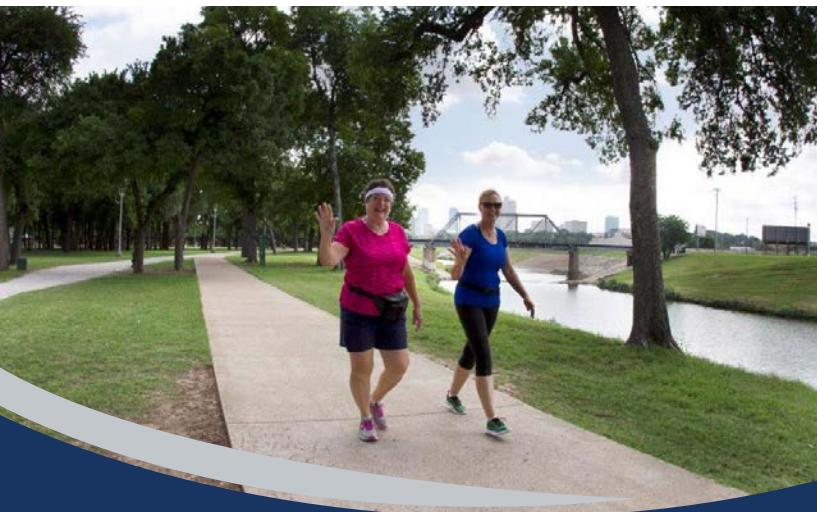


Fort Worth Active Transportation Plan

TRAILS MASTER PLAN EXECUTIVE SUMMARY

April 2019



North Central Texas
Council of Governments

Information contained in this document is for planning purposes and should not be used for final design of any project. All results, recommendations, cost opinions, and commentary contained herein are based on limited data and information, and on existing conditions that are subject to change.

Acknowledgments

City of Fort Worth

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City Council

District 2 – Carlos Flores

District 3 – Dr. Brian Byrd

District 4 – Cary Moon

District 5 – Gyna Bivens

District 6 – Jungus Jordan

District 7 – Dennis Shingleton

District 8 – Kelly Allen Gray

District 9 – Ann Zadeh

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American Association of Retired Persons	MedStar
Area Agency on Aging	Mental Health Mental Retardation/Tarrant County
Azle Independent School District	Near South Side
Bike Friendly Fort Worth	North Fort Worth Alliance
Blue Zones Project	Northwest Independent School District
Burleson Independent School District	Oncor
Castleberry Independent School District	Park & Recreation Advisory Board
Central City Committee	Pedestrian and Bicycle Advisory Commission
Clear Fork Bicycle Club	Real Estate Council of Greater Fort Worth
Crowley Independent School District	Sixty and Better
Cultural District Alliance	SteerFW
Development Advisory Committee	Streams and Valleys, Inc.
Downtown Fort Worth Inc	Tarrant County
Eagle Mountain Saginaw Independent School District	Tarrant County Community College
Everman Independent School District	Tarrant County Public Health
FitWorth	Tarrant Regional Water District
Fort Worth Bike Sharing	Tarrant Transit Alliance
Fort Worth Independent School District	Texas Christian University
Fort Worth League of Neighborhoods	Texas Wesleyan University
Fort Worth Safe Communities Coalition	Trinity Metro
Greater Fort Worth Association of Realtors	Trinity River Vision Authority
Greater Fort Worth Builders Association	TxDOT
Hurst Eules Bedford Independent School District	University of North Texas Health Sciences Center
Keller Independent School District	White Settlement Independent School District
Lake Worth Independent School District	YMCA

Table of Contents

Acknowledgments iii

Overview 1

Relationship Between Trails and User
Comfort..... 1

**Trail Network Development
Approach..... 2**

Identification of Future Trail Network
Alignments 3

Spine and Rib Trail Characteristics 4

Trail Network Development 4

Trail-Related Policies 6

Trail Projects 7

Trails Cost Assumptions..... 7

Project Prioritization 7

Trail Project Cut Sheets 10

Trail Design Toolbox 16

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OVERVIEW

The following executive summary excerpts the trail-related content from the Fort Worth Active Transportation Plan (ATP). It is intended for agency staff and community members who are primarily focused on developing trails in Fort Worth.

It contains:

- The Trail Network Development Approach
- Relevant Policies
- Priority Trail Projects
- Trail Network Maps, and
- Trail and Sidepath Design Guidance

Relationship Between Trails and User Comfort

A trail is a path fully separated and independent from a road, shared by bicyclists, pedestrians, and others. As a result of this separation, a well-designed trail is comfortable for users in most contexts. Higher-demand trails, such as those included in the ATP Spine network, should be wider to accommodate more users traveling at varied speeds. Pedestrians and bicyclists may be separated to increase comfort. If the trail is congested, some bicyclists may choose to ride on adjacent roads.



Figure 1. Trails in Fort Worth provide a comfortable place for exercise, recreation, and transportation. (Photo credit: Tarrant Regional Water District)

TRAIL NETWORK DEVELOPMENT APPROACH

The recommended network structure for the Active Transportation Plan consists of a combination of Spine and Ribs and Connected Neighborhood Networks. Major Spine corridors support uninterrupted longer-distance trips, and Rib corridors provide connections between the Spines and neighborhoods. Fort Worth’s existing trail network naturally acts as many of the Spine and Rib connections. These facilities provide many of the long-distance routes between the city’s major activity centers and neighborhoods. More on these structures and how they impact design is found on pages 13-15.



Figure 2. New trails may take advantage of natural corridors, such as streams, utility and rail corridors, and parks and open space areas. (Photo credit: Tarrant Regional Water District)

Criteria	Description	Impact on Network Development
Existing Trails	An inventory of all existing trails.	Included in the network, except local park trails.
Previous Plans	Bike Fort Worth, Confluence: The Trinity River Strategic Master Plan, Regional Veloweb, and other regional and local plans.	Included in the network.
New Trail Opportunities	Floodplains and streams, utility easements, rail corridors, parks and open space areas	Corridors were mapped and evaluated for trail projects.

Table 1. Trail network development inputs.

Identification of Future Trail Network Alignments

Existing Trail Inventory

The identification of candidate alignments for expanding the City's trail network began with an assessment of existing trail conditions. Several organizations have worked together over the years to develop the trail system as it exists today. The Tarrant Regional Water District (TRWD) has constructed, and maintained, much of the existing Trinity Trails system. The City of Fort Worth has constructed trails, many located within city parks and within parks along the Trinity River corridor. Local neighborhood-level trails have been constructed as part of private development projects that can be integrated into the citywide trail network. The Regional Transportation Council has provided funding for several Regional Veloweb trails in Fort Worth. An inventory of all existing trails was compiled in order to make additional network alignment recommendations.

Previous Plans

Previous planning efforts that included trail alignment recommendations were reviewed for integration with the Active Transportation Plan, including:

- **Bike Fort Worth** – Trail alignment recommendations identified in the City's previous bicycle and pedestrian plans were re-evaluated for inclusion in the ATP trail network.
- **Confluence: The Trinity River Strategic Master Plan** – Led by Streams & Valleys, a nonprofit organization whose mission is to fund and develop projects that enhance the river and trails, this plan was developed in coordination with TRWD and the City of Fort Worth to identify a variety of projects to enhance all major segments of the Trinity River. All trail facility recommendations were integrated into the Active Transportation Plan.

- **Regional Veloweb** – Established by the North Central Texas Council of Governments (NCTCOG) to create a region-wide plan for future trail development. Veloweb corridors were incorporated and updated. Refined Regional Veloweb alignments are proposed for the next adopted Metropolitan Transportation Plan.

Trail recommendations identified in other regional and local plans, as outlined in the ATP Existing Conditions Report, were also evaluated for inclusion in the citywide trail system.

New Trail Opportunities

Building upon the existing and previously planned trails, new trail opportunity areas were mapped and evaluated for trail projects. These areas include:

- Floodplains and streams
- Utility easements
- Rail corridors (existing and abandoned)
- Parks and open space areas

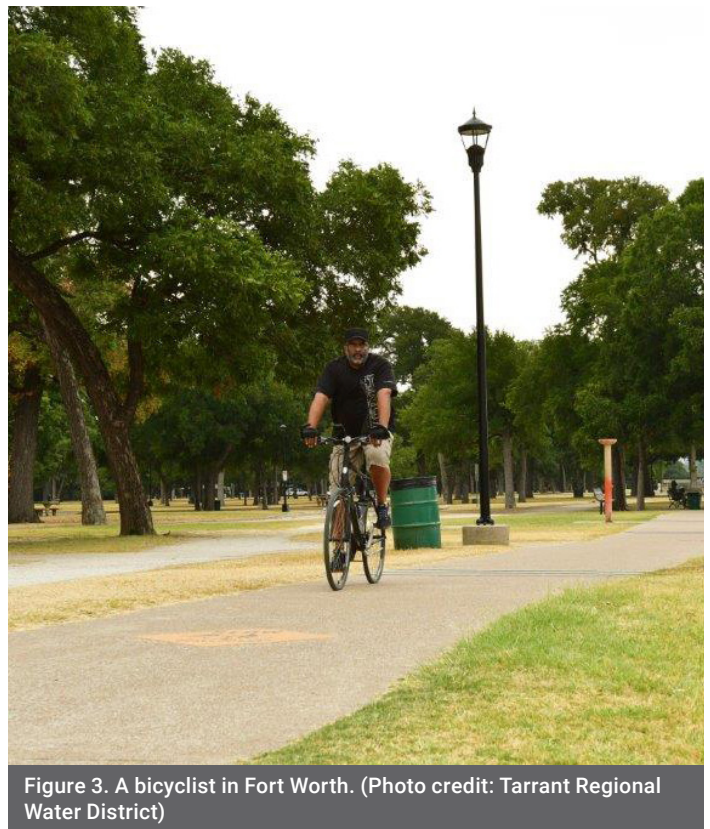


Figure 3. A bicyclist in Fort Worth. (Photo credit: Tarrant Regional Water District)

Trail Network Development

Building on the existing trails and opportunity areas, the Trails Master Plan identifies a network of interconnected off-street alignments to provide comfortable routes for recreation and transportation. The majority of trails identified in the plan can be considered part of the Spine and Ribs structure as described in the box below.

