide public meetings were held to gather additional information from a broad range of road users.

### Public Involvement Schedule:

- Bicycle Rider Focus Group October 15, 2013
- City Council and MPFDC Work Session October 28, 2013
- Public Input Meeting #1 October 29, 2013
- City Council and MPFDC Work Session January 23, 2014
- Public Input Meeting #2 February 6, 2014

## Public Input Feedback Summary

From these public meetings, 30 surveys were completed that assessed rider skill level, trip type interest, existing barriers to cycling in the City, and preferred destinations. The results showed a strong interest in having an on-street network provide connections to trails and other recreational destinations, with moderate interest in bicycling for errands and personal trips. The top obstacles to cycling include not enough bike lanes/trails, lack of signage/education, and not feeling safe while riding in traffic. Full survey results are included in the **Appendix**.



*Public Input Meeting, October 29, 2013*

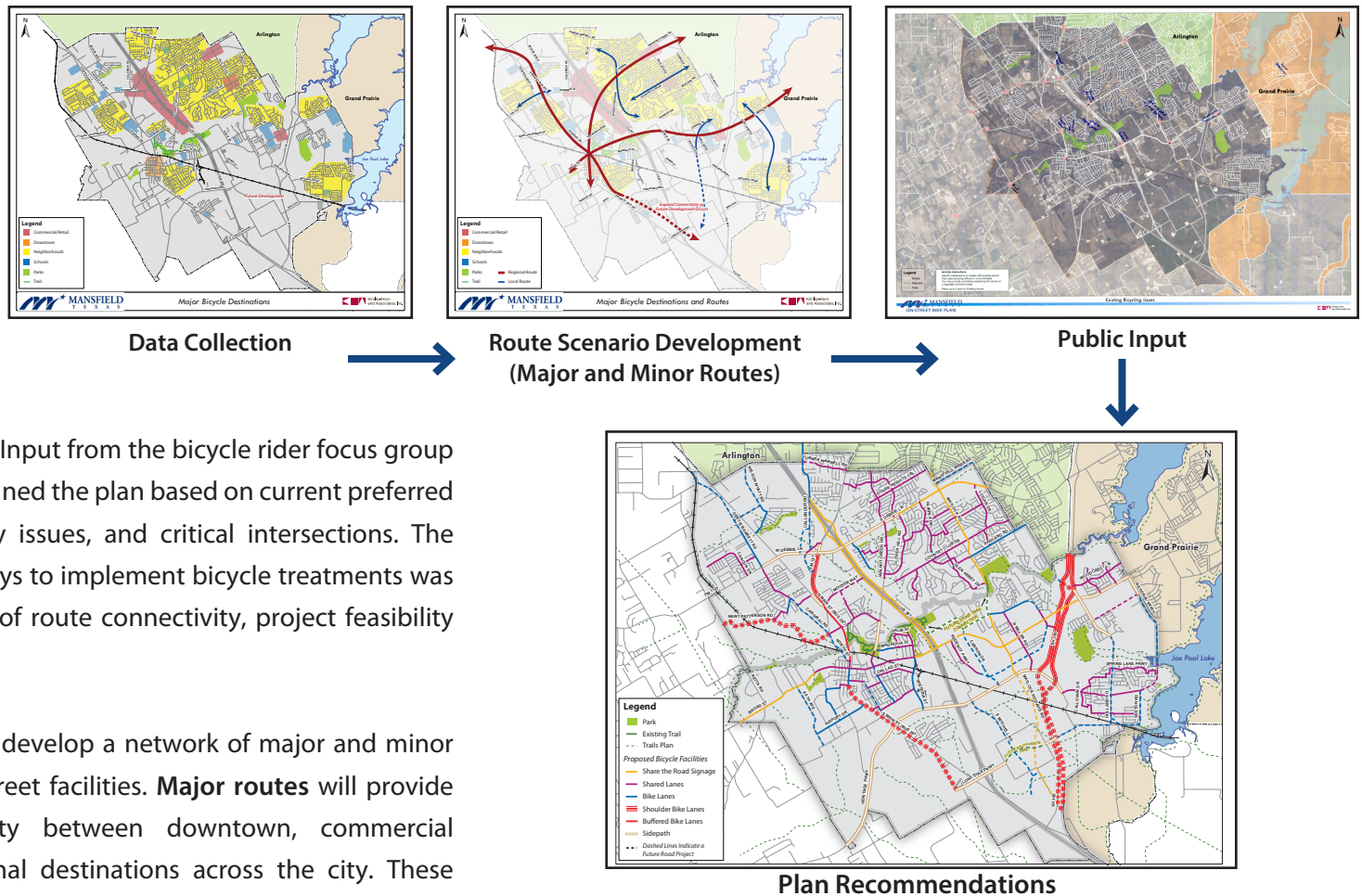


*Bicycle Rider Focus Group, October 15, 2013*

## Plan Development

The set of recommendations presented in this plan were selected based on a thorough assessment of the roadway conditions and bicycle transportation needs within Mansfield. Major trip origins and destinations were identified within the city and in adjacent communities, and all routes that could provide beneficial connections were studied. Input from the bicycle rider focus group and public input meetings further refined the plan based on current preferred destinations, difficult barriers, safety issues, and critical intersections. The most appropriate network of roadways to implement bicycle treatments was selected based on the combination of route connectivity, project feasibility and roadway safety factors.

The ultimate vision of the plan is to develop a network of major and minor routes that consists of on and off-street facilities. **Major routes** will provide long-distance, regional connectivity between downtown, commercial centers, and high-activity recreational destinations across the city. These facilities will typically carry the highest number of bicyclists and should have greater separation from traffic, particularly if located on high volume or high speed roadways. These routes will typically include bike lanes, sidepaths and connections to the planned off-street trail system. These separated facilities will benefit less skilled riders who prefer not to ride in mixed traffic. A system of bicycle safety signage on the City's major roadways, such as Broad Street and



Debbie Lane, will benefit the more confident bicycle riders. These roadways tend to attract recreational riders looking for faster, long-distance rides. **Minor routes** are shorter-distance routes within the city that will connect neighborhoods to schools, parks, local businesses, and other major routes. Depending on roadway conditions, these routes may consist of dedicated bike lanes or shared-use lanes.



## Chapter 2: Bicycle Facility Toolbox

The Bicycle Facility Toolbox is a supplemental chapter to guide the implementation of the Mansfield On-Street Bicycle Plan. The following pages introduce innovative bicycle facilities that are not currently included in the City of Mansfield Roadway Design Manual. This toolbox can be used by city staff during implementation of facilities identified in the Bicycle Master Plan and also to select appropriate facilities during future roadway design. Given the unique characteristics of each roadway, the most appropriate facility should be selected based on adjacent land use context, roadway characteristics, and existing or expected bicycle use demand. As the City of Mansfield continues to develop, city staff can use this toolbox to reevaluate its bikeway network and refine facility selection. The bikeway types and design guidance in this chapter are consistent with national design standards. The following design manuals should be referenced for additional guidance:

- American Association of State Highway and Transportation Officials (AASHTO) Guide for the Development of Bicycle Facilities (4th Edition, 2012)
- Federal Highway Administration (FHWA) 2009 Manual of Uniform Traffic Control Devices (MUTCD)
- National Association of City Transportation Officials (NACTO) Urban Bikeway Design Guide
- Institute of Transportation Engineers (ITE) Designing Walkable Urban Thoroughfares

The bicycle facilities covered in this toolbox include:

- Shared Lanes/Signed Routes
- Bike Lanes
- Shoulder Bike Lanes
- Buffered Bike Lanes
- Protected Bike Lanes/Cycle Tracks
- Shared-Use Sidepaths
- Intersection Treatments
- Roadway Lane Conversion (Road Diet)

A standard striping detail has been provided in the **Appendix**.



# SHARED LANES/SIGNED ROUTES

## Description

Bicycles may be operated on all roadways, except where prohibited. However, certain roads may be more desirable for use due to low traffic speeds and volumes and do not necessitate a separated bike facility. These roadways can be designated as shared lane bike routes with route signage and pavement markings to designate shared use of the travel lanes. However, shared lanes should not be used as a substitute for conventional bike lanes when space permits.

## Typical Use

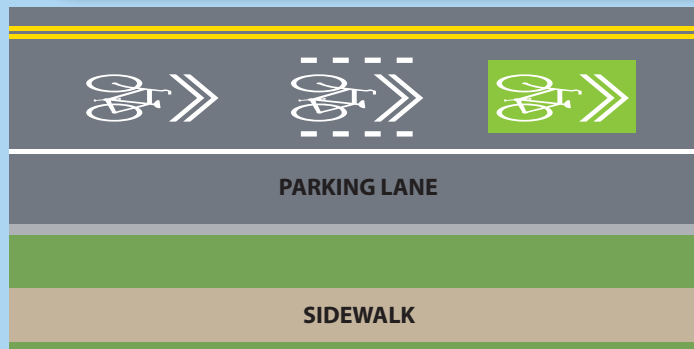
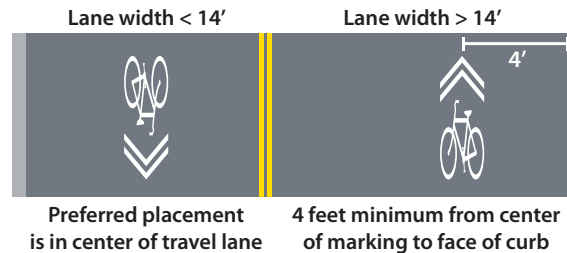
- On streets with low traffic volume ( $\leq 3,000$  ADT)
- On streets with low travel speeds ( $\leq 35$  mph)
- To fill a gap or transition between bike facilities

## Facility Benefits

- Bike route signage alerts motorists of the increased potential for bicycle activity and informs bicyclists that they are on a preferred roadway.
- Signage may include wayfinding information to indicate destinations and when to turn onto another street. This helps familiarize riders with the overall bicycle network.
- The "Bicycles May Use Full Lane" sign may be used for travel lanes too narrow for bicyclists and motorists to safely navigate side by side.
- Shared lane pavement markings (sharrows) may be used in combination with signage and guides bicyclists to the proper positioning within the travel lane.
- Shared lane pavement markings and signage require no additional street width.

## Design Guidelines

- Shared lane markings (sharrows) may only be used on roadways with posted travel speeds  $\leq 35$  mph.
- When used, shared lane markings should be placed immediately after an intersection and spaced no more than 250 feet apart.
- Shared lane markings may be marked in combination with dashed lines or green color to enhance visibility and encourage riding in the center of the travel lane.
- The preferred placement of markings is in the center of the travel lane to promote single-file positioning of vehicles and to minimize wear of the markings.



Sharrow Marking Options



Shared Lane Marking (Sharrow)



Shared Lane & Bike Route Signage



Signed Route with Wayfinding

# BIKE LANES

## Description

Bike lanes are one-way facilities that typically carry bicycle traffic in the same direction as adjacent motor vehicle traffic. Bike lanes are provided for the exclusive or preferential use of bicyclists on a roadway and are identified through signage, striping, or other pavement markings. These lanes allow bicyclists to ride at comfortable speeds and encourage a position within the roadway where they are more likely to be seen by motorists. Bike lanes are typically on the right side of the street, between the outside travel lane and curb, parking lane, or road edge. While the lane distinguishes predictable areas for bicyclist and automobile movement, bicyclists may leave the bike lane to pass other cyclists or avoid debris and conflicts with other street users.

## Typical Use

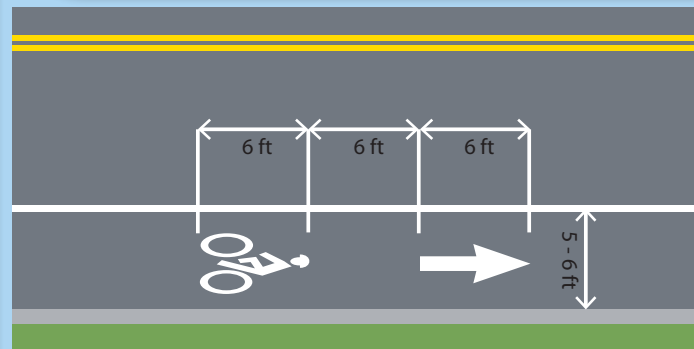
- On streets with moderate traffic volume (3,000-10,000 ADT)
- On streets with moderate travel speeds ( $\leq 40$  mph)
- Bicycle facilities with greater separation should be considered on higher speed and higher volume roadways.

## Facility Benefits

- Bike lanes create a designated space for bicycle travel and increases separation from automobiles.
- Positioning of bicyclists is more predictable than on roadways without bike lanes.
- Bicyclists are able to continue riding at a comfortable speed even as vehicular traffic slows in the adjacent travel lanes.

## Design Guidelines

- The recommended bike lane width of 6 feet to allow bicyclists room to avoid potential conflicts such as wide gutters or parked cars. However, a minimum bike lane width of 5 feet is acceptable.
- The maximum width should not exceed 7 feet so that lanes are not mistaken for automobile travel lanes or parking areas.
- A solid white edge line should be placed between the bike lane and travel lane.
- Standard bike lane symbols and arrows inform bicyclists and motorists of the restricted nature of the bike lane, and markings should be placed at periodic intervals to remind motorists of the presence of bicyclists.



Standard Bike Lane Marking



Bike Lane



Bike Lane Signage



3-Lane Roadway with Bike Lanes

# SHOULDER BIKE LANES

## Description

Maintaining paved shoulders on rural roadways without curbs and gutters may offer convenient connections to regional destinations, particularly for recreational cyclists. When shoulders are not constructed or maintained for bicycle use, the higher posted speeds and narrow shoulder widths on rural highways typically deter inexperienced riders. Some of the City's rural roads may eventually be reconstructed to include bike lanes, but if the road is not expected to be widened in the near future, the City can consider adding or improving paved shoulders to accommodate bicyclists.

## Typical Use

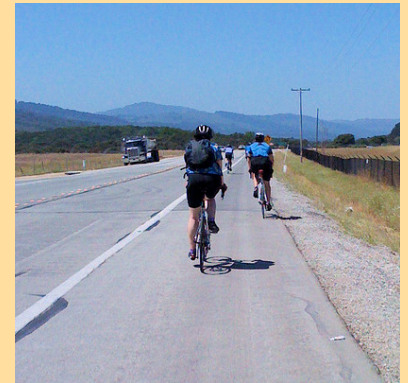
- On rural roadways with higher speeds or traffic volumes
- Improved maintenance and signage on state highway shoulders can improve rider comfort.

## Facility Benefits

- Wide shoulders provide a more comfortable bicycling experience than a wide outside lane without shoulders.
- Shoulders are useful facilities for long-distance recreational cycling.
- A paved shoulder extends the life of the travel lanes.

## Design Guidelines

- A paved shoulder should have a minimum of 4 feet for bicycle use, with a minimum 5 foot width when a guardrail, curb or barrier is present.
- Additional shoulder width (minimum of 8 feet) is recommended on roadways with high expected bicycle use or those with speeds above 50 mph.
- "Share the Road" signage may be used to increase motorist awareness but should not be used to indicate a bike route.
- A paved shoulder may be marked as a bike lane if it meets recommended bike lane criteria.
- Paved shoulders can be improved at intersection approaches by introducing bike lanes only at intersections to keep bicyclists to the left of right-turning vehicles.
- Raised pavement markers and rumble strips along the roadway edge can be difficult for bicyclists to maneuver around. Design of these features should provide a clear path for bicyclists to maneuver between the shoulder and adjacent travel lane.



*Wide Paved Shoulder*



*Narrow Paved Shoulder*



*"Share the Road" Sign Assembly*



# BUFFERED BIKE LANES

## Description

When sufficient roadway width is present, or if extra travel lanes are reduced, a buffer may be striped between a bike lane and travel lane to provide additional comfort for both bicyclists and motorists. This provides space for bicyclists to pass one another or ride side by side without encroaching into a motor vehicle travel lane. The buffer adds to the perception of safety and encourages greater use of the on-street bicycle network. It appeals to a wider set of bicycle users by providing added separation between motorists and bicyclists that may be traveling at substantially different speeds.

## Typical Use

- Appropriate for use anywhere a standard bicycle lane is being considered
- Beneficial on streets with higher travel speeds ( $\geq 40$  mph), higher travel volumes (10,000+ ADT), and higher truck traffic
- The inclusion of buffered bike lanes is best accomplished as part of retrofits of existing roadways with more travel lanes than needed.

## Facility Benefits

- Creates greater separation between bicyclists and motor vehicles
- Increases the perception of safety among bicyclists
- Encourages less-skilled riders to cycle on streets with higher travel speeds and higher travel volumes

## Design Guidelines

- Buffers should be delineated by two solid white lines and be at least 2 feet wide. If wider than 3 feet, chevron or diagonal hatching should also be marked.
- A 5 foot minimum bike lane is recommended.
- Bicycle markings and signage should be used the same as a conventional bike lane.



*Residential Buffered Bike Lane*



*Buffered Bike Lane*



*2-Lane Divided Roadway with Buffered Bike Lanes*

# PROTECTED BIKE LANES/CYCLE TRACKS

## Description

Protected bike lanes, commonly known as **cycle tracks**, are bicycle facilities that are physically separated from adjacent motor vehicle travel. Typical on-street cycle tracks are designed similar to bike lanes with one-way travel and may be designed with a variety of methods for physical protection. These on-street one-way cycle tracks are similar to a buffered bike lane but with the addition of a physical separation in the buffer area.

