

Fort Worth Active Transportation Plan

April 2019



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North Central Texas
Council of Governments

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Introduction



About the Fort Worth Active Transportation Plan

The Fort Worth Active Transportation Plan (ATP) serves as an update to the 2010 Bike Fort Worth Plan and the 2014 Walk Fort Worth Plan, and it is Fort Worth’s first ever citywide trails master plan. Active transportation includes walking, bicycling, wheelchair use, and all non-motorized means of travel for transportation and recreation. Each of these elements supports access to the city’s transit network.

The ATP provides a shared vision for active transportation priorities and a comprehensive framework for implementation. It identifies the priority infrastructure network for citywide and regional active transportation travel, placing an emphasis on local, short trips and connections to transit. It also includes policy recommendations, performance measures to guide investments and accountability, and prioritized project lists with cost opinions.

ATP Vision

The following statement, derived from extensive public and stakeholder input, identifies the vision of the ATP. The vision provides the framework for policy recommendations:

*The Fort Worth Active Transportation Plan aims to create a **regionally coordinated and locally connected** bicycle and pedestrian system that provides a **safe, comfortable, accessible, and equitable network** of trails, sidewalks, and on-street bicycle facilities for people of all ages and abilities that encourages a **healthy lifestyle, economic development**, and increases **community awareness and funding** for alternative modes of transportation.*

“ If we are to improve our city, we must think big—initiate our own changes and assume the leadership that is our responsibility. ”

—Phyllis J. Tilley
 Founder, Streams & Valleys

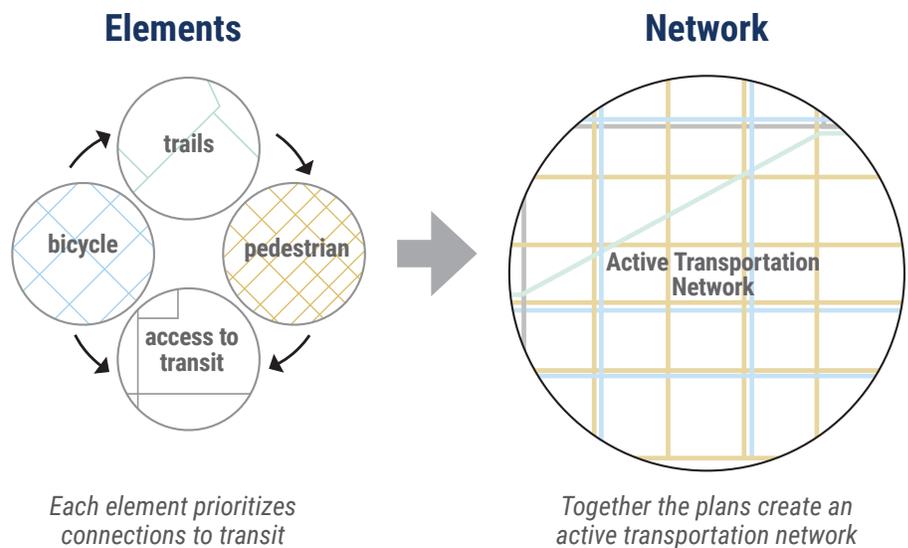


Figure 1. The Fort Worth Active Transportation Plan (ATP) serves as an update to the Bike Fort Worth Plan and the Walk Fort Worth Plan, and it is Fort Worth’s first ever citywide trails master plan. Each of these elements supports access to the city’s transit network. “Access to transit” refers to a priority woven into all of the modal networks.

Plan Objectives

The objectives listed below will help to achieve the vision described on the previous page and are expanded upon in the subsequent chapters.

- 1** Identify a seamless citywide network of on- and off-street bicycle and pedestrian facilities for people of all ages and abilities to walk, access transit, and bicycle. *See Chapter 3.*
- 2** Develop a level of comfort analysis for walking and bicycling in Fort Worth. *See Chapter 3.*
- 3** Update the Bike Fort Worth and Walk Fort Worth plans, and serve as the citywide trails master plan. *See Chapter 3 and the Trails Master Plan Executive Summary.*
- 4** Develop principles and criteria for network alternatives. *See Chapter 3 and the Network Planning Approach Memorandum.*
- 5** Recommend policies, performance measures, and design guidelines. *See Chapter 5, the Fort Worth Facility Selection Guide and Design Toolkit.*
- 6** Prioritize trail, bicycle, and pedestrian projects. *See Chapter 4.*
- 7** Develop an implementation and funding plan. *See Chapters 4 and 5.*

Navigating the Plan

The ATP is organized as follows:

Executive Summary – Brief summary of ATP recommendations.

Chapter 1. Introduction – Description of plan vision, objectives, coordination, and process.

Chapter 2. Existing Conditions Summary – Overview of existing conditions and findings.

Chapter 3. Network Development and Analysis – Discussion of network priorities, structures, inputs and analyses, and network maps.

Chapter 4. Prioritization, Projects, and Cost Opinions – Description of how projects were identified and prioritized, with priority project lists, maps, and cost estimates.

Chapter 5. Policies and Procedures – Recommended policies, performance measures, project lists and maps, network maps, partners, and funding strategies.

Appendices, Reports, and Memoranda

1. Existing Conditions Report
2. Public Engagement Process and Findings
3. Pedestrian Experience Index (PEI) Methodology Memorandum
4. Level of Traffic Stress (LTS) Analysis Methodology Memorandum
5. Network Planning Approach Memorandum
6. Trails Master Plan Executive Summary

Guides

ATP Design Toolbox and Facility Selection Guide – Information on the design of active transportation facilities and identifying the appropriate facility for the roadway context.

Pop-Up Projects: A Community Guide for Fort Worth – Information on community-driven demonstration projects.

Coordination Between City Planning and Design Documents

The process of planning, designing, and implementing the active transportation network involves identifying priority locations, selecting the appropriate improvement-type, and following the City’s standards for facility design. There are several resources that should be used to complete these steps. *See Table 1.*

Step	Resource
1 Identify location for facility	ATP Network Maps and Project Lists
2 Choose facility type	ATP Facility Selection and Design Guide and Fort Worth Master Thoroughfare Plan (MTP) [MTP supercedes the ATP.]
3 Design Project	City of Fort Worth Traffic Engineering Manual

Table 1. Building the Active Transportation Network involves using the resources in this table to identify and evaluate locations, chose facility types, and design and implement projects.

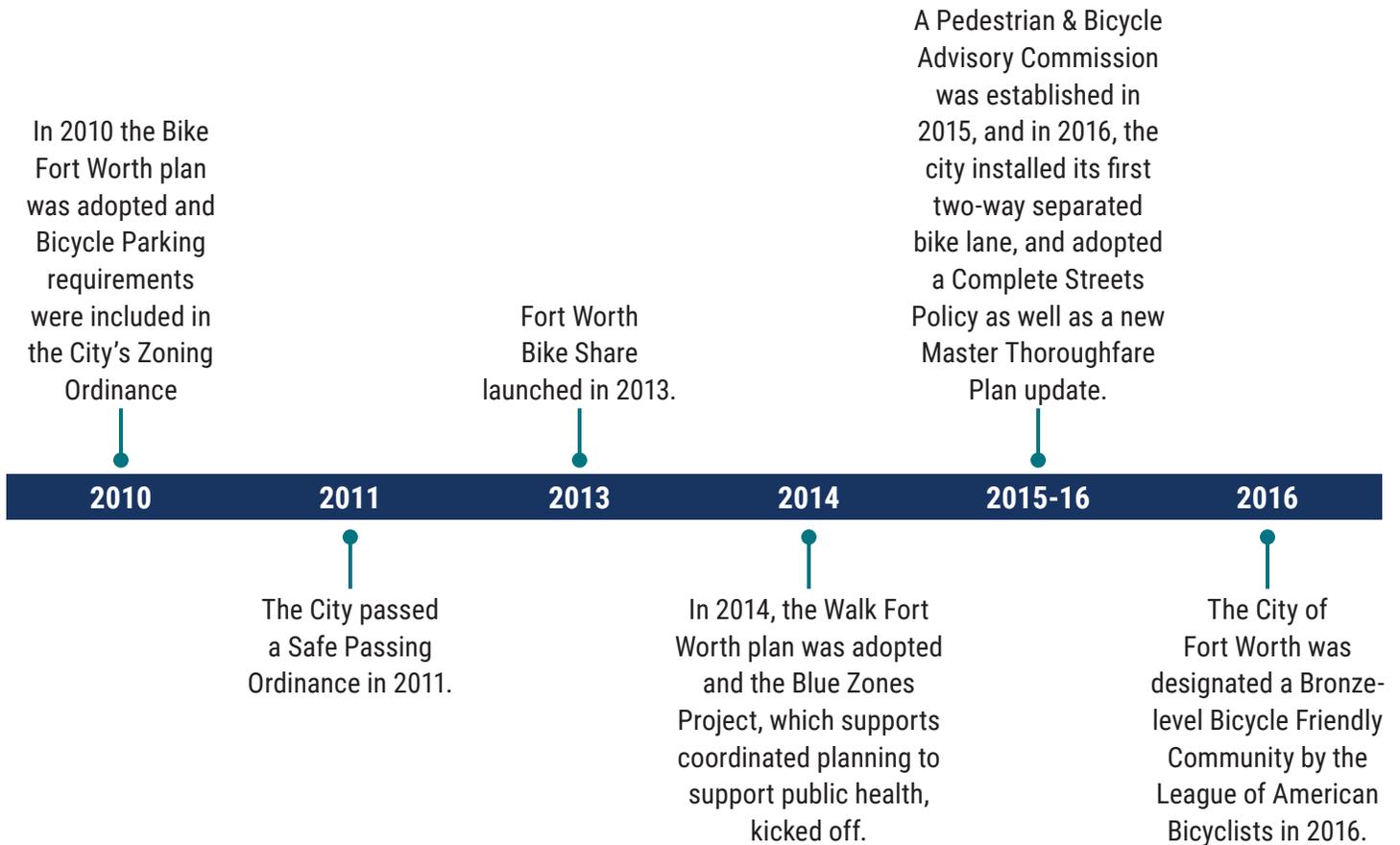


Figure 2. A Timeline of the City of Fort Worth’s Progress on Improving Bicycling and Walking

Relationship with Other Plans, Policies, and Projects

Implementing walking, bicycling, and trail networks requires coordination with various agencies and stakeholders. The development of the ATP included coordination with several concurrent planning efforts, and the document builds upon previous planning efforts. The full list and description of each plan are provided in the Existing Conditions Report appendix. The following sections describe how selected plans and initiatives impacted the ATP.

Blue Zones Project

The Blue Zones Project is a community-wide initiative to help make healthy choices easier for everyone in Fort Worth. The Blue Zones project provided support for the ATP and guidance during the planning process through participation in the stakeholder group. Adoption of the ATP was a validation requirement to become Blue Zone certified.



Active Transportation Plan Public Meeting in March 2018

Master Thoroughfare Plan (MTP)

The MTP is the long-range plan for major roads in Fort Worth and its extraterritorial jurisdiction (ETJ). It preserves right-of-way for future roads as the city grows with cross-sections that include bicycle and pedestrian accommodations. It provides required width ranges for integrating bicycle facilities and sidewalks into established thoroughfares. The ATP incorporates the sidepaths and separated bike lanes required in the MTP. The MTP supercedes the ATP.

Mobility 2045 Regional Veloweb

The Regional Veloweb is a 1,883 mile-network of trails adopted as part of Mobility 2045, the North Central Texas Council of Governments' long-range transportation plan. Analyzing the planned Veloweb corridors in Fort Worth was part of the ATP's trail planning process. These corridors were incorporated into the ATP as part of the ATP's Spine network, and modified based on stakeholder feedback. ATP Spine trails will be proposed for the Regional Veloweb to be adopted in the next update to the Metropolitan Transportation Plan.

Fort Worth Task Force on Race and Culture Recommendations

The Transportation Committee of the Task Force on Race and Culture identified disparities related to street conditions, sidewalk conditions, street light conditions, and pedestrian and bicyclist crashes in Super Majority Minority Areas (S-MMAs)—areas with a minority population 75% or greater. The ATP directly addresses disparities related to sidewalks and crashes by emphasizing equity and S-MMAs in the project prioritization process. *See Chapter 4 and the Chapter 5 Action Plan.*

Complete Streets Policy and Implementation Plan

The ATP policy recommendations were developed in coordination with the City of Fort Worth’s Complete Streets Policy and subsequent implementation planning process. The Facility Selection and Design Guide emphasizes a Complete Streets approach and the plan supports the goals of the City’s Complete Streets Policy.¹

Transit Moves Fort Worth

The City of Fort Worth initiated Transit Moves Fort Worth to expand on the 2014 Transit Master Plan and to work with Trinity Metro and other local and regional stakeholders. This study is intended to look at transit in Fort Worth and develop priorities that maximize return on transit investments and identify capital investment strategies to support the success of transit. The ATP was developed in coordination with the transit planning team and information was shared about key corridors and analysis methodologies to ensure consistency and collaboration.

Confluence: The Trinity River Strategic Plan

The ATP team coordinated with Streams & Valleys, a nonprofit organization that works on the Trinity River and trails, as they developed *Confluence: The Trinity River Strategic Plan*, which proposed important new trail projects. The ATP includes the Confluence plan’s trail recommendations.

City of Fort Worth Comprehensive Plan

The City’s Comprehensive Plan calls for the implementation of the City’s bicycle and pedestrian plans, now the ATP. The ATP supports the Comprehensive Plan’s Bicycle Transportation, Pedestrian Transportation, and Public Transportation sections, and recommendations from the Comprehensive Plan were incorporated into the ATP’s policy recommendations.

Park, Recreation and Open Space Master Plan

The Fort Worth Park, Recreation and Open Space Master Plan contains trails in its 5-year work plan. It also provides trails classifications and standards. The ATP provides additional guidance on trail design, and its proposed trails network connects to many park trails.



Figure 3. Many projects, programs, and initiatives informed, and are supported by, the ATP.

¹ Adopted Fort Worth Complete Streets Policy, <http://fortworthtexas.gov/planninganddevelopment/complete-streets/complete-streets.pdf?v=20160511>

Planning Process

The 15-month planning process, described below, involved deliberate stakeholder and public involvement, detailed analysis, and extensive review. The numbers in the headers correspond to the numbers in [Figure 4](#).

1 Stakeholder Engagement

Public and stakeholder involvement was critical to the ATP's development. The City held three rounds of public meetings and open houses and five stakeholder group meetings, and staff also attended several community events and festivals. Stakeholder engagement also included two interactive map surveys. Input from the public and stakeholders directly impacted the ATP's network routes, trail alignments, identified barriers, project prioritization, and recommended policies. [See the Public Engagement Process and Findings appendix for more information.](#)

2 Existing Conditions

The City reviewed existing plans, analyzed data, interviewed stakeholders, held a public meeting, and conducted an interactive map survey to understand existing conditions in Fort Worth related to active transportation. The results of these activities are summarized in [Chapter 2](#) and described in full in the [Existing Conditions Appendix](#).

3 Network Development

The active transportation network was developed, reviewed, and refined. Bicycle and pedestrian network structures from across the country were assessed and those most appropriate for Fort Worth were selected.

[See the Network Planning Approach Memorandum.](#)

Two analyses were conducted on current conditions: a bicycle Level of Traffic Stress (LTS) analysis and a Pedestrian Experience Index (PEI) of walking conditions.

Using results from the analyses, existing conditions information, and feedback from stakeholders and the public, draft trail, bicycle, and pedestrian networks were developed. [See Chapter 3](#). The recommended network was revised based on stakeholder and public feedback. It was then finalized and prioritized. [See Chapter 4](#).

4 Action Plan

The ATP is focused on implementable recommendations. It contains targeted policy recommendations, which were reviewed by City staff and the stakeholder group. [Chapter 4](#) includes priority projects and cost opinions. [Chapter 5](#) includes a discussion of who is responsible for implementing the plan, funding, policies, a project-specific evaluation checklist, and an amendment procedure.

5 Plan Development

The ATP, accompanying guides, and appendices were drafted and revised. The adoption process involved meetings with relevant committees, City Council members, the Pedestrian and Bicycle Advisory Board (PABAC), and the Park & Recreation Advisory Board.

Active Transportation Plan Project Process and Timeline

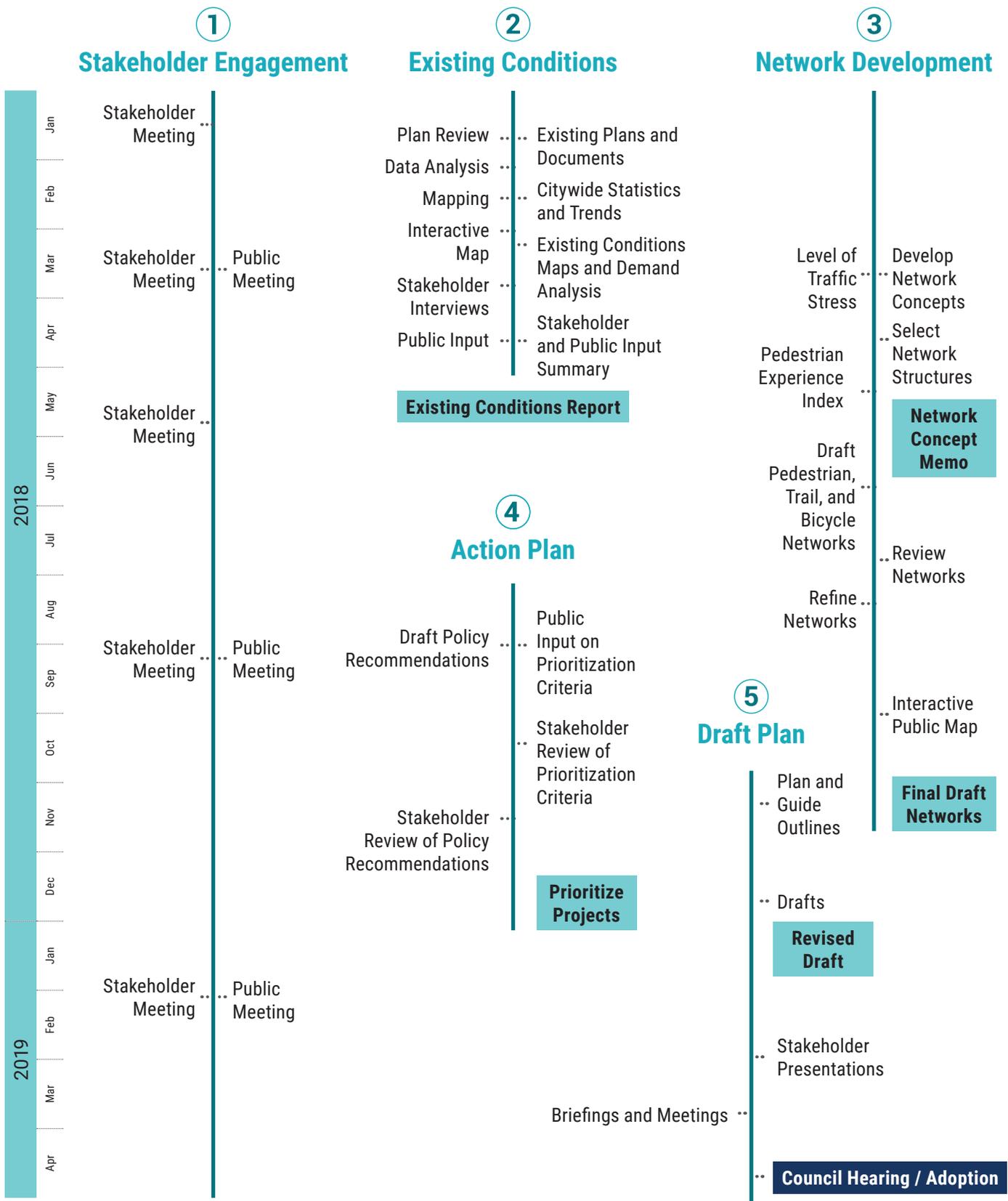


Figure 4. The development of the ATP included several major elements over the course of 15 months.

Why Active Transportation?

The following pages describe the benefits of active transportation in terms of transportation choices, health, economic development, and safety.

Demand for and Benefits of Active Transportation Choices

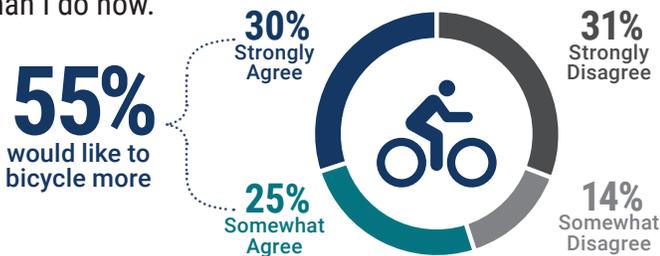
People in Fort Worth want a range of transportation options—there are many benefits to providing a system of safe and comfortable sidewalks, trails, and bikeways.

Regional Survey Results

A recent survey of residents in the region shows that people want to bicycle more and want more safe places to bike.²

Frequency of Bicycling

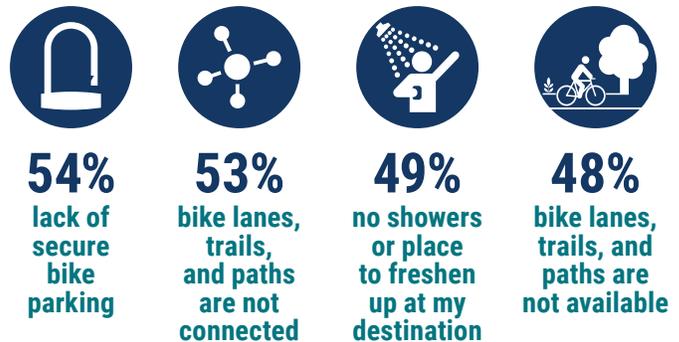
I would like to travel more by bicycle than I do now.



Obstacles to Bicycling More Often

Lack of bicycle facilities are among the top barriers to bicycling more.

What prevents you from riding a bike more often than you currently do?



A majority of respondents indicated that there are **too few** bicycle facilities in their communities. They also consider increased bicycle access to be **essential** or **very important** for their community.