SPINE AND RIB TRAIL CHARACTERISTICS

Spine Trail Connectivity

- Emphasis on long-distance connectivity
- Trails create major cross-town connections or regional connections to adjacent cities
- Interconnected network with connections to/from other Spine trails

Rib Trail Connectivity

- Emphasis on connectivity between Spine trails and neighborhoods
- Non-regional (shorter-distance) connections between neighborhoods

Selected routes are intended to be primarily separated from roadways with minimal crossings, utilizing natural areas, floodplain, rail alignments, or other easements. Emphasis was placed on identifying trail alignment opportunities that serve all major districts, activity centers, neighborhoods, and future growth areas. It is important that the trail network be fully coordinated and connected with the on-street bicycle and pedestrian networks to increase trail access and route continuity throughout the Fort Worth.

Local/Neighborhood Trails

Local trails that serve as part of a Neighborhood Network are typically not mapped as part of the Trails Master Plan. However, local off-street and on-street connections should be considered in existing and future development areas to enhance access to the Spine and Rib trail network. When determining local trail alignments, access from all neighborhoods to the proposed Active Transportation Plan network should be provided to promote the connectivity of the trail network to community destinations within neighborhoods. The Neighborhood Trail Connectivity section of Chapter 5 provides more information.



Figure 4. Trail users in Fort Worth. (Photo credit: Tarrant Regional Water District)

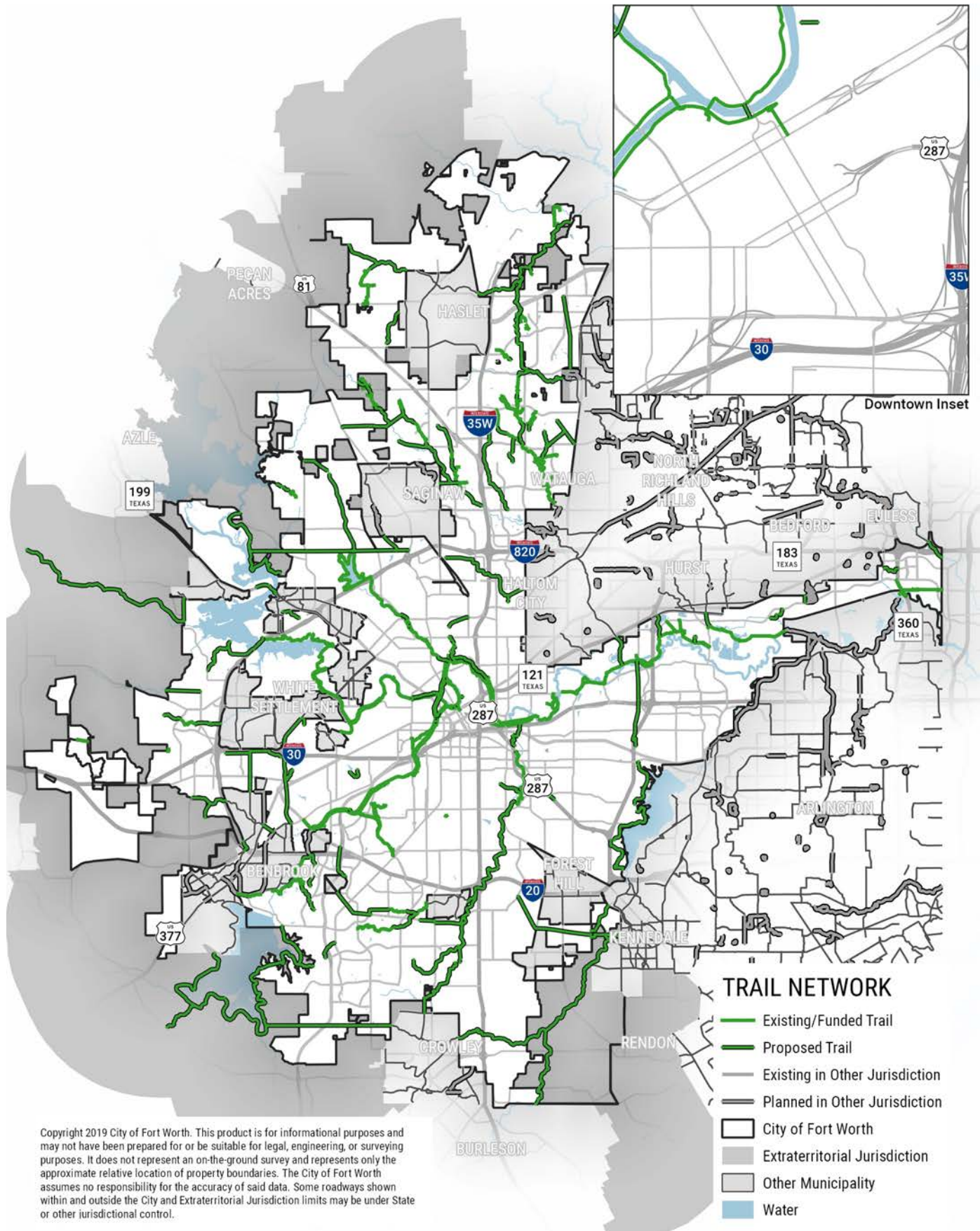


Figure 5. Existing and proposed trail network map

Trail-Related Policies

Chapter 5 of the ATP contains a list of policies to support the development of the active transportation network and encourage walking, bicycling, and trail use in Fort Worth. Several policies that related to the trail network are listed below.

Goal	Policy	Implementer
2. Connected	2.7. Update development requirements to include easement dedication for trails, and require pedestrian and bicycle connectivity to new development.	Planning & Development (P&D)
3. Safe and Comfortable	3.10 Develop a Low Water Crossing Indication System for the Spine Network	City of Fort Worth (CFW), Tarrant Regional Water District (TRWD)
5. Equitable	5.4 Include Equity as a prioritization measure in all projects	City of Fort Worth (CFW)
7. Community Awareness and Culture	7.1. Review Subdivision and Zoning codes to develop and adopt changes that incorporate language that supports and promotes bicycling and walking such as connectivity and development requirements. See subdivision ordinance policy discussion in Chapter 5.	Planning & Development (P&D)
8. Funding	8.1. Continue to pursue federal funding sources such as Congestion Mitigation and Air Quality (CMAQ) Improvement Program, the Transportation Alternatives and Recreational Trails Programs, and BUILD grants.	Transportation & Public Works (TPW); Park and Recreation (PARD)

Table 2. Fort Worth ATP Trail-Related Policies.

Local/Neighborhood Connectivity Policy

When a new development is approved, it is important to consider what trails or facilities are located nearby. The ATP recommends a revision to Section 31-102 “Streets and Block Arrangement” of the Subdivision Ordinance that would require access from all neighborhoods to the proposed Active Transportation Plan network and the provision of trail network connections to community destinations.

Recommended changes ensure that:

- Subdivisions provide connectivity for pedestrians and bicyclists to adjacent ATP facilities and between adjacent neighborhoods. This is accomplished through a connected street network and, in some cases, cul-de-sac easements.
- Subdivisions provide an internal circulation plan that considers bicycle and pedestrian connectivity.
- Streets should be designed with appropriate bicycle and pedestrian accommodations to convey residents conveniently throughout the neighborhood, and to parks, schools, and/or shopping areas within the neighborhood.

TRAIL PROJECTS

The trail projects in Table 4 scored the highest in the ATP prioritization process. Details on the top six projects are included starting on page 10. The ATP's recommended trail network includes approximately 174 miles of trail, 94 river crossings, 331 street crossings, 34 highway crossings, and 25 railroad crossings. The cost opinion for implementation of the entire recommended trail network is \$714,500,000.

Trails Cost Assumptions

A 10-foot-wide concrete path is estimated to cost an average of \$1.9 million per mile based on observed trail cost estimates in Fort Worth, including the cost for design, right-of-way acquisition, and contingency. The citywide cost opinion for recommended trail projects also includes adjustments for recommended trails in floodplains and major crossings:

- In floodplain: +\$250,000
- In floodplain with one river crossing: +\$500,000
- In floodplain with two or more river crossings: +\$500,000 per 2,000 feet of trail in floodplain or +500,000 per river crossing, whichever total is less
- Street crossing: +\$250,000
- Highway crossing: +\$3,000,000
- Railroad crossing: +\$500,000

Project Prioritization

Recognizing that there are limited funds and resources for project implementation, the prioritization process used in the ATP provides information on which projects should be funded and implemented first. The ATP's data-driven prioritization process scored and ranked each project in the pedestrian, bicycle, and trails networks. The table below shows the weights for each factor used in the trail project prioritization.

Prioritization Factor	Description	Weight
Equity	Majority Minority Area, low-income populations, population of people with disabilities	30%
Spine Trail	On a Spine network alignment	30%
Connectivity	Intersects with an existing bikeway or trail	30%
Stakeholder Input	Interactive map priority	10%
Funding	20% funding from external sources	10% (bonus)
Feasibility	Evaluated through 30% design	10% (bonus)

Table 3. Prioritization factors and weights for trail projects.