Raised cycle tracks are one-way facilities that are vertically separated from the roadway, located at or near sidewalk-level. Cycle tracks may also be designed as two-way facilities to allow bicycle movement in both directions along one side of a roadway.

## Typical Use

- Protected cycle tracks are recommended on major arterials with high travel speeds, high traffic volumes and multiple lanes. Conventional bike lanes without protection on these types of roadways can be stressful for less confident riders.
- Raised cycle tracks may be considered when adjacent parkway width is available and on-street pavement width is limited.
- Two-way cycle tracks may be considered when there is not enough room for one-way cycle tracks on both sides of the street or when extra right-of-way is available only on one side.

## Facility Benefits

- Cyclists tend to feel most secure on roads with cycle tracks.

## Description

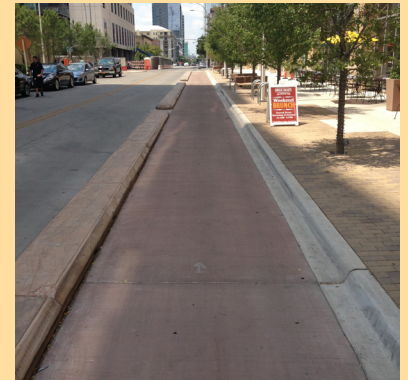
- Physical protection decreases bicyclists' fear of vehicles encroaching into the bike lane.
- Protected cycle tracks are more appealing to a wide range of skill levels and ages.

## Design Guidelines

- A one-way cycle track should be a minimum width of 5 feet, and 7 feet is preferred to allow bicyclists to pass each other.
- Cycle tracks may be protected with on-street parking, planters, flexible bollards, or raised curbs.
- If a cycle track is placed adjacent to on-street parking, a 3 foot buffer should be used to prevent door collisions.
- When raised cycle tracks cross driveways or minor intersections, pavement color and "Yield to Bikes" signage should be used to increase motorist awareness.
- Raised cycle tracks adjacent to a sidewalk should be differentiated with pavement markings, textured surfaces or landscaping to discourage pedestrian use of the cycle area.
- A two-way cycle track should be a preferred width of 12 feet, with a minimum width of 8 feet in constrained areas. A dashed yellow line should be used to separate the two directions of travel.
- Bicycle lane symbols and arrows should be placed appropriately on all types of cycle tracks.



*Protected Cycle Track with Bollards*  
CC Photo Credit: Gordon Werner (Flickr)



*Protected Cycle Track with Curb*



*Two-Way Raised Bikeway*

# SHARED-USE SIDEPATHS

## Description

Shared-use sidepaths function like most paved trails. They are physically separated from motorized vehicular traffic, either by a landscaped buffer or a barrier, but rather than having an independent alignment, they are designed to follow roadway corridors. These facilities are particularly useful when roadway width is limited and providing an on-street bike facility is not possible. These paths are designed for two-way travel, and in addition to bicyclists, path users may include inline skaters, skateboarders and pedestrians.

## Typical Use

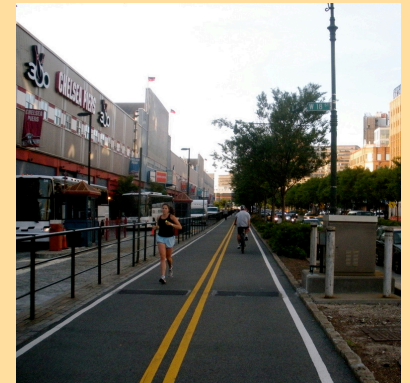
- Connecting on-street bikeways to the off-street trail network
- Continuing the on-street bike network in areas with constrained pavement width or other physical constraints
- Along higher-speed roadways with wide parkways and limited driveway and street crossings
- Providing a two-way bike route near schools or other areas that attract younger bicyclists

## Facility Benefits

- Sidepaths tend to attract a wider variety of bicycle rider skills and ages due to the increased separation from vehicle traffic.
- Sidepaths can provide access to destinations along limited-access freeways where other bike facilities would be inappropriate.

## Design Guidelines

- Sidepaths should avoid being built along roadways with frequent street or driveway crossings. At intersections, bicyclists will often be out of the line of sight of turning motorists.
- Appropriate signage and markings should be included at each driveway and street intersection to alert motorists of bicycle travel.
- Prohibiting right turns on red at sidepath crossings can reduce conflicts between drivers and bicyclists.
- Providing a leading pedestrian interval at crossings may be appropriate to accommodate higher levels of path use.
- Each end of a sidepath should directly connect to an on-street bike facility, another trail or path, or to a bicycle-compatible local street.
- The minimum paved width for a shared-use path is 10 feet. In constrained areas or when low bicycle traffic is expected, a reduced width of 8 feet may be used.
- The minimum recommended distance between a sidepath and adjacent roadway edge is 5 feet. A barrier should be provided where the separation is less than 5 feet.



*Urban Shared-Use Sidepath*



*Shared-Use Sidepath along Highway Frontage Road*



*Neighborhood Shared-Use Sidepath*

# INTERSECTION TREATMENTS

## Description

The configuration of bicycle facilities at intersections should be given extra consideration given the variety of turning movements and potential conflicts with motor vehicles. When bicycle intersection treatments are implemented appropriately, both motorists and bicyclists should be able to clearly understand how to navigate through facility transitions and intersection turning movements. Intersection improvements may include elements such as pavement markings, pavement color, medians and signage.

## Typical Use

- All bicycle facilities should be designed appropriately at intersections and driveways.
- Bicycle facilities should avoid being abruptly ended prior to an intersection.
- Intersection treatments should be routinely maintained since the visibility of markings and signage enhances their effectiveness and rider safety.

## Facility Benefits

- Designing bicycle treatments at intersections allows travel to be direct and logical for both bicycles and motorists.
- Appropriate intersection design increases visibility of bicyclists, helps all road users anticipate travel movements and informs when travel is mixed or separated.
- Treatments are recommended for transitioning from one bicycle facility type to another.

## Design Guidelines

### Intersection Crossing Markings

- Markings may be used to help guide bicyclists on a safe path through intersections and across driveways.
- Both shared lanes and bicycle lanes may be marked through an intersection with dotted lines. Crossing markings should match the width of the bike lane.
- Directional chevrons, bike symbols or colored pavement may be included with the dotted lines to increase visibility.

### Bike Boxes

- Bike boxes may be used at signalized intersections to designate an area for bicyclists to wait ahead of traffic during red signal phases. Bike boxes are typically 10 to 16 feet deep, and stop lines should be used to indicate where motor vehicles should stop during a red signal.
- A “No Turn on Red” sign should be used with bike boxes to prevent vehicles from entering the bike box area. Optionally, a “Stop Here on Red” sign may be used for reinforcement.
- Bike boxes may be appropriate at intersections of major roadways where a separate right-turn lane is not present. Positioning bicycles ahead of traffic can reduce “right-hook” conflicts of turning vehicles.
- Bike boxes that extend the width of the intersection allow bicyclists to position themselves for left turns ahead of queuing traffic. A “two-stage turn queue box” may be used to turn left at multi-lane roadways.



*Intersection Crossing Markings*



*Bike Box at Signalized Intersection*



*Intersection Crossing Markings*

# INTERSECTION TREATMENTS

## Design Guidelines

### Two-Stage Turn Queue Box

- Turn queue boxes provide a space for bicyclists to make a left turn across an intersection with multiple lanes.
- The queue box should be placed in a protected area, typically between the bike lane and the pedestrian crossing. It may also be placed within the sidewalk space to allow turns at midblock locations.
- Colored pavement should be used in the queue box to increase visibility of the space.

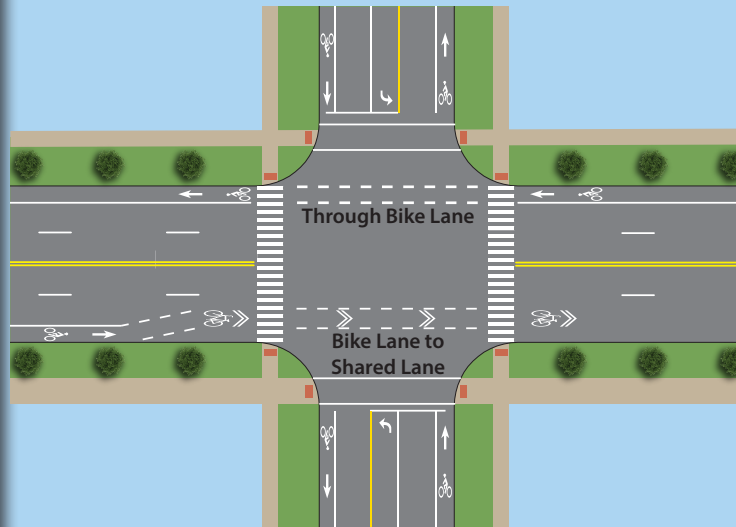
### Bike Lanes at Intersections

- When an intersection approach has a right-turn only lane, a **through bike lane** should be provided to allow bicyclists to position themselves to the left of the right turn lane.
- A dotted bike lane transition area should be striped at least 50 feet before an intersection, and 100 feet before on higher speed roadways. This indicates where motor vehicles should merge into the turn lane and alerts motorists to yield to bicyclists.
- Right-turn only lanes should be as short as possible to prevent high speed traffic on both sides of the through bike lane.
- When an intersection cannot accommodate a through bike lane, bicycle travel may transition to a shared right-turn only lane. Signage and pavement markings should indicate the shared lane and that bicyclists may continue straight at the intersection.

## Design Guidelines

### Median Refuge Island

- Median refuge islands allow bicyclists to cross a two-way street one direction at a time.
- The desirable width of a median refuge is 10 feet or greater, with an area large enough to accommodate two-way bicycle travel.
- This treatment is recommended where bikeways cross streets with higher volumes and higher speeds, particularly at unsignalized intersections.
- Median refuge islands may be used to connect routes at an off-set intersection.



Intersection Crossing Treatments



Through Bike Lane at Intersection



Typical Bike Lane Intersection



Median Refuge Island

# ROADWAY LANE CONVERSION (ROAD DIET)\*

\*Not currently identified in the Master Plan as a priority, only as a street design alternative.

## Description

### Roadway Candidates for a Road Diet

Reconfiguring travel lanes is one of the methods cities can take to optimize street space to benefit all roadway users. The reconfiguration requires analysis of traffic conditions to determine that an alternative lane layout is appropriate. A typical conversion involves replacing a four-lane undivided roadway (4U) with two through lanes and a center two-way left-turn lane (3U). This usually provides the necessary pavement width to provide for on-street bicycle facilities without widening the road. While there can be the concern that a lane reduction will increase trip times, when volumes are low (12-15,000 trips per day or less), a 3-lane roadway can be safer, more efficient and have improved multi-modal mobility.

### Road Diet Candidate Factors

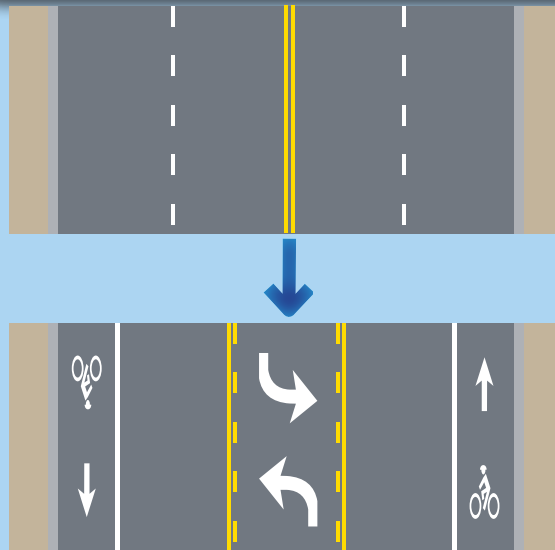
- Moderate traffic volumes (< 15,000 ADT) for a 4U → 3U
- Roads with multiple safety issues (vehicle, bicycle & ped)
- Popular or priority bicycle routes
- Commercial reinvestment areas
- Main/historic streets

### Benefits of Road Diets (from FHWA Proven Safety Measures)

- Improves safety and comfort for pedestrians by providing additional buffer from adjacent motor vehicle travel and requiring less crossing distance
- Provides room for a pedestrian refuge island
- Reduces rear-end and side-swipe conflicts by moving left-turning vehicles to a center turn lane
- Improves speed limit compliance
- Allows for on-street bicycle facilities

## Design Guidelines

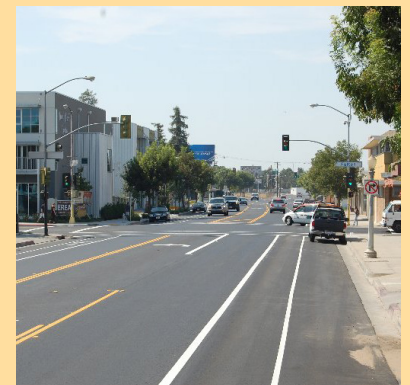
- All roadway lane conversions should be approved by Council prior to implementation
- Lane conversions and any adjustment to on-street parking should be considered on a case-by-case basis and involve community input.
- Bicycle facilities designed as part of a lane conversion should follow the standard design guidelines as outlined previously in this toolbox.
- Road diets make pedestrian crossings shorter and can be enhanced with curb extensions and mid-block pedestrian refuge islands.
- The demand for on-street parking should be considered during the design and implementation of a roadway reconfiguration.



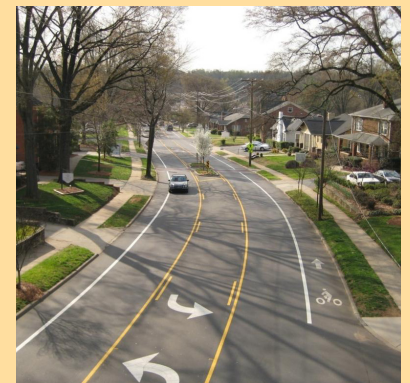
Typical 4U to 3U Conversion



Bishop Ave, Dallas, TX



Divisadero St, Fresno, CA  
Photo Credit: City of Fresno, CA



East Blvd, Charlotte, NC  
Photo Credit: City of Charlotte, NC

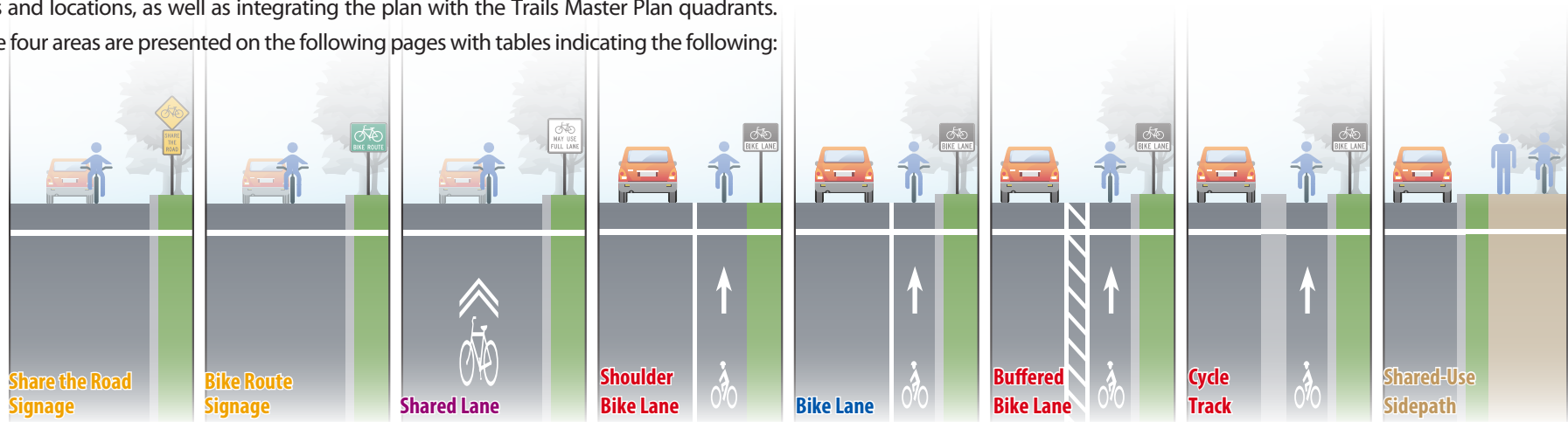
# Chapter 3: On-Street Bicycle Master Plan

## Vision of the Plan

The network of bicycle facilities presented in this plan were selected based on a thorough assessment of the roadway conditions and active transportation needs within the City of Mansfield. Major trip origins and destinations were identified throughout the city, feedback from existing bicycle riders was received, and all routes that could provide beneficial connections were studied. The most appropriate network of roadways to implement on-street bicycle treatments was selected based on the combination of route connectivity, project feasibility and roadway safety factors. The previously adopted Trails Master Plan was integrated with this plan's recommendations to create a single comprehensive bicycle route plan. Given that many riders prefer low-stress on-street routes and protected/off-street bikeways, it was important to identify safe and convenient routes between residential areas and higher-demand destinations.