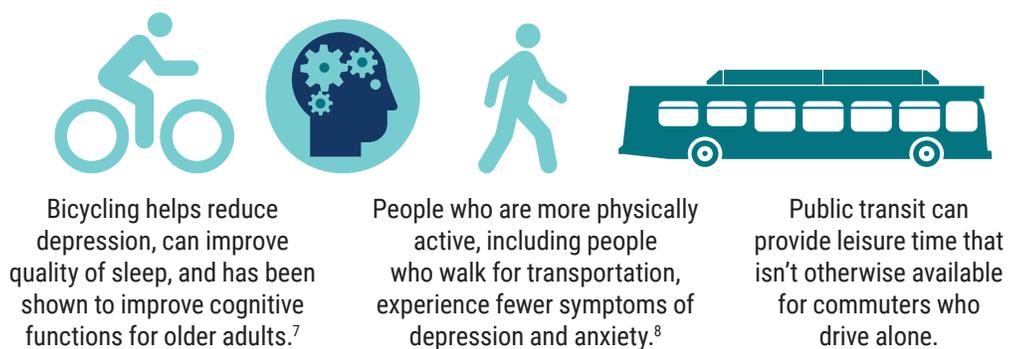
Having Active Transportation Options...

...Saves Money

Estimated Annual Cost



...and Reduces Stress



2 2017 North Texas Regional Bicycle Opinion Survey, NCTCOG, Sustainable Development Program, Kevin Kokes, AICP
 3 AAA Your Driving Costs. Based on 15,000 miles driven annually. Range from small sedan \$6,354 to pickup truck \$10,054.
 4 Trinity Metro, Fare Information, <https://ridetrinitymetro.org/fares/fare-information/>
 5 Estimates range from \$100-\$400, "How Much Do You Spend on Bicycling Every Year?," Elly Blue for Bicycling Magazine.
 6 Average answer to Marist Poll "What is the most you have spent on a pair of shoes?"
 7 Physical Activity Guidelines Advisory Committee Report, 2008, <https://health.gov/paguidelines/report/pdf/CommitteeReport.pdf>
 8 American Heart Association, Recommendations for Physical Activity, <https://www.heart.org/en/healthy-living/fitness/fitness-basics/aha-recs-for-physical-activity-in-adults>

Health Benefits of Active Transportation

Walking and bicycling are physically active modes of transportation and recreation that provide a range of health benefits. Walking and bicycling are associated with improved heart health and lower levels of obesity, Type 2 diabetes, and cancer.



Walking and bicycling rates are inversely associated with obesity rates.⁹




1 mile of walking each way = 2/3 of the daily recommended 60 minutes of physical activity¹⁰



Bicycling commuters live longer and are 45% LESS LIKELY to have cancer.¹²



Every \$1 invested in trails can yield anywhere from \$1.65 to \$13.40 in direct medical benefits.¹¹



Commuting by bicycle enhances cardiovascular health, controls cholesterol levels, and prevents elevated blood pressure levels even if adopted at a middle age.



In addition to improving physical health, walking can boost creativity.¹³



Bicycling reduces depression, can improve quality of sleep, and has been shown to improve cognitive functions for older adults.¹⁴



Bicyclists report greater satisfaction with their commute than people who drive to work.¹⁵



9 Walking and Cycling to Health: A Comparative Analysis of City, State, and International Data <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2937005/>

10 <https://www.saferoutespartnership.org/healthy-communities/101/facts>

11 A Cost-Benefit Analysis of Physical Activity Using Bike/Pedestrian Trails, Health Promotion Practice, https://conservationtools.org/library_items/1085/files/995

12 Association between active commuting and incident cardiovascular disease, cancer, and mortality: prospective cohort study, BMJ 2017;357:j1456 <https://doi.org/10.1136/bmj.j1456>

13 Bicycling to Work and Primordial Prevention of Cardiovascular Risk, Journal of the American Heart Association, <http://jaha.ahajournals.org/content/5/11/e004413>

14 Give Your Ideas Some Legs: The Positive Effect of Walking on Creative Thinking, Marily Opezzo and Daniel L. Schwartz, 2014, <https://www.apa.org/pubs/journals/releases/xlm-a0036577.pdf>

15 Physical Activity Guidelines Advisory Committee Report, 2008, <https://health.gov/paguidelines/report/pdf/CommitteeReport.pdf>

16 http://tram.mcgill.ca/Research/Publications/Cycling_Satisfaction_TRB.pdf

Economic Benefits of Active Transportation

Investments in bicycling and walking can have significant benefits for businesses, commercial districts, homeowners, and customers. Walkability is associated with higher home values; bike share attracts customers to local businesses; trail users spend money on equipment, apparel, and food; and employers are vying to locate in walkable and bikeable cities.²¹



Magnolia Street, Fort Worth, TX

179% increase in restaurant revenues after 2008 restriping with bike lanes.¹⁷

Broad Street, Memphis, TN

Within three years of Memphis Broad Street Arts District and bicycle lanes, 30 properties were renovated with 25 new businesses and \$20 million in reinvestment.¹⁸



Homes located near trails sell for 6% more than comparable homes located far from trails.¹⁹



In the U.S., an additional one point increase in Walk Score is associated with a \$500 to \$3,000 increase in home values.²⁰



17 <https://www.triplepundit.com/2013/12/bike-lanes-increase-small-business-revenue/> Photo: <http://fortworthtexas.gov/news/2018/04/magnolia-ave/>

18 Complete Streets in Practice: Memphis, Tennessee <https://www.smartgrowthamerica.org/app/legacy/documents/cs/resources/cs-brief-memphis.pdf> Photos: Justin Fox Burks

19 Our Roads Are in Bad Shape... Why Spend Money on Trails?, American Trails, <https://www.americantrails.org/resources/faq-our-roads-are-in-bad-shape-why-spend-money-on-trails>

20 Walking the Walk: How Walkability Raises Home Values in U.S. Cities, CEOs for Cities http://blog.walkscore.com/wp-content/uploads/2009/08/WalkingTheWalk_CEOsforCities.pdf

21 Bicycling Means Business: The Economic Benefits of Bicycle Infrastructure https://bikeleague.org/sites/default/files/Bicycling_and_the_Economy-Econ_Impact_Studies_web.pdf

22 www.pedbikeimages.org/ Dan Burden

Benefits of Active Transportation Infrastructure on Safety

Well-planned and well-designed sidewalks, trails, bikeways, intersections, and crossings can increase safety for pedestrians, bicyclists, and wheelchair users while increasing the number of people choosing active transportation. Better infrastructure and more people using active transportation can make traveling safer for everyone.

Traffic Safety Basics

Crashes between people walking, bicycling, and driving can be mitigated through one or a combination of the strategies below.



Decrease Motor Vehicle Speeds

The likelihood of a pedestrian surviving being struck by a motorist increases from 41% at 45 mph to 87% at 25 mph.²³

Improve Crossing Visibility

Maintaining unobstructed sight lines between motorists and pedestrians, bicyclists, and wheelchair users waiting to cross can increase yielding rates and enhance crossing safety.



Reduce Conflict Points

A reduction in conflict points—locations at intersections where crashes may occur—increases safety and comfort.

Separate Transportation Modes

Providing dedicated space, as well as horizontal and vertical separation, enhances comfort especially for vulnerable users.

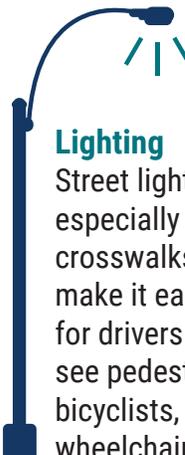


Street Design Strategies



Traffic Calming

Traffic calming treatments, such as speed humps, curb extensions, and neighborhood traffic circles, can encourage motorists to drive at safer speeds.



Lighting

Street lighting, especially at crosswalks, can make it easier for drivers to see pedestrians, bicyclists, and wheelchair users.



Signal Operations

Providing more time for pedestrians to cross and providing pedestrian-only phases can make intersections much safer, especially for people who need more time, such as wheelchair users, seniors, and children.



Separated Bike Lanes

Separated bike lanes provide a physical buffer between bicyclists and drivers, improving safety and comfort for all travelers.

²³ "Impact Speed and a Pedestrian's Risk of Severe Injury or Death," Brian Teft, September 2011, <http://aaafoundation.org/wp-content/uploads/2018/02/2011PedestrianRiskVsSpeedReport.pdf>



2

**Existing
Conditions
Summary**



Introduction

Active transportation trends, previous and ongoing planning efforts, technical analyses, and input from stakeholders and the public informed the development of the Fort Worth Active Transportation Plan's (ATP) network and policy recommendations.

This chapter summarizes existing conditions in Fort Worth related to active transportation. More detail is provided in the Existing Conditions Report and the Public Input Summary in the Appendix.

Findings, Themes, and Priorities

The existing conditions review and analyses yielded several key themes, which guided the ATP's network development and policy recommendation process.

Complete Networks

TRAILS

- Fort Worth has the foundation necessary for a world-class trail network along the Trinity River and elsewhere in the city.
- There is a lack of comfortable connections to trails.

ON-STREET BIKEWAYS

- The on-street bicycle network has been slowly expanding over the past decade.
- Bike lanes have been built opportunistically, taking advantage of street resurfacing and Capital Improvement Program (CIP) projects.
- Dedicated funding to make connections has been limited.

SIDEWALKS

- Policies on sidewalk requirements have fluctuated over the years.
- Newer Fort Worth neighborhoods have strong sidewalk networks but are often in disrepair.

- In certain circumstances, developers have received waivers that allow them to not construct sidewalks.
- Available funding for repairing and building new sidewalks has been limited.

Equity

- Areas of Fort Worth where minorities make up more than 75 percent of the population have a disproportionate share of poor condition and missing sidewalks.
- A disproportionate share of pedestrian and bicycle crashes resulting in incapacitating injuries or fatalities are located in majority minority areas (70 percent).

Connections to Transit

- There is a significant need for pedestrian and bicycle connections to transit.
- Connections and accessibility to bus stops and rail stations are a priority for the city.
- Trinity Metro has made sidewalk improvements to enhance Americans with Disabilities Act (ADA) access to bus stops and has added bus shelters.

Barrier Mitigation

- Highways, roads with high traffic volumes and speeds, railroads, rivers, and other bodies of water can be barriers to active transportation in Fort Worth.
- Stakeholders identified the Union Pacific Davidson Rail Yard, I-20, I-30, I-35, and I-820 as some of the key barriers.
- Sidewalks in disrepair and intersections with insufficient crossing time and accommodation are barriers for people with disabilities.

Geographic Variation

- Fort Worth has varied walking and bicycling environments ranging from dense activity centers to suburban and rural areas.
- The ATP's network recommendations and analyses reflect the different needs in Fort Worth's urban core, suburban areas, and extraterritorial jurisdictions.

Safety and Comfort

- Network facilities should comply with the latest guidelines and resources from the American Association of State Highway and Transportation Officials (AASHTO), Federal Highway Administration (FHWA), and National Association of City Transportation Officials (NACTO).
- The ATP's comfort analyses highlight the most and least comfortable sections of the walking and biking networks, informing the ATP's network recommendations (see Chapter 3).

Accessibility

- ADA accessibility improvements are a high priority.

- ADA-accessible routes to transit stops and daily destinations, regular sidewalk repair and maintenance, and addressing sidewalk gaps are critical to ensuring accessibility to people walking and using wheelchairs.
- The ATP's analyses identified locations with sufficient and insufficient curb ramps, which can inform priority and funding decisions.

Daily Destinations

- The ATP seeks to accommodate Fort Worth residents' preference to travel by foot and bike to daily destination within relatively short distances.
- Daily destinations include schools, transit stations and stops, employment centers, retail areas, trails parks, community center, and libraries.

Short-Trip Areas

- Walking and bicycling trips are typically short compared to trips made by motor vehicle.
- According to the National Household Travel Survey (NHTS), the average walking trip for work, shopping, and social activities in Texas is between 0.6 – 0.7 miles. The average bicycling trip in Texas is 1.8 miles.²⁴
- Short-trip areas in Fort Worth comprise areas identified as Urban Villages, mixed-use growth centers, and other high demand areas. In this study, short trip areas were identified through a combination of factors such as population density, employment density, and the presence of bus stops, schools, and households without a motor vehicle.

Short-Trip Area Connectivity

- While short trips to daily destinations are important, trips between neighborhoods are also important.

24 Federal Highway Administration. (2017). 2017 National Household Travel Survey, U.S. Department of Transportation, Washington, DC.

Available online: <https://nhts.ornl.gov>.

Citywide Statistics and Trends

Fort Worth is one of the fastest growing large cities in the United States. Its population grew 17.9 percent between 2010 and 2017, from 741,206 to 874,168 people. Fort Worth is the 15th largest U.S. city by population, however it is one of the three least dense among the 20 largest U.S. cities, along with Charlotte, NC and Indianapolis, IN. Low land use density means that people have to travel further between destinations, which is particularly challenging for people who walk, bicycle, and use wheelchairs or are disabled.

Fort Worth’s population is expected to reach 1.4 million by 2045.²⁵ A larger population will likely contribute to more demand for sidewalks and bicycle facilities, especially in areas with higher density and generators of activity such as schools, parks, and trails. This in turn creates greater potential for making walking and bicycling popular and viable modes of transportation for an increasing number of Fort Worth residents.

Bicycling and walking infrastructure are most effective when destinations are nearby (as in mixed-use development) and when multiple transportation options are available for residents near employment centers. The ATP focuses on opportunities for increased walking and bicycling in short-trip opportunity areas. By fostering the development of safe, comfortable, connected, and accessible walking and biking networks, this plan directly supports the Age-Friendly Fort Worth Action Plan goal of ensuring mobility equity for older adults and people with disabilities. The ATP also supports the City of Fort Worth’s economic development goals of increasing mixed-use development, improving the balance of jobs and housing, and attracting higher wage jobs.

In August 2017, the Fort Worth City Council appointed a 23-member task force to advise on issues related to

²⁵ City of Fort Worth, 2019 Comprehensive Plan, Chapter 1: Population Trends

²⁶ City of Fort Worth Planning and Development Department

race and culture in Fort Worth. Fort Worth is 60 percent non-white and has many neighborhoods where there are more non-white residents than white residents (referred to in the task force materials as “majority minority” neighborhoods). These majority minority neighborhoods have a disproportionate share of the pedestrian and bicycle crashes and fatalities citywide.

As shown in Figure 5²⁶, poverty is not evenly distributed in the City of Fort Worth. Planning for safe bicycling and walking facilities in low-income areas was factored into the planning process—for example, through the project prioritization methodology outlined in Chapter 4.

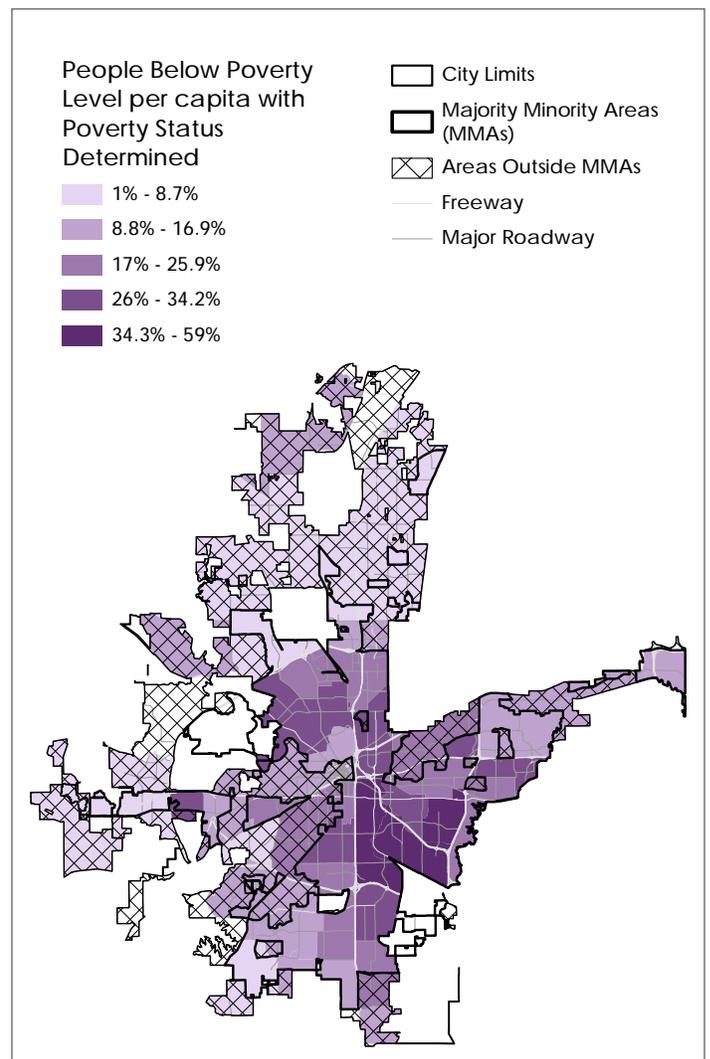
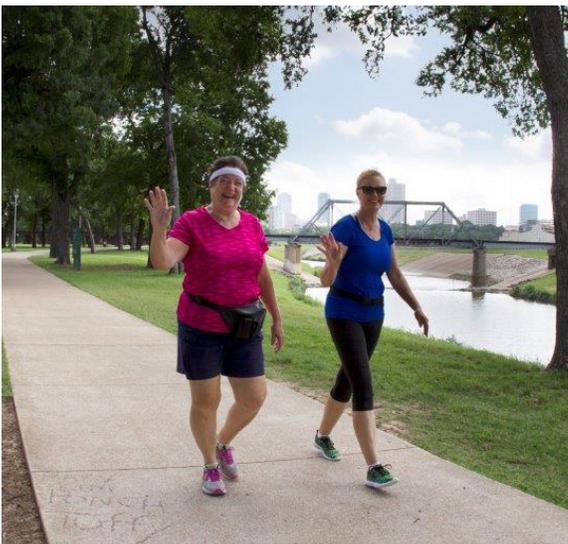


Figure 1. Spatial distribution of poverty in Fort Worth.

Existing Plans and Documents

The ATP builds on the City’s existing planning documents and recent progress. The ATP’s recommendations incorporate and are consistent with completed and in-progress planning efforts that impact trail development, bicycling, and walking, especially as they relate to areas of future growth, integration with transit, priority corridor selection, safety, and citywide design standards, policies, and planning visions. A list of plans and resources that were reviewed and incorporated into this plan is provided on this page.

The City of Fort Worth’s Complete Streets Policy and the Master Thoroughfare Plan’s (MTP) goals and guidance support the accommodation of all modes and all users, ages, and abilities. The MTP requires construction of pedestrian and bicycle facilities along thoroughfares that have not yet been fully completed. It also includes requirements for roadways that have been built to fully planned dimensions.



Active Transportation networks promote healthy habits and improve quality of life. (Photo credit: Tarrant Regional Water District)

Plan/Policy Review

Trails Gap Analysis (in progress)

Transit Moves Fort Worth (in progress, update to 2015 Transit Master Plan)

Confluence: The Trinity River Strategic Plan

Traffic Engineering Design Standards “Brown Book” (1987, update currently underway)

Access Management & Collector Street Network Policies (2018)

Strategic Stormwater Program Master Plan (2018)

Fort Worth Economic Development Strategic Plan (2017)

Fort Worth Form Based Code Districts (2012-2017)

NCTCOG 2045 Regional Veloweb (2018)

Panther Island Development Standards (2016)

East Lancaster Avenue Pedestrian Improvements/ Complete Streets Project (2016)

Age-Friendly Fort Worth (2016)

Fort Worth Complete Streets Policy (2016)

Fort Worth Master Thoroughfare Plan (2016)

Downtown Urban Design Standards and Guidelines (2002/2016 update)

Near Southside Development Standards and Guidelines (2016)

Parks and Open Space Master Plan (2015)

Trinity Lakes Development Standards (2015)

Walk Fort Worth (2014)

Downtown Access and Circulation Study (DACS) (2013)

Planning Livable Military Communities Regional Vision (2013)

Bike Fort Worth (2010)

Trinity River Vision (2009)

Park Dedication Policy (2019)

Urban Villages Plan (2007)

Active Transportation Data and Analysis

The study process for the ATP included a spatial analysis of commuting patterns, existing infrastructure, crashes, economic and demographic patterns, connections to transit, and other factors that are likely to contribute to higher demand for sidewalks, trails, and bicycle facilities.

Commuting Rates

The 2016 American Community Survey indicates that 0.1 percent of Fort Worth residents commute by bicycle citywide, while 1.2 percent walk, 1.4 percent use transit, and 90.5 percent use a motor vehicle. The combined rate of walking and bicycling to work in Fort Worth ranges from less than 1 percent to over 20 percent by census block group. Commuting by transit is above 11 percent in some neighborhoods, according to the 2010 U.S. Census, but is not evenly distributed throughout the city.

In a 2017 Bicycle Opinion Survey conducted by the North Central Texas Council of Governments (NCTCOG), 13 percent of respondents reported that they had bicycled for transportation in the past month. This included bicycling to work, school, or shopping, or to get to another destination.

Trails, Bicycle Facilities, and Bicycle Crashes

As of early 2018, there were 89 miles of paved trails, 30 miles of natural surface trails, and 45 miles of on-street bicycle facilities in Fort Worth. The trails primarily run along the extensive river system and parks in the city. The on-street bicycle facilities are concentrated in the central city, with additional bike lanes across the city that are not consistently connected.

Fort Worth has been named a pedestrian and bicycle safety focus city by the Federal Highway Administration due to high numbers of pedestrian and bicycle crashes and fatalities²⁷. The locations of bicycle crashes and fatalities are dispersed across the city, but some corridors, such as Camp Bowie Boulevard and East Lancaster Avenue, have disproportionately large numbers of bicyclist injuries and fatalities. The top factors leading to bicycle crashes were driver inattention, bicyclist failure to yield to traffic controls or pedestrians, and failure of drivers to control their speed.²⁸

Year	All Bicycle Crashes	Bicycle Fatalities
2010	50	0
2011	49	2
2012	61	0
2013	80	3
2014	80	1
2015	85	1
2016	71	1
2017	97	1
2018	74	1

Table 1. Crashes Involving Bicyclists in Fort Worth²⁹

Sidewalks and Pedestrian Crashes

Fort Worth's sidewalk network is inconsistent citywide. There are roughly 4,000 miles of streets in Fort Worth that lack sidewalks. Newer neighborhoods have stronger sidewalk networks. Some older neighborhoods lack sidewalks entirely, and those that exist are often in disrepair.