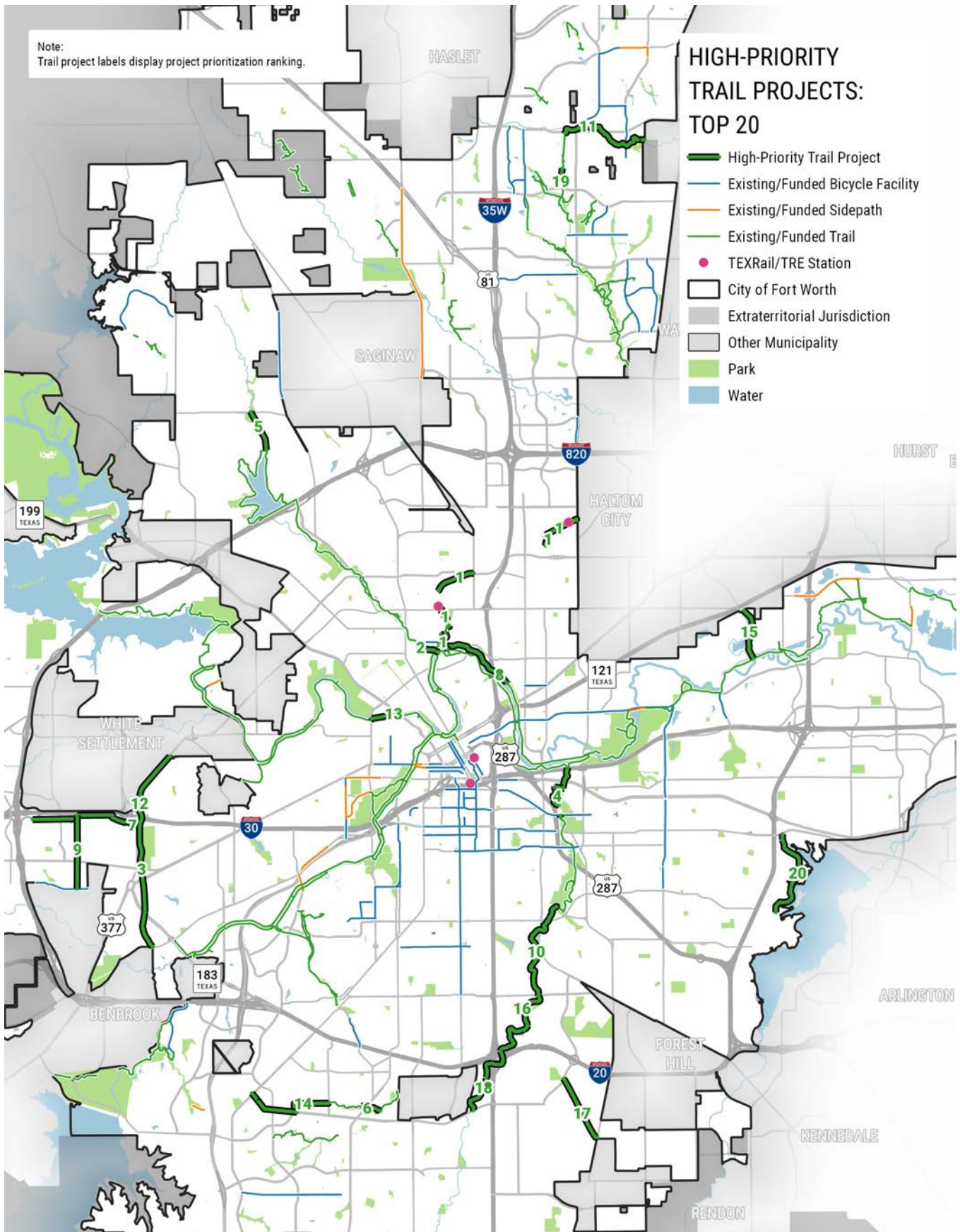


Figure 6. Top 20 trail projects

Priority Rank	Trail Name	From	To	Length (feet)	Cost Opinion
1	TEXRail Trail Segments	Trinity River (near Trail Drivers Park)	TEXRail Mercantile Center Station	14,054	\$14,000,000
2	Marine Creek Trail	23rd St	Trinity River Trail	2,547	\$2,200,000
3	Bomber Spur Trail (South Extension)	Calmont Ave	Vickery Blvd	12,916	\$21,100,000
4	Sycamore Creek Trail	I-30	Sycamore Park	6,118	\$14,200,000
5	Marine Creek Trail	Cromwell Marine Creek	Marine Creek Lake Trail	4,399	\$2,700,000
6	Krauss Baker Park/ Woodmont Park Trail Connection	Krauss Baker Park (McCart Ave)	Woodmont Park (Woodmont Trl)	1,974	\$1,900,000
7	Western Hills Oncor Trail North	Dale Ln	Calmont Ave (at SH 183)	11,466	\$7,100,000
8	Trinity Trail (North Bank)	Trinity River (near Trail Drivers Park)	Riverside Park (near Embrey Pl)	8,217	\$9,300,000
9	Western Hills Oncor Trail South	Calmont Ave (at Glenrock Dr)	Chapin Rd	7,265	\$11,300,000
10	Sycamore Creek Trail	Cobb Park (Old Mansfield Rd)	Carter Park (Seminary Dr)	11,982	\$11,800,000
11	Big Bear Creek Trail	Existing Trail (near Golden Triangle Blvd and Goldrush Dr)	Fort Worth/Keller City Limits	10,743	\$5,700,000
12	Bomber Spur Trail (North Extension)	Sherry Ln (Fort Worth/ Westworth Village City Limits)	Calmont Ave	8,512	\$12,800,000
13	Trinity Trail (North Bank)	University Dr	SH 199	2,999	\$7,100,000
14	Wedgwood Trail	Granbury Rd	Woodway Dr	10,043	\$8,900,000
15	Fossil Creek Trail	TX-121 (Fort Worth/Richland Hills City Limits)	Existing Trinity Trail	5,640	\$3,600,000
16	Sycamore Creek Trail	Seminary Dr	Fair Park Blvd	5,262	\$2,700,000
17	Altamesa Rail Trail	Campus Dr	Wichita St	7,154	\$4,800,000
18	Sycamore Creek Trail	Fair Park Blvd	Altamesa Blvd	13,862	\$21,800,000
19	Crawford Farms Park Trail Connection	Wexford Dr (Existing Trail)	Sinclair Park Trail (Existing Trail)	805	\$1,100,000
20	Lake Arlington Trail	Rosedale St	Berry St	10,436	\$4,100,000

Table 4. Top 20 priority trail projects and cost opinions.

Fort Worth Active Transportation Plan Priority Trail Project

#1: TEXRail Trail Connection

General Description

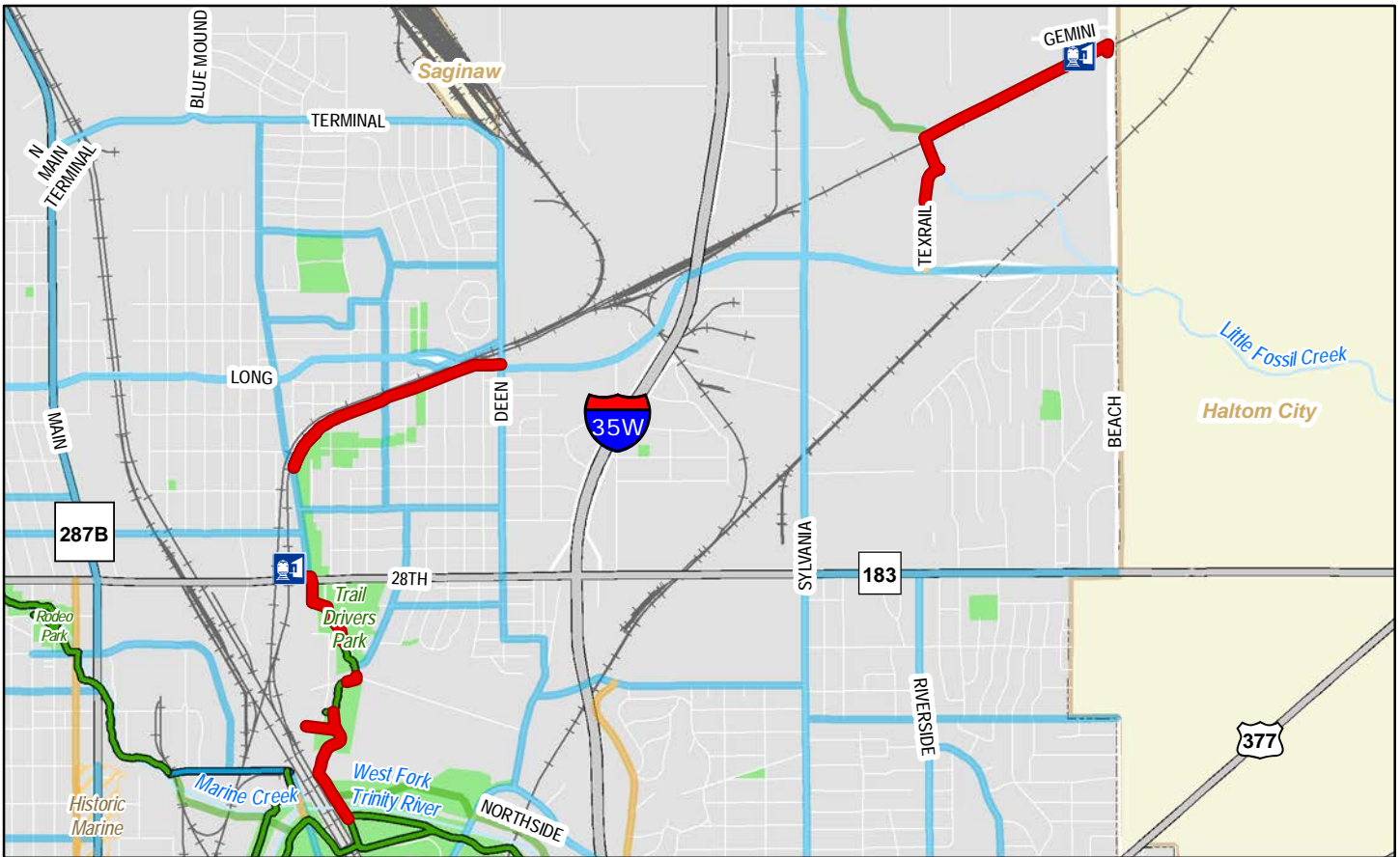
This trail would provide a shared-use trail connection between the existing Trinity River Trail near Trail Drivers Park to two TEXRail stations (North Side Station and Mercantile Center Station) via the TEXRail rail corridor and Long Avenue. It would connect to existing trail segments in Trail Drivers Park. On-street bicycle facilities along Decatur Ave and Long Ave would be necessary to create a continuous route. This project requires interagency coordination (TxDOT, rail).