Specific treatment recommendations for these bikeways and all other appropriate roadways are identified in the On-Street Bicycle Master Plan map. Bicycle projects that should be completed during future roadway construction are identified on the map with dashed lines. The city-wide study area has been divided into four quadrants for ease in identifying project types and locations, as well as integrating the plan with the Trails Master Plan quadrants. These four areas are presented on the following pages with tables indicating the following:

- **Facility Type** – Each table is divided into sections by facility type (bike lanes, shared lanes, etc.)
- **Project Location and Limits** – These columns identify the street and extent of each facility recommendation.
- **Master Thoroughfare Plan (MTP) Roadway Classification** – This column indicates the thoroughfare classification of each project. A set of cross section options organized by thoroughfare classification is provided in the **Appendix** for design guidance. The City should refer to the Bicycle Facility Toolbox for design guidance on local streets.
- **Extra Pavement Consideration** – Some bicycle facilities implemented during future roadway construction may require additional pavement width compared to current standard construction details. This pavement width has been identified in the table and is reflected in the thoroughfare cross section design options in the **Appendix**.



## Bicycle Master Plan Overview

### Quadrant 1 (Northwest Mansfield)

- This area is a developing mix of commercial and residential activity. Numerous schools are located in this area, along with the western entrance to the Walnut Creek Linear Park.
- Major route opportunities include north-south routes into downtown along Cardinal Rd and BUS 287, and a sidepath route along Debbie Ln.

### Quadrant 2 (Northeast Mansfield)

- This area contains a large number of neighborhoods with a mix of shops, restaurants and businesses, especially along US 287.
- Major route opportunities include east-west connections to recreational destinations east of the City. Country Club Drive is the only minor arterial in this area and has the long-term potential to be reconfigured as a bicycle and pedestrian-friendly connection between neighborhoods, future trails, and the golf course. Shared lane markings and signage will also be important to designate safe, slow-speed routes through residential areas.

### Quadrant 3 (Southwest Mansfield)

- This area includes Mansfield's historic downtown, older neighborhoods, and industrial sites.
- Major route opportunities include connections to and from downtown, which will support the City's recent economic development efforts. Shared lane markings and bicycle signage will also help educate road users of recreational activity along major roadways, including Broad Street and Main Street (BUS 287).

### Quadrant 4 (Southeast Mansfield)

- This area contains many of the newer developments in the City, and many bicycle facilities may be built during future roadway projects.
- Major route opportunities include a network of bicycle lanes through The Reserve and to Joe Pool Lake. Designating SH 360 with shoulder bike lanes will also support existing demand for recreational cycling routes.