27 Pedestrian and Bicycle Safety States and Cities, FHWA, https://safety.fhwa.dot.gov/ped_bike/ped_focus/

28 City of Fort Worth Police Department, Report Beam

29 City of Fort Worth Police Department

Pedestrian fatalities in Fort Worth increased from 11 in 2010 to 36 in 2018. The locations of pedestrian injuries and fatalities are clustered in the central city and along corridors that generally have higher motor vehicle speeds, higher motor vehicle volumes, and greater numbers of pedestrians. Many of these corridors are served by transit. Pedestrian crashes and fatalities frequently occur near bus stops. The most common causes of pedestrian crashes in Fort Worth were driver inattention, failure to yield to pedestrians, motorist failure to control their speed, unsafe backing, and impaired vision.

Year	All Pedestrian Crashes	Pedestrian Fatalities
2010	216	11
2011	179	19
2012	210	19
2013	265	14
2014	269	19
2015	284	21
2016	308	30
2017	335	33
2018	337	36

Table 2. Crashes Involving Pedestrians in Fort Worth³⁰

Demand Analysis

Many factors influence the likelihood that people will walk and bike for transportation. Latent demand analysis is a tool to determine the locations in a city where bicycling and walking trips are likely to occur if safe and comfortable infrastructure is provided. This helps to prioritize investments that maximize impact. It is based on an analysis of population, employment, and destinations. Table 4 presents each factor, its weight, and its source.

Locations with higher population and employment densities—where people and jobs are concentrated—are

likely to have more demand for walking and bicycling because trip distances tend to be shorter. Schools are often indicators of potential demand for safe walking and bicycling conditions because elementary and middle school children often live within walking and bicycling distance from school. Areas with higher concentrations of households without access to motor vehicles are likely to be more dependent on walking, bicycling, and transit for their transportation needs. People who use transit are likely to walk to bus stops and stations. Finally, existing trailheads show where trail use is concentrated and may be expanded. See Figure 6 presents the high demand areas resulting from this analysis.

Factor	Weight	Source
Population Density	25%	U.S. Census Bureau. Block Groups. "Counts." American Community Survey, 2014
Employment Density	20%	NCTCOG. "Employers"
Primary, Secondary, and Post-Secondary Schools	20%	NCTCOG. "Features"
Households without Access to a Motor Vehicle	20%	U.S. Census Bureau. Block Groups. "Household Characteristics." American Community Survey, 2014
Bus and Passenger Rail Stations	10%	Fort Worth Transportation Authority. GTFS Feed. NCTCOG. "Features."
Trail Heads	5%	City of Fort Worth. "Trail Bike Lane Connections"

Table 3. Demand Analysis Factors

30 City of Fort Worth Police Department

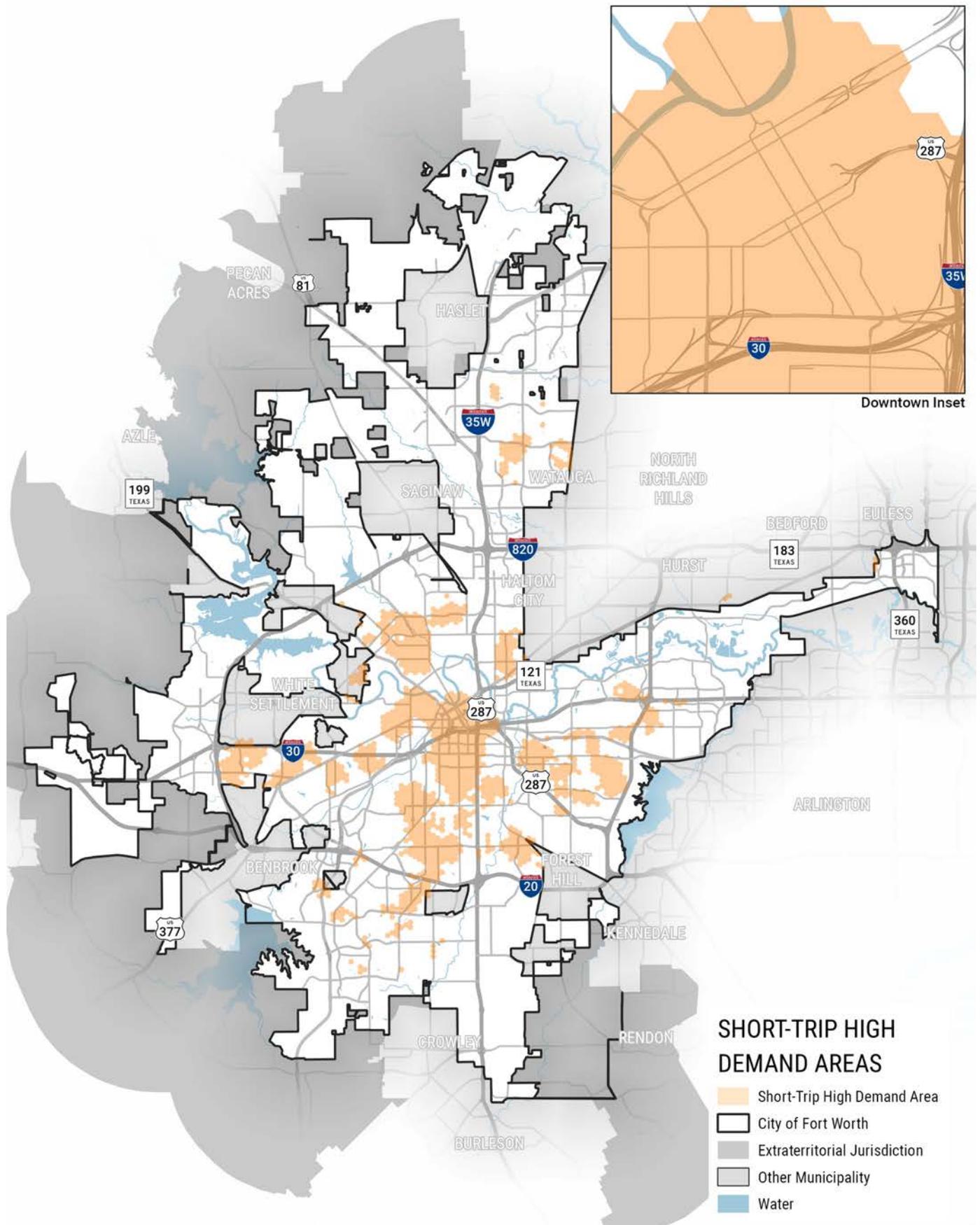


Figure 2. Demand Analysis Results Map

3

Network Development and Analysis

Introduction

This chapter describes the concept of the All Ages and Abilities Network, overall network priorities and how they impact the final network, network structures, the inputs used to determine the design of the networks, the analyses used to evaluate the comfort level of current walking and bicycling conditions, and network maps.

The chapter is organized with the pedestrian network information first: the pedestrian network structure, the pedestrian network development approach, the Pedestrian Experience Index analysis, and pedestrian network maps. It then describes the bicycle and trails network structure, the bicycle network development approach, the bicycle Level of Traffic Stress, the trails network development approach, and the bicycle, trail, and sidepath network maps.



Sidewalks serve many purposes and often need space for people walking, dining, trees and more (Photo credit: City of Fort Worth)



A trail user enjoys the Trinity Trails system. (Photo credit: Tarrant Regional Water District)



Recent investments in bike lanes form the backbone of the network. (Photo credit: City of Fort Worth)

All Ages and Abilities and the Role of Comfort in Networks

All Ages and Abilities (AAA) active transportation networks are safe, comfortable, and equitable networks for all residents and visitors in Fort Worth.

In an All Ages and Abilities network, bicycle facilities should separate people biking from fast-moving and high volumes of motor vehicle traffic. A pedestrian All Ages and Abilities network requires a complete Americans with Disabilities Act (ADA)-accessible sidewalk and street crossing network with direct connections to transit. Trails should be designed to accommodate the anticipated number of trail users.

The ATP calls for a connected All Ages and Abilities network for pedestrian, bicyclists, and trail and transit users. It accomplishes this through analysis, network planning, and design guidance.

The existing network was analyzed to evaluate its current levels of comfort for the broadest range of users. Walking conditions were analyzed using a Pedestrian

Experience Index (PEI) developed specifically for the ATP (page 30), and bicycling conditions were analyzed using a Level of Traffic Stress Analysis (page 41) based on nationally accepted best practices.

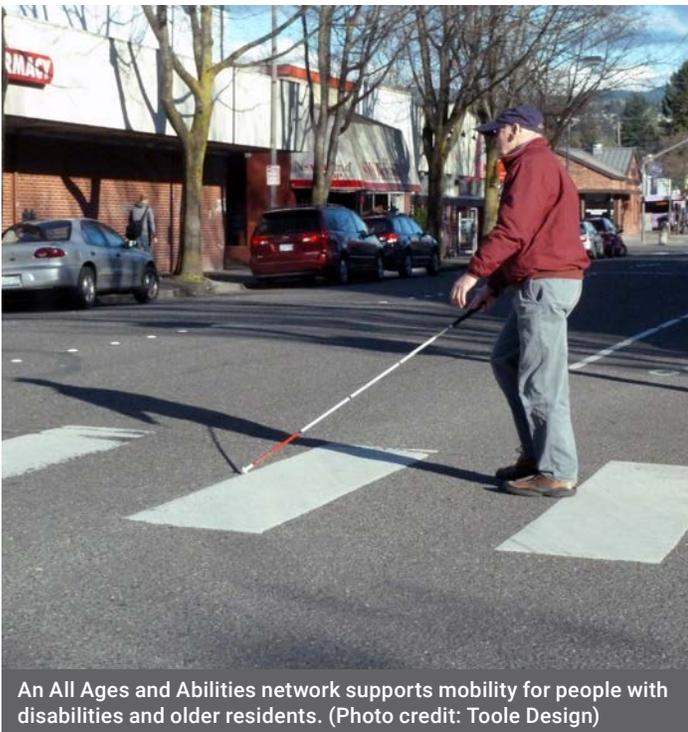
All Ages and Abilities

All Ages and Abilities networks accommodate all users, including:

- Children
- Seniors
- Women and men
- People of all races and income levels
- People with disabilities
- Transit users
- Bike share users
- Confident bicyclists

All Ages and Abilities facilities include:

- Well-maintained sidewalks with buffers
- ADA-accessible curb ramps with detectable warning surfaces
- ADA-accessible curb extensions
- Audible pedestrian signals
- Bicycle signals
- High-visibility and raised crosswalks
- Median refuge islands
- Bicycle boulevards
- Buffered and separated bike lanes
- Sidepaths
- Trails



An All Ages and Abilities network supports mobility for people with disabilities and older residents. (Photo credit: Toole Design)

The results of these analyses—which identify more and less comfortable blocks and intersections—informed development of the ATP’s network recommendations from the network design through project identification and prioritization.

The ATP Facility Selection Guide provides procedures for selecting an appropriate bicycle facility for users

of all ages and abilities based on traffic volumes, lanes, and speeds. It also provides context where the Master Thoroughfare Plan does not provide a pre-defined bicycle facility. The Master Thoroughfare Plan has defined sidewalk buffers, sidepaths, and sidewalk widths that conform to the AAA network principles. Information on trail design can be found in the Fort Worth Design Toolkit and the trails executive summary.



Figure 1. All Ages and Abilities bicycle riders (top) and pedestrians (bottom)

Network Priorities

Chapter 2 describes the themes that emerged from the existing conditions research and public engagement. These themes became network priorities for the ATP. This table describes how they impact the ATP network.

Network Priority		Impact on Network
 Complete Networks	Sidewalk networks should not have gaps, and sidewalks should be in good condition and must be ADA-accessible. Bicycle facilities should connect to one another and to trails. Trails should connect to other trails, and pedestrian and bicycle networks.	Proposed bicycle and trail segments connect or intersect with one another. Sidewalk gaps are identified.
 Connections to Transit	First- and last-mile connections to transit should be provided for people walking and biking. Sidewalks and bike facilities should connect to bus stops and passenger rail stations.	Rapid and frequent transit service corridors make up the backbone of the pedestrian network. Proposed bicycle segments connect to transit corridors.
 Equity	The network should acknowledge and address the historical disparities in infrastructure investments and disproportionate number of pedestrian and bicycle crashes in minority and low-income areas.	Connected bicycle facilities, trails, and sidewalks are proposed in low-income and minority communities.
 Accessibility	Sidewalks must be accessible for people with disabilities and comply with accessibility requirements, including the provision of accessible curb ramps.	New proposed sidewalk projects enhance accessibility. The pedestrian level of comfort analysis, known as the Pedestrian Experience Index, assesses curb ramp coverage and is incorporated into project prioritization.
 Safety and Comfort	The active transportation network should be safe and comfortable for people walking and bicycling. High-stress roadways and roadways with a history of crashes should be addressed to mitigate risk and discomfort.	Bicycle connections provide safe and comfortable routes, and alternatives to high-stress roads are identified. New sidewalks improve safety and comfort.
 Reduce Barriers	Roadways, rivers, railroads, and other physical barriers should be addressed to provide a connected network with limited detours.	Significant barriers are identified, and projects are recommended to address them.
 Daily Destinations	In addition to commute trips and recreation trips, daily destinations like parks, restaurants, schools, libraries, local retail, and houses of worship should be connected to where people live by sidewalks, trails, and bicycle facilities.	The bicycle network includes a Neighborhood Network layer of proposed facilities that connect daily destinations.
 Short Trip Areas	Locations with the most potential for short trips—larger populations, more jobs, bus and rail stations, trailheads, schools, and households without a motor vehicle—should be supported with a dense network of sidewalks and bicycle facilities.	The pedestrian network focuses on high-demand short trip areas. Proposed bicycle facilities are denser in these areas.
 Connecting Short Trip Areas	Locations with the most potential for short trips should be connected to one another by pedestrian-friendly transit corridors, trails, and bicycle facilities.	The pedestrian network focuses on high-demand transit corridors to connect short trip areas. Trail and bicycle projects connect short trip areas to one another.
 Needs Differ	The purpose of walking and bicycling trips varies across the city. For example, in less dense residential areas, trips to parks and schools may be more common, while in denser areas, commute trips may be more common. The ATP networks should accommodate these context-specific differences.	The networks connect to points of interest that are important to the context of the neighborhood.

Table 1. Role of Various Priorities on the Network.

Active Transportation Networks

The ATP's pedestrian, bicycle, and trail networks were developed to achieve a single connected and strategic network that meets the needs of a growing Fort Worth community.

The first step was to identify conceptual network structures tailored to Fort Worth in order to guide network development. A review of active transportation networks across the country informed the selection of the most appropriate and strategic structures for Fort Worth. The review is summarized below; please also see the [Network Planning Approach](#) memorandum.

The next step was to convert the conceptual structure into specific corridors and high-priority areas using

existing data and stakeholder input. The two network comfort analyses described in this chapter were used to guide the selection of these corridors and areas.

The resulting networks were mapped, showing the complete vision. [Chapter 4](#) describes how these networks were divided into projects and prioritized.

The network maps in this plan do not represent an on-the-ground survey and represent only the approximate relative location of property boundaries. The City of Fort Worth assumes no responsibility for the accuracy of said data. Some roadways shown within and outside the City and Extraterritorial Jurisdiction limits may be under State or other jurisdictional control.



The ATP lays out a vision for comfortable and connected walking and bicycling facilities such as these on University Drive and Trinity River Trail. (Photo credit: City of Fort Worth)

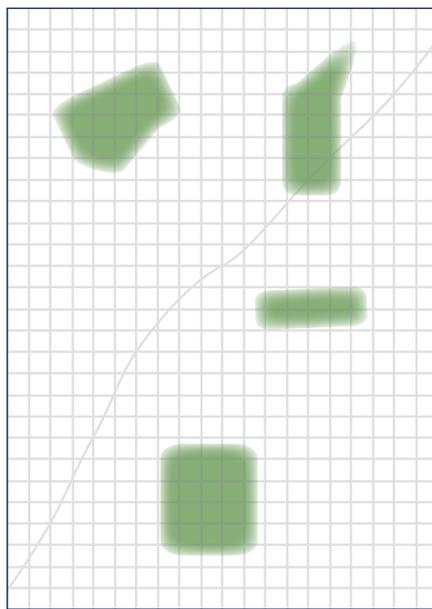
The Pedestrian Network

Pedestrian Network Structure

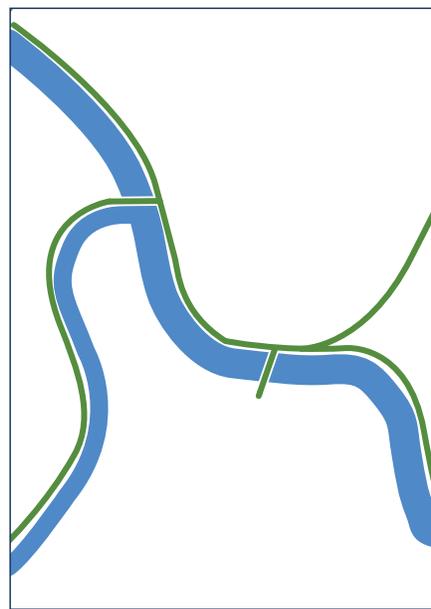
Walking trips are typically shorter than other types of trips. As a result, the ATP's pedestrian network was designed to support short walking trips through the identification of high-demand areas. It was also designed to provide access to transit stops to facilitate longer trips by bus and train. Trails connect neighborhoods to one another and provide a comfortable experience for pedestrians.

High-Demand Areas

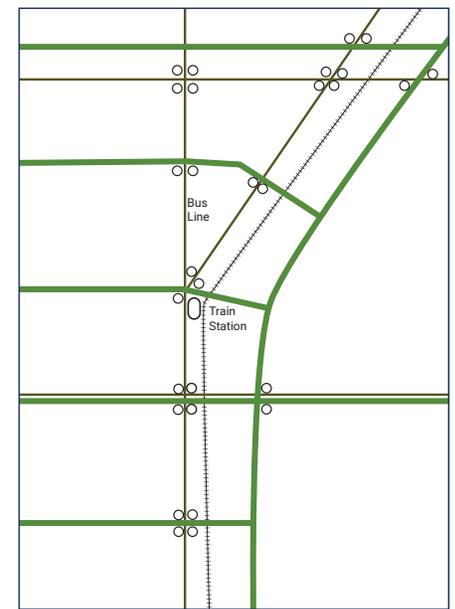
High-demand areas are areas with high population and employment densities, transit stops, trailheads, schools, and households without access to motor vehicles. Investments in these areas support short trips around major activity centers.



High-Demand Areas



Trail Corridors



Transit Corridors

Trail Corridors

Fort Worth's trails follow linear corridors across the city, connecting many of its neighborhoods. Since they are separated from motor vehicle traffic, they accommodate a wide range of users, including children and seniors. When connected to neighborhoods, they allow for recreation or transportation walking trips without a vehicle.

Transit Corridors

Transit corridors play two important roles in the Fort Worth pedestrian network. First, the bus stops located along these corridors allow pedestrians to extend their trips over longer distances. Second, transit corridors are often significant commercial corridors and can contain many important destinations for pedestrians such as jobs, medical services, and retail. The corridors should provide a comfortable and accessible walking environment, and bus stops must be ADA-accessible.

Figure 2. Pedestrian conceptual network structures.

Pedestrian Network Development Approach

The identification of the pedestrian network structures influenced the development of the pedestrian network. High-priority pedestrian corridors and areas were determined by mapping high-priority transit corridors, short trip demand areas, and trails. The following table summarizes the ATP’s pedestrian network development approach.

Criteria	Description	Impact on Network Development
Interactive Map Survey	Collected information on places where respondents like to walk, challenging places to walk, and important transit-access locations.	Confirmed network gaps.
Stakeholder Input	Interviews with project stakeholders provided details on high-demand and challenging walking locations.	Informed network structure priorities and identified barriers.
Pedestrian Experience Index (PEI)	Analysis of pedestrian comfort.	Identified locations where sidewalk additions support an otherwise highly walkable environment.
Short-Trip Demand Areas	Analysis of neighborhoods with high densities of population, employment, schools, bus stops, and households without a car.	Identified locations that benefit significantly from sidewalk investments.
High-Priority Transit Corridors	Rapid transit and frequent transit routes.	Make up the central corridors of the pedestrian network.
Trails and Sidepaths	Shared use facilities for walking, bicycling, wheelchair use, etc.	Provide important All Ages and Abilities routes in the network.

Table 2. Pedestrian Network Development Inputs

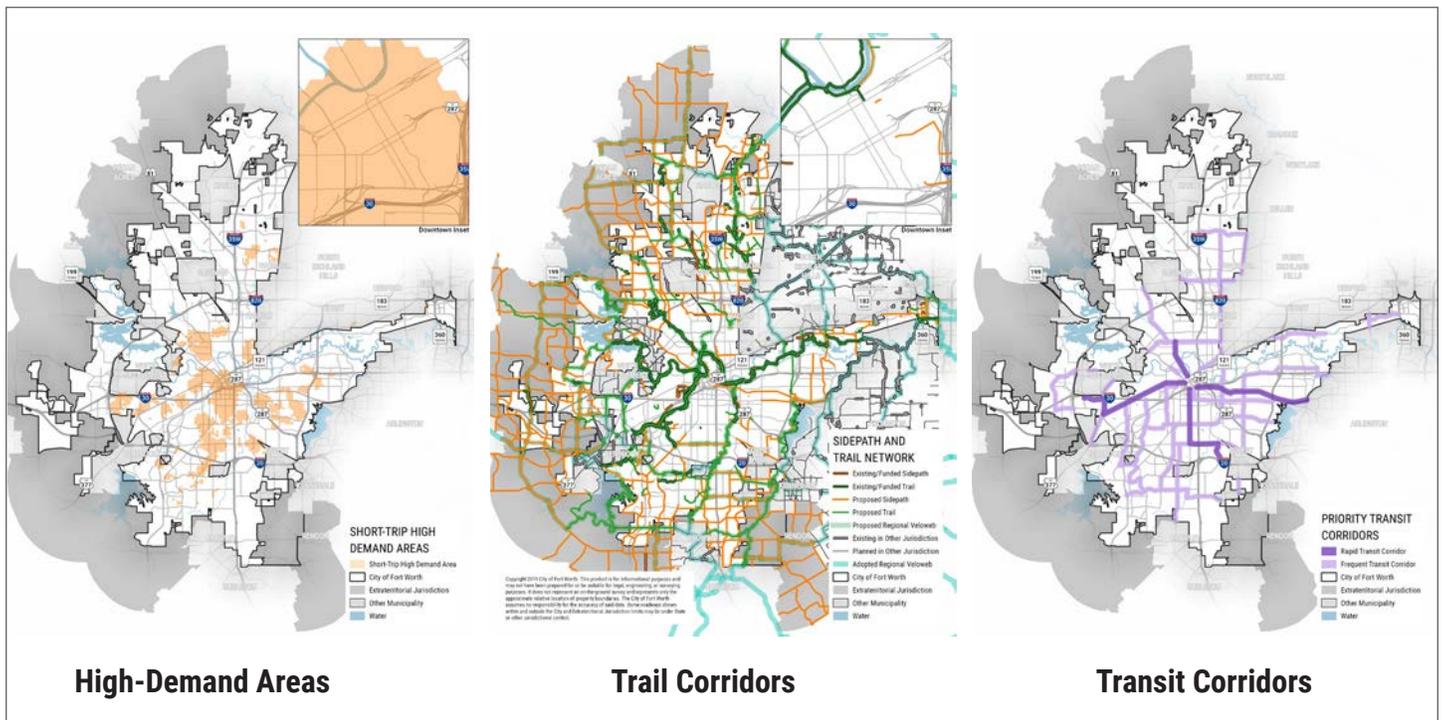


Figure 3. Conceptual network structures applied to the City of Fort Worth.