Additional Project Considerations

- | | |
|--|---|
| <input type="checkbox"/> 1 Major Thoroughfare/ Highway Crossing(s) | <input type="checkbox"/> 2 Floodplain/ Estimated Stream Crossing(s) |
| <input type="checkbox"/> 1 Rail Crossing(s) | <input checked="" type="checkbox"/> Connects to Existing Trail System |
| <input checked="" type="checkbox"/> Interjurisdictional Connection | |

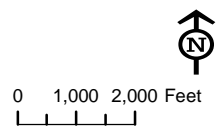
Project Characteristics

Trail Name/Location		TEXRail Trail
Project Limits	From	Trinity River Trail (near Trail Drivers Park)
	To	TEXRail Mercantile Center Station
Length (mi)		2.7 (trail segments only)
Facility Type		Trail
Proposed Veloweb		Yes
Project Status		Proposed Alignment
Estimated Project Cost		\$14,000,000*
Funding Source		TBD
Major Destinations		<ul style="list-style-type: none"> Trinity Trails Trail Drivers Park North Side Station Mercantile Center Station City of Haltom City (future trail connection)



- | | | | |
|---|---|---|---|
| █ Priority Trail Project | █ Existing and Funded Facilities | Urban Villages | Public Park |
| █ Proposed Facilities | █ Trail | City of Fort Worth | Water |
| █ Bicycle Facility | █ Sidepath | Other Cities | █ River |
| █ Sidepath | █ Bicycle Facility | █ TexRail Stations | + Rail |
| █ Trail | █ Natural Surface Trail | | |

*Estimate does not include cost for on-street facility connections



Fort Worth Active Transportation Plan Priority Trail Project

#2: Marine Creek Trail Connection

General Description

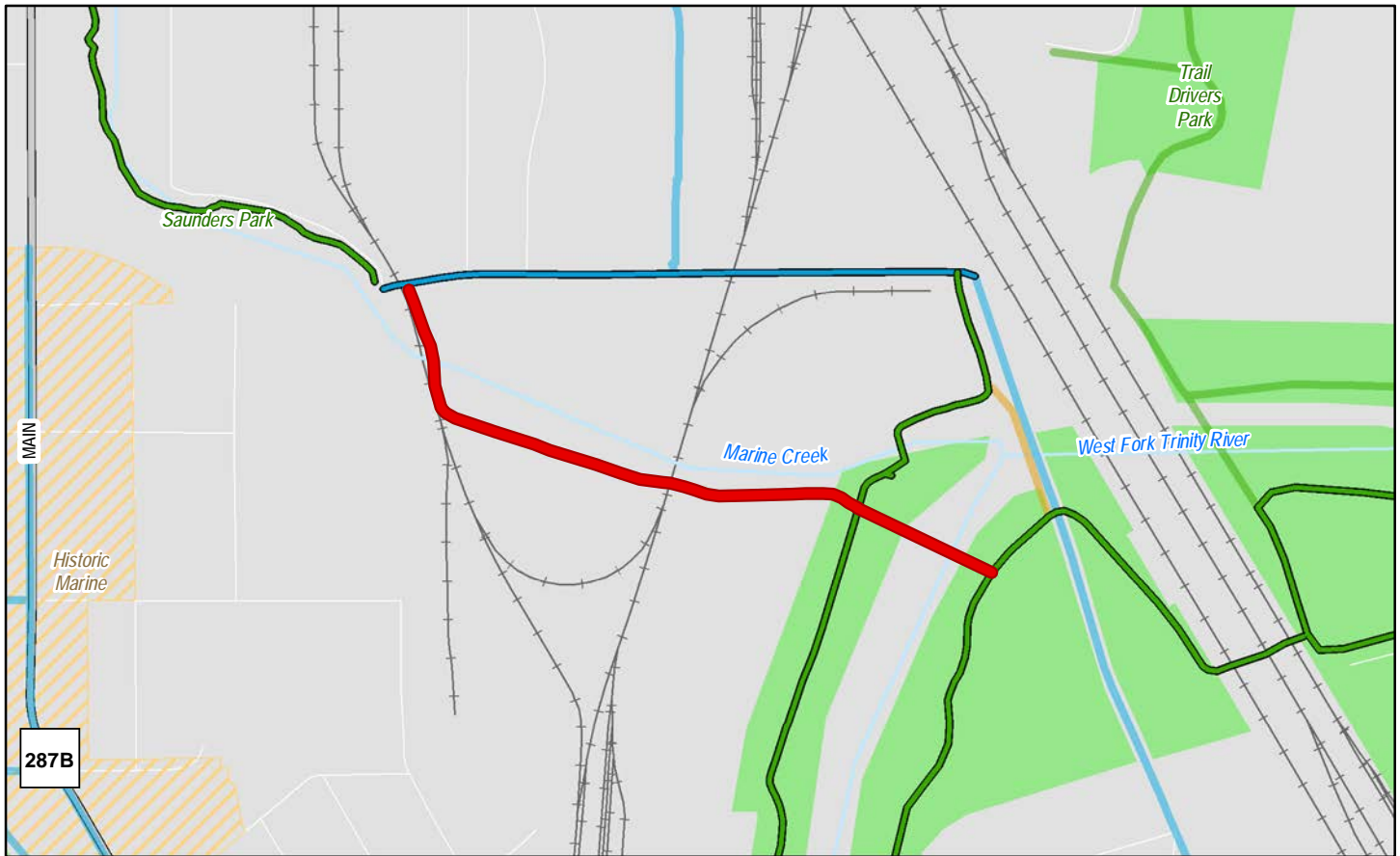
This trail would complete a shared-use trail connection between the southern end of the existing trail through Saunders Park in the Stockyards District and the Trinity Trails. This connection would primarily follow the Marine Creek waterway. This project requires interagency coordination (rail).

Additional Project Considerations

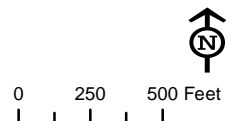
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| <input checked="" type="checkbox"/> 1 Rail Crossing(s) | <input checked="" type="checkbox"/> Connects to Existing Trail System |
| <input type="checkbox"/> Interjurisdictional Connection | |

Project Characteristics

Trail Name/Location	Marine Creek Trail Connection	
Project Limits	From	23rd Street (near the Stockyards)
	To	Trinity Trails
Length (mi)	0.5	
Facility Type	Trail	
Proposed Veloweb	Yes	
Project Status	Proposed Alignment	
Estimated Project Cost	\$2,200,000	
Funding Source	TBD	
Major Destinations	<ul style="list-style-type: none"> Fort Worth Stockyards Trinity Trails 	



- | | | | |
|-------------------------------|---------------------------------------|--------------------|-------------|
| Priority Trail Project | Existing and Funded Facilities | Urban Villages | Public Park |
| Proposed Facilities | Trail | City of Fort Worth | Water |
| Bicycle Facility | Sidepath | Other Cities | River |
| Sidepath | Bicycle Facility | TexRail Stations | Rail |
| Trail | Natural Surface Trail | | |



Fort Worth Active Transportation Plan Priority Trail Project

#3: Bomber Spur Trail

General Description

This trail would complete the southern extension of the Bomber Spur Trail from the Ridgmar Mall area near I-30 to Vickery Boulevard and the City of Benbrook. This project would connect to the existing Trinity River trails via a planned on-street bicycle facility on Vickery Boulevard. This alignment primarily utilizes the former Bomber Spur rail corridor. This project requires interagency coordination (TxDOT).

Project Characteristics

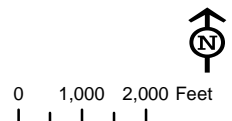
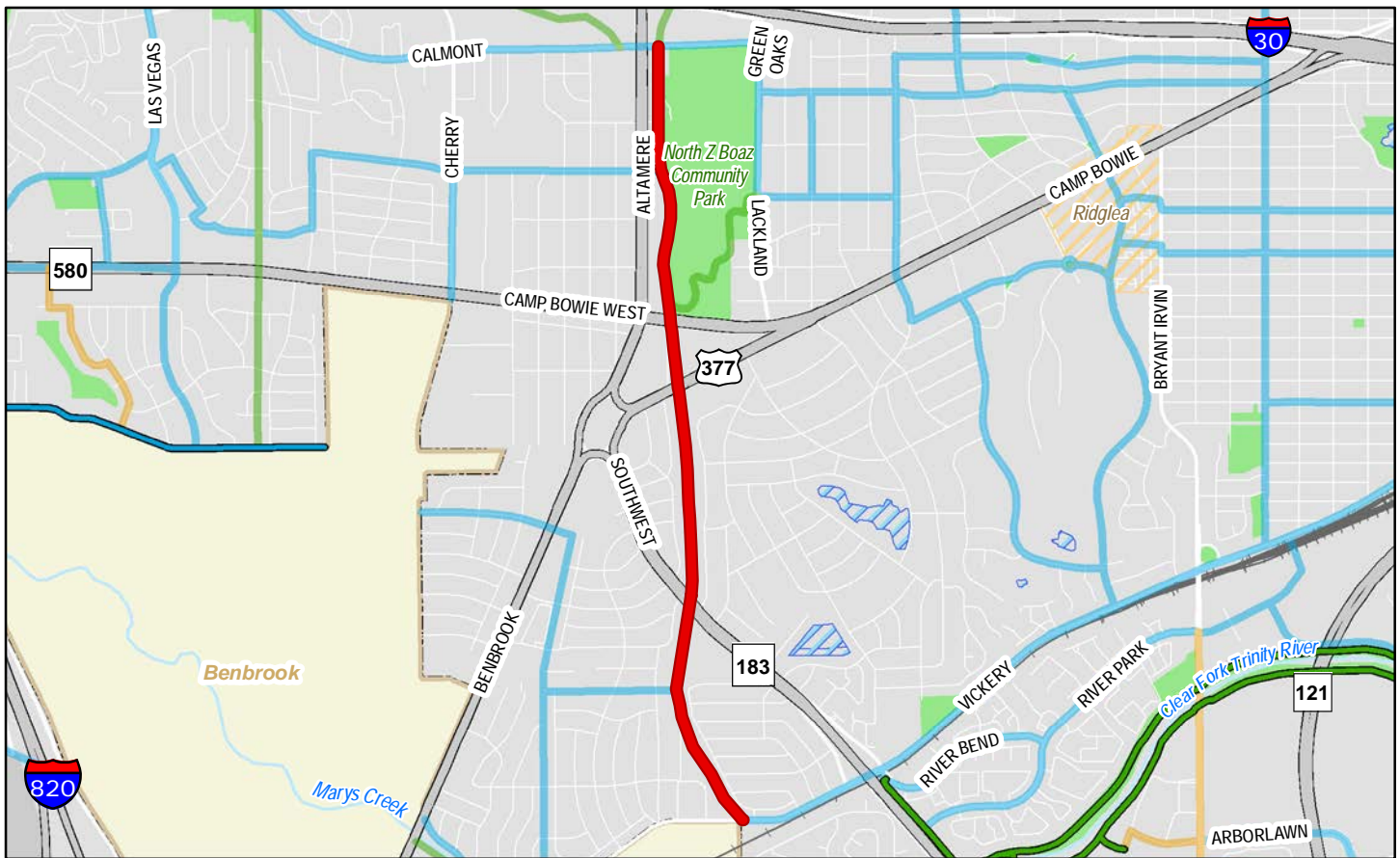
Trail Name/Location	Bomber Spur Trail	
Project Limits	From	Calmont Ave
	To	Vickery Blvd
Length (mi)	2.4	
Facility Type	Trail	
Proposed Veloweb	Yes	
Project Status	Proposed Alignment	
Estimated Project Cost	\$21,100,000	
Funding Source	TBD	