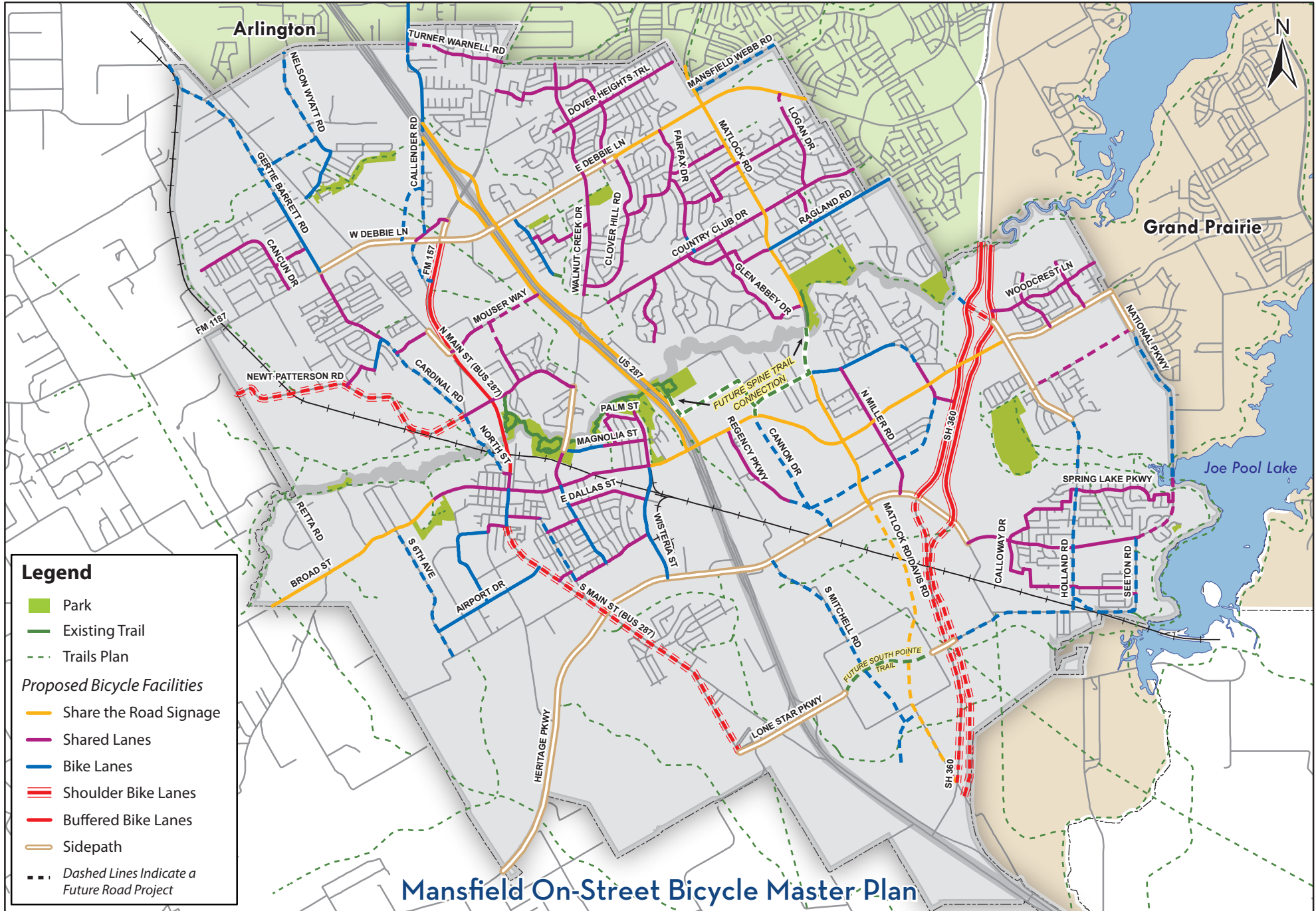


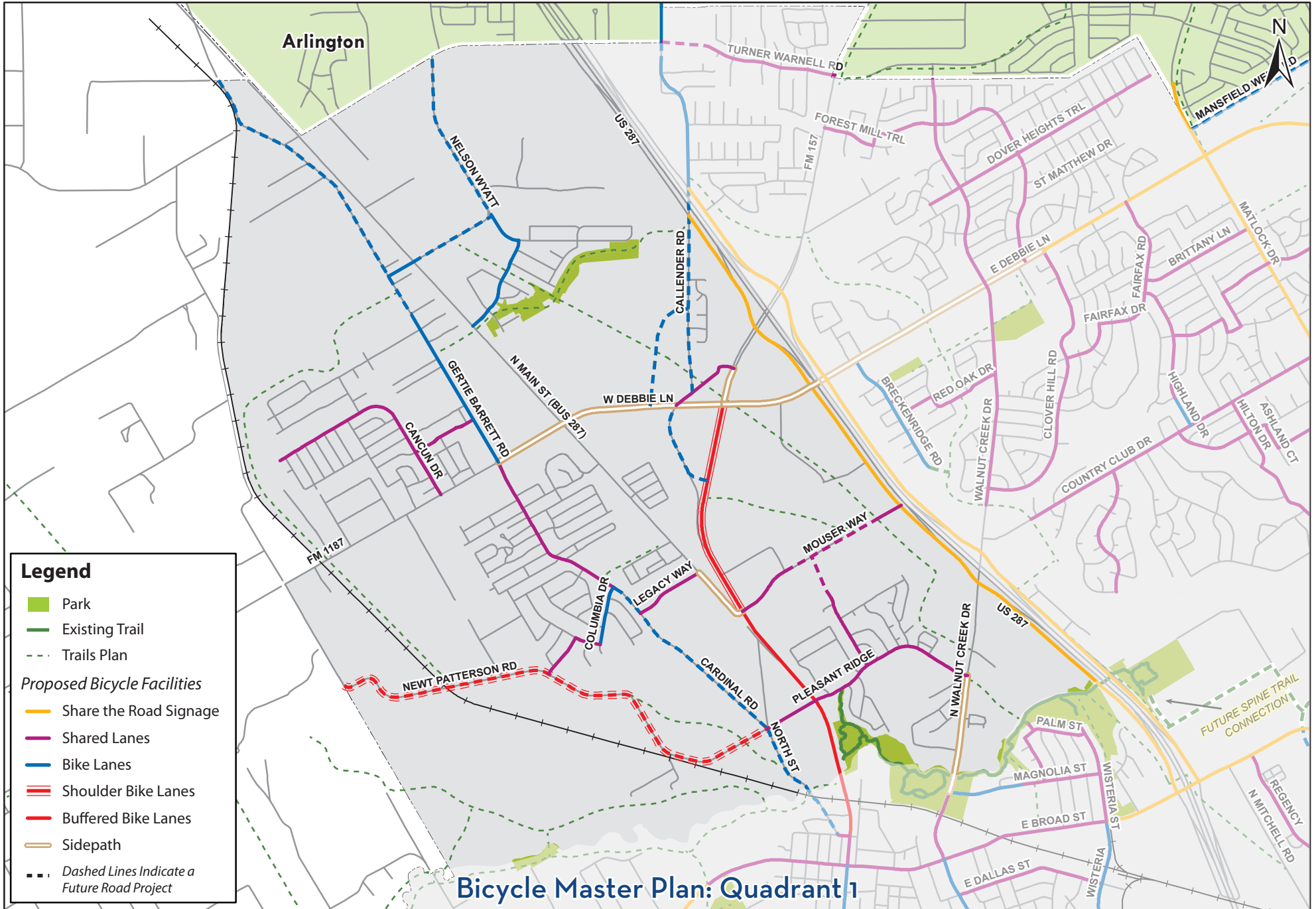
*Country Club Drive (Quadrant 2)*



*Main Street at Broad Street (Quadrant 3)*

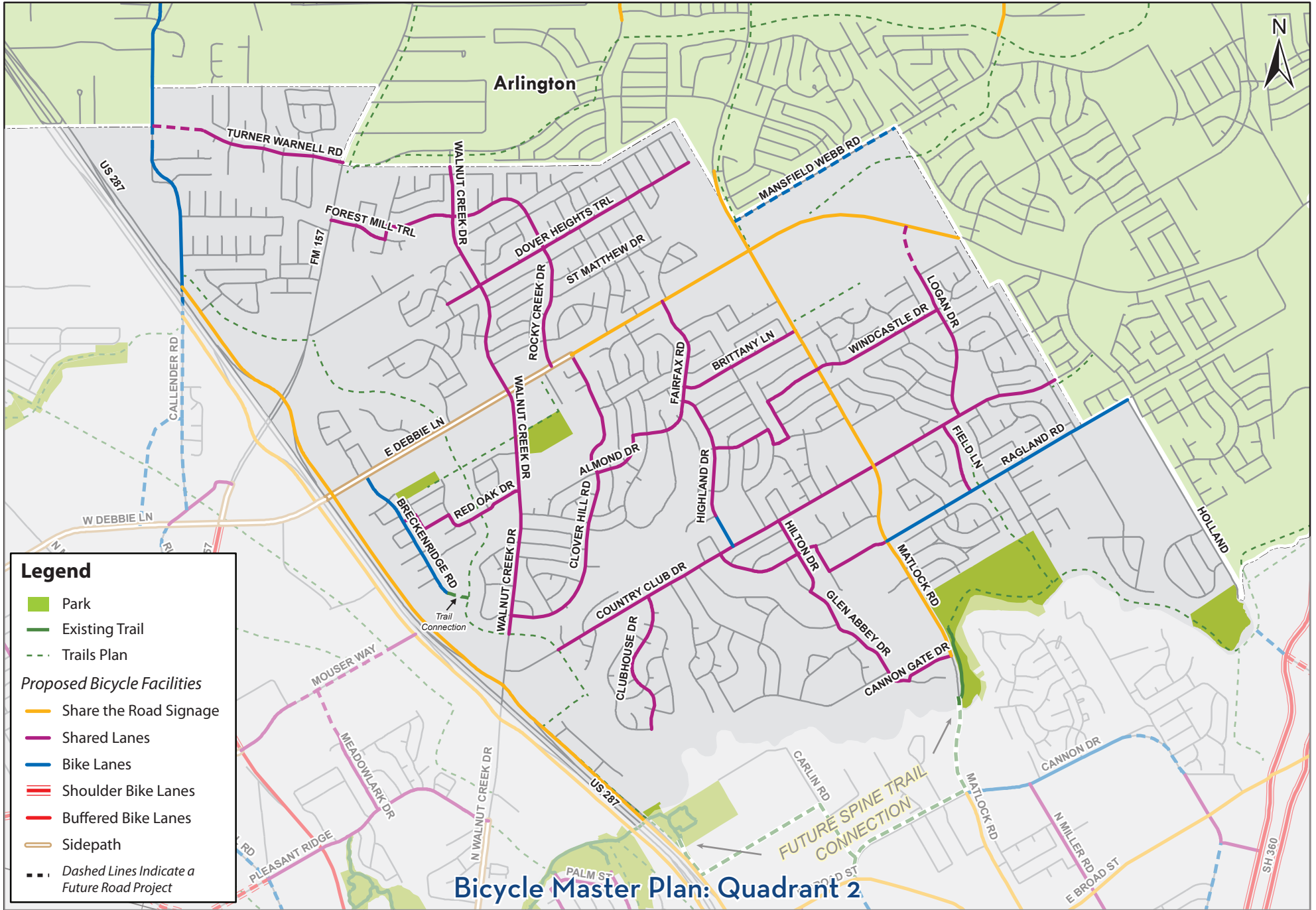






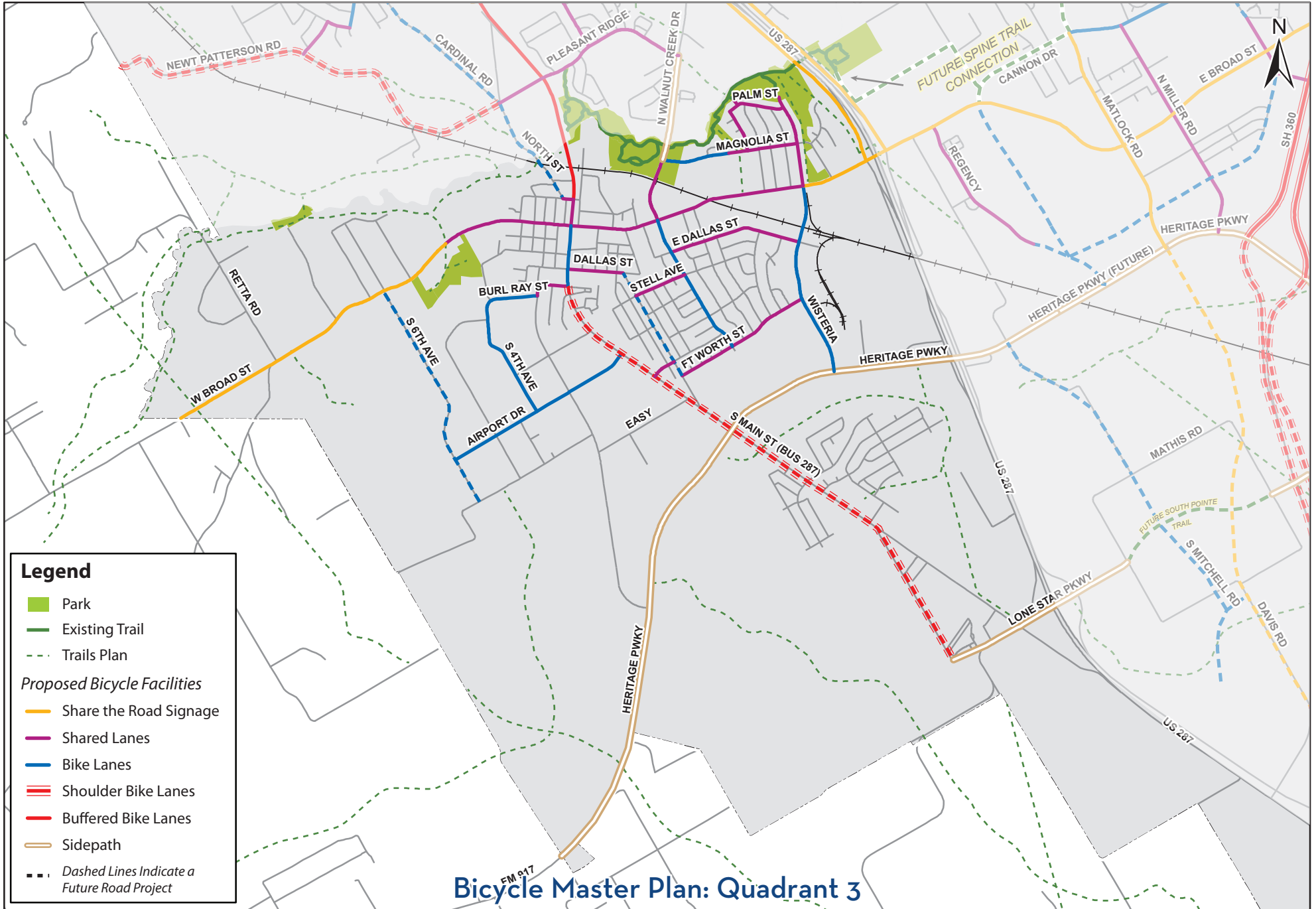
## Bicycle Master Plan: Quadrant 1

Project Location	Project Limits		MTP Roadway Classification	Extra Pavement Consideration (ft)
Street	From	To		
<b>Share the Road Signage</b>				
US 287 SB FRONTAGE ROAD	CALLENDER RD	BROAD ST		NO
<b>Shared Lanes</b>				
CARDINAL RD	FM 1187	COLUMBIA DR	Minor Collector	NO
MOUSER WAY	HOUSE RD	EXISTING MOUSER WAY	Major Collector	NO
PLEASANT RIDGE	NORTH ST	N WALNUT CREEK DR	Major Collector	NO
MOUSER WAY	FM 157	HOUSE RD	Major Collector	NO
MOUSER WAY	MOUSER WAY (FUTURE)	US 287 SBFR	Major Collector	NO
RUSSELL LN	W DEBBIE LN	FM 157	Minor Collector	NO
<b>Neighborhood Shared Lanes</b>				
MEADOWLARK DR	MOUSER WAY	MEADOWLARK DR		NO
BERTRAM DR	BARBADOS DR	GERTIE BARRETT RD		NO
CANCUN DR	ABACO DR	FM 1187		NO
HUDSON DR	SABINE TRL	COLUMBIA DR		NO
LEGACY WAY	CARDINAL RD	N MAIN ST	Minor Collector	NO
MEADOWLARK DR	FUTURE MEADOWLARK DR	PLEASANT RIDGE DR		NO
SABINE TRL	NEWT PATTERSON RD	HUDSON DR		NO
<b>Bike Lanes</b>				
CARDINAL RD	COLUMBIA DR	PLEASANT RIDGE DR	Minor Collector	NO
COLUMBIA DR	CARDINAL RD	HUDSON DR		NO
KILLIAN DR	NELSON WYATT RD	WOOD RIVER PKWY		NO
NELSON WYATT RD	GERTIE BARRETT RD	N MAIN ST (BUS 287)	Minor Collector	NO
NELSON WYATT RD	TURNER WARNELL RD	N MAIN ST (BUS 287)	Minor Collector	NO
NORTH ST	NEWT PATTERSON RD	OAK ST	Minor Collector	NO
RUSSELL LN	W DEBBIE LN	RUSSELL LN (FUTURE)	Minor Collector	NO
WOOD RIVER PKWY	N MAIN ST (BUS 287)	KILLIAN DR		NO
RUSSELL LN	RUSSELL LN (EXISTING)	FM 157	Minor Collector	NO
GERTIE BARRETT RD	N CITY LIMITS	COUNTRY MEADOW DR	Minor Collector	NO
GERTIE BARRETT RD	COUNTRY MEADOW DR	W DEBBIE LN	Minor Collector	NO
FUTURE MINOR COLLECTOR	CALLENDER RD	W DEBBIE LN	Minor Collector	NO
<b>Shoulder Bike Lanes</b>				
FM 157	FUTURE RUSSELL LN	MOUSER WAY	Principal Arterial	NO
FM 157	W DEBBIE LN	FUTURE RUSSELL LN	Principal Arterial	NO
NEWT PATTERSON RD	W CITY LIMITS	CARDINAL RD	Minor Collector	NO
<b>Buffered Bike Lanes</b>				
N MAIN ST (BUS 287)	MOUSER WAY	OAK ST	Principal Arterial	NO
<b>Sidepaths</b>				
FM 157	RUSSELL LN	W DEBBIE LN	Principal Arterial	NO
N MAIN ST (BUS 287)	LEGACY WAY	MOUSER WAY	Major Collector	NO
N WALNUT CREEK DR	PLEASANT RIDGE DR	MAGNOLIA ST	Minor Arterial	NO
W DEBBIE LN	GERTIE BARRETT RD	US 287	Principal Arterial	NO



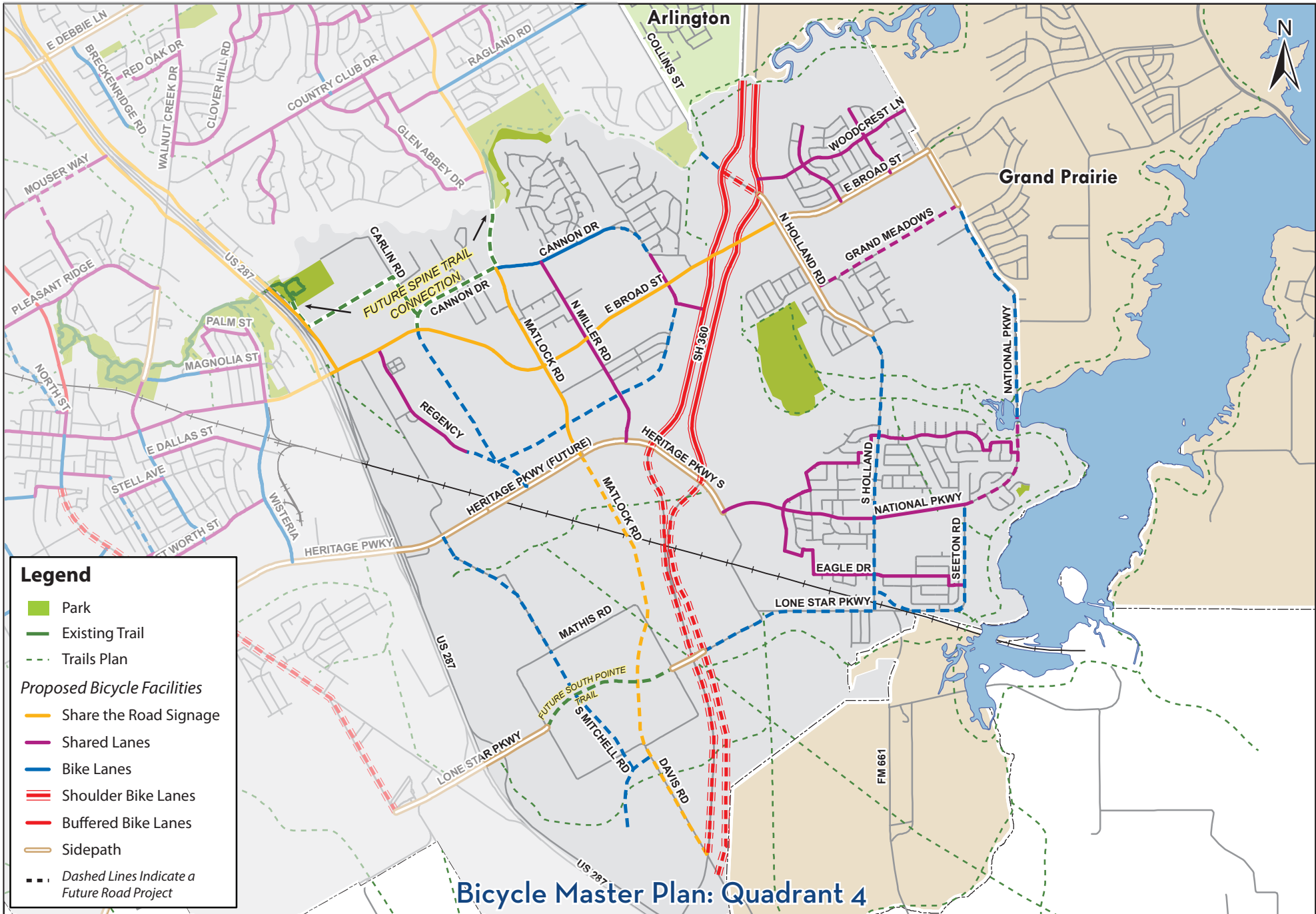
## Bicycle Master Plan: Quadrant 2

Project Location	Project Limits		MTP Roadway Classification	Extra Pavement Consideration (ft)
Street	From	To		
<b>Share the Road Signage</b>				
E DEBBIE LN	CLOVER HILL RD	E CITY LIMITS	Principal Arterial	NO
MATLOCK RD	N CITY LIMITS	CANNON GATE DR	Principal Arterial	NO
US 287 NB FRONTAGE ROAD	CALLENDER RD	BROAD ST		NO
<b>Shared Lanes</b>				
COUNTRY CLUB DR	FUTURE TRAIL	E CITY LIMITS	Major Arterial	NO
TURNER WARNELL RD	CALLENDER RD	TURNER WARNELL (EXISTING)	Principal Arterial	NO
TURNER WARNELL RD	TURNER WARNELL (FUTURE)	FM 157	Principal Arterial	NO
WALNUT CREEK DR	N CITY LIMITS	E DEBBIE LN	Major Arterial	NO
<b>Neighborhood Shared Lanes</b>				
ALMOND DR/FAIRFAX DR	CLOVER HILL RD	E DEBBIE LN		NO
AUBURNDALE DR/RED OAK DR	N WALNUT CREEK DR	BRECKENRIDGE DR		NO
BRITTANY LN	FAIRFAX DR	MATLOCK RD		NO
CLOVER HILL RD	E DEBBIE LN	N WALNUT CREEK DR	Local Collector	NO
CLUBHOUSE DR	COUNTRY CLUB DR	PEBBLE BEACH DR		NO
DOVER HEIGHTS TRL	BAINBRIDGE TRL	ST JOSEPH DR		NO
FAIRHAVEN/CHRETIEN POINT DR	COUNTRY CLUB DR	MATLOCK RD		NO
FIELD LN	COUNTRY CLUB DR	RAGLAND RD		NO
FOREST MILL/MISTY MESA TRL	N WALNUT CREEK DR	FM 157		NO
HIGHLAND DR	FAIRFAX DR	WILLIAMSBURG RD	Local Collector	NO
HILTON DR/CANNON GATE DR	COUNTRY CLUB DR	MATLOCK RD	Local Collector	NO
LINCOLN DR/WINDCASTLE DR	HIGHLAND DR	MATLOCK RD		NO
LOGAN DR	LOGAN DR (FUTURE)	COUNTRY CLUB DR	Local Collector	NO
LOGAN DR (FUTURE)	E DEBBIE LN	LOGAN DR	Minor Collector	NO
ROCKY CREEK DR	N WALNUT CREEK DR	E DEBBIE LN	Local Collector	NO
WALNUT CREEK DR	E DEBBIE LN	FUTURE TRAIL	Major Collector	NO
WINDCASTLE DR	MATLOCK RD	LOGAN DR	Local Collector	NO
<b>Bike Lanes</b>				
BRECKENRIDGE RD	E DEBBIE LN	END		NO
CALLENDER RD	MAJESTIC OAKS CT	US 287 NBFR	Major Collector	6'
CALLENDER RD	FUTURE TURNER WARNELL RD	MAJESTIC OAKS CT	Major Collector	6'
HIGHLAND DR	WILLIAMSBURG RD	COUNTRY CLUB DR	Local Collector	NO
MANSFIELD WEBB RD	MATLOCK RD	E CITY LIMITS	Major Collector	6'
CALLENDER RD	US 287 NBFR	FUTURE MINOR COLLECTOR	Major Collector	6'
RAGLAND RD	MATLOCK RD	E CITY LIMITS	Minor Collector	NO
CALLENDER RD	FUTURE MINOR COLLECTOR	RUSSELL LN	Minor Collector	NO
<b>Sideways</b>				
E DEBBIE LN	US 287	CLOVER HILL RD	Principal Arterial	NO
<b>Trail Connection</b>				
TRAIL EXTENSION	BRECKENRIDGE RD	FUTURE TRAIL		NO



## Bicycle Master Plan: Quadrant 3

Project Location	Project Limits		MTP Roadway Classification	Extra Pavement Consideration (ft)
Street	From	To		
<b>Share the Road Signage</b>				
BROAD ST	W CITY LIMITS	FUTURE TRAIL	Major Arterial	NO
<b>Shared Lanes</b>				
BROAD ST	FUTURE TRAIL	WISTERIA ST	Major Arterial	NO
N MAIN ST (BUS 287)	OAK ST	BROAD ST	Minor Arterial	NO
N WALNUT CREEK DR	MAGNOLIA ST	BROAD ST	Minor Arterial	NO
S WALNUT CREEK DR	BROAD ST	FT WORTH ST	Major Collector	NO
W OAK ST	NORTH ST	N MAIN ST (BUS 287)	Minor Collector	NO
<b>Neighborhood Shared Lanes</b>				
DALLAS ST	S MAIN ST (BUS 287)	PRICE RD	Local Collector	NO
E DALLAS ST	S WALNUT CREEK DR	WISTERIA ST	Local Collector	NO
FT WORTH ST	PRICE RD	WISTERIA ST	Local Collector	NO
HUNT ST	S 2ND AVE	S MAIN ST (BUS 287)		NO
LAUREL ST	PALM ST	MAGNOLIA ST		NO
MAGNOLIA ST	ERMA NASH ELEM SCHOOL	WISTERIA ST	Local Collector	NO
PALM ST	LAUREL ST	WISTERIA ST		NO
S 2ND AVE	HUNT ST	BURL RAY ST	Local Collector	NO
SHERMAN DR	S MAIN ST (BUS 287)	PRICE RD	Local Collector	NO
STELL AVE	PRICE RD	S WALNUT CREEK DR		NO
N WISTERIA ST	EXISTING TRAIL	PALM ST		NO
N WISTERIA ST	PALM ST	BROAD ST	Local Collector	NO
LINCOLN DR/WINDCASTLE DR	HIGHLAND DR	MATLOCK RD		NO
GENESIS DR	DON DR	E BROAD ST		NO
LOWE'S FARM PKWY	LAKESHORE DR	E BROAD ST		NO
<b>Bike Lanes</b>				
AIRPORT DR	S 6TH AVE	S MAIN ST (BUS 287)		NO
BURL RAY ST	S 4TH AVE	S 2ND AVE		NO
MAGNOLIA ST	N WALNUT CREEK	ERMA NASH ELEM SCHOOL	Local Collector	NO
PRICE RD	DALLAS ST	FT WORTH ST	Local Collector	NO
S 4TH AVE	BURL RAY ST	AIRPORT DR		NO
S 6TH AVE	W BROAD ST	EASY DR	Minor Collector	NO
S MAIN ST (BUS 287)	BROAD ST	HUNT ST		NO
WISTERIA ST	E BROAD ST	HERITAGE PKWY	Minor Collector	NO
<b>Shoulder Bike Lanes</b>				
S MAIN ST (BUS 287)	HUNT ST	LONE STAR PKWY	Principal Arterial	NO
<b>Sidepaths</b>				
HERITAGE PKWY	W CITY LIMITS	US 287	Principal Arterial	NO





## Bicycle Master Plan: Quadrant 4

Project Location Street	Project Limits		MTP Roadway Classification	Extra Pavement Consideration (ft)
	From	To		
<b>Share the Road Signage</b>				
MATLOCK RD	CANNON DR	HERITAGE PKWY	Principal Arterial	NO
MATLOCK RD/DAVIS RD	HERITAGE PKWY	SH 360 SB	Major Arterial	NO
BROAD ST	WISTERIA ST	HOLLAND RD	Principal Arterial	NO
<b>Shared Lanes</b>				
CANNON DR	LAKE CREEK TRL	E BROAD ST	Minor Collector	NO
GRAND MEADOW	HOLLAND RD	NATIONAL PKWY	Major Collector	NO
N MILLER RD	CANNON DR	HERITAGE PKWY	Minor Collector	NO
NATIONAL PKWY	HERITAGE PKWY	SEETON RD	Major Arterial	NO
NATIONAL PKWY	GRAND MEADOW (FUTURE)	SEETON RD	Major Arterial	NO
REGENCY PKWY	E BROAD ST	REGENCY PKWY (FUTURE)	Major Collector	NO
<b>Neighborhood Shared Lanes</b>				
CALLOWAY DR/FOX MEADOWS LN	VICTORY LN	SEETON RD		NO
CANNON DR/CONIFER ST	E BROAD ST	SH 360 SB	Minor Collector	NO
VICTORY LN/SPRING LAKE PKWY	CALLOWAY DR	E SEETON RD		NO
WOODCREST LN	SH 360	E CITY LIMITS		NO
<b>Bike Lanes</b>				
CANNON DR	MATLOCK RD	ARBORS DR	Minor Collector	NO
CANNON DR	ARBORS DR	LAKE CREEK TRL	Minor Collector	NO
CANNON DR	E BROAD ST	FUTURE REGENCY PKWY	Minor Collector	NO
BRITTON RD	SH 360 NB	HOLLAND RD	Major Collector	6'
NATIONAL PKWY	GRAND MEADOW (FUTURE)	SEETON RD	Major Collector	6'
REGENCY PKWY	REGENCY PKWY (EXISTING)	HERITAGE PKWY (FUTURE)	Major Collector	6'
S MITCHELL RD	HERITAGE PKWY	FUTURE COLLECTOR	Minor Collector	NO
SEETON RD	NATIONAL PKWY	BRITTON RD	Local Collector	NO
HOLLAND RD	N CITY LIMITS	SH 360 SB	Principal Arterial	14'
FUTURE COLLECTOR	MATLOCK RD/DAVIS RD (FUTURE)	END	Minor Collector	NO
SEETON RD	HOLLAND RD	SEETON RD (EXISTING)	Local Collector	NO
CANNON DR	REGENCY PKWY (FUTURE)	CONIFER ST	Minor Collector	NO
HOLLAND RD	WATERFORD GLEN RD	BRITTON RD	Principal Arterial	14'
<b>Shoulder Bike Lanes</b>				
SH 360 FRONTAGE ROADS	N CITY LIMITS	HERITAGE PKWY		NO
SH 360 FRONTAGE ROADS	HERITAGE PKWY	MATLOCK RD/DAVIS RD (FUTURE)		NO
HOLLAND RD	SH 360 SB	SH 360 NB	Principal Arterial	NO
<b>Sidepaths</b>				
HERITAGE PKWY	MATLOCK RD	NATIONAL PKWY	Principal Arterial	NO
HERITAGE PKWY (FUTURE)	US 287	MATLOCK RD	Principal Arterial	NO
NATIONAL PKWY	E BROAD ST	GRAND MEADOWS (FUTURE)	Major Collector	NO
BROAD ST	WISTERIA ST	E CITY LIMITS	Principal Arterial	NO
HOLLAND RD	SH 360 NB	WATERFORD GLEN DR	Principal Arterial	NO
LONE STAR PKWY	FLYING L LN	FUTURE TRAIL	Principal Arterial	NO
LONE STAR PKWY	FUTURE TRAIL	SH 360 NB	Principal Arterial	NO