Pedestrian-Friendly Transit Corridors

Transit trips generally begin and end with walking (including mobility devices for persons with disabilities). Pedestrian-friendly transit corridors are a critical element of the ATP pedestrian network. High-priority transit corridors connect short-trip areas to one another and are critical to the pedestrian system. The ATP prioritizes high-use transit corridors for sidewalk projects. Trinity Metro has made significant investments in improving bus stop access, including sidewalk construction and repair, concrete platforms, and shelters. See the ATP Design Toolkit for more information.

Transit stops must meet all applicable ADA accessibility requirements and may include:

- Waste receptacles
- Seating or leaning rails
- Route maps

High-use transit stops may have:

- Larger shelters
- More comfortable waiting spaces
- Enhanced rider services
- Place-making elements

Pedestrian improvements include:

- Street trees
- Pedestrian-scale street lights
- Wayfinding signs
- Public art



Camp Bowie Boulevard and Ridglea Avenue before and after bus shelter improvement (Photo credit: Trinity Metro)

Pedestrian Experience Index

The ATP developed a methodology to measure how comfortable a pedestrian will feel on a street. Several factors influence pedestrian comfort: scale, the design and orientation of buildings to the sidewalk (built form), the street grid, and other infrastructure. The methodology, called the Pedestrian Experience Index (PEI), uses existing public data to evaluate the pedestrian comfort of each block and intersection in Fort Worth.

Figure 10 shows an example of how available data was used to assess various factors that influence the pedestrian experience. Table 7 on page 37 shows all of the data used to evaluate pedestrian comfort. In areas of dense land use, the infrastructure and built form factors were used. Only the infrastructure factors were used in non-dense areas. Dense and non-dense areas were based on zoning classification.

The Index includes a comfort assessment of every intersection in the city, which is based on the number of lanes, traffic speeds and volumes, and the presence of traffic signals, crosswalks, and ADA-accessible curb ramps. By analyzing gaps in accessible infrastructure at intersections and other locations, the PEI will help inform ADA planning, problem identification, and prioritization. It can also contribute to project scoping related to the connectivity of neighborhoods.

No large citywide dataset is perfect and not all data are complete and available. The analysis only used complete, citywide datasets. Data on the availability of shade, windows in storefronts, sidewalk width, and sidewalk buffer are not available and thus were not incorporated into the analysis.



					
Infrastructure	Sidewalk Presence & Condition	Posted Speed Limit	Number of Lanes	Bike Lane Presence	Car Parking Presence
Effect	Existing and in good condition = more comfortable	Lower = more comfortable	Fewer = more comfortable	Present = more comfortable	Present = more comfortable

				
Built Form	Block Length	Building Set Back	Driveways	Addresses per Block
Effect	Shorter = preferable	Closer to the sidewalk = more comfortable	Fewer = more comfortable	More = preferable

						
Intersection	Number of Lanes	Posted Speed Limit	Average Daily Traffic	Accessible Curb Ramps	Traffic Signals	Crosswalks
Effect	Fewer = more comfortable	Lower = more comfortable	Lower = more comfortable	More = more comfortable	Present = more comfortable	Present = more comfortable

Table 3. Infrastructure, Built Form, and Intersection Factors and their Effect on Pedestrian Comfort

A Good Pedestrian Experience



A Poor Pedestrian Experience



Figure 5. Examples of good and poor pedestrian environments.

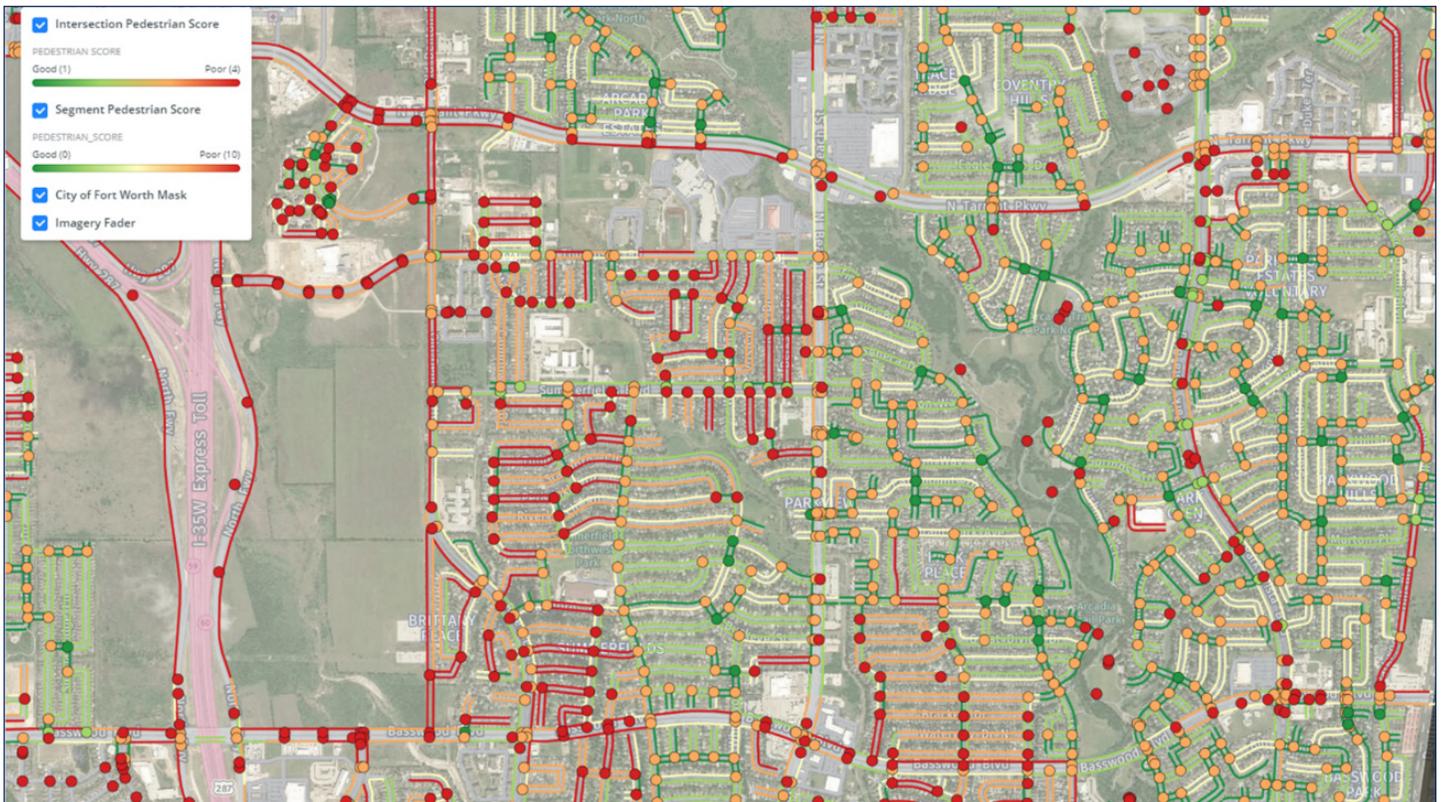


Figure 6. Partial view of the Pedestrian Experience Index (PEI) map. Green indicates more comfortable block segments and intersections and red indicates less comfort. Citywide results are shown in Figure 14.

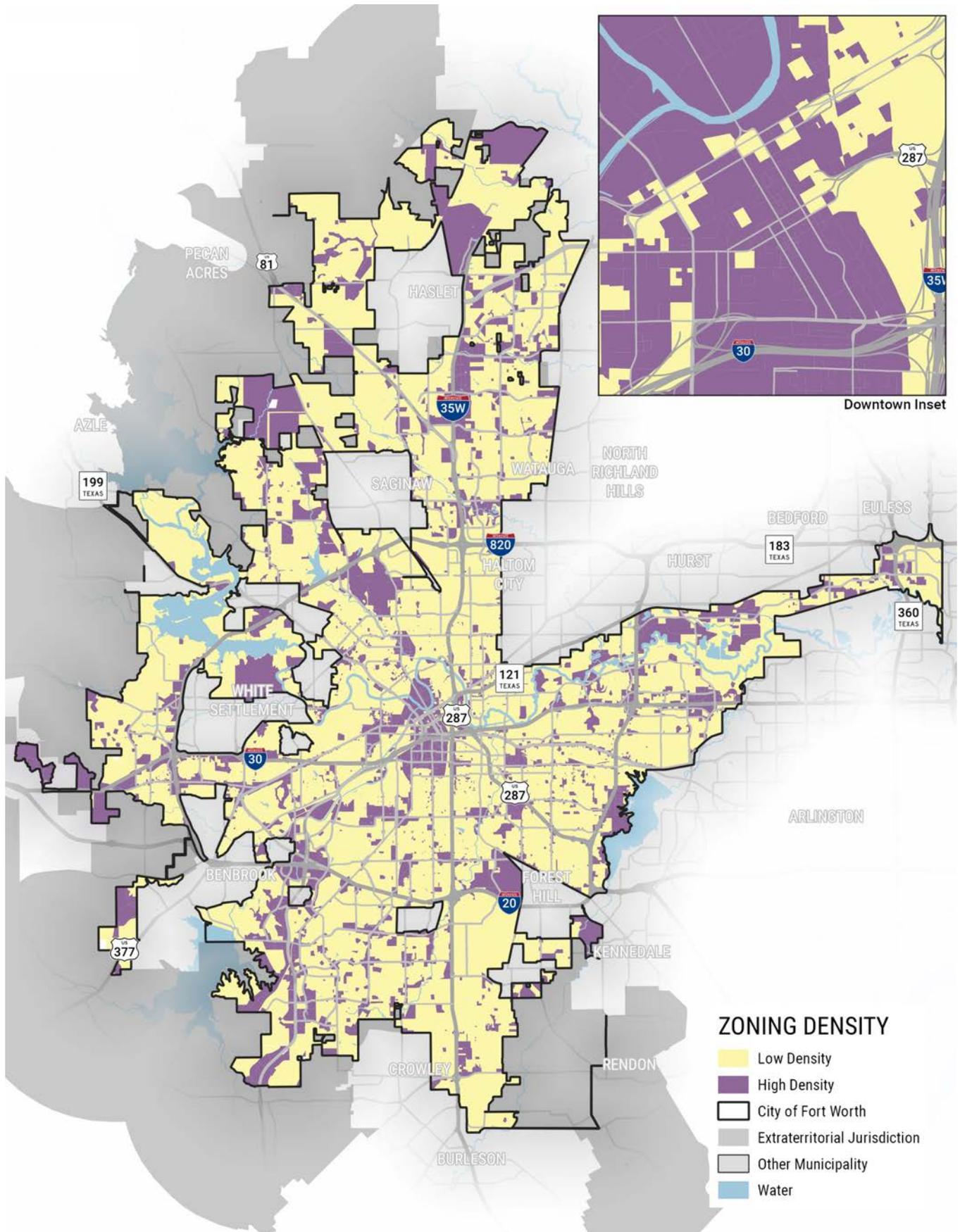


Figure 7. City of Fort Worth zoning data (2018).

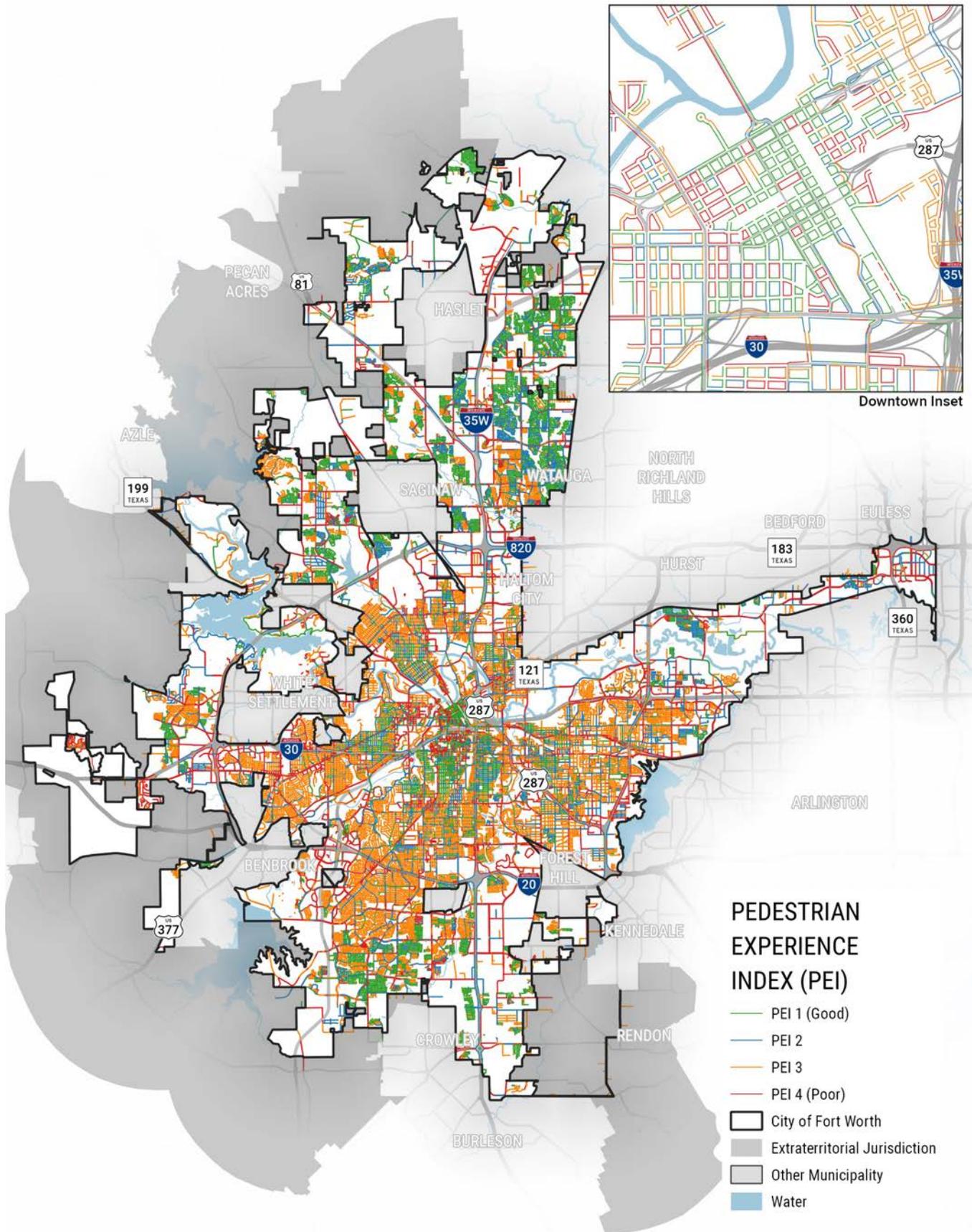
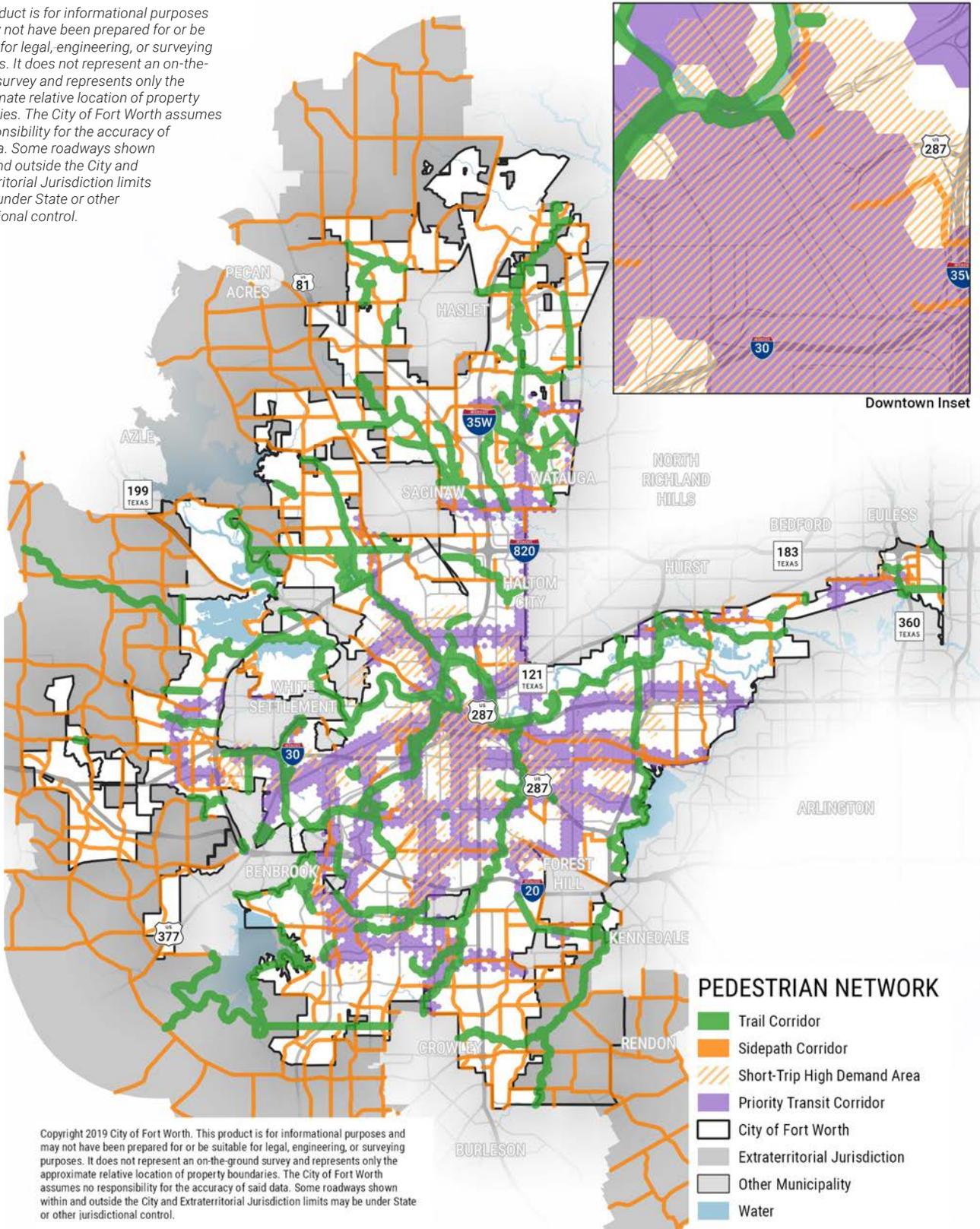


Figure 8. Citywide map of the results of the Pedestrian Experience Index.

Pedestrian Network Map

This product is for informational purposes and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. It does not represent an on-the-ground survey and represents only the approximate relative location of property boundaries. The City of Fort Worth assumes no responsibility for the accuracy of said data. Some roadways shown within and outside the City and Extraterritorial Jurisdiction limits may be under State or other jurisdictional control.



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Figure 9. The ATP pedestrian network is built around high-demand areas, trail corridors, and transit corridors. Detailed network maps may be found at <http://fortworthtexas.gov/atp/>.

Bicycle and Trail Networks

Bicycle and Trail Network Structure

The ATP's recommended bicycle and trails networks are planned around major corridors that cross large parts of the city (Spines), important connections to these corridors that also connect neighborhoods to each other (Ribs), and routes that support local travel (Neighborhood Networks and Local Trails). These network structures guided the selection of corridors, as described in the bicycle and trail network development sections below.

Spines

Fort Worth's major trails make up the Spine network to:

- Support long-distance connectivity
- Create major cross-town connections and regional connections to adjacent cities
- Connect with other Spine trails

Spine trail sections should be designed to accommodate large numbers of bicyclists and pedestrians.

Ribs

Supporting trails, sidepaths, and bicycle facilities make up the rib network. They do the following:

- Support connectivity between Spine trails and neighborhoods
- Connect neighborhoods

Rib segments should separate bicyclists from traffic to the maximum extent possible.

Neighborhood Networks and Local Trails

Local trails that don't connect to main transportation routes and on-street bicycle facilities make up the Neighborhood Networks. They do the following:

- Support short trips to local destinations
- Create the basis for neighborhood networks

According to the *Fort Worth ATP Facility Selection and Design Guide*, neighborhood streets should control traffic volumes and speeds and provide bicycle facilities when necessary to achieve user comfort. [See page 39](#) for more on implementing Neighborhood Networks.

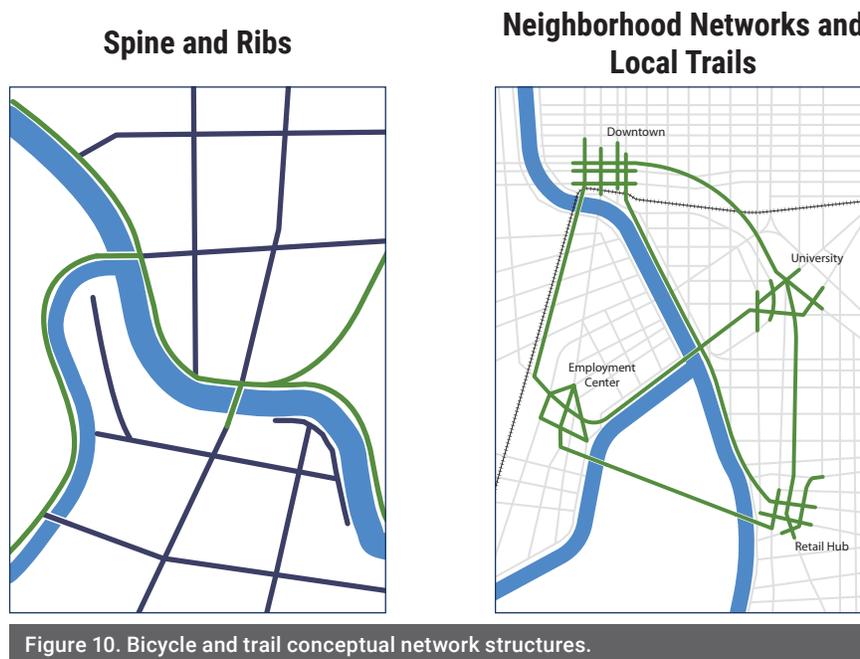


Figure 10. Bicycle and trail conceptual network structures.