Additional Project Considerations

- | | |
|---|---|
| <input checked="" type="checkbox"/> Major Thoroughfare/ Highway Crossing(s) | <input type="checkbox"/> Floodplain/ Estimated Stream Crossing(s) |
| <input type="checkbox"/> Rail Crossing(s) | <input type="checkbox"/> Connects to Existing Trail System |
| <input checked="" type="checkbox"/> Interjurisdictional Connection | |

Major Destinations

- Ridgmar Mall area
- North Z Boaz Community Park
- City of Benbrook



Fort Worth Active Transportation Plan Priority Trail Project

#4: Sycamore Creek Trail

General Description

This trail would provide a shared-use trail connection between the existing Trinity River Trail north of I-30 (near Beach Street) and the existing trail in Sycamore Park. This project requires interagency coordination (TxDOT, rail).

Project Characteristics

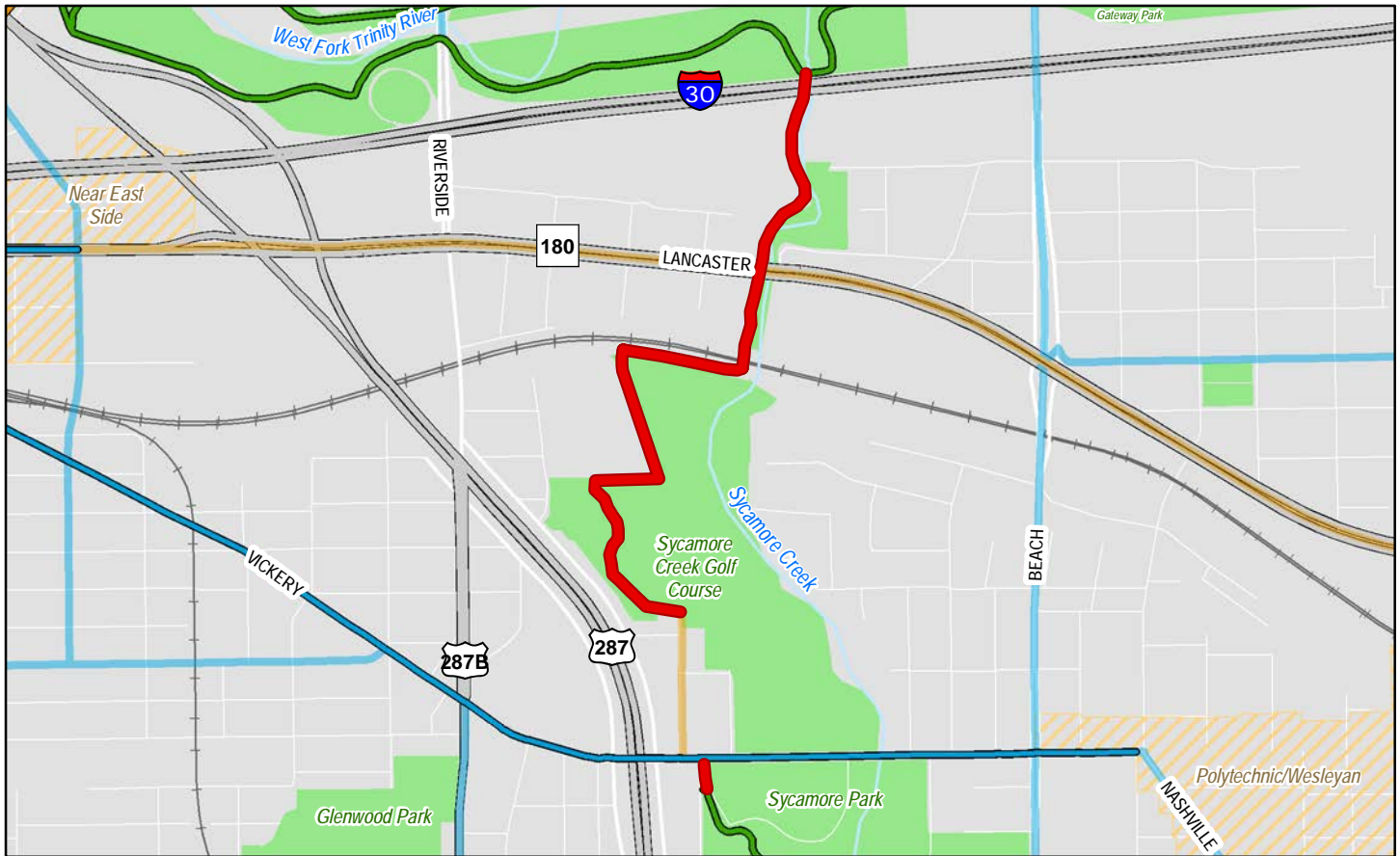
Trail Name/Location	Sycamore Creek Trail	
Project Limits	From	Trinity River Trail
	To	Sycamore Park
Length (mi)	1.2	
Facility Type	Trail	
Proposed Veloweb	Yes	
Project Status	Proposed Alignment	
Estimated Project Cost	\$14,200,000*	
Funding Source	TBD	

Additional Project Considerations

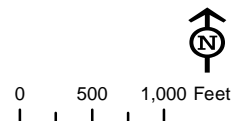
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| <input checked="" type="checkbox"/> 2 Rail Crossing(s) | <input checked="" type="checkbox"/> Connects to Existing Trail System |
| <input type="checkbox"/> Interjurisdictional Connection | |

Major Destinations

- Trinity Trails
- Sycamore Park



Priority Trail Project	Existing and Funded Facilities	Urban Villages	Public Park
Bicycle Facility	Trail	City of Fort Worth	Water
Sidepath	Sidepath	Other Cities	River
Bicycle Facility	Bicycle Facility	TexRail Stations	Rail
Trail	Natural Surface Trail		



*Estimate does not include cost for on-street facility connections

Fort Worth Active Transportation Plan Priority Trail Project #5: Marine Creek Trail

General Description

This trail would provide a shared-use trail connection from the existing Marine Creek Lake Trail and the Tarrant County College - Northwest Campus Area north to Cromwell Marine Creek Road. This trail extension would add connectivity near the Northwest Branch Library, as well as a number of local schools and existing neighborhoods.