# Chapter 4: Plan Implementation

## *Ultimate Plan Implementation*

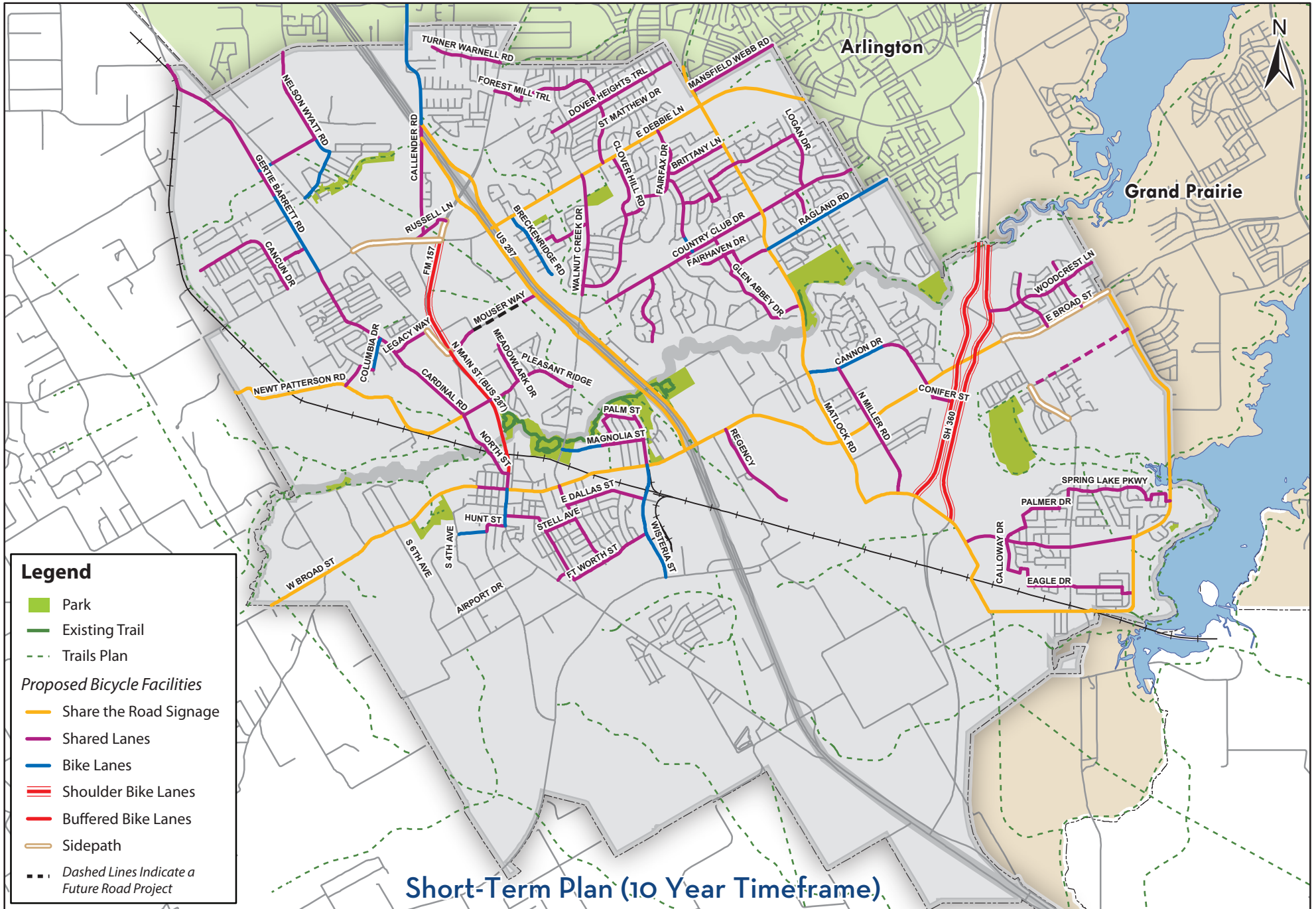
The implementation of the City's ultimate bicycle network will be accomplished over many years. The On-Street Bicycle Master Plan identifies the most appropriate projects for over 100 miles of roadway throughout the city based on the City's Master Thoroughfare Plan. Given that the City of Mansfield continues to develop new areas and many thoroughfares are not built to their ultimate designs, many of the recommended bicycle facilities will be best implemented during future roadway widening and construction projects. The cost to construct bicycle infrastructure is relatively low compared to most other construction projects. However, including bicycle infrastructure design and review in future thoroughfare projects is the most cost-effective and practical approach to implementing the long-term vision of the plan. During these opportunities, city staff should refer to this document's Master Plan, Bicycle Facility Toolbox, and Complete Streets Cross Sections for facility design guidance.



*Shared Lanes with Sharrow Markings*

## *Short-Term Plan Implementation*

The City's existing roadway network has many opportunities for developing on-street bikeways without relying on future construction projects. Over 60 miles of existing pavement may be retrofitted with shared lanes, bike lanes, shoulder lanes and bicycle route signage in the short-term without widening roadways. These projects have been identified in this chapter as a **Short-Term Plan**. Some short-term recommendations provide an interim bike facility alternative to the ultimate Master Plan recommendation. For example, the existing 2-lane section of Callender Road south of US 287 is not currently wide enough to accommodate bike lanes, but would be appropriate for shared lane markings. In the future, when this road is reconstructed to its ultimate Major Collector cross section, the City could then install bike lanes. Implementation of these projects may be accomplished as funding becomes available or during routine resurfacing, restriping and regular maintenance projects. The following sections provide guidance on prioritizing short-term project recommendations based on various factors that consider both the immediate benefit of new facilities and the feasibility to construct them. Planning-level cost estimates are also provided so that the city can develop its bicycle network in phases and effectively direct available funding when selecting projects.



## Planning-Level Project Cost Estimates and Assumptions

The planning-level cost projections provided in this plan have been developed for planning purposes. Further design is recommended to obtain more accurate cost estimates prior to implementation.

- **Short-Term Plan** projects do not require reconstruction of existing roadways and have been estimated based on a general unit cost per mile shown in Table 4-1. The estimated costs for each project is included in the Short-Term Implementation Project tables on p. 38-41.
- Some **Bicycle Master Plan** projects implemented during future roadway construction require additional pavement width compared to current standard construction details. This pavement width is reflected in the alternative thoroughfare cross section designs in the **Appendix**. Cost estimates for bicycle facilities that require additional pavement width are based on the total of the general unit cost per mile shown in Table 4-1 and \$7 per sq. ft. for the incremental pavement cost.

**Table 4-1: Planning-Level Project Costs**

Bicycle Facility	Planning Level Cost (per mile)
Signed Roadway (signing only)	\$1,000
Standard Shared Lanes (signing and marking)	\$10,000
Neighborhood Shared Lanes (signing and marking)	\$6,000
Bike Lane (signing and marking)	\$25,000
Shoulder Bike Lanes, within Existing Shoulders (signing and marking)	\$25,000
Bike Lane Road Diet Project (signing, marking, and travel lane reconfiguration)	\$40,000
Buffered Bike Lane (signing and marking)	\$40,000
10' Shared-Use Sidepath (on one side of road)	\$300,000
10' Shared-Use Trail	\$300,000
Adding 4' paved shoulders on rural roadways	\$400,000

## Short-Term Plan Projects

Project Location	Project Limits		Length (ft)	Estimated Cost
Street	From	To		
<b>Share the Road Signage</b>				
BRITTON RD	MILLER RD	SEETON RD	3,920	\$ 1,500
E BROAD ST	N MAIN ST (BUS 287)	HOLLAND RD	22,590	\$ 8,600
E DEBBIE LN	US 287	E CITY LIMITS	14,430	\$ 5,500
HERITAGE PKWY S	MATLOCK RD	MILLER RD	6,680	\$ 2,500
MATLOCK RD	N CITY LIMITS	HERITAGE PKWY	20,830	\$ 7,900
NATIONAL PKWY	E BROAD ST	SEETON RD	11,680	\$ 4,400
NEWT PATTERSON RD	W CITY LIMITS	CARDINAL RD	10,770	\$ 4,100
S MILLER RD	HERITAGE PKWY	SEETON RD	1,550	\$ 600
SEETON RD	BRITTON RD	NATIONAL PKWY	4,960	\$ 1,900
US 287 FRONTAGE ROADS	CALLENDER RD	BROAD ST	17,350	\$ 6,600
W BROAD ST	W CITY LIMITS	N 4TH AVE	9,950	\$ 3,800
<b>Shared Lanes</b>				
CALLENDER RD	US 287 NBFR	RUSSELL LN	4,530	\$ 8,600
CANNON DR	LAKE CREEK TRL	E BROAD ST	2,590	\$ 4,900
CARDINAL RD	FM 1187	NEWT PATTERSON RD	8,640	\$ 16,400
COUNTRY CLUB DR	FUTURE TRAIL	E CITY LIMITS	11,520	\$ 21,800
GERTIE BARRETT RD	N CITY LIMITS	COUNTRY MEADOW DR	7,120	\$ 13,500
GRAND MEADOW	HOLLAND RD	NATIONAL PKWY	4,720	\$ 8,900
MANSFIELD WEBB RD	MATLOCK RD	E CITY LIMITS	3,810	\$ 7,200
MOUSER WAY	FM 157	HOUSE RD	1,330	\$ 2,500
MOUSER WAY	MOUSER WAY (FUTURE)	US 287 SBFR	590	\$ 1,100
N MAIN ST (BUS 287)	OAK ST	BROAD ST	660	\$ 1,200
N MILLER RD	CANNON DR	HERITAGE PKWY	5,830	\$ 11,000
NATIONAL PKWY	HERITAGE PKWY	SEETON RD	7,050	\$ 13,400
NELSON WYATT RD	TURNER WARNELL RD	N MAIN ST (BUS 287)	5,920	\$ 11,200
NORTH ST	NEWT PATTERSON RD	OAK ST	2,910	\$ 5,500
PLEASANT RIDGE	NORTH ST	N WALNUT CREEK DR	5,170	\$ 9,800
RUSSELL LN	W DEBBIE LN	FM 157	1,630	\$ 3,100
TURNER WARNELL RD	TURNER WARNELL (FUTURE)	FM 157	2,900	\$ 5,500
W BROAD ST	N 4TH AVE	N MAIN ST (BUS 287)	1,280	\$ 2,400
W OAK ST	NORTH ST	N MAIN ST (BUS 287)	260	\$ 500
WALNUT CREEK DR	E DEBBIE LN	FUTURE TRAIL	4,960	\$ 9,400

## Short-Term Plan Projects

Project Location	Project Limits		Length (ft)	Estimated Cost
Street	From	To		
<b>Neighborhood Shared Lanes</b>				
ALMOND DR	CLOVER HILL RD	FAIRFAX DR	1,210	\$ 1,400
ASHBURY LN	MEADOWBROOK LN	SEETON RD	470	\$ 500
ASHLAND CT	FAIRHAVEN DR	CHRETIEN POINT DR	590	\$ 700
AUBURNDALE DR	BRECKENRIDGE RD	WHISPERING WATER LN	290	\$ 300
BAYONNE DR	WINTERVIEW DR	OLDCASTLE DR	210	\$ 200
BERTRAM DR	BARBADOS DR	GERTIE BARRETT RD	1,490	\$ 1,700
BIRDIE DR	CALLOWAY DR	BOGEY LN	510	\$ 600
BOGEY LN	BIRDIE LN	TITLEIST DR	200	\$ 200
BRITTANY LN	FAIRFAX DR	MATLOCK RD	2,560	\$ 2,900
CALLOWAY DR	VICTORY LN	BIRDIE DR	2,220	\$ 2,500
CANCUN DR	ABACO DR	FM 1187	4,980	\$ 5,700
CANNON DR	E BROAD ST	CONIFER ST	620	\$ 700
CANNON GATE DR	GLEN ABBEY DR	MATLOCK RD	1,030	\$ 1,200
CHRETIEN POINT DR	ASHLAND CT	MATLOCK RD	1,330	\$ 1,500
CLOVER HILL RD	E DEBBIE LN	N WALNUT CREEK DR	6,670	\$ 7,600
CLUBHOUSE DR	COUNTRY CLUB DR	PEBBLE BEACH DR	2,990	\$ 3,400
CONIFER ST	CANNON DR	SH 360 SB	820	\$ 900
DALLAS ST	S MAIN ST (BUS 287)	PRICE RD	1,380	\$ 1,600
DOVER HEIGHTS TRL	BAINBRIDGE TRL	ST JOSEPH DR	5,670	\$ 6,400
E DALLAS ST	S WALNUT CREEK DR	WISTERIA ST	3,320	\$ 3,800
EAGLE DR	HOGAN ALLEY DR	HOLLAND RD	1,740	\$ 2,000
EDGEWATER DR	LORIENT DR	SEETON RD	190	\$ 200
FAIRFAX DR	E DEBBIE LN	ALMOND DR	3,610	\$ 4,100
FAIRHAVEN DR	COUNTRY CLUB DR	ASHLAND CT	2,180	\$ 2,500
FIELD LN	COUNTRY CLUB DR	RAGLAND RD	1,480	\$ 1,700
FOREST MILL TRL	FM 157	CRYSTAL BROOK CT	1,170	\$ 1,300
FOX MEADOWS LN	HOLLAND RD	MEADOWBROOK LN	2,140	\$ 2,400
FT WORTH ST	PRICE RD	WISTERIA ST	3,560	\$ 4,000
GENESIS DR	DON DR	E BROAD ST	2,180	\$ 2,500
GLEN ABBEY DR	GLEN ABBEY DR	CANNON GATE DR	2,860	\$ 3,300
GLENEAGLES DR	SPRING LAKE PKWY	NORMAN LN	830	\$ 900
HIGHLAND DR	FAIRFAX DR	WILLIAMSBURG RD	2,600	\$ 2,900
HILTON DR	COUNTRY CLUB DR	GLEN ABBEY DR	1,640	\$ 1,900
HOGAN ALLEY DR	TITLEIST DR	EAGLE DR	700	\$ 800