Bicycle Network Development Approach

The following table describes the inputs used to develop an All Ages and Abilities bicycle network (page 23) that supports the overall network priorities (page 25). It describes each criterion and its influence on the bicycle network's development. Examples are provided to illustrate how locations and corridors were affected by the criteria.

Criteria	Description	Impact on Network Development	Selected Examples for Illustration Purposes
Stakeholder Input	Interviews with project stakeholders helped to identify popular destinations, and important or challenging routes.	Added connections to access destinations and improve comfort.	Recommended connections for barriers identified by stakeholders, i.e., I-35W. See Chapter 4.
Interactive Map Survey	The ATP interactive map survey gathered input from respondents on popular and challenging bicycling routes.	Included respondent-preferred routes. Addressed barriers and provided alternatives or addressed stressful routes.	Ramey Avenue, Dillard Street, Vaughn Boulevard, and East Rosedale Street.
Existing Level of Traffic Stress	Analysis of existing conditions based on bicycle facilities, traffic volumes, and traffic speeds.	Included lower stress routes when available and higher-stress segments as needed. Crossed major roads at low-stress intersections.	Recommended north-south low-stress connections as alternatives to high-stress Riverside Drive.
Short-trip Demand Areas	Parts of the city that have a high existing or latent demand for active transportation infrastructure.	Added connections within and between these areas.	Dense grid of recommended bikeways in urban villages.
Existing Facilities	Existing trails or streets with existing infrastructure, including signed routes.	Included in the network, may be upgraded in the future.	Bike lanes, such as on Rosedale Street, were included in the network as existing facilities.
Planned Facilities	Adopted and in-progress plans with bicycle and pedestrian infrastructure recommendations.	Included in network.	Sidepaths identified in the Master Thoroughfare Plan.
Established Thoroughfares	Constraints on established thoroughfares may preclude lane reconfiguration or roadway widening for bicycle facilities.	Selected alternative, parallel routes where possible. Included critical connections to increase safety and connectivity.	Recommended bikeways along neighborhood streets as an alternative to South Hulen Street.

(Table continued on next page.)

Criteria	Description	Impact on Network Development	Selected Examples for Illustration Purposes
Intersection Crossings	High-speed and high-volume intersection with and without traffic control were identified.	Selected routes through four-way stop intersections and signalized intersections.	Recommended crossing of Camp Bowie Boulevard at Clayton Road East instead of Edgehill Road.
Major Barriers	Rivers, freeways, and railyards that interrupt bicycling routes.	Added new connections and improved existing connections across major barriers.	Recommended grade-separated crossing of future Sycamore Creek Trail at Interstate 820.
Strava Data	Strava allows users to track their bicycle routes and provides data on the number of users, travel times, and intersection delay.	Referenced in areas with high Strava usage only, selected included routes in network.	Recommended bicycle facility on Park Place Ave, a popular route for Strava users.

Table 4. Bicycle network development inputs



Left: A comfortable trail (Photo credit: City of Fort Worth). Right: Bike lane on 10th Street (Photo credit: City of Fort Worth).

Implementing Neighborhood Networks

The ATP recommends a dense network of bicycle facilities in areas identified as having a high potential for short trips, referred to as Neighborhood Networks. The ATP's Neighborhood Networks link people to nearby daily destinations like parks, schools, retail, residences, places of worship, libraries, and essential services on connected and comfortable routes. Neighborhood Network corridors (mapped as pink on the bicycle network classifications map on page 40) connect to local destinations and are more tightly grouped than Rib and Spine segments.

Since research shows that complete, connected, dense networks are associated with higher levels of bicycling, concentrated investments in specific Neighborhood Networks within Fort Worth can provide a proof-of-concept that investments are effective. Good locations for Neighborhood Networks have:

- A mix of uses and a variety of local destinations;
- Short average trip distances; and
- A connected local street and bike lane network.

How to Build a Neighborhood Network

- **Ensure comfort:** Provide All Ages and Abilities routes and facilities.
- **Network density:** Develop a dense network of comfortable streets.
- **Destinations:** Connect to common local trip destinations such as parks, schools, retail, residences, places of worship, libraries, and essential services.

- **Barriers:** Provide ways to safely and comfortably get across major roadways and other barriers.
- **Identity:** Consider branding or naming the neighborhood network to build support. Engage the community to own and develop a unique identity.
- **Wayfinding:** Provide signs, markings, and information to help travelers navigate to neighborhood destinations.
- **Bike parking:** Provide secure bike parking at neighborhood destinations.
- **Outreach:** Conduct strong community outreach to build support and understanding.
- **Pilots:** Implement one or two pilot neighborhood networks for proof-of-concept. Start with neighborhoods with strong support.

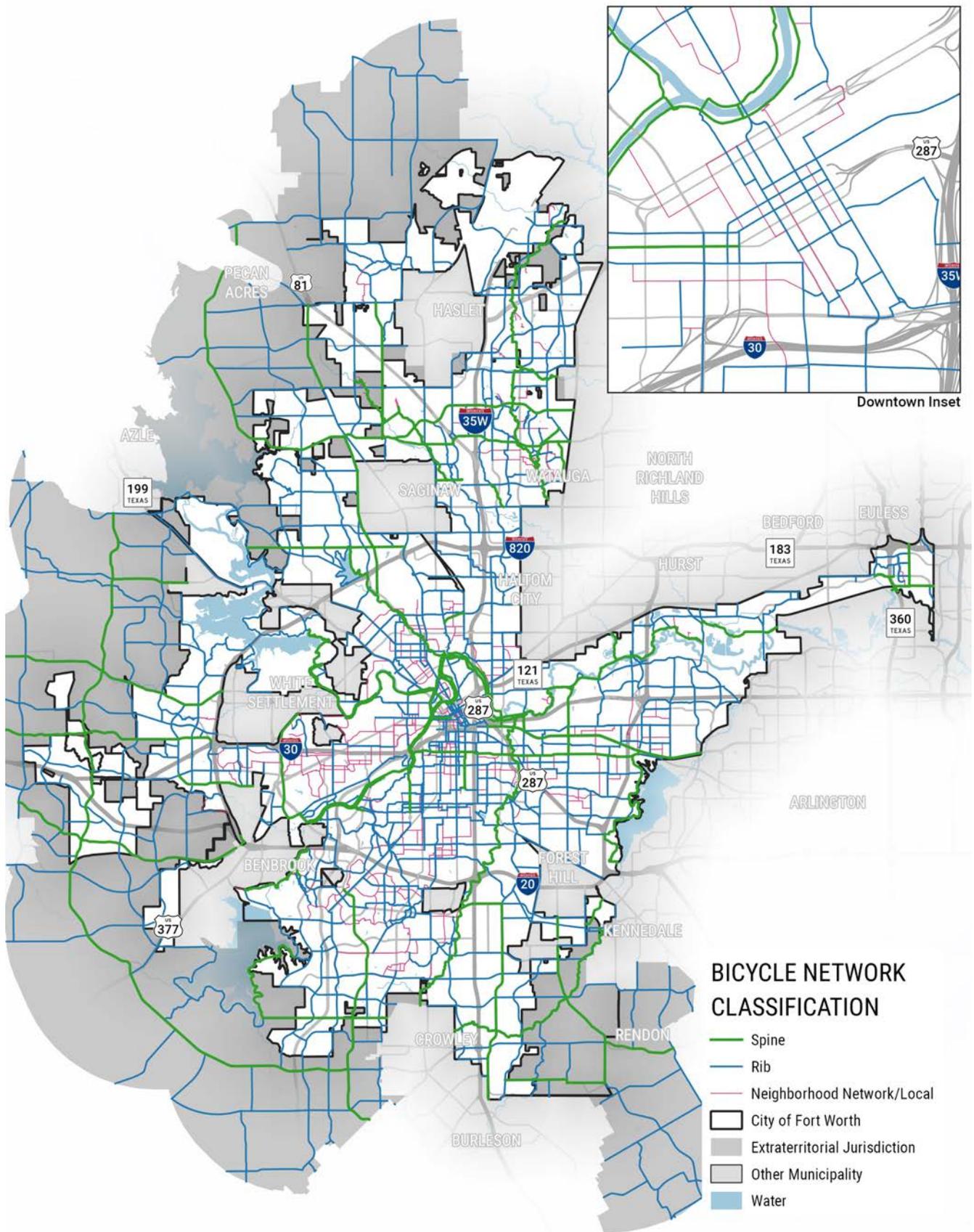


Figure 11. The ATP bicycle network structure includes Spine trails (green), Ribs that connect between neighborhoods (blue), and Neighborhood Networks of bike lanes (pink) and local trails. Detailed network maps may be found at <http://fortworthtexas.gov/atp/>.

Bicycle Level of Traffic Stress

Supporting bicycling in Fort Worth requires creating comfortable riding conditions. Bicycle Level of Traffic Stress (LTS) is a nationally recognized analysis that assesses each road segment and intersection in a community to estimate how comfortable each would be for different types of bicyclists. The methodology is based on national research that shows that roadway factors such as bike facility design, location, and traffic

volumes influence the comfort of riding a bicycle. Busier roads are more stressful and bicycle facilities that separate riders from traffic increase comfort.

Regional research supports these findings. Respondents to a North Central Texas Council of Governments survey found that respondents felt most comfortable riding a bike on an off-street path (85 percent reported feeling “very” or “somewhat comfortable”) or riding in an on-street bike lane separated from traffic by a raised curb (86% comfortable) over that same road without any bike lanes (9%).²⁷

Level of Traffic Stress		Shared Lanes	Bike Lanes	Intersections	Trails	Separated Bike Lanes
Traffic Stress	<p>1</p> <p>'All Ages and Abilities' Comfortable for users from age 8 (children) to 80 (seniors)</p>	 <p>Low Traffic Low Speed</p>	 <p>< 25 mph 2-3 Lanes</p>	 <p>Protected</p>	 <p>Greenway and Sidepath</p>	 <p>Cycle Track</p>
	<p>2</p> <p>'Interested but Concerned' Comfortable for the mainstream adult population</p>	 <p>Low /Medium Traffic 30 mph</p>	 <p>30 mph 2-3 Lanes</p>	 <p>Short Right Turn Lane</p>		
	<p>3</p> <p>'Enthusiastic and Confident' Acceptable for adult population comfortable in shared traffic but who may prefer some separation</p>	 <p>Medium/High Traffic 35 mph</p>	 <p>35 mph 3-4 Lanes</p>	 <p>Long Right Turn lane</p>		
	<p>4</p> <p>'Strong and Fearless' Tolerable for adult population comfortable in shared traffic with no separation</p>	 <p>High Traffic 40+ mph</p>	 <p>> 40 mph > 4 Lanes</p>	 <p>Bike Lane Drop</p>		

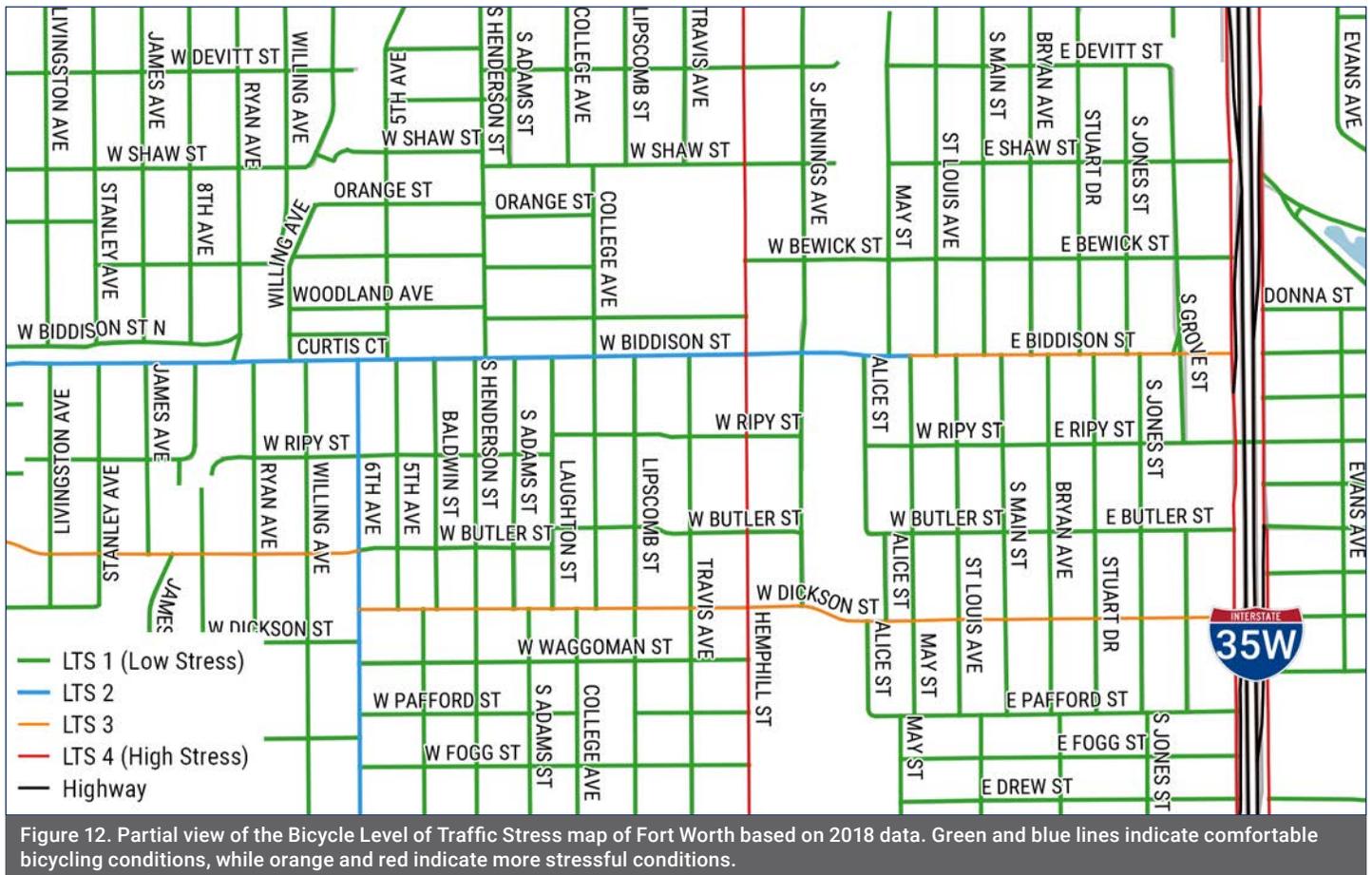
Table 5. Table showing the relationship between various traffic conditions, bicycle facility, and comfort.

27 North Central Texas Council of Governments, Bicycle Opinion Survey Report of Results, October 2017

Existing Conditions Analysis

An LTS analysis was conducted on the existing network to evaluate the stress or comfort of each segment and intersection based on traffic speeds, separation from traffic, and number of travel lanes—see Figure 18 and See Figure 19. Local streets are generally comfortable but are interrupted by larger, more stressful roads throughout the City of Fort Worth.

The results of the LTS were used to identify network routes that avoid stressful roadways and to propose bicycle facility improvements on stressful roads that are currently barriers to comfortable bicycling in the city. The LTS score was incorporated into the prioritization process (see [Chapter 4](#)) so that stressful roads are improved in the near term.



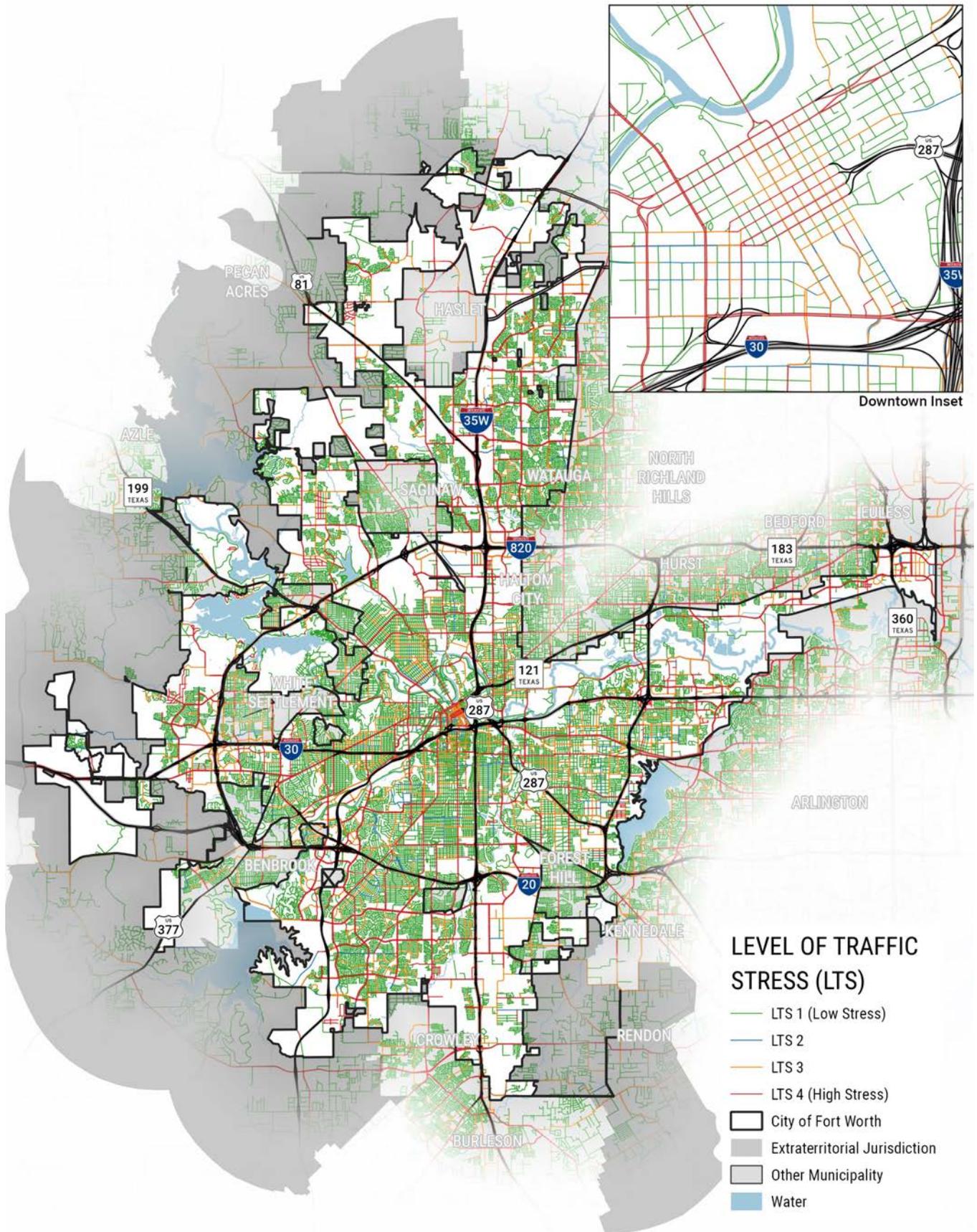


Figure 15. Bicycle Level of Traffic Stress map.

Bicycle Network Analysis (BNA)

An additional analysis was conducted to determine the extent to which comfortable places to bike are connected in different parts of the city. This connectivity analysis is known as the Bicycle Network Analysis (BNA). It measures how easily a person can travel to and from points in the city by bike without ever encountering a stressful crossing or riding along a stressful roadway.

The BNA builds on the Fort Worth LTS analysis, which scores each street and intersection for stress based on roads conditions and presence of a bicycle facility. The BNA uses Census data on population and jobs, and Open Street Map (OSM) data for destinations to determine how well people and places are connected by entirely low-stress routes. The BNA uses these six categories:

- People: Access to other people in the city based on the resident population distribution

- Opportunity: Access to jobs and educational institutions
- Core Services: Access to critical services such as health care
- Recreation: Access to public recreation outlets
- Retail: Access to shopping areas
- Transit: Access to major transit hubs

More on the BNA methodology can be found here: <https://bna.peopleforbikes.org/#/methodology>

The BNA was conducted once using the existing bicycle facilities and trails and then again to access the resulting network if the top 20 trail projects and top 150 bicycle projects were implemented. Two separate maps were created to show the existing conditions connectivity and future-condition connectivity. The connectivity results are shown in the table below. The scores indicated, on average, how the bicycle network allows people to access different destinations along low-stress routes.