Project Characteristics

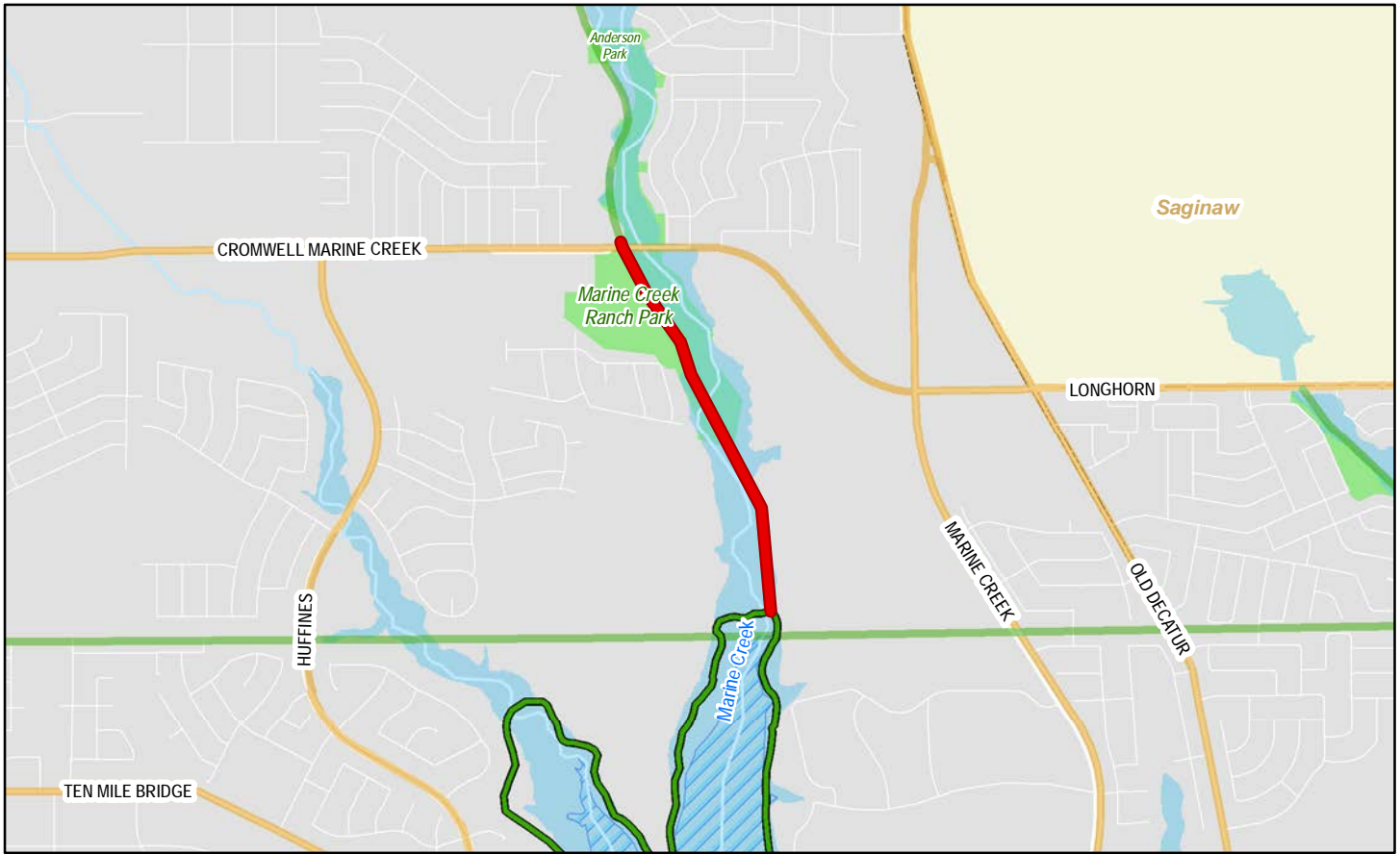
Trail Name/Location	Marine Creek Trail	
Project Limits	From	Cromwell Marine Creek Road
	To	Marine Creek Lake Trail
Length (mi)	0.8	
Facility Type	Trail	
Proposed Veloweb	Yes	
Project Status	Proposed Alignment	
Estimated Project Cost	\$2,700,000	
Funding Source	TBD	

Additional Project Considerations

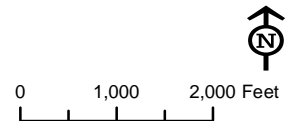
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| <input checked="" type="checkbox"/> 1 Major Thoroughfare/ Highway Crossing(s) | <input type="checkbox"/> 1 Floodplain/ Estimated Stream Crossing(s) |
| <input type="checkbox"/> Rail Crossing(s) | <input checked="" type="checkbox"/> Connects to Existing Trail System |
| <input type="checkbox"/> Interjurisdictional Connection | |

Major Destinations

- Northwest Branch Library
- Marine Creek Lake
- Tarrant County College - Northwest Campus Area



- | | | | |
|----------------------------|---------------------------------------|--------------------|-------------|
| Priority Trail Project | Existing and Funded Facilities | Urban Villages | Public Park |
| Proposed Facilities | Trail | City of Fort Worth | Water |
| Bicycle Facility | Sidepath | Other Cities | River |
| Sidepath | Bicycle Facility | TexRail Stations | Rail |
| Trail | Natural Surface Trail | | |



Fort Worth Active Transportation Plan Priority Trail Project

#6: Krauss Baker Park/Woodmont Park Trail Connection

General Description

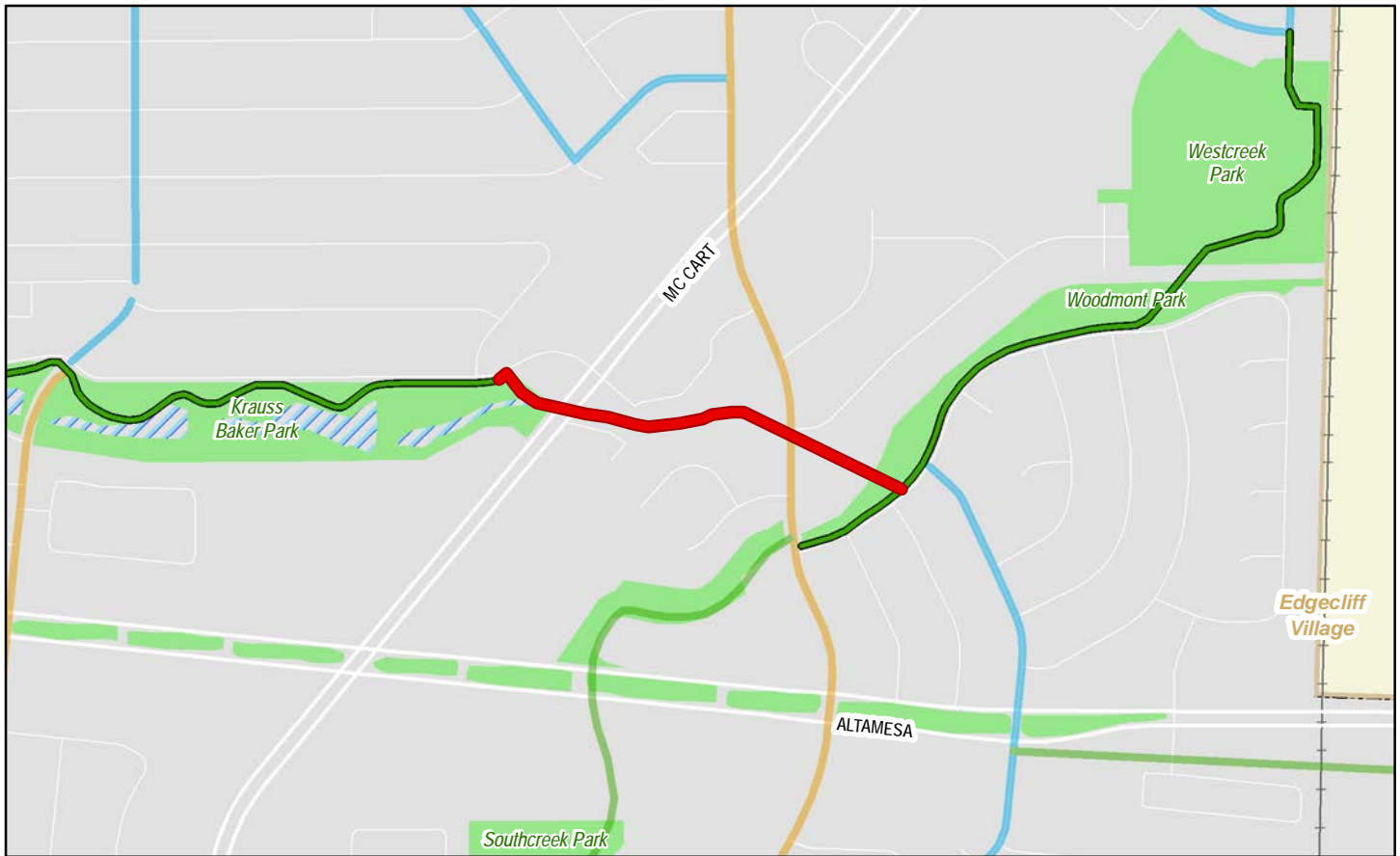
This trail would provide a shared-use trail connection between the existing trail in Krauss Baker Park to the existing trail in Woodmont Park.

Project Characteristics

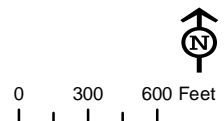
Trail Name/Location		Krauss Baker Park/Woodmont Park Trail Connection
Project Limits	From	Krauss Baker Park (near McCart Ave)
	To	Woodmont Park (near Woodmont Trl)
Length (mi)		0.4
Facility Type		Trail
Proposed Veloweb		Yes
Project Status		Proposed Alignment
Estimated Project Cost		\$1,900,000
Funding Source		TBD
Major Destinations		<ul style="list-style-type: none"> Krauss Baker Park Woodmont Park

Additional Project Considerations

- | | |
|--|--|
| <input type="checkbox"/> 2 Major Thoroughfare/ Highway Crossing(s) | <input checked="" type="checkbox"/> Floodplain (no estimated stream crossings) |
| <input type="checkbox"/> Rail Crossing(s) | <input checked="" type="checkbox"/> Connects to Existing Trail System |
| <input type="checkbox"/> Interjurisdictional Connection | |



- | | | | |
|-------------------------------|---------------------------------------|--------------------|-------------|
| Priority Trail Project | Existing and Funded Facilities | Urban Villages | Public Park |
| Proposed Facilities | Trail | City of Fort Worth | Water |
| Bicycle Facility | Sidepath | Other Cities | River |
| Sidepath | Bicycle Facility | TexRail Stations | Rail |
| Trail | Natural Surface Trail | | |



TRAIL DESIGN TOOLBOX

Introduction

The Trail Design Toolbox describes the design criteria that the Fort Worth Active Transportation Plan recommends for trails that run in an independent right-of-way. This toolbox is divided into three sections:

1. Trail Network Classifications
 - A. Spines
 - A. Ribs
 - A. Local Trails
2. Trail Amenity Accommodation Checklist
3. Trail Design Best Practices
 - A. Trailheads
 - A. Creating Trail Identity
 - A. Lighting
 - A. Signage & Wayfinding
 - A. Intersections & Crossings

To guide the future development of trails in Fort Worth, a range of design standards have been developed to accommodate different conditions based on the current or anticipated level of activity and user type. Providing a range takes into account the many constraints and particularities of varying trail settings. This flexible approach to trail design aims to maintain superior standards and ensures that all users can feel comfortable using active transportation facilities all over the City of Fort Worth.