## Short-Term Plan Projects

Project Location	Project Limits		Length (ft)	Estimated Cost
Street	From	To		
<b>Neighborhood Shared Lanes</b>				
HOLLEY CREEK LN	WATER VIEW DR	RED OAK CT	260	\$ 300
HUDSON DR	SABINE TRL	COLUMBIA DR	570	\$ 600
HUNT ST	S 2ND AVE	S MAIN ST (BUS 287)	730	\$ 800
LAUREL ST	PALM ST	MAGNOLIA ST	1,080	\$ 1,200
LEGACY WAY	CARDINAL RD	N MAIN ST	1,610	\$ 1,800
LINCOLN DR/WINDCASTLE DR	HIGHLAND DR	MATLOCK RD	3,910	\$ 4,400
LOGAN DR	LOGAN DR (FUTURE)	COUNTRY CLUB DR	2,280	\$ 2,600
LORIENT DR	OLDCASTLE DR	EDGEWATER DR	300	\$ 300
LOWE'S FARM PKWY	LAKESHORE DR	E BROAD ST	2,680	\$ 3,000
MAGNOLIA ST	ERMA NASH ELEM SCHOOL	WISTERIA ST	1,710	\$ 1,900
MEADOWBROOK LN	FOX MEADOWS LN	ASHBURY LN	270	\$ 300
MEADOWLARK DR	FUTURE MEADOWLARK DR	PLEASANT RIDGE DR	1,720	\$ 1,900
MISTY MESA TRL	WILLOWSTONE TRL	N WALNUT CREEK DR	1,370	\$ 1,600
N WISTERIA ST	EXISTING TRAIL	PALM ST	170	\$ 200
N WISTERIA ST	PALM ST	E BROAD ST	2,310	\$ 2,600
NORMAN LN	GLENEAGLES DR	PALMER DR	290	\$ 300
OLDCASTLE DR	BAYONNE DR	LORIENT DR	560	\$ 600
PALM ST	LAUREL ST	WISTERIA ST	1,420	\$ 1,600
PALMER DR	VICTORY LN	NORMAN LN	1,600	\$ 1,800
PRICE MANSFIELD RD	DALLAS ST	FT WORTH ST	2,950	\$ 3,300
RED OAK DR	RED OAK CT	WALNUT CREEK DR	1,490	\$ 1,700
REGENCY	E BROAD ST	REGENCY PKWY (FUTURE)	3,960	\$ 4,500
ROCKY CREEK DR	N WALNUT CREEK DR	E DEBBIE LN	6,720	\$ 7,600
S 2ND AVE	HUNT ST	BURL RAY ST	270	\$ 300
SABINE TRL	NEWT PATTERSON RD	HUDSON DR	1,010	\$ 1,200
SHERMAN DR	S MAIN ST (BUS 287)	PRICE RD	610	\$ 700
SPRING LAKE PKWY	GLENEAGLES DR	WINTERVIEW DR	3,560	\$ 4,000
STELL AVE	PRICE RD	S WALNUT CREEK DR	1,320	\$ 1,500
TITLEIST DR	BOGEY LN	HOGAN ALLEY DR	280	\$ 300
VICTORY LN	PALMER DR	CALLOWAY DR	510	\$ 600
WATER VIEW DR	WHISPERING WATER LN	HOLLEY CREEK LN	580	\$ 700
WHISPERING WATER LN	DONALD R BARG PARK	WATER VIEW DR	320	\$ 400
WILLOWSTONE TRL	MISTY MESA TRL	FOREST MILL TRL	290	\$ 300



## Short-Term Plan Projects

Project Location	Project Limits		Length (ft)	Estimated Cost
Street	From	To		
<b>Neighborhood Shared Lanes</b>				
WINDCASTLE DR	MATLOCK RD	LOGAN DR	2,740	\$ 3,100
WINTERVIEW DR	SPRING LAKE PKWY	BAYONNE DR	200	\$ 200
WOODCREST LN	SH 360	E CITY LIMITS	4,780	\$ 5,400
<b>Bike Lanes</b>				
BRECKENRIDGE RD	E DEBBIE LN	END	2,940	\$ 13,900
BURL RAY ST	S 4TH AVE	S 2ND AVE	1,150	\$ 5,400
CALLENDER RD	N CITY LIMITS	US 287 NBRF	3,460	\$ 16,400
CANNON DR	MATLOCK RD	ARBORS DR	3,400	\$ 16,100
COLUMBIA DR	CARDINAL RD	HUDSON DR	1,310	\$ 6,200
GERTIE BARRETT RD	COUNTRY MEADOW DR	W DEBBIE LN	3,640	\$ 17,200
HIGHLAND DR	WILLIAMSBURG RD	COUNTRY CLUB DR	720	\$ 3,400
KILLIAN DR	NELSON WYATT RD	WOOD RIVER PKWY	850	\$ 4,000
MAGNOLIA ST	N WALNUT CREEK	ERMA NASH ELEM SCHOOL	1,680	\$ 8,000
NELSON WYATT RD	GERTIE BARRETT RD	N MAIN ST (BUS 287)	640	\$ 3,000
RAGLAND RD	MATLOCK RD	E CITY LIMITS	5,660	\$ 26,800
S MAIN ST (BUS 287)	BROAD ST	HUNT ST	1,500	\$ 7,100
S WALNUT CREEK DR	BROAD ST	FT WORTH ST	3,670	\$ 17,400
WISTERIA ST	E BROAD ST	HERITAGE PKWY	4,860	\$ 23,000
WOOD RIVER PKWY	N MAIN ST (BUS 287)	KILLIAN DR	2,220	\$ 10,500
<b>Shoulder Bike Lanes</b>				
FM 157	W DEBBIE LN	MOUSER WAY	4,880	\$ 23,100
SH 360 FRONTAGE ROADS	N CITY LIMITS	HERITAGE PKWY	11,440	\$ 54,200
<b>Buffered Bike Lanes</b>				
N MAIN ST (BUS 287)	MOUSER WAY	PLEASANT RIDGE	2,590	\$ 19,600
N MAIN ST (BUS 287)	PLEASANT RIDGE	OAK ST	3,140	\$ 23,800
<b>Sidepaths</b>				
E BROAD ST	HOLLAND RD	E CITY LIMITS	4,810	\$ 65,000
FM 157	RUSSELL LN	W DEBBIE LN	830	\$ 33,200
HOLLAND RD	GRAND MEADOW	WATERFORD GLEN DR	2,090	\$ 83,800
N MAIN ST (BUS 287)	LEGACY WAY	MOUSER WAY	1,380	\$ 55,200
W DEBBIE LN	N MAIN ST (BUS 287)	FM 157	3,650	\$ 72,900

## Summary Cost of Implementation

Table 4-2: Planning-Level Cost Summary

Project Facility Type	Short-Term Plan Projects	Future Master Plan Projects <sup>1</sup>	Total
Share the Road Signage	\$47,400	\$4,700	\$52,100
Shared Lanes	\$295,800	\$188,600	\$484,400
Bike Lanes	\$178,400	\$1,974,000	\$2,152,400
Shoulder Bike Lanes	\$77,300	\$178,600	\$255,900
Buffered Bike Lanes	\$43,400	\$-	\$43,400
Sidepath	\$310,100	\$2,076,800	\$2,386,900
Trail Extension	\$-	\$25,300	\$25,300
<b>Construction Total</b>	<b>\$952,400</b>	<b>\$4,448,000</b>	<b>\$5,400,400</b>
<i>Design &amp; Contingency (25%)</i>	<i>\$238,100</i>	<i>\$1,112,000</i>	<i>\$1,350,100</i>
<i>Bicycle Education Program</i>	<i>\$30,000</i>	<i>\$-</i>	<i>\$30,000</i>
<b>Total</b>	<b>\$1,220,500</b>	<b>\$5,560,000</b>	<b>\$6,780,500</b>

(1) Costs for Future Master Plan Projects do not include projects identified in the Short-Term Implementation Plan. If a Master Plan recommendation differs from the Short-Term Implementation Plan recommendation, the cost of this new project has been included.

## Master Transportation Plan Update

The City is also encouraged to update their Master Thoroughfare Plan (MTP) in order to integrate the On-Street Bicycle Plan facility recommendations into the adopted thoroughfare design standards. This will ensure that all streets provide appropriate mobility options and make bicycling a viable mode of transportation. When updating the MTP, special consideration should be given to future Minor Collectors with bike lanes to determine whether or not a center two-way left-turn lane is appropriate. If so, the thoroughfare should be evaluated for implementation as a Major Collector (70' ROW).

## Bicycle Education Program

A city's bicycle network is intended to provide mobility options for all ages and skill levels. Education of both cyclists and motorists can improve the safety on city roadways and increase the use of bicycle facilities among inexperienced riders. Bicycle education classes and information, for adults and children, teach how to ride safely on all types of facilities and can be offered in schools, workplaces or community events. The League of American Bicyclists certified instructors are a resource to lead high quality education programs. Courses give riders the confidence to use both on and off-street facilities and connect people with other bicyclists in the area. Education for motorists at the community level can be achieved through the addition of shared lane and wayfinding signage that indicates the presence of bicyclists. Schools can be a valuable partner by offering bicycle rodeos or bicycle education during driver's education. It is recommended that the City dedicate funds toward bicycle education programs during the first three years of plan implementation.

## Education and Enforcement

While the intent of this plan is to provide the tools to implement the physical infrastructure that makes up a functional bicycle network (the engineering step of bicycle planning), education and enforcement should be evaluated as ways to ensure the long-term success of the City's transportation investments. The on-street facilities outlined in this plan, along with the City's trail network, will provide safe places for people to ride, but bicyclists also need to know the proper way to ride and how to interact with motorists on the roadway. Bicyclist education programs can be effective in many different ways, from creating simple informational brochures to organizing school-based bike safety training programs, such as MISD bicycle rodeos. Both the FHWA and BikeTexas have resources for developing a quality bicycle safety education program. The FHWA *Good Practices for Bicycle Safety Education* is one source for exploring options for funding, developing partnerships, program evaluation and publicity.

In addition to educating bicyclists about how to ride safely, it is important that a comprehensive safety program includes education and enforcement of motorists sharing the road with bicyclists. Materials that explain what on-street bicycle facilities are and how they work can be particularly beneficial for motorists who have no previous experience bicycling on-street. In addition, a stronger connection between the bicyclist community and local law enforcement can be achieved with a designated cycling police representative that increases awareness of relevant transportation issues. Special law enforcement programs and events can also raise understanding of laws regarding the shared use of roadways. Some communities have adopted policies to train police officers in bicycle safety issues and add bicycle patrols as a community-policing tool.



*Bicycle Education Event*

## Plan Summary by Project Length

Table 4-3 summarizes the planned length of all recommended projects in both the Short-Term Implementation Plan and Master Plan. The mileage total in the Master Plan reflects the combined build-out total of short-term projects and future roadway projects. Some existing roadways with short-term recommendations have different bicycle facility recommendations when those roadways are reconstructed. This is most notable in the conversion of shared lanes to bicycle lanes as roadways are widened.

Table 4-3: Plan Summary by Project Length

Project Facility Type	Short-Term Plan Project Length (mi)	Master Plan Total Project Length (mi)
Share the Road Signage	23.6	15.2
Shared Lanes	38.9	35.5
Bike Lanes	7.1	28.1
Shoulder Bike Lanes	3.1	12.4
Buffered Bike Lanes	1.1	1.1
Sidepath	2.4	12.3
Trail Extension	0	0.9
<b>Total</b>	<b>76.2</b>	<b>105.3</b>

## Facility Maintenance

Bikeways and shared use paths deteriorate and accumulate debris over time. These facilities need periodic maintenance so that they do not become unusable for bicyclists. Some roadway surface issues may seem minor to motor vehicles, but can become serious hazards to bicyclists with much narrower tires. These include cracks and potholes in the pavement, gravel or branches accumulated in bike lanes, and broken glass which can puncture tires. A good bikeway maintenance program preserves the investment in bikeways and ensures the continued safety of riders.

### Recommendations

- Establish a regular roadway sweeping schedule to remove debris. Debris should not be swept onto sidewalks.
- Inspect and repair bikeways regularly regarding surface defects, and establish a process to receive user feedback of poor bikeway conditions.
- Pavement overlay projects are good opportunities to restripe roadways with new bike facilities and improve existing bikeway conditions. Overlays should be extended over the entire road surface so bicyclists do not encounter abrupt edges.
- Vegetation growth should be controlled to preserve roadway surfaces and safe sight distances.
- Inspect signs and markings regularly for good visibility, including night reflectivity. Black pavement tape placed underneath markings can improve visibility on concrete roadways.
- Maintain proper drainage to allow for continuous use of bikeways.
- Bicycle travel should continue to be accommodated in roadway work zones.



*Deteriorated Bike Lane*

## Initial Plan Implementation

To aid the City in selecting projects for the initial implementation of this plan, a subset of projects identified on the Short-Term Plan have been prioritized based on factors that consider project cost and the near-term benefit to the bicycle network. This plan was formed with the intent that approximately \$300,000 will be spent during the first three years (\$100,000 per year). This includes the projects identified on p. 46 and the educational component. This initial implementation plan presented represents slightly more than can be completed in the first three years but allows flexibility of routes to be chosen for funding. However, the initial plan recommendations are subject to change and available funding. Three of the projects included in the initial plan implementation are currently under construction or design. These projects include the sidepaths on East Broad, S Holland, and W Debbie Ln. This priority list will allow the City to more effectively develop its bicycle network in phases and direct available funding to projects that best meet the goals of this plan.

The following criteria have been considered when selecting near-term priority projects:

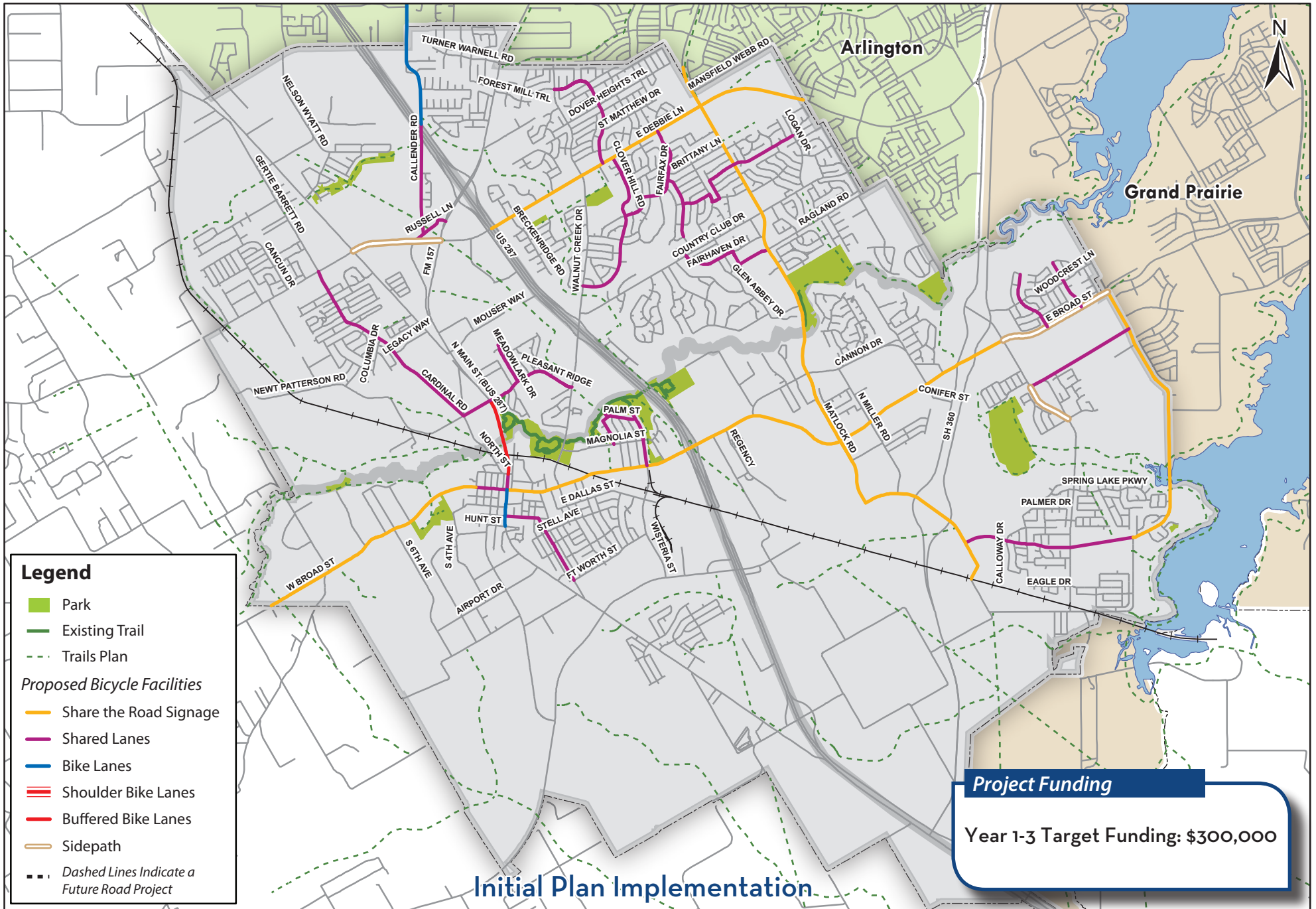
- Overall Route Connectivity
- Level of Safety Benefit/Separation from Traffic
- Access to Existing Trailheads
- Access to the planned Spine Trail network
- Distance to Bicycle-Oriented Destinations
- Access to Schools, Parks, Major Retail Centers
- Project Cost