Category	Existing conditions (2018 Facilities)		After the first 150 bicycle projects and top 20 bike projects	
	Connectivity score	Percentage of the population that can reach at least one of the following destinations using a low-stress route	Connectivity score	Percentage of the population that could reach at least one of the following destinations using a low-stress route
Overall	23	NA	35	NA
Population Connectivity Score	35	NA	47	NA
Core Services Connectivity Score (medical, grocery, social services)	11	NA	21	NA
Employment Score (connectivity to jobs)	21	NA	35	NA
Parks	32	68%	45	77%
Retail	14	26%	23	36%
Major Transit Hubs	2	2%	9	9%

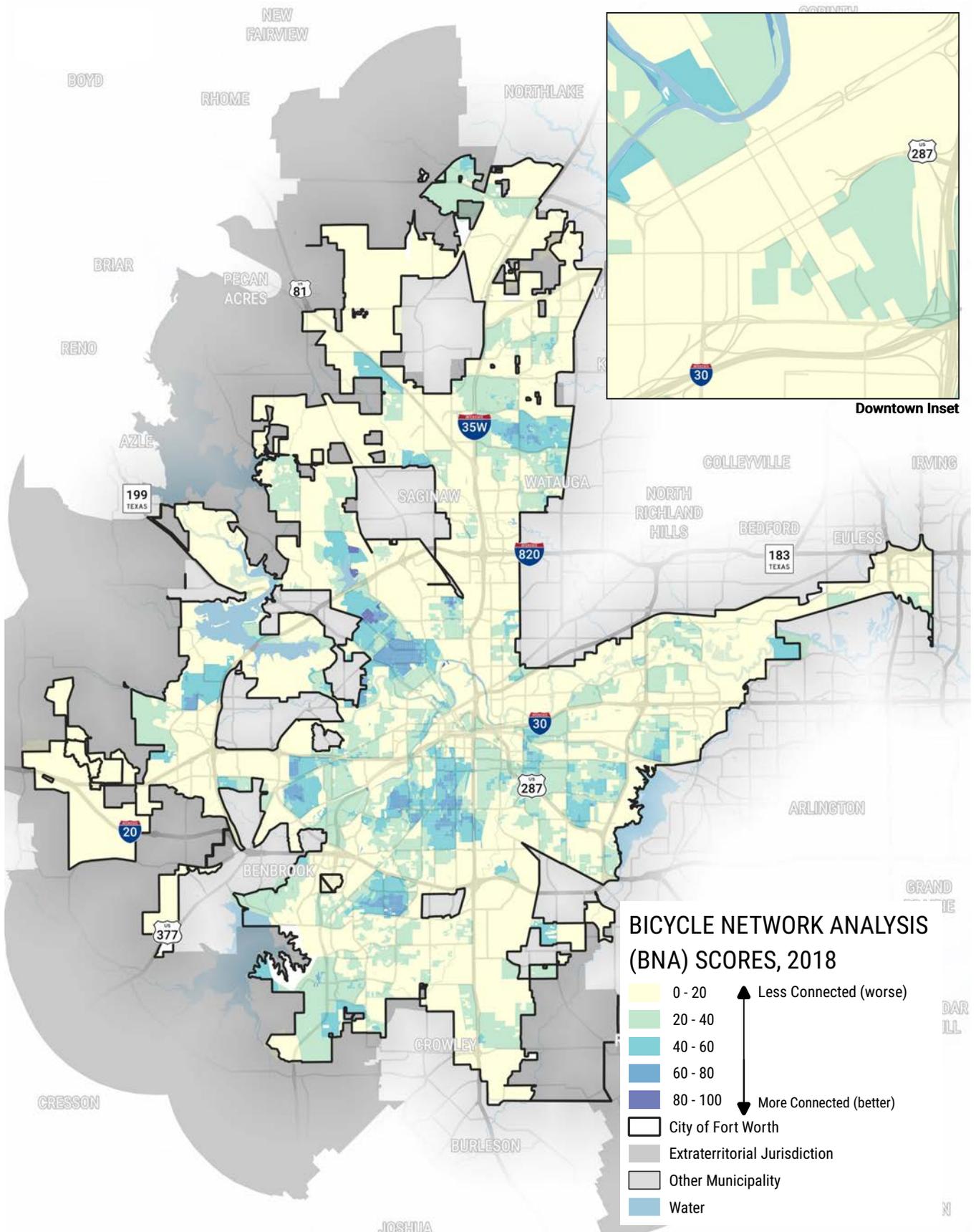


Figure 13. Existing conditions Bicycle Network Analysis for Fort Worth showing areas that are well and less-well connected by low-stress bicycling routes.

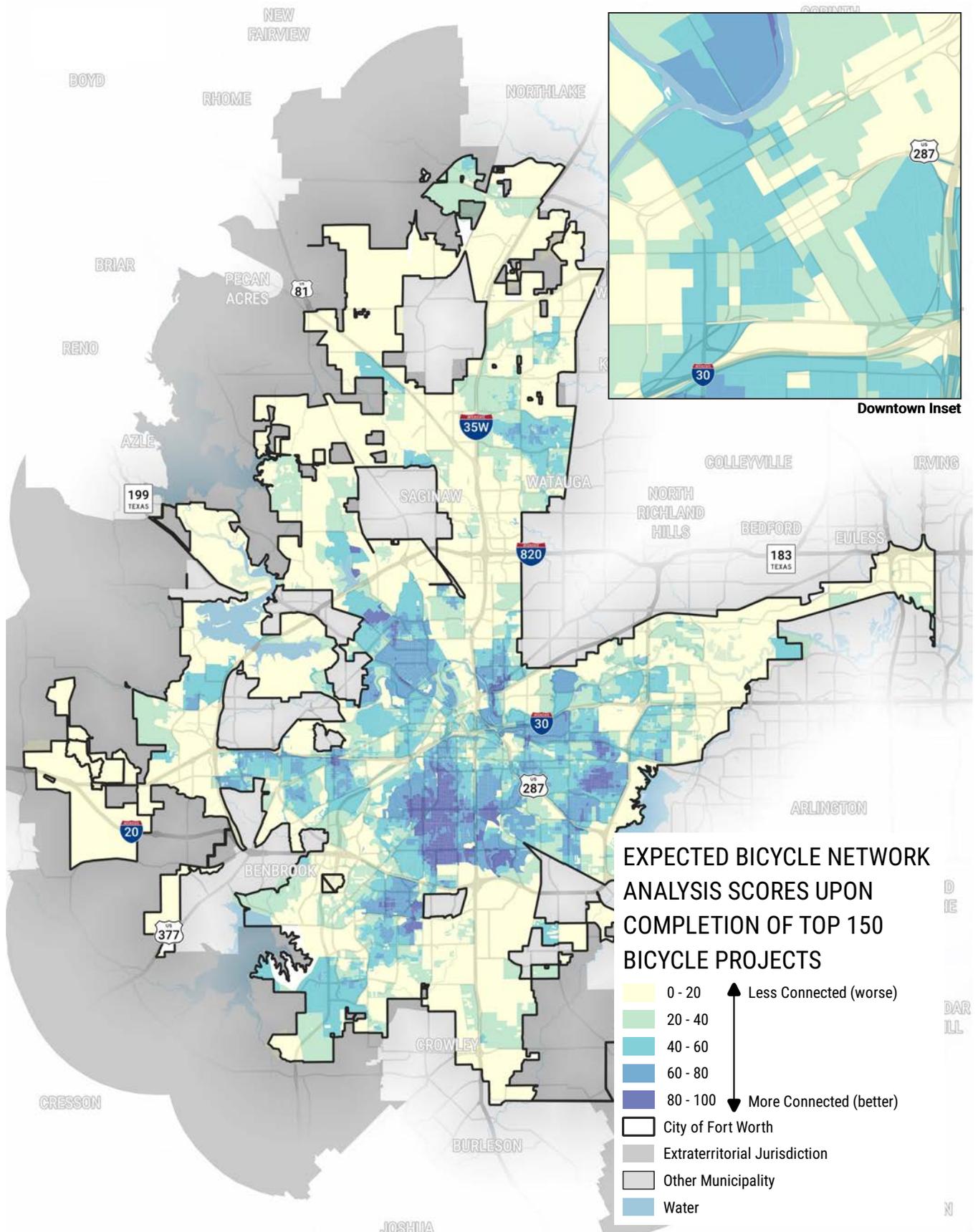
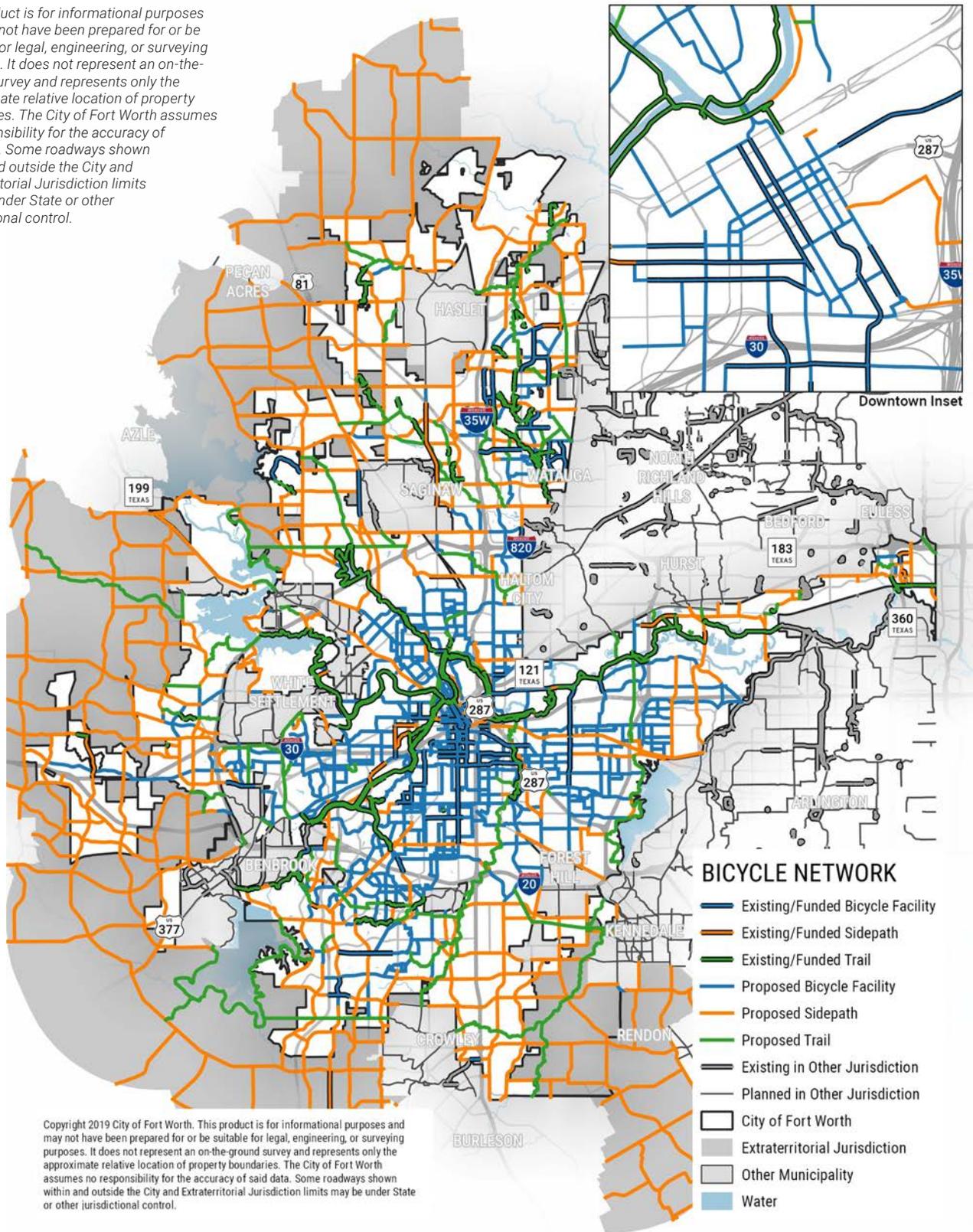


Figure 14. Future conditions Bicycle Network Analysis for Fort Worth showing areas that are well and less-well connected by low-stress bicycling routes after the first 150 bicycle projects and top 20 trail projects are built.

Bicycle Network Map

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Figure 16. The ATP bicycle network uses on-street bicycle facilities (blue), trails (green), and sidepaths (orange). Detailed network maps may be found at <http://fortworthtexas.gov/atp/>.

Trail Network Development Approach

The Active Transportation Plan consists of a combination of Spines, 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.

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 6. 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. The existing trail system was brought about by a collaboration of several organizations. The Tarrant Regional Water District (TRWD) has constructed, and maintains, much of the existing Trinity Trails system. The City of Fort Worth has constructed trails, many of which are located within city parks or stream corridors. Many local neighborhood-level trails were constructed as part of private development projects and have the potential to be integrated into the citywide trail network. An inventory of all existing trails was completed in order to make additional network alignment recommendations.

Previous Plans

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

- ***Bike Fort Worth*** – Trail alignment recommendations identified in the City’s previous bicycle plan 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 projects to enhance all major segments of the Trinity River. All trail facility recommendations were incorporated.
- ***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 projects 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, potential 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

Trail Network Development

With an understanding of the existing trails and future opportunity areas, the next objective of developing the complete Trails Master Plan was to identify a network of inter-connected off-street alignments to provide comfortable routes for recreation and transportation. The majority of trails identified in the plan are part of the Spine and Ribs structure. Where feasible, trails are intended to be separated from roadways using over or underpasses, natural areas, floodplains, rail alignments, or other easements.

While emphasis was placed on identifying trail alignment opportunities that serve all major districts, activity centers, neighborhoods, and future growth areas, trails cannot practically serve all destinations. It was therefore important that the trail network be connected with on-street bicycle and pedestrian networks to increase trail access and route continuity throughout the city.

The recommended locations of future local trails that create shorter, neighborhood-level connections to the spine and rib network have predominantly not been mapped, as these connections may best be determined during project implementation. This is particularly true for undeveloped areas where neighborhoods and streets have not yet been constructed. However, certain local trail recommendations that make logical connections to existing developed areas or to other existing local trails have been included in the plan.

Local Trails

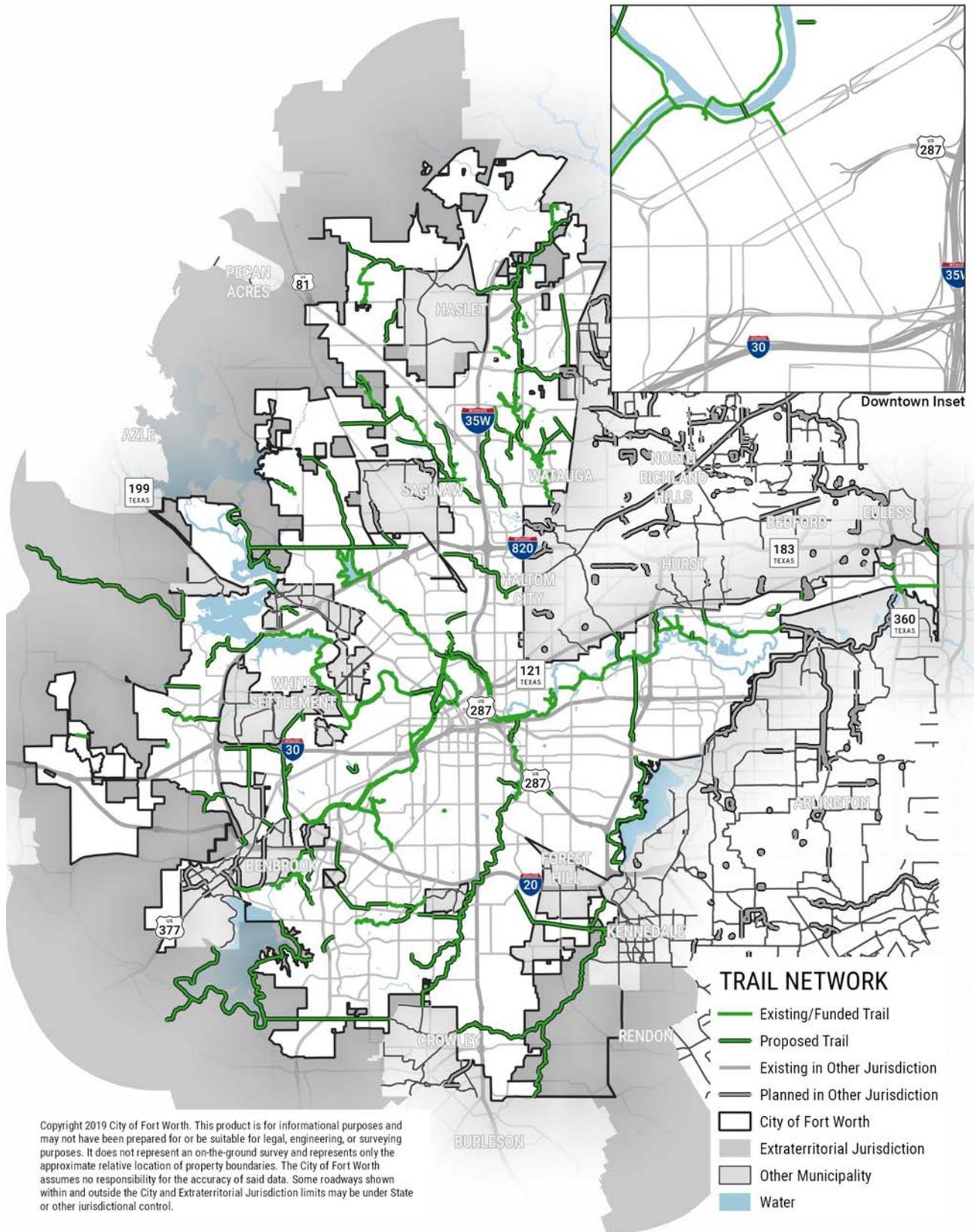
Local trails that serve as part of a Neighborhood Network are typically not mapped as part of the Trails Master Plan. However, local off-street and on-street connections should be considered in existing and future development areas to enhance access to the Spine and Rib trail network. When determining 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.

Refer to the [ATP Facility Selection Guide and Design Toolkit](#) for additional guidance on trail network classifications.



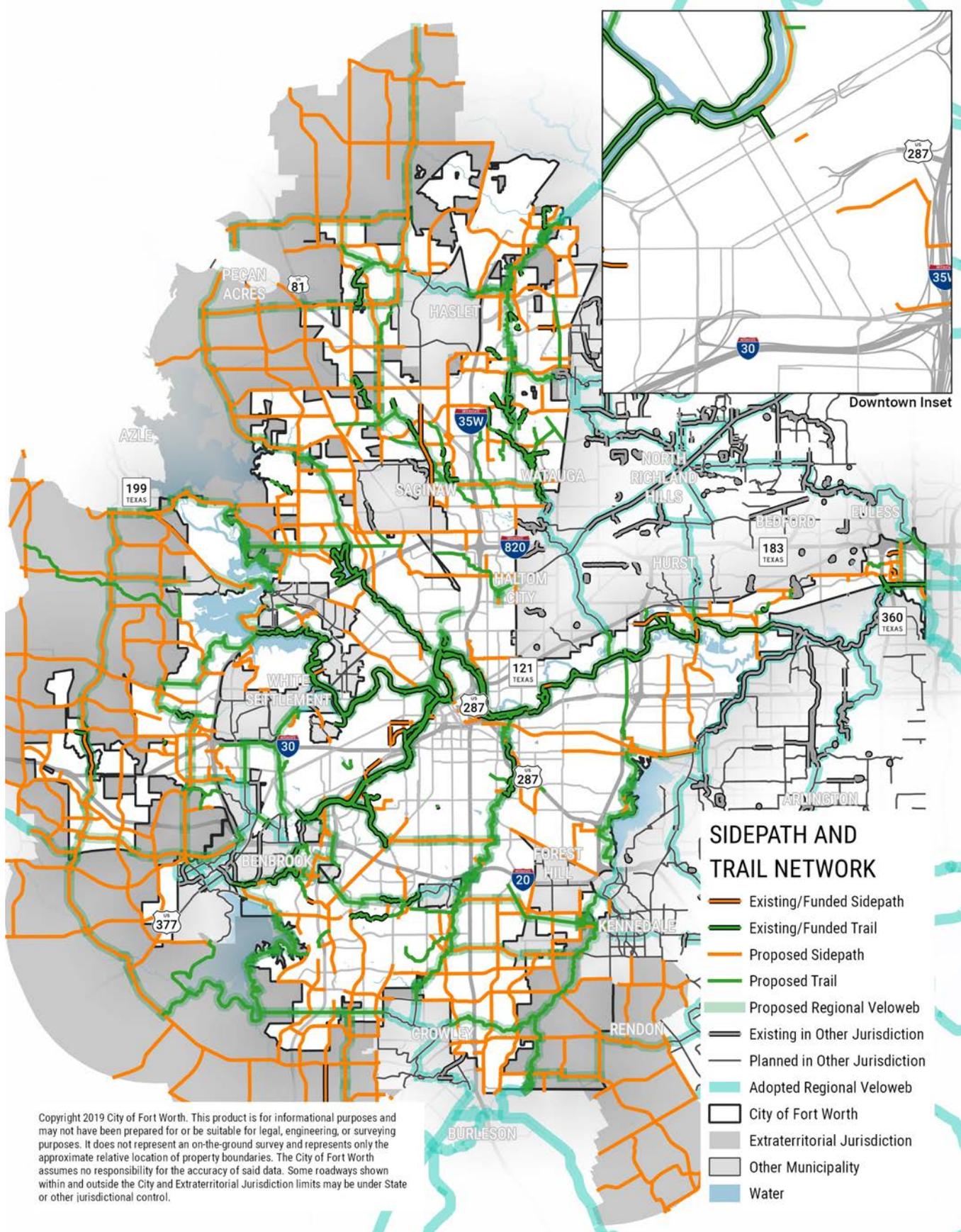
A local trail in Fort Worth (Photo credit: City of Fort Worth)

Trail Network Maps



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Figure 17. The ATP Trail Network. Detailed network maps may be found at <http://fortworthtexas.gov/atp/>.



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Figure 18. The ATP trail and sidepath network. Detailed network maps may be found at <http://fortworthtexas.gov/atp/>.

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4

Prioritization, Projects, and Cost Opinions

Introduction

This chapter explains how the pedestrian, bicycle, and trail networks described in Chapter 3 were segmented into individual projects and prioritized. It lists the most highly prioritized projects for near-term implementation and provides high-level cost opinions for planning purposes.

Project Identification

For each network, segments of the full network were defined as specific projects, with defined limits. These projects were then prioritized. This section describes the project identification process for pedestrian projects and bicycle and trail projects.

Pedestrian Projects

Before sidewalk projects could be prioritized, sidewalk gaps had to be identified and grouped into projects.

Gaps in the sidewalk network were identified using sidewalk condition data. Streets where no condition grade was available indicated the absence of sidewalks. These were coded in the data as sidewalk gaps.

There are more than 4,000 miles of streets in Fort Worth that do not have sidewalks, spread over thousands of different blocks. In order to develop a manageable project list, it was necessary to group sidewalk gaps together. Fort Worth was organized into more than 8,000 ½-mile wide hexagons. Sidewalk gaps were then grouped into these hexagons. Each hexagon became a project that could be prioritized.

Sidewalk Project Identification and Prioritization Steps



1. Identified gaps in the sidewalk network, based on condition data, which showed the absence of sidewalks.



2. Grouped sidewalk gaps into project hexagons.



3. Identified gaps in the sidewalk network, based on condition data, which showed the absence of sidewalks.

Figure 1. Sidewalk project identification and prioritization steps.

Each project hexagon was prioritized using available data on equity, short-trip demand and transit corridors, safety, comfort, and stakeholder input.