Figure 7. Trail system map sign. (Photo: City of Fort Worth)



Figure 8. Share the trail signs. (Photo credit: Kimley-Horn and Associates)



Figure 9. Map under bridge along the Clearfork Branch of Trinity Trails. (Photo credit: Kimley-Horn and Associates)

Trail Classifications

Trail classifications bring a context-sensitive approach that uses the anticipated function to inform how the trail should be designed. The trail network was designed by classifying all trails into three categories:

- Spines
- Ribs
- Local Trails

Trails classified as Spines act as the primary backbone for the network and largely incorporate the Regional Veloweb network. They emphasize long-distance connectivity and create major cross-town connections.

Branching off of the spine trails are the Ribs. The primary purpose of these trails is to connect spine trails to neighborhoods and make non-regional connections.

Local Trails are the final network level and make the last-mile connections to destinations and neighborhoods.



Figure 10. Welcome sign at River Park. (Photo credit: Kimley-Horn and Associates)



Figure 11. Decorative statue along the Clearfork Branch of Trinity Trails. (Photo credit: Kimley-Horn and Associates)

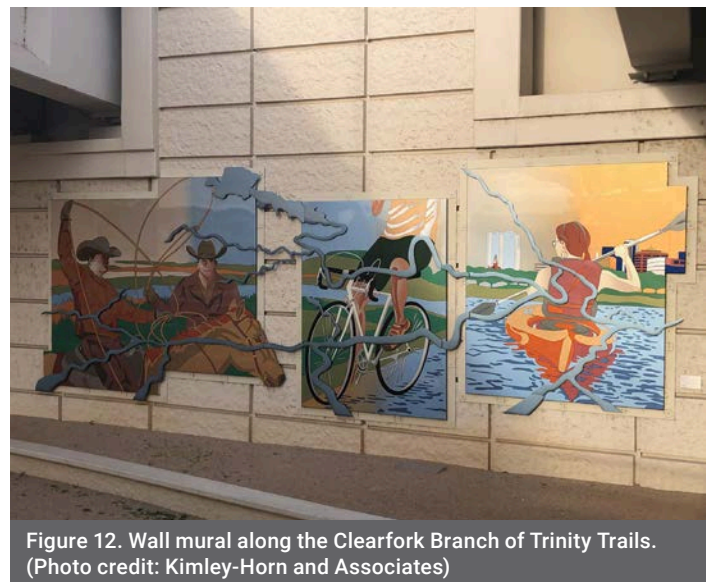
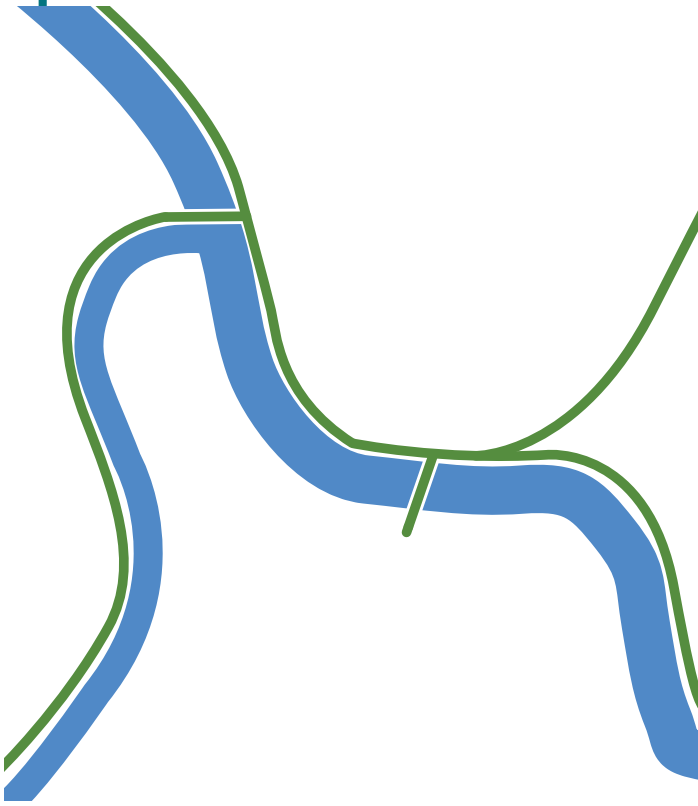


Figure 12. Wall mural along the Clearfork Branch of Trinity Trails. (Photo credit: Kimley-Horn and Associates)

Network Classifications: Spines



Description

Spine trails are the highest level of trail classification. They make regional connections and accommodate large volumes of users.

Design

The standard width of a spine should ideally be between 12 and 16 feet. The width may go down to 10 feet in constrained conditions. An operational study should be conducted to determine the appropriate width of trails based on context and projected volume of users. Since spine trails need to be able to serve large volumes of users, and potentially emergency vehicles, the recommended surface material is Portland cement concrete.

The following design elements, including shoulder width, vertical clearance, maximum cross slope, and maximum grade for spine trails, were all determined according to AASHTO design recommendations.

Design Elements

Standard Width	12' – 16'
Minimum Width	10'
Easement Width	25' – 35' Depending on width of trail
Surface Material	Concrete
Shoulder Width	3'
Horizontal Clearance	2'
Vertical Clearance	10' 12' for emergency vehicles
Maximum Cross Slope	2%
Maximum Grade	5%
Design Speed	18 mph
Pavement Thickness	5" 6" for PARD 6" for TRWD

Dual-Track Alternative

If a trail consistently has higher volumes of users, there may be a need to separate wheeled users from pedestrians. In these cases, a spine may be designed as a dual-track path. This design dedicates 10 feet of width to bicyclists and 5 feet to pedestrians.

Centerline striping, directional arrows, and mode symbols should be used on spines where directions and modes are separated. Centerlines can be painted or represented by a change in surface.

Traffic Calming

If bicyclists regularly ride at speeds that reduce comfort or safety for other users, traffic calming techniques can be applied: speed limit signs, slow zones, center islands, and chicanes.

Network Classifications: Ribs



Design Elements

Standard Width	10' – 12'
Minimum Width	10'
Easement Width	25'
Surface Material	Concrete or Asphalt
Shoulder Width	2'
Vertical Clearance	10'
Maximum Cross Slope	2%
Maximum Grade	5% 8.33% for segments <200'
Design Speed	18 mph

Description

Trails classified as ribs provide important connections, dispersing spine traffic out to their final destinations.

Design

The standard width of a rib trail is 12 feet with 10 feet as a minimum. The surface material of rib trails can be either concrete or asphalt, depending on the local context.

The following design elements, including shoulder width, vertical clearance, maximum cross slope, and maximum grade for rib trails, were all determined according to AASHTO design recommendations.

Network Classifications: Local Trails



Design Elements

Standard Width	10'
Minimum Width	8'
Easement Width	20'
Surface Material	Concrete (preferred), Asphalt, or Limestone
Shoulder Width	Optional
Vertical Clearance	10'
Maximum Cross Slope	2%
Maximum Grade	5 – 8.33% for <200' or 8.33 – 10% for <30'
Design Speed	15 mph

Description

Local trails serve as the final connection to common destinations for bicyclists. Destinations may include anything from a local neighborhood to downtown. These trails may be narrower than spine and rib trails because they tend to have lower user volumes.

Design

On local trails, the preferred width is 10 feet, and the minimum width is 8 feet. Concrete is the preferred material in most contexts, but asphalt, crushed limestone or other materials may be used at the direction of the appropriate City agency. Default to the relevant agency design standards.

The shoulder width, vertical clearance, maximum cross slope, and maximum grade for local trails were all determined according to AASHTO design recommendations.

Trail Amenity Checklist

Recommended Amenities

Trail amenities are essential for improving user experience and enhancing trail safety. **The following list of amenities are recommended on all trails in Fort Worth:**

- **Bicycle Parking** allows trail users to safely park their bicycles if they wish to stop along the way, particularly at parks and other destinations.
- **Maps and Wayfinding** allow users to navigate the trail system. Information kiosks with maps at trailheads and wayfinding signs can provide all the information that someone would need to use the trail system to reach key destinations. The Trinity Trails App provides information on the location of restrooms, 911 signs, trail parking, and kayak launch sites.
- **Pedestrian-Scale Lighting** improves safety by providing night-time visibility and the perception of security. Lighting allows the trail to be used throughout the evening.
- **Reference Location Markers** communicate the trail name and reference location in miles approximately every 1,000 feet. This includes 911 emergency markers.
- **Trash Receptacles and Dog Waste Pick-Up Stations** help keep the trails clean and litter free. Periodic containers at access points should be provided, and regularly trash collection service is key.
- **Fix-It Stations** provide basic tools that can be used to address common repair problems that may occur during a bike ride.



(Photo credit: Kimley-Horn and Associates)



(Photo credit: Kimley-Horn and Associates)



(Photo credit: City of Fort Worth)



Fort Worth Bike Sharing Station at a Trailhead.
(Photo credit: Kimley Horn and Associates)



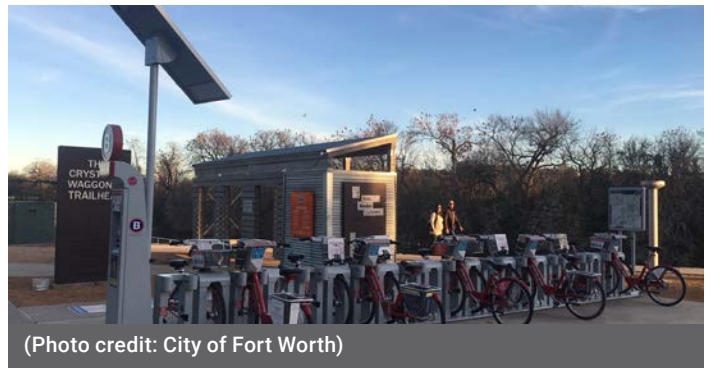
(Photo credit: Kimley-Horn and Associates)

Figure 13. Trail Amenities in Fort Worth.