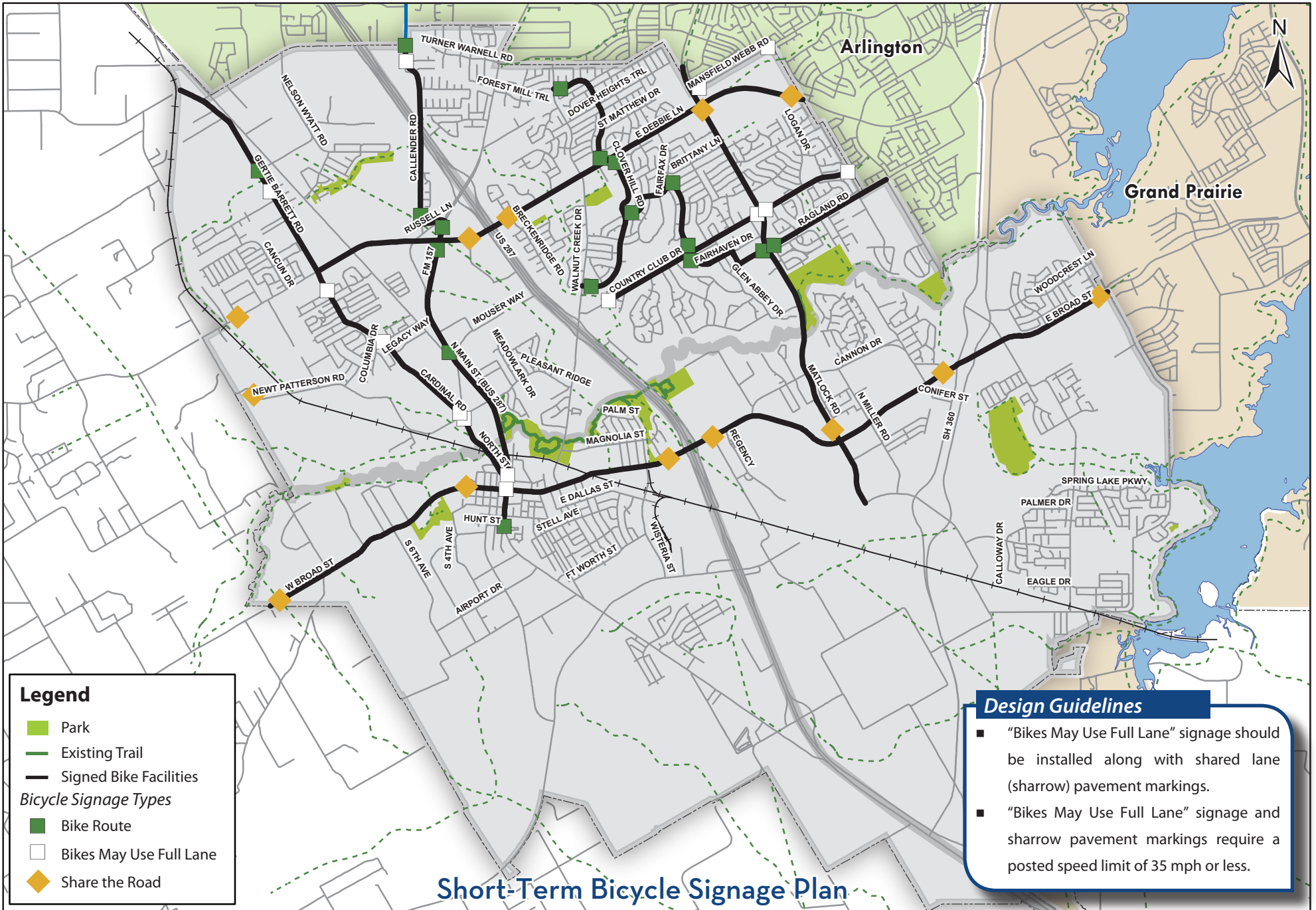
## Short-Term Bicycle Signage Plan

Most bicycle signage will be installed as part of the design of the bicycle facilities outlined in the Short-Term and Future Master Plan project tables. However, the City may choose to install an initial set of signs independent of any on-street striping projects. This could include a combination of “Share the Road”, “Bike Route”, and “Bikes May Use Full Lane” (BMUFL) signs. “Share the Road” signage is useful for bicyclists who use the primary, higher speed thoroughfares throughout the city, which typically would not be designated as a bike route. These signs alert motorists that bicyclists may be present, and placement of these signs is recommended at entries to the city and near major intersections. “Bikes May Use Full Lane” signs identify shared lane sections of the bicycle plan, and should be installed with sharrow pavement markings. “Bike Route” signs should be used to indicate to both bicyclists and motorists that they are traveling a recommended roadway for bicycle use due to its slower speeds and connectivity. “Bike Route” signs may include wayfinding information and may be used in combination with other bicycle facility signage. Based on the Focus Group and other public feedback, a city-wide signage plan would be beneficial to existing cyclist activity in the City and is recommended as a first priority project. This plan map can be seen on p. 47.



*Bike Route Sign*





# Appendices

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Appendix B: Complete Streets Cross Sections ..... 53

    Future Alternative Street Sections

    Retrofit Street Sections

Appendix C: Bike Facility Pavement Markings Standard  
Details .....57

## Mansfield's Bicycle Masterplan Public Input Meeting



The City of Mansfield and the Mansfield Parks & Recreation Department will host a public input meeting regarding the proposed Bicycle Masterplan.  
**Your input is important!**


Tuesday, October 29  
6 p.m.  
Mansfield City Hall  
Multi-purpose Room  
1200 E. Broad St.

Please RSVP to James Fish at  
817-473-1943 or email  
james.fish@mansfield-tx.gov





# Appendix A: Public Input Survey Results (30 Surveys Completed)



## City of Mansfield Bicycle Plan Survey

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**1. Demographic Questions**

<b>Age</b>	<b>Gender</b>
Under 18 years old <input type="checkbox"/>	Male <input type="checkbox"/>
18-24 <input type="checkbox"/>	Female <input type="checkbox"/>
25-34 <input type="checkbox"/>	
35-44 <input type="checkbox"/>	
45-54 <input type="checkbox"/>	
55-64 <input type="checkbox"/>	
65+ <input type="checkbox"/>	

---

<b>2. How often do you ride a bicycle?</b>	<b>3. What best describes your bicycling skill level?</b>
Never <input type="checkbox"/>	Strong & Fearless <input type="checkbox"/>
Once per month <input type="checkbox"/>	Enthusied & Confident <input type="checkbox"/>
Once per week <input type="checkbox"/>	Interested but Concerned <input type="checkbox"/>
More than once per week <input type="checkbox"/>	No Way, No How <input type="checkbox"/>

---

**4. How likely are you to make the following types of trips on a bicycle?**

	Very Likely	Likely	Neutral	Unlikely	Very Unlikely
Exercise/recreational activity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Travel to work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Travel to school	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Errands/shopping	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Personal trips – visit friends, travel to entertainment, go out to eat, etc.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (please specify) _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

---

**5. What prevents you from cycling more often in Mansfield? (select all that apply)**

Not enough bike lanes <input type="checkbox"/>	Nothing prevents me from cycling <input type="checkbox"/>
Not enough bike trails <input type="checkbox"/>	Difficult barriers to cross (intersections, railroads, etc.) <input type="checkbox"/>
Not enough bicycle safety signage/education <input type="checkbox"/>	I don't feel safe riding a bicycle in traffic <input type="checkbox"/>
Destinations do not have convenient bicycle parking <input type="checkbox"/>	I am physically limited from riding a bicycle <input type="checkbox"/>
Destinations are too far away <input type="checkbox"/>	Weather (hot, cold, rain) <input type="checkbox"/>
Roads are in poor condition <input type="checkbox"/>	I don't own a bike <input type="checkbox"/>

*(continue on reverse)*

**6. Where in Mansfield do you live? (see map)**

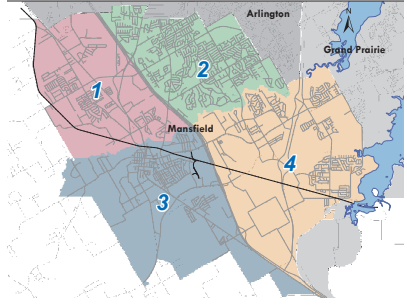
1 - West of US 287, North of Walnut Creek

2 - East of US 287, North of Walnut Creek

3 - West of US 287, South of Walnut Creek

4 - East of US 287, South of Walnut Creek

5 - Other/Outside of Mansfield



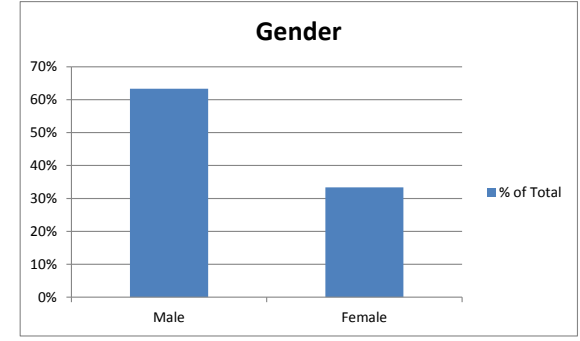
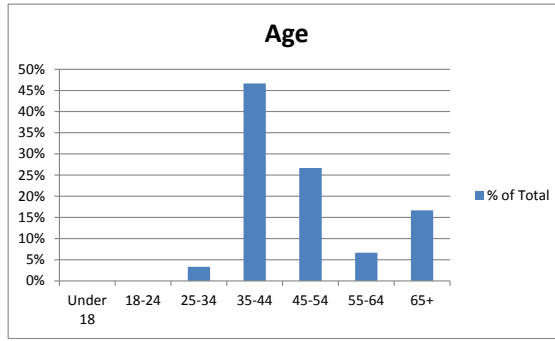
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**7. What destinations would you most like to ride to on a bicycle? (select top 3 choices)**

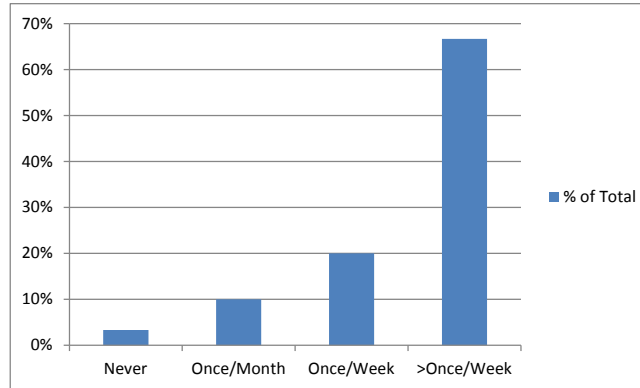
Parks and recreational facilities <input type="checkbox"/>	Regional destinations – Arlington, Grand Prairie, Joe Pool Lake, etc. <input type="checkbox"/>
Trails <input type="checkbox"/>	School _____ <input type="checkbox"/>
Local shops and restaurants <input type="checkbox"/>	Work _____ <input type="checkbox"/>
City Facilities (City Hall, libraries, etc.) <input type="checkbox"/>	Other _____ <input type="checkbox"/>