The resulting project list shows the areas of the city where sidewalks are both the most needed and the most useful. However, within a hexagon, agency staff should consider which sidewalks are most critical. It may not be equally necessary to fill each sidewalk gap in a particular hexagon. Sidewalks on major roads, adjacent to retail, and where there is a pedestrian crash history should be prioritized within a hexagon. Side streets that provide access to bus stops should also be prioritized within a hexagon.

Bicycle and Trails Network Projects

The alignments identified for the trail and bicycle networks were broken up into projects defined by start and end points. Logical termini include existing trails and bikeways; destinations such as transit facilities, schools, parks, and commercial areas; and jurisdictional boundaries. Projects on arterials on the Master Thoroughfare Plan (MTP) begin or end at an intersection of another MTP street. Projects do not exceed 2 miles in length. Each project includes a single, consistent bicycle facility type.

Determining the On-Street Bicycle Facility Type

The ATP network identifies over 1,200 trail and bicycle projects for the City of Fort Worth. These projects represent recommended corridors and, in most cases, do not specify a bicycle facility type or design.

The *ATP Facility Selection Guide* provides information to help planners and designers select the appropriate facility for the corridor as part of the project planning and design process. Where the Master Thoroughfare Plan specifies a project type, it supersedes the ATP.

Funding

Potential funding sources are discussed in [Chapter 5](#). Demand for new trails, sidewalks, and bicycle facilities exceeds currently available dedicated funds for these purposes. The ATP provides information to help decision makers understand what can be built if additional funds are made available. The prioritization process described below helps identify high-impact projects for near-term implementation.



Runners and bicyclists on trails in Fort Worth. (Photo credit: City of Fort Worth)

Project Prioritization

Given limited funding and resources, the prioritization process provides information on which projects should be funded and implemented first. The ATP's data-driven prioritization process scored and ranked each project.

The ATP's prioritization process for trails and bikeways used the project segments described on page 51. Note that sidepaths and bicycle projects on future roadways in the MTP are considered part of the network, but are not included in prioritization because they will be built when those roads are constructed. Also, neighborhood streets with existing bicycle routes are not included in prioritization.

The sidewalk prioritization used the hexagons described on page 50. The prioritization factors and

weighting were customized for pedestrian, bikeway, and trail projects as outlined in Table 11 below.

The factors were derived from project goals and stakeholder input. Scoring connectivity ensures that new projects support the existing system. Scoring demand means that projects get built where they are likely to be well-used. Scoring crash history and comfort addresses safety. Scoring stakeholder input means that projects the public sees as important are the ones that move forward. Projects located in equity areas are weighted highly because they contain a disproportionate number of pedestrian and bicycle crashes. Crashes are concentrated in majority minority areas, areas with high rates of poverty, and areas with high populations of people with disabilities. See See Figure 24.

Prioritization Factor	Description	Weight		
		Sidewalks	Bikeways	Trails
Equity	Majority Minority Area, low-income populations, population of people with disabilities	40%	30%	30%
Spine Trail	On a Spine network alignment	--	--	30%
Connectivity	Intersection with existing bikeway or trail	--	25%	30%
Demand	Population density, employment density, transit stations/stops, trail heads, schools, and households without access to a motor vehicle	30%	20%	--
Crash History	Available crash record	20%	10%	--
Comfort	Pedestrian Experience Index or Level of Traffic Stress	5%	10%	--
Stakeholder Input	Interactive map priority	5%	5%	10%
Funding	20% funding from external sources	--	--	10% (bonus)
Feasibility	Evaluated through 30% design	--	--	10% (bonus)

Table 1. Prioritization factors and weights for pedestrian, bicycle, and trail projects.

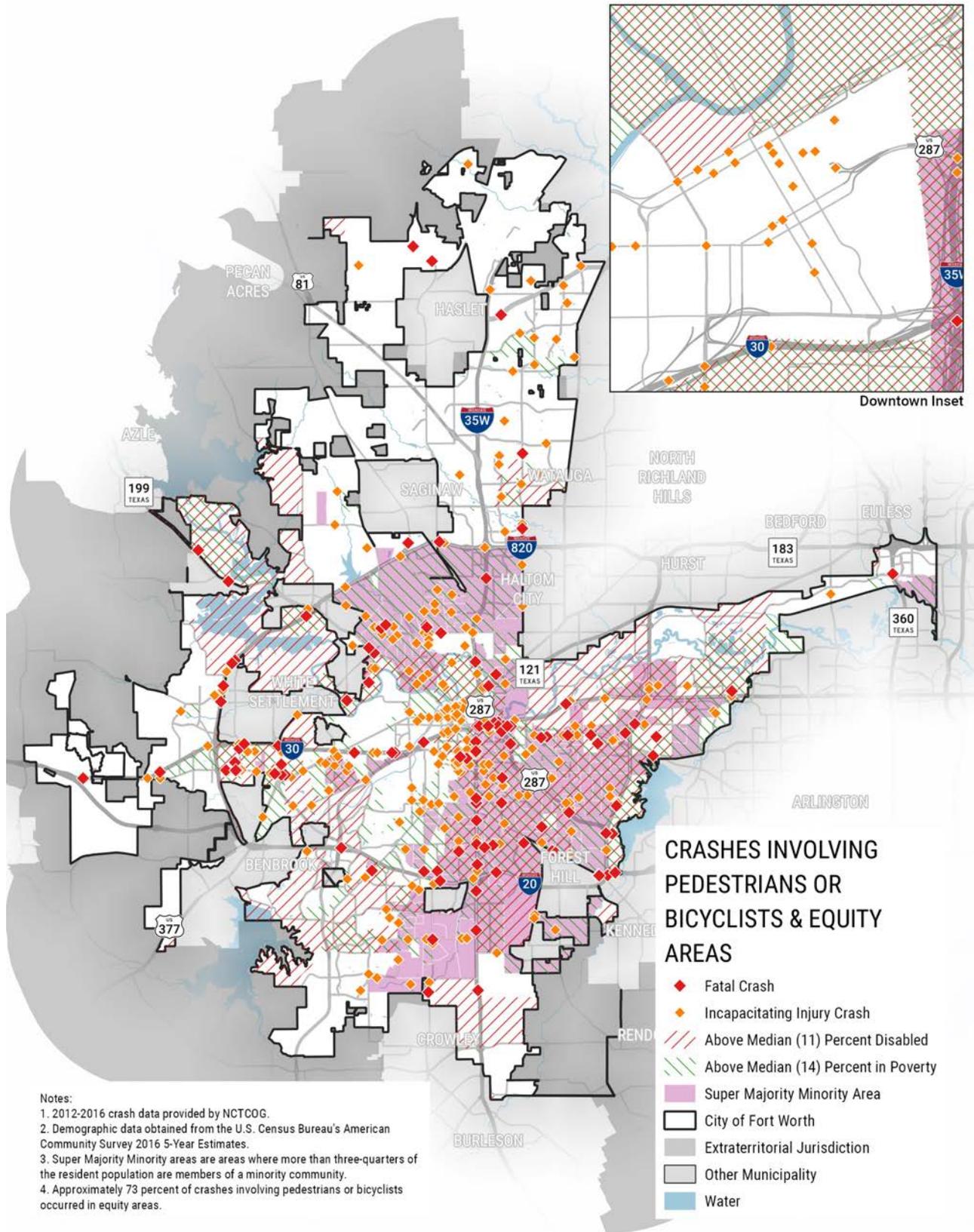


Figure 2. Map showing the distribution of pedestrian and bicyclist fatal (red) and incapacitating (orange) crashes over majority minority areas (purple), areas with high rates of poverty (green hash lines) and areas with high population of people with disabilities (pink hash lines). These areas contain a disproportionate number of pedestrian and bicycle crashes.

Prioritized Project Lists

This section lists prioritized projects based on the methodology described in the previous pages.

Pedestrian Projects

The pedestrian prioritization process is based on the sidewalk gaps that were grouped into project hexagons. The priority project hexagons are mapped and listed on the following pages. However, it will be useful for implementers to know the top priority streets inside the project hexagons. The table below lists the streets with the most sidewalk gap mileage located within the

300 highest ranked project hexagons. Cost opinions in the table below are based on an estimated cost of \$966,000 per mile of 5-foot wide sidewalk.

See Figure 25 shows the 20 top project hexagons. The pedestrian projects listed on page 60 scored highest in the ATP prioritization process. The hexagons on the map on the following page represent small clusters or projects in high-priority areas. During implementation, it may be more efficient to fill sidewalks in groups of hexagons of varying priority levels in close proximity, rather than going in strict numerical ranked order.

Street Name	Length of Sidewalk Gap (Miles) Located in Top 300 Project Hexagons	Cost Opinion Assuming \$966,000/ Mile, Rounded
South Riverside Drive	3.08	\$3,000,000
Camp Bowie West Boulevard	1.60	\$1,600,000
East Lancaster Avenue	1.55	\$1,500,000
Mansfield Highway	1.47	\$1,500,000
Northwest 28th Street	1.36	\$1,400,000
Calmont Avenue	1.36	\$1,400,000
East Rosedale Street	1.36	\$1,400,000
Ash Crescent Street	1.23	\$1,200,000
East Seminary Drive	1.16	\$1,200,000
East Vickery Boulevard	1.08	\$1,100,000
Littlepage Street	1.06	\$1,100,000
Kearney Avenue	0.99	\$1,000,000
Crawford Street	0.95	\$1,000,000
Coleman Avenue	0.89	\$900,000
South Freeway	0.87	\$900,000
South Jennings Avenue	0.85	\$900,000

Table 2. Streets in Fort Worth with the greatest length of sidewalk gap in the top 50 priority project hexagons.

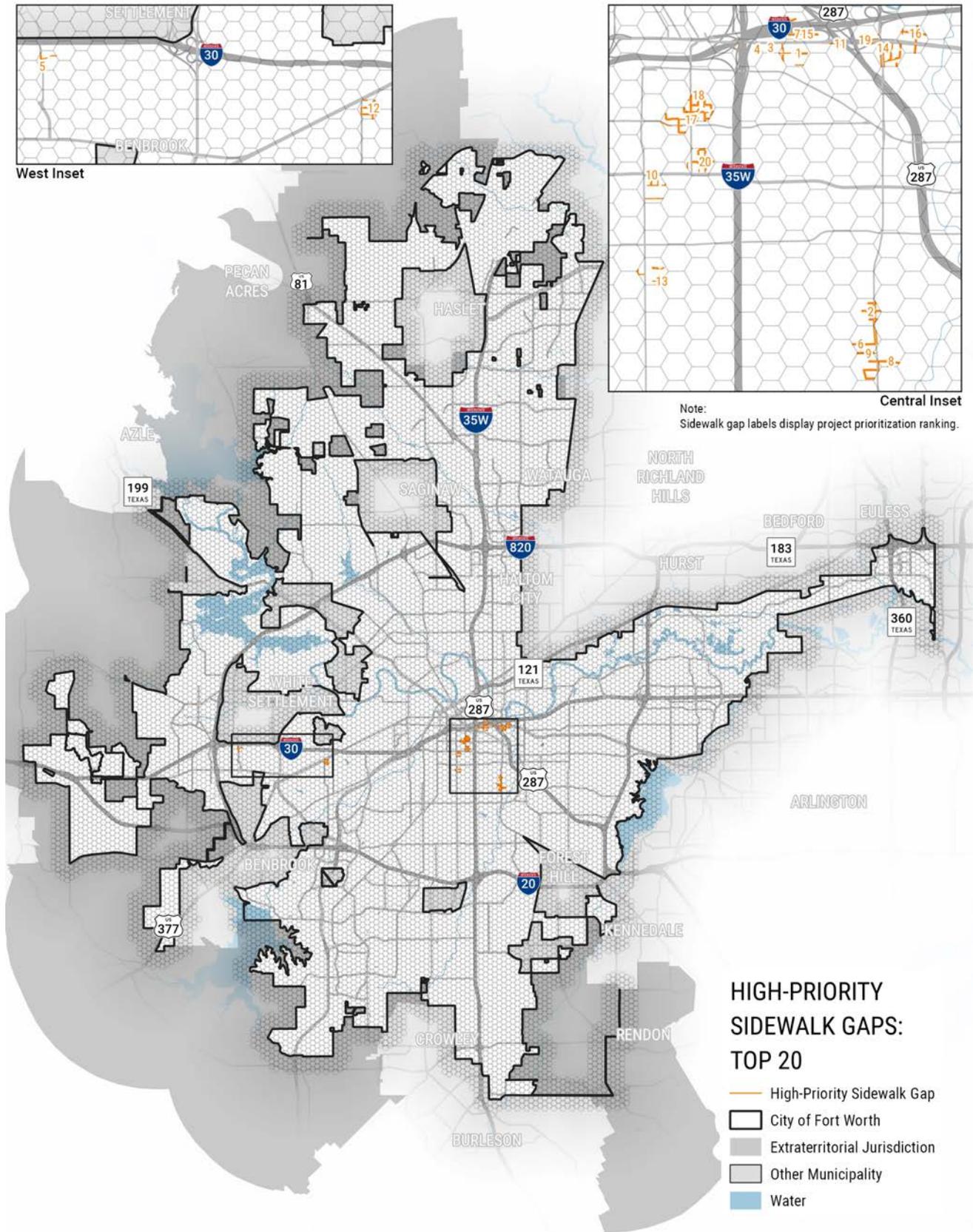


Figure 3. Map of the 20 highest ranked project hexagons.

Priority Rank	Street in Sidewalk Project Hexagon	Length of Sidewalk Gap in Miles	Cost Opinion Assuming \$966,000/Mile, Rounded
1	Cedar Street / Cypress Street / East el Paso Street / East Presidio Street	0.38	\$400,000
2	East Harvey Avenue / East Jessamine Street / East Powell Avenue / South Riverside Drive	0.64	\$700,000
3	Cedar Street / Poplar Street	0.06	\$100,000
4	East Presidio Street / North Kentucky Avenue / South Freeway	0.09	\$100,000
5	Calmont Avenue / Las Vegas Trail	0.28	\$300,000
6	East Mulkey Street / East Robert Street / South Riverside Drive	0.64	\$700,000
7	19th Street / Chambers Street / Cypress Street / Kennedy Street	0.46	\$500,000
8	Ash Crescent Street / Colvin Avenue / East Robert Street / South Riverside Drive	0.36	\$400,000
9	Colvin Avenue / East Morningside Drive / East Robert Street / South Riverside Drive / Talton Avenue	0.68	\$700,000
10	Grainger Street / May Street / South Jennings Avenue / West Magnolia Avenue / West Oleander Street	0.33	\$400,000
11	East Lancaster Avenue	0.04	\$100,000
12	Bryant Irvin Road / Camp Bowie Boulevard / Diaz Avenue / Donnelly Avenue / Geddes Avenue / Littlepage Street	0.84	\$900,000
13	Travis Avenue / West Arlington Avenue / West Baltimore Avenue / West Richmond Avenue	0.23	\$300,000
14	Chester Street / Cromwell Street / East Avenue / Grafton Street / Riverside Drive / South Riverside Drive	0.69	\$700,000
15	East Lancaster Avenue / Kennedy Street	0.11	\$200,000
16	Bomar Avenue / Grafton Street / Windham Street	0.62	\$600,000
17	Cleveland Avenue / Galveston Avenue / Pennsylvania Avenue / South Main Street / West Annie Street / West Cannon Street / West Tucker Street	0.77	\$800,000
18	Bryan Street / Cleveland Avenue / Crawford Street / East Annie Street / East Peter Smith Street / East Tucker Street / South Calhoun Street / South Main Street / West Annie Street / West Tucker Street	1.18	\$1,200,000
19	East Lancaster Avenue / Riverside Drive	0.20	\$200,000
20	Bryan Street / Crawford Street / East Dashwood Street / East Terrell Avenue / Oak Grove Street / South Main Street	0.60	\$600,000

Table 3. List of 20 highest ranked sidewalk project hexagons, total length of sidewalk gap, and high-level cost opinion.

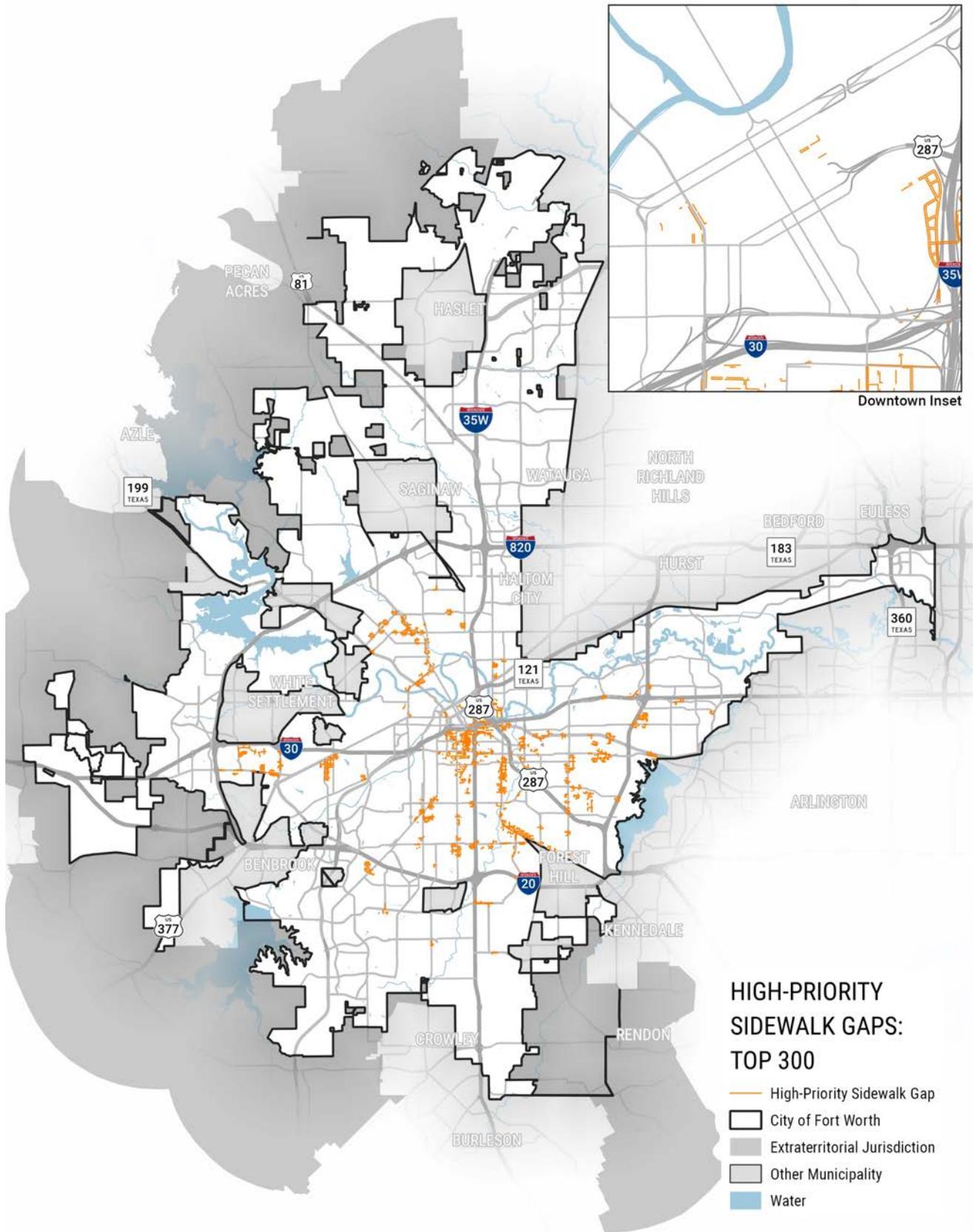


Figure 4. Top 300 priority sidewalk gaps, grouped into project hexagons.

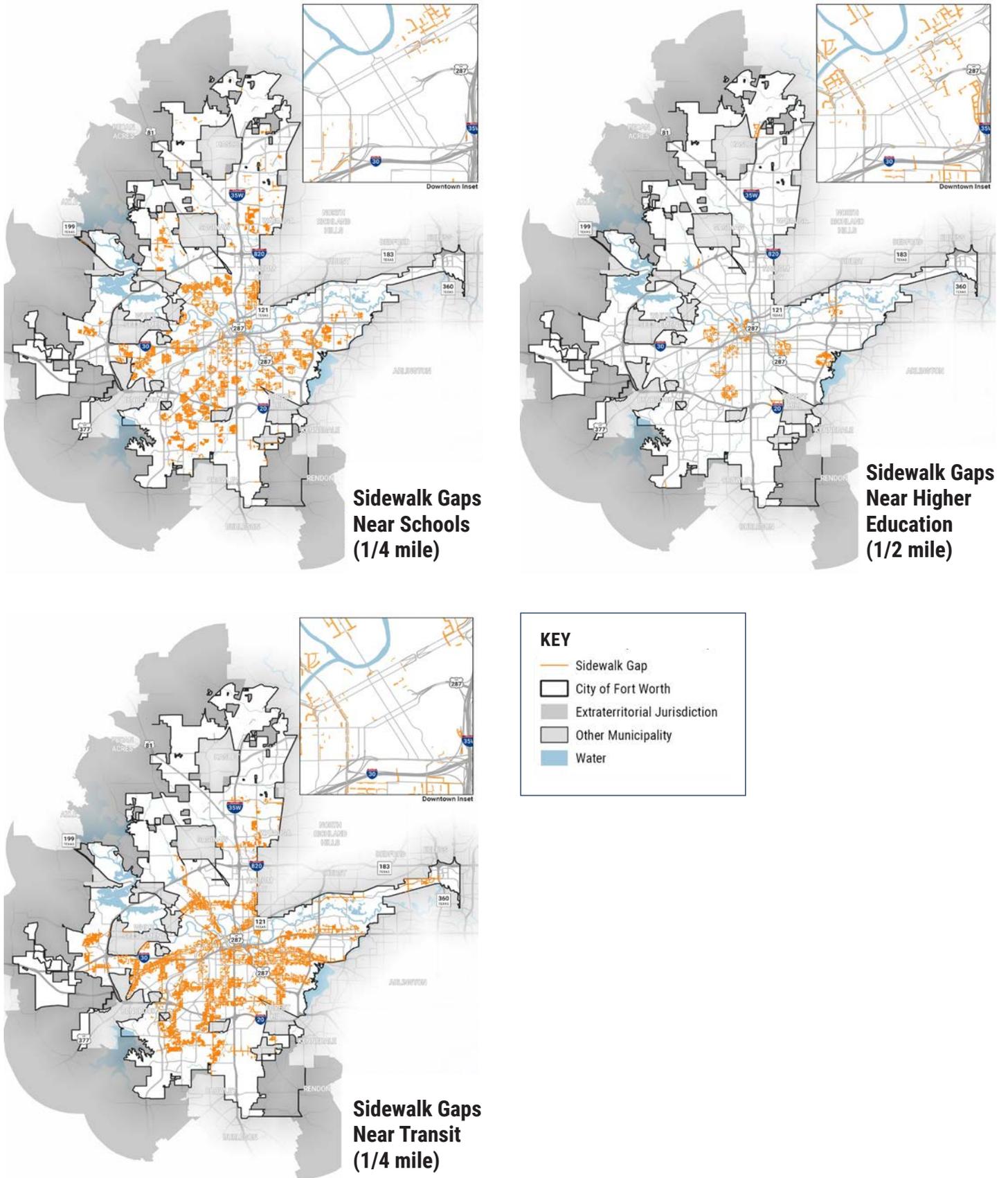


Figure 5. Maps showing high-priority sidewalk gaps near schools, higher education, and transit corridors.