Optional Amenities

The following trail enhancements are provided in strategic locations and can further enhance trail users' comfort and safety.

- **Art Installations** make a trail system distinct and can reflect local culture or history.
- **Bike Share** bicycles are made available for shared use on a short-term basis for the cost of a daily or annual membership fee. Fort Worth Bike Sharing provides stations across the central city of Fort Worth.
- **Drinking Fountains** provide drinking water for people (and pets in some cases).
- **Trailhead Maps** provide trail users with information and the rules of the trail. A legible trail system map with a “you are here” marker is helpful for orientation.
- **Landscaping** should consider practical and aesthetic appeal, including trees for shade and native, low-maintenance plants.
- **Restrooms** shall be ADA accessible and are particularly appropriate at major trailheads. There are also many existing restrooms in City parks along trail routes.
- **Shade Pavilions** give trail users a respite from the sun and weather. Shade pavilions should include furniture for trail users to take a break or have a picnic.
- **Trail Furniture** encourages people of all ages to use the trail by ensuring that they have a place to rest along the way. Benches can be provided at rest areas and viewpoints, as well as periodically along longer routes.



(Photo credit: City of Fort Worth)



(Photo credit: Kimley-Horn and Associates)



(Photo credit: Tarrant Regional Water District)



(Photo credit: City of Fort Worth)



(Image: Tarrant Regional Water District)

Figure 14. Examples of optional amenities in Fort Worth.

Trail Design Best Practices

Trailheads

It is important that trails are designed to be accessed at multiple points.

Long stretches of trail with no access points can feel isolated to users. More access points and intersections also increase a sense of security because they create moments of visibility and permeability between the trail and surrounding uses. They also provide opportunities for people to exit the trail if they suddenly feel unsafe. Access points should be no more than $\frac{1}{4}$ mile to a $\frac{1}{2}$ mile apart, and placement of access points should take into consideration the nearby on-street transportation network, transit stops, bike share stations, and points of interest. Access points should provide adequate signage and wayfinding, though they do not all need to be designed as trailheads.



Figure 15. Proposed Marine Creek Public Art Space (Source: Confluence: The Trinity River Strategic Master Plan)



Figure 16. Proposed University Drive Trail Bridge (Source: Confluence: The Trinity River Strategic Master Plan)



Figure 17. Coffee Shop Cart at the Clearfork trailhead. (Photo: Kimley-Horn Associates)



Figure 18. Stock Yards Entrance Sign (Photo: Kimley-Horn Associates)

Creating Trail Identity

Trails are a source of community identity and pride. These effects are magnified when communities use trails to highlight and provide access to historic and cultural resources. Many trails themselves preserve historically significant transportation corridors.

The City of Fort Worth has a rich historical background that can be incorporated into many different trail projects such as the Trinity Trails, the Bomber Spur, and the Cotton Belt Trail. Incorporating a unified vision and character into a trail's design can help transform trails from basic transportation corridors into cherished community gathering places.

Lighting Placement

Trail lighting is recommended at the following locations:

- Under vehicular bridges, underpasses, tunnels, or locations with limited visibility
- Along bridges used by bicycles and pedestrians
- Along routes or trail segments where frequent evening or nighttime use is anticipated
- On routes that are within ¼ mile from Trinity Metro transit stations, near schools and major employers
- Along high-use portions of trails that lead to areas with frequent evening events
- At trail intersections with roadways or driveways where crossing is required
- At major trail entrances/trailheads



Figure 19. Sidepath Lighting in Burlington, VT.
(Photo: Toole Design)

Other Factors

Other factors to consider when planning lighting elements for a trail include:

- Limit lighting in natural and undeveloped areas to mitigate environmental disturbance, or use light fixtures designed to minimize negative impacts
- Consider timed lighting for commuting (e.g. evening and early dawn)
- Consider other needs of users related to nighttime and evening use (e.g., security measures)
- Include signage or information for trail users to notify the City if a light is out or damaged
- Artificial nighttime lighting should be turned off after curfew along riparian corridors and other less-developed areas.
- Trail lighting is not permitted on Oncor easement alignments

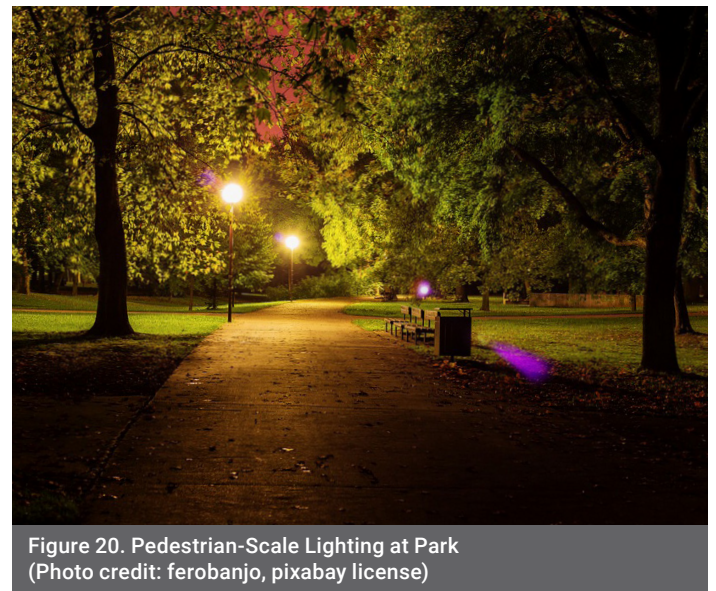


Figure 20. Pedestrian-Scale Lighting at Park
(Photo credit: ferobanjo, pixabay license)

Signage and Wayfinding

Appropriate and helpful signage is essential to making users comfortable along extensive trail systems. The elements of a well-designed signage system include:

- Uniformity and Design
- Legibility
- Placement
- Safety
- Communication
- Awareness



Figure 21. Example of Wayfinding Sign in Fort Worth.
(Photo Credit: City of Fort Worth)

Design Factors

Uniformity and Design

City staff and stakeholders should work together to create a streamlined design for wayfinding signs that allows trail users to easily identify, understand, and navigate the network.

Legibility

The shape, size, text, and icons on a sign should be legible for users of all ages and for both locals and visitors. They should also be easy to understand for English and non-English speakers, as well as visually impaired people. For important messages conveyed by text, consider including a Spanish translation.

Placement

Signs should be placed at entrances, intersections, and at forks in the trails to inform and guide trail users. Such signage aims to inform users of all directional options, nearby destinations, and attractions.

Communication

Signage should convey distance, direction, and destination. Trail etiquette signage conveys appropriate speed and “keep right, pass left” messages.

Awareness

In order for more people to use the trails, they need to know that they exist, where they are located, and how to access them. Better wayfinding and signage can attract more users.

Intersections and Crossings

It is important to properly design crossings to provide the safest situation for all users. Poorly designed or regulated crossings can lead to people disregarding traffic control measures, which reduces safety for everyone. The sign types, pavement markings, and crossing types will depend on the local conditions at each crossing.

Mid-Block Roadway Crossings

Mid-block trail crossings should be properly signed and marked. The crossing should be perpendicular to the street to minimize the crossing length. The approaching path can also have a horizontal curve in advance of the crossing to help slow down trail users as they approach. Mid-block crossings are not recommended on roadways with posted speeds of 40 MPH or greater unless a signal is installed.

Trail Bridges and Underpasses (Grade-Separated Crossings)

Bridges and underpasses are permitted when grade separation is needed for crossing a roadway or railroad, or when the natural topography cannot accommodate trail requirements such as streams or hills.

Bridges should be at least 1-2 feet wider than the trail on each side to allow users to stop without obstructing the trail and to provide a clearance for bicyclists from the adjacent railings.

When designing a trail to accommodate bicycles across a high bridge, such as a bridge that goes over a body of water or major roadway, railing should be provided. AASHTO recommends a railing height of 42" – 48" depending on the site location. The railing design should also consider sight lines of pedestrians and bicyclists. Bridge approaches and span should not exceed 5% slope ADA access. Underpasses should be built to allow a vertical clearance of at least 10 feet.

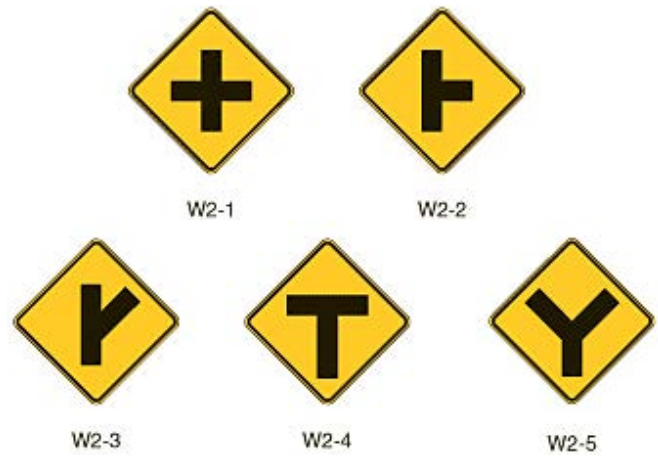


Figure 22. MUTCD signs W2-1, 2, 3, 4, and 5

Refer to the 2019 Fort Worth Traffic Engineering Manual (TEM) for further guidance on bicycle facility design on bridges.

Multi-Use Trail

Users should be given adequate advance notice of intersections between two trails. Advanced warning signs, such as the MUTCD Intersection Warning signs (See Figure 15) or directional signs should be placed near the intersection. Advanced warning signs should be placed a minimum of 50 feet from the crossing and directional signs could be placed on the corners. The crossing paths should try to be aligned at a 90-degree angle when possible. The line of sight as the two trails converge should be kept clear of obstructions. Roundabout style intersections are also permitted as an alternative.

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Fort Worth Active Transportation Plan
TRAIL EXECUTIVE SUMMARY
April 2019



North Central Texas
Council of Governments