# Appendix A: Public Input Survey Results (30 Surveys Completed)

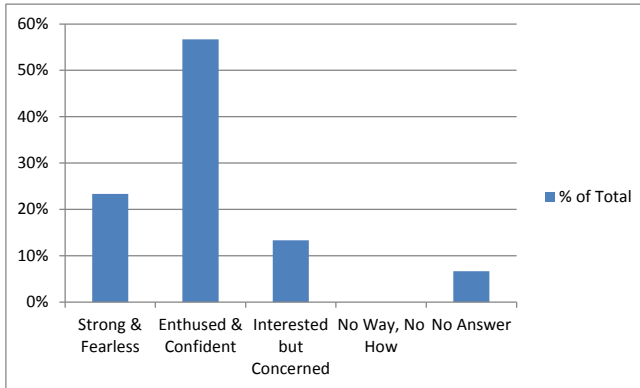
## 1. Demographic Questions



## 2. How often do you ride a bicycle?

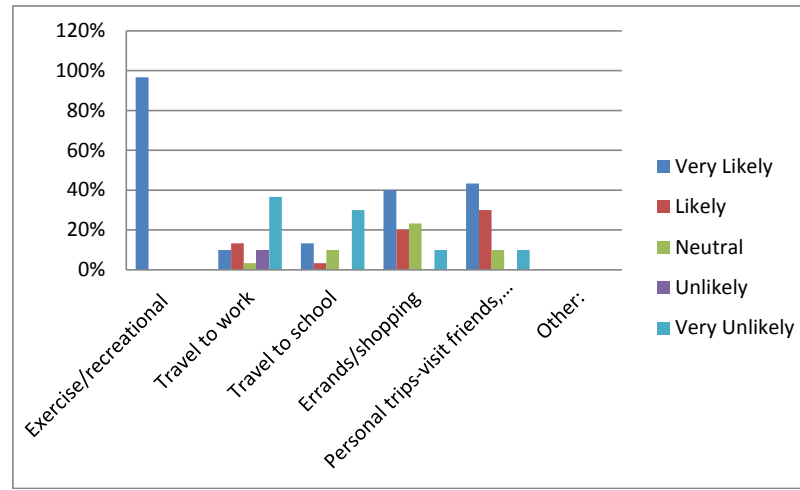


## 3. What best describes your bicycling skill level?

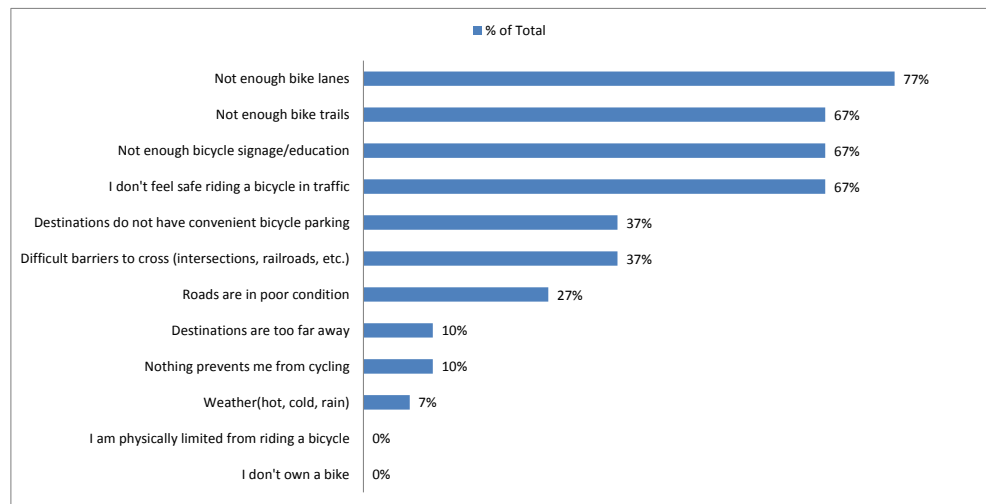


## Appendix A: Public Input Survey Results (30 Surveys Completed)

### 4. How likely are you to make the following types of trips on a bicycle?

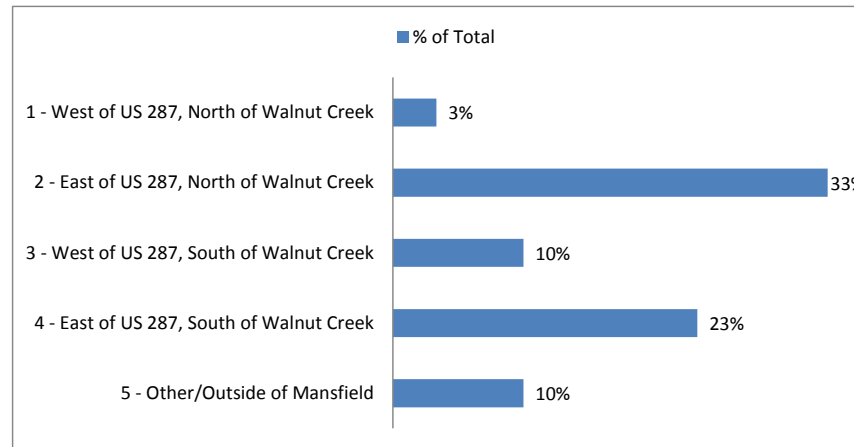


### 5. What prevents you from cycling more often in Mansfield? (select all that apply)

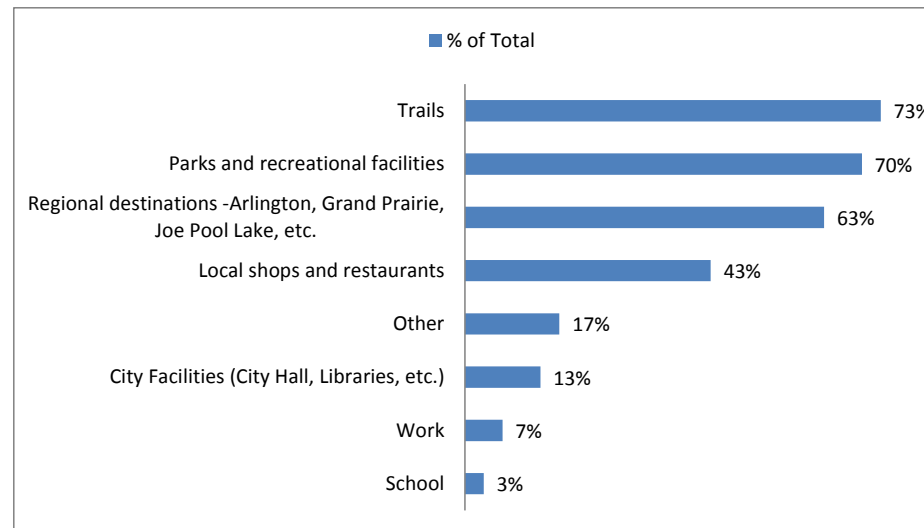


## Appendix A: Public Input Survey Results (30 Surveys Completed)

### 6. Where in Mansfield do you live?



### 7. What destinations would you most like to ride to on a bicycle? (select top 3 choices)

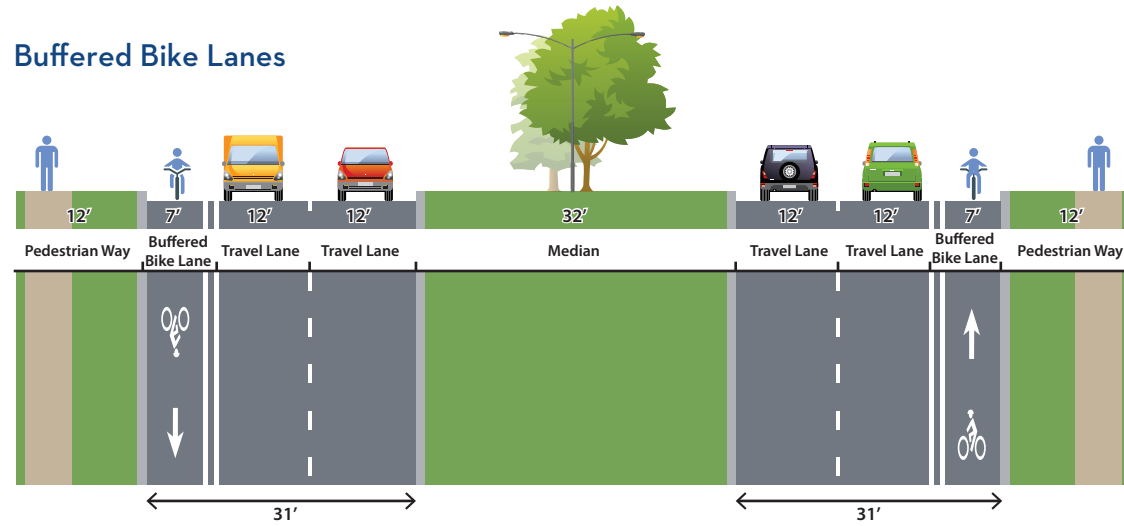


# Appendix B: Complete Streets Cross Sections

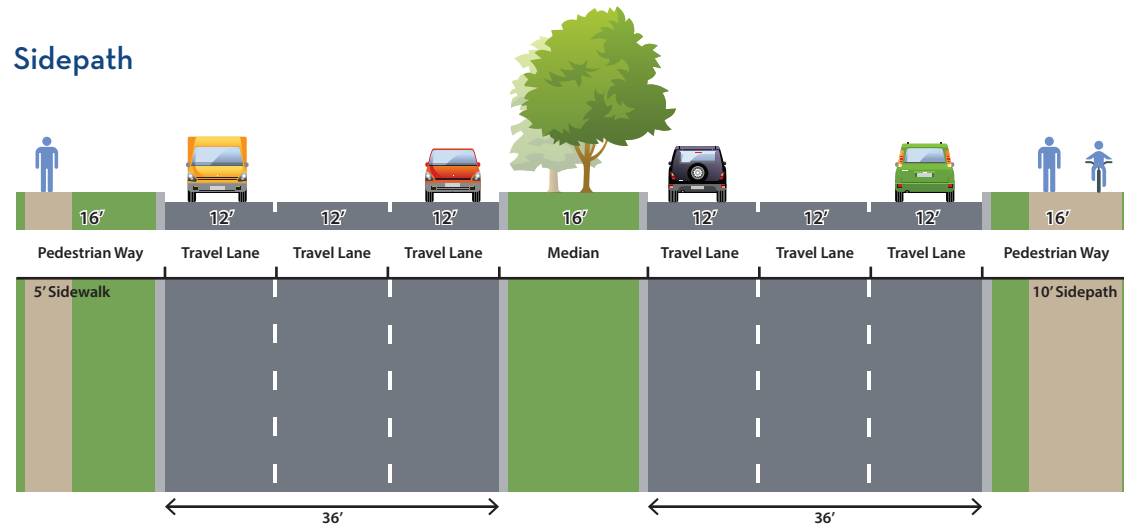
## Principal Arterial (120')

\*For this plan, buffered bike lanes are the accepted facility type for a 4-lane Principal Arterial. It is recommended that the City construct a shared-use sidepath when widening to 6 lanes.

### Buffered Bike Lanes

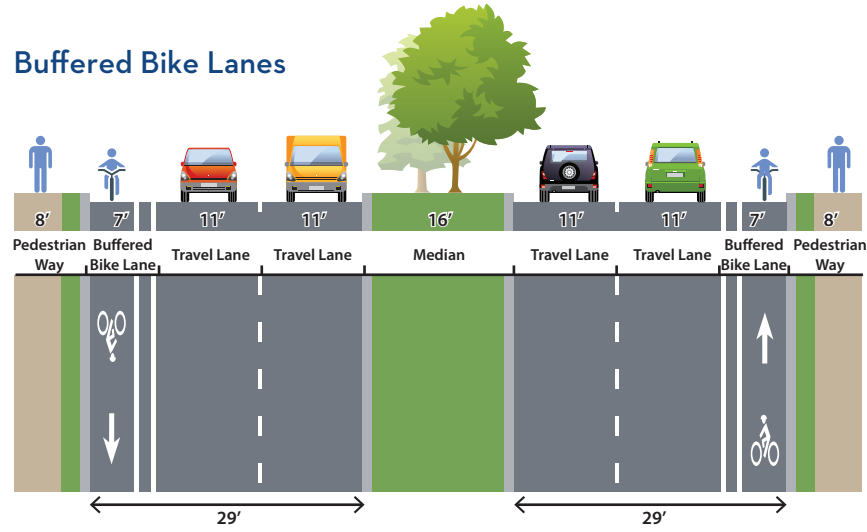


### Sidepath



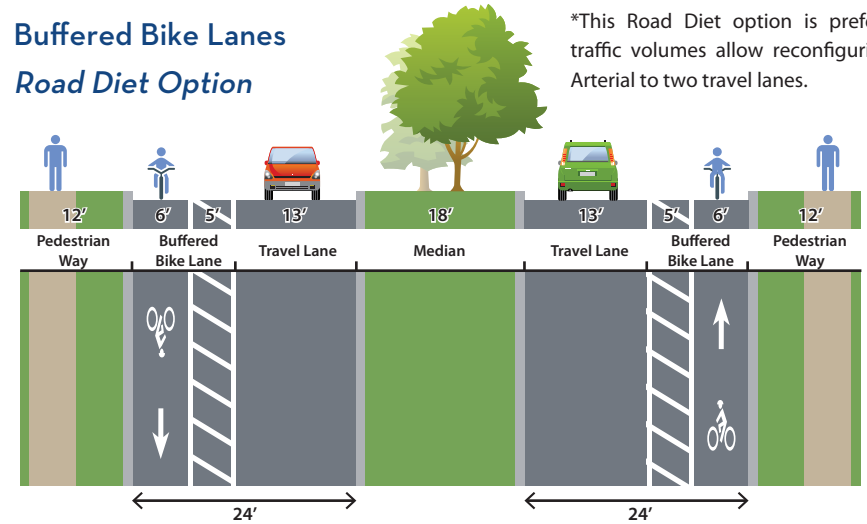
# Major/Minor Arterial (90')

## Buffered Bike Lanes



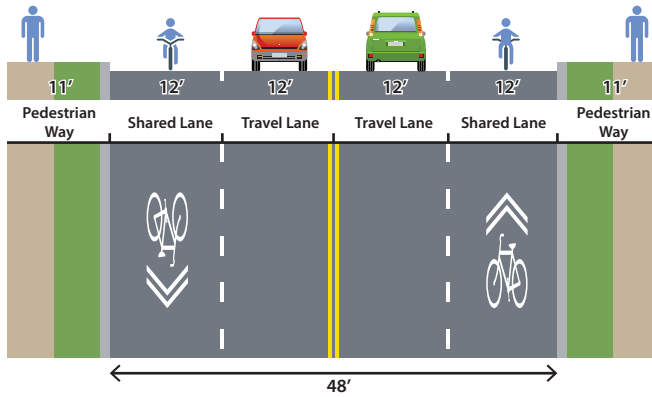
## Buffered Bike Lanes Road Diet Option

\*This Road Diet option is preferred when traffic volumes allow reconfiguring a Major Arterial to two travel lanes.



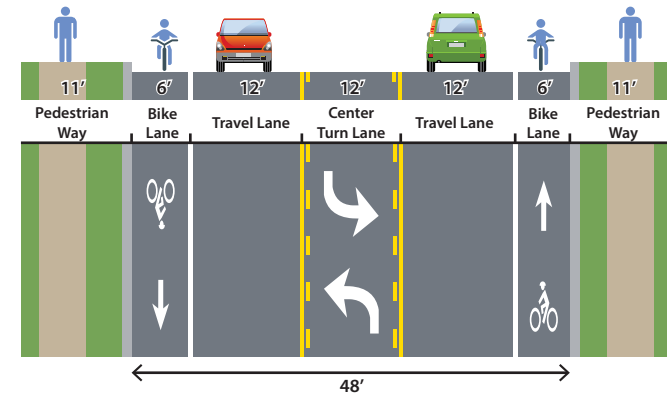
# Major Collector (70')

## Shared Lanes

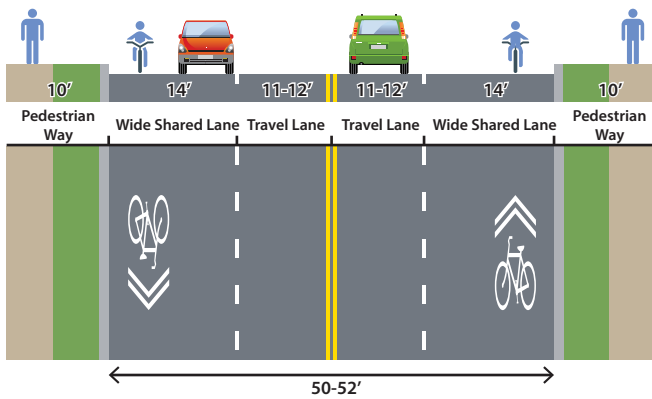


## Bike Lanes

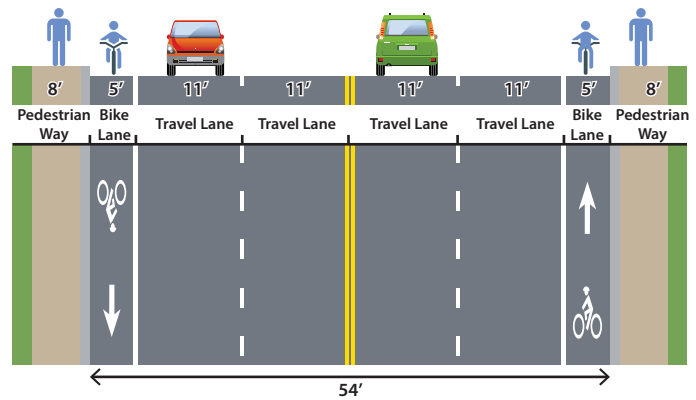
### Road Diet Option



## Shared Lanes

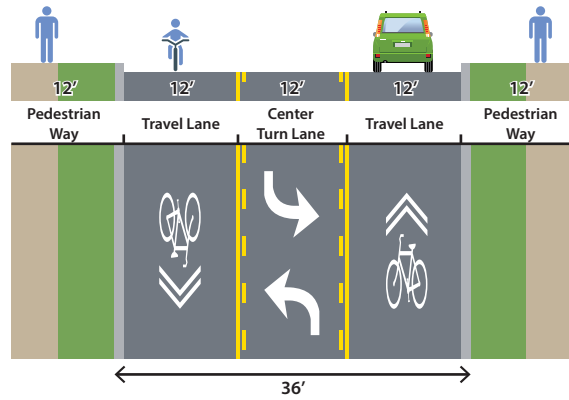


## Bike Lanes



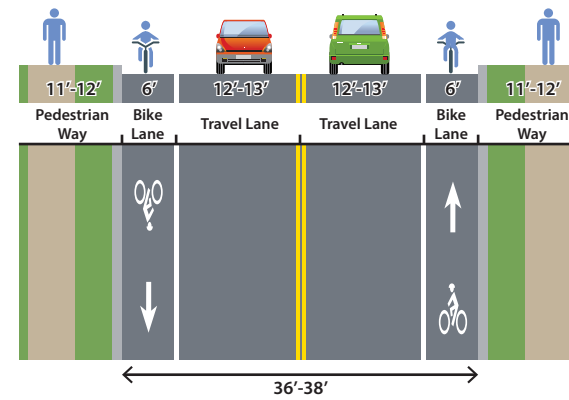
# Minor/Local Collector (60')

## Shared Lanes

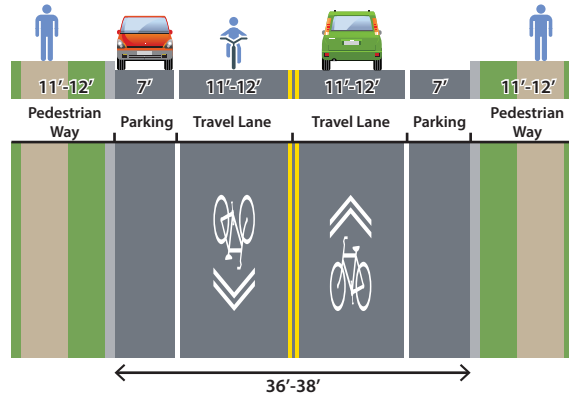


## Bike Lanes

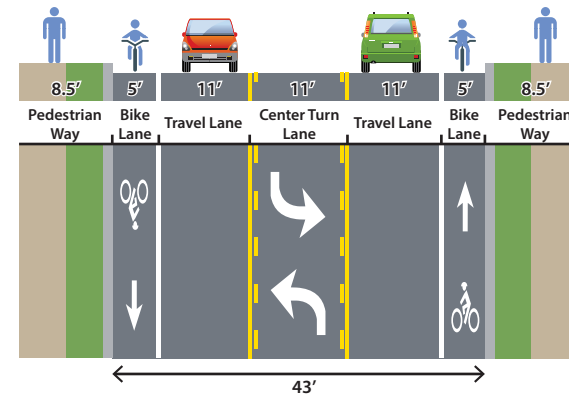
\*When implementing bike lanes on Minor Collectors, left-turn lane evaluation should be given. If additional ROW width is available, the thoroughfare could be upgraded to a Major Collector (70' ROW).



## Shared Lanes \*Parking may or may not be striped.



## Bike Lanes





# Appendix C: Bike Facility Pavement Markings Standard Details

### SHARED PAVEMENT MARKING

NOTE:  
1. SEE STRIPING LAYOUT SHEETS FOR PLACEMENT OF MARKINGS AND LEGENDS.

### BIKE LANE SYMBOL AND ARROW DIMENSIONS

### TYPICAL BIKE LANE DETAIL

### TYPICAL BIKE LANE WITH ON-STREET PARKING

NOTE:  
1. SEE STRIPING LAYOUT SHEETS FOR PLACEMENT OF MARKINGS AND LEGENDS.  
2. BIKE LANE WIDTH TO BE DETERMINED BY ENGINEER. MINIMUM EFFECTIVE BIKE LANE WIDTH IS 4'. RECOMMENDED WIDTH IS 5' TO 6'.

### TYPICAL BIKE LANE PLACEMENT AND SPACING AT PRIVATE DRIVEWAYS AND PUBLIC STREETS (SIGNALIZED AND UNSIGNALIZED)

### TYPICAL BIKE LANE PLACEMENT AND SPACING AT PRIVATE DRIVEWAYS AND PUBLIC STREETS (SIGNALIZED AND UNSIGNALIZED)

### TYPICAL BIKE LANE DETAIL

REFERENCE SHARED PAVEMENT MARKINGS DETAILS AS INDICATED IN THE DRAWINGS FOR PLACEMENT

4" SOLID WHITE    4" WHITE

50'    (VARIES)

R3-17 (30"x24")    R4-11 (30"x30")

R3-17b (24"x8")    MAY USE FULL LANE

REFERENCE TABLE 1 FOR RECOMMENDED SIGN SPACING BASED ON POSTED SPEED LIMIT

ROAD CLASSIFICATION	POSTED SPEED (MPH)	SIGN SPACING (FEET)
CONVENTIONAL	25	100
HIGHWAY	30	120
	35	160
	40	240
	45	320

### TYPICAL BIKE LANE DETAIL

8" SOLID WHITE @ 45°    R5-1B (12"x18")    R3-17 (30"x24")

4" SOLID WHITE    SIGN LOCATION VARIES

CURB    20' (TYP.)

MIDDLE OF EFFECTIVE BIKE LANE VARIES (2' TO 3' RECOMMENDED)

### TYPICAL BIKE LANE DETAIL

TRAVEL LANE > 14'

TRAVEL LANE ≤ 14'

### TYPICAL BIKE LANE DETAIL

TRAVEL LANE > 14'

TRAVEL LANE ≤ 14'

### TYPICAL SHARED PAVEMENT PLACEMENT AND SPACING

NOTE:  
1. SHARED LANE MARKING SHOULD BE PLACED IMMEDIATELY AFTER AN INTERSECTION AND SPACED AT INTERVALS NOT GREATER THAN 250 FEET THEREAFTER.