Bicycle Projects

The following on-street bicycle projects scored most highly in the ATP's prioritization process. The ATP Facility Selection Guide should be used to select the appropriate facility to provide bicyclist comfort given the roadway conditions and context. The Bicycle Network Analysis in Chapter 3 shows the impact of the first 150 bicycle projects on the City's overall low-stress connectivity.

Rank	On-Street Bicycle Project	In an MMA or Super MMA?	Within 1/4 Miles of a School?	Within 1/2 Mile of Higher Education?	Within 1/4 Mile of a Transit Corridor?
1	Rosedale Street from Main Street to Evans Ave	Super MMA			Yes
2	Tennessee Ave/Pine Street/IM Terrell Way from Hattie Street to IM Terrell Circle	Super MMA	Yes		Yes
3	Lancaster Ave from Pine Street to Riverside Drive	Super MMA	Yes		Yes
4	Vickery Blvd from Main Street to Kentucky Ave	Super MMA	Yes	Yes	Yes
5	Cantey Street from University Drive to Willing Ave	MMA	Yes	Yes	Yes
6	Jennings Ave from Terrell Ave to Pennsylvania Ave	MMA			Yes
7	Evans Ave from Berry Street to Allen Ave	Super MMA	Yes		Yes
8	Vickery Blvd / Rogers Rd / Colinsworth Street / S. University Dr from Montgomery Street to Old University Drive	Super MMA	Yes		Yes
9	Main Street from Morningside Drive to Allen Ave	Super MMA			Yes
10	Terrell Ave from College Ave to Jennings Ave	MMA	Yes		Yes
11	Adams Street from Pennsylvania Ave to Vickery Blvd	MMA	Yes		
12	McCart Ave from Berry Street to Park Hill Dr		Yes	Yes	Yes
13	University Drive from Benbrook Blvd to Bellaire Drive			Yes	Yes
14	Riverside Drive/Sylvania Ave from Trinity Trails to 4th Street	Super MMA	Yes		Yes
15	Cannon Street from Henderson Street to Hemphill Street	MMA	Yes		Yes
16	9th Street/Harding Street/Luella Street/IM Terrell Circle from Jones Street to 19th Street	Super MMA	Yes	Yes	Yes
17	Park Vista Blvd from Keller Hicks Road to Caylor Road	MMA			
18	Henderson Street from Terrell Ave to Pennsylvania Ave		Yes		
19	Henderson Street from Pennsylvania Ave to Lancaster Ave	MMA	Yes		
20	Jennings Ave from Jarvis Street to Lancaster Ave	MMA		Yes	Yes

Table 4. List of 20 highest ranked bicycle projects.

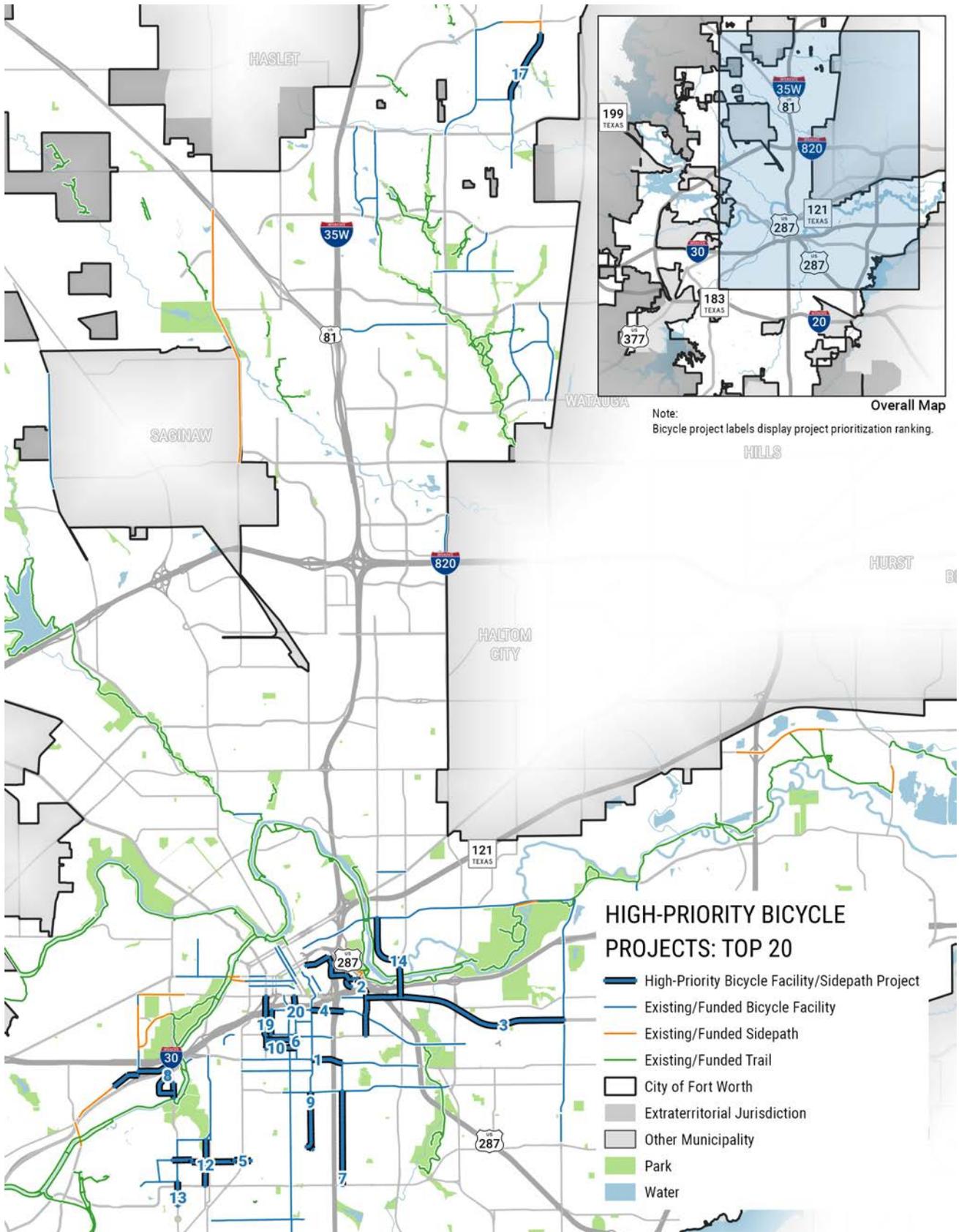


Figure 6. Top 20 priority bicycle projects.

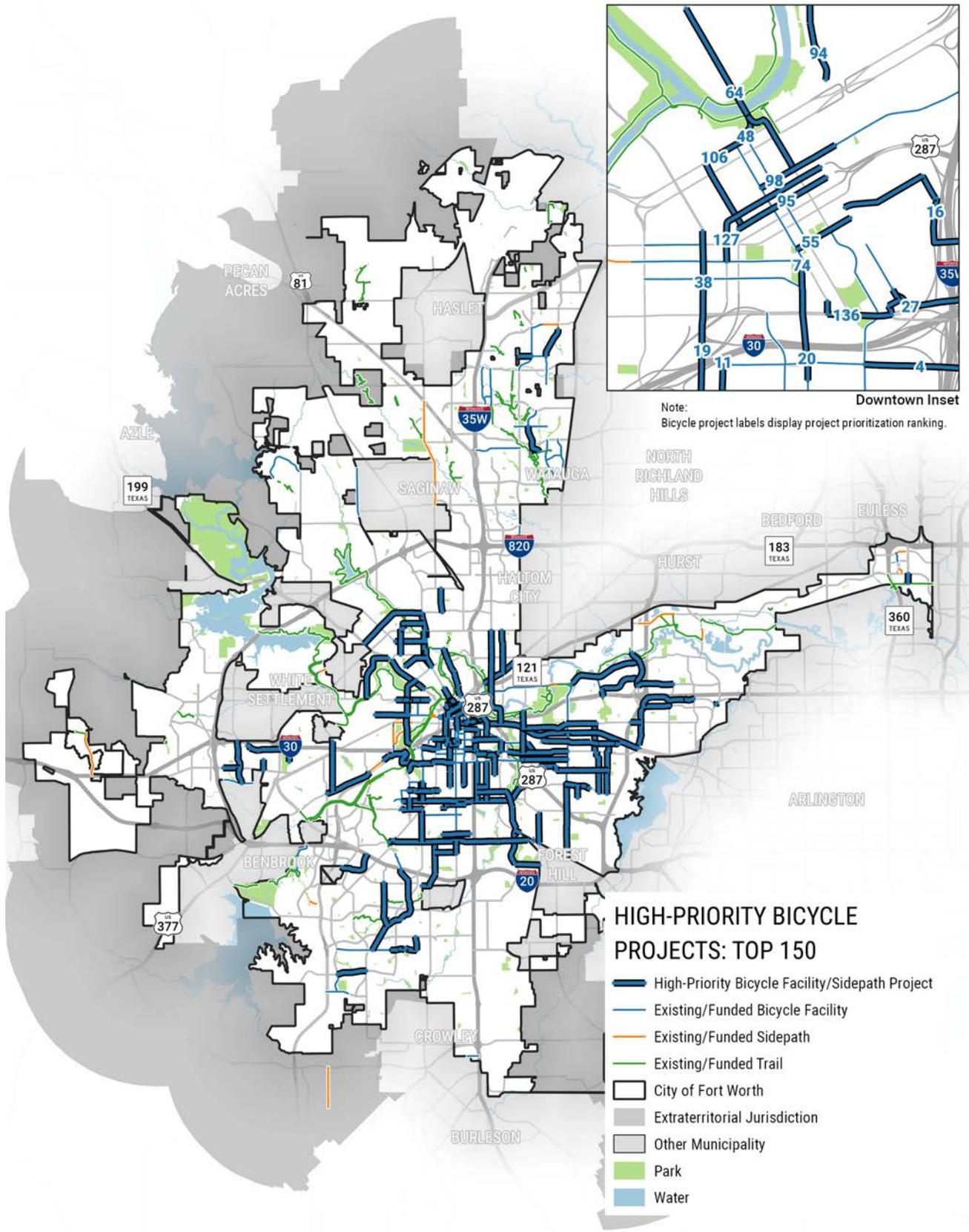


Figure 7. Top 150 priority bicycle projects

Trail Projects

The following trail projects scored highest in the ATP's prioritization process. See the discussion of cost opinions starting on page 70.

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 5. Top 20 priority trail projects and cost opinions.

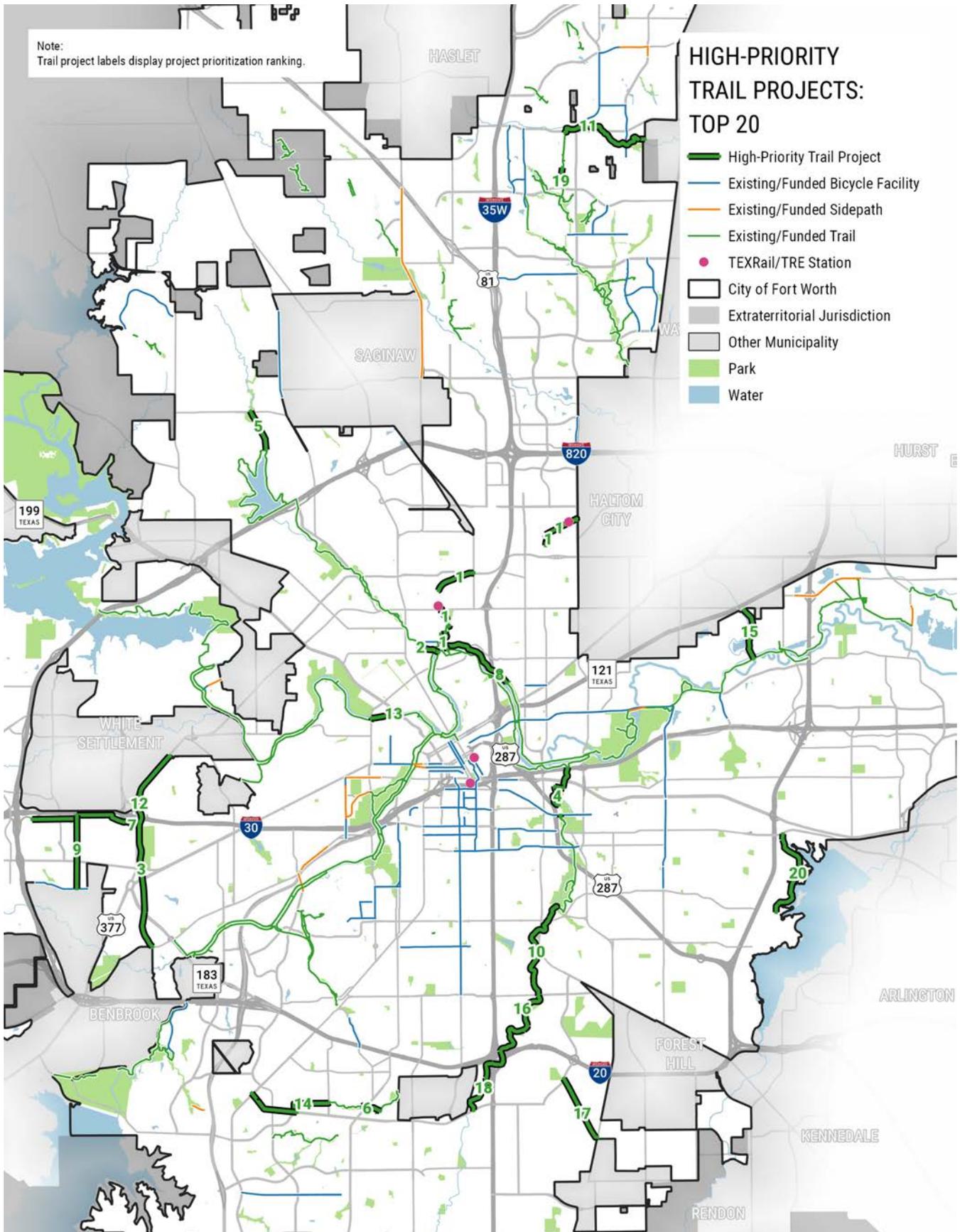


Figure 8. Top 20 priority trail projects

Barrier Reduction Projects

The following projects have the potential to reduce barriers and increase connectivity in Fort Worth based on information gathered during stakeholder interviews and the network planning approach. Map numbers correspond with the labels on Figure 31 and do not indicate prioritization.

Map Number	Barrier	Barrier Type	Recommendation
1	Clear Fork Trinity River and Union Pacific Davidson Yard	River/Rail	Upgrade Hulen St bridge to provide separated bicycle and pedestrian facilities and a connection to Trinity Trails
2	I-20 (east of I-35) and I-35W south of I-20	Highway	Construct Sycamore Creek Trail
3	I-20 (west of I-35)	Highway	Upgrade South Drive to provide north-south connection
4	I-30 (west of I-35) and Railroad	Hwy/Rail	Upgrade Henderson St with sidewalks and bicycle facilities
5	I-30 and West Fork Trinity River (east of I-35)	River/Hwy	Upgrade Beach St to provide north-south connectivity across West Fork Trinity River and I-30
6	I-35 (south of Morningside Drive)	Highway	Upgrade E Seminary Drive with sidewalks and bicycle facilities
7	I-35 and Peach Yard	Hwy/Rail	Upgrade E 8th/9th St to connect to Trinity Trails via existing bridges over I-35 and US 287
8	I-35 and Union Pacific Ney Yard	Hwy/Rail	Upgrade Rosedale St to connect streetscaping/ bike lanes to the west and east
9	I-820 (east of I-35W)	Highway	Upgrade N Riverside Dr with wider sidewalks and separate bicycle facilities
10	I-820 (south of I-30 on east side)	Highway	Upgrade E Rosedale Ave to provide sidewalks and bicycle facilities
11	I-820 (south of I-30 on west side)	Highway	Upgrade Chapin Rd with sidewalks and bicycle facilities
12	I-820 (west of I-35W)	Highway	Construct Marine Creek Trail connection
13	Railroad (north of I-20)	Rail	Construct pedestrian bridge to connect McCart Ave to Southcrest Dr
14	US 287	Highway	Construct Sycamore Creek Trail
15	West Fork Trinity River (west of I-35)	River	Upgrade N University Dr with bicycle facilities

Table 6. Potential barrier reduction projects.

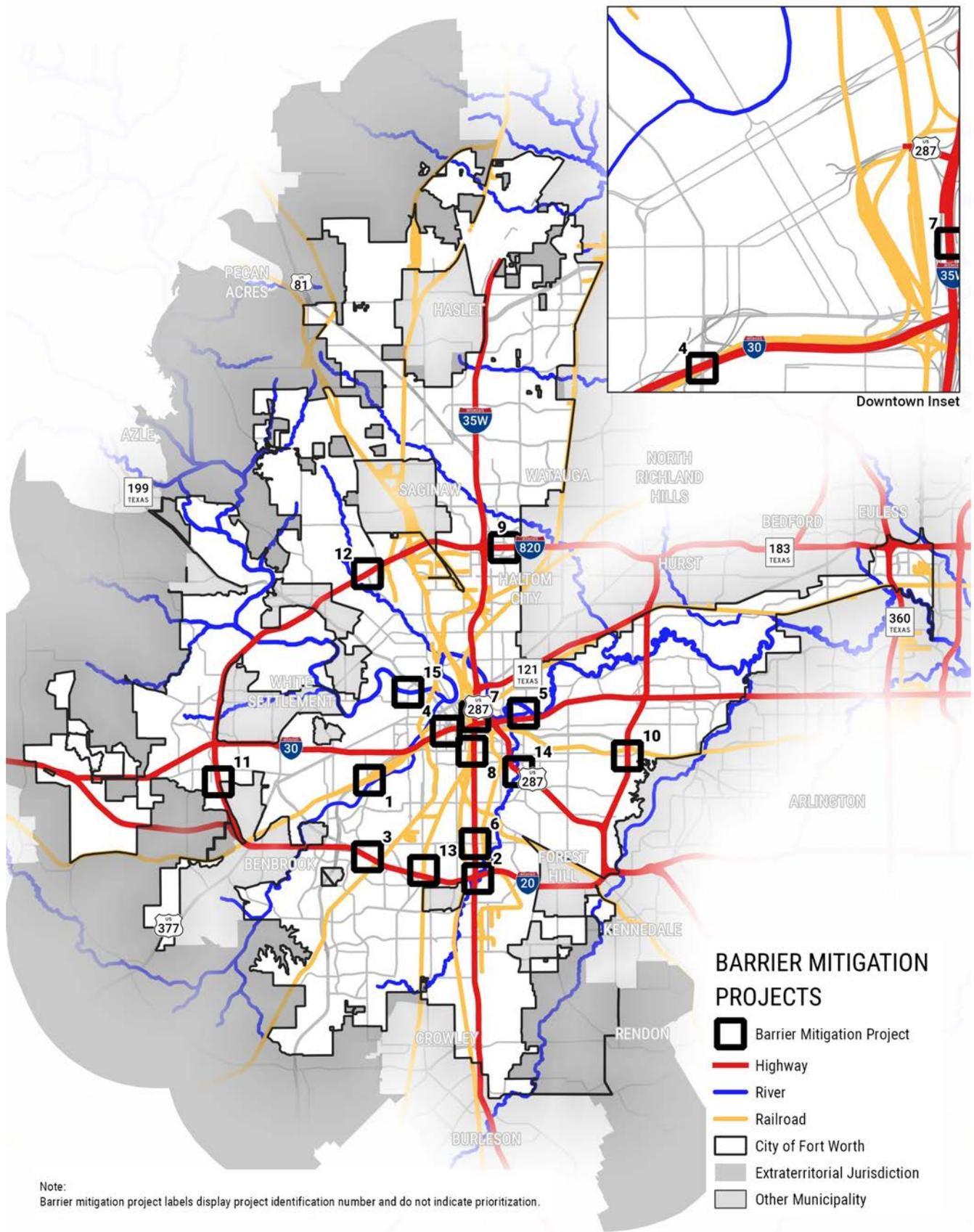


Figure 9. Map of barrier mitigation projects

Planning-level Cost Opinions

During the development of the ATP, planning-level cost opinions were developed to assist the City of Fort Worth and its partners in making high-level planning decisions. The cost opinions are based on currently available information, without the benefit of preliminary engineering studies. Construction costs will vary based on the ultimate project scope, actual site conditions and constraints, schedule, and economic conditions at the time of construction. *The ATP cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its planning-level cost opinions.*

Cost opinions were developed for full proposed pedestrian, bicycle, and trail networks based on unit costs and the estimated number of miles in each network. All cost opinions are rounded up to the nearest \$100,000.

Sidewalk and trail projects have project-level opinions as well. No project-level opinions are available for the bicycle network because the ATP does not identify specific facility types for bicycle facility projects.

Unit costs are based on historical cost data from the City of Fort Worth and other sources.²⁸ Cost opinions include costs for design, right-of-way acquisition, temporary construction easements, and contingency but do not include utility relocation, permitting, inspection, construction management, geotechnical investigation, environmental documentation, special site remediation, escalation, or the cost for ongoing maintenance.

The following summarizes estimated network costs for sidewalks, trails, sidepaths, and on-street bicycle facilities.

Sidewalks

A 5-foot wide, concrete sidewalk is estimated to cost \$966,000 per linear-mile based on information provided by the City of Fort Worth. The total length of sidewalk needs in Fort Worth is approximately 3,395 miles, 151 miles of which are priority sidewalks based on the ATP's sidewalk project prioritization process. See Table 17 displays citywide sidewalk project mileage and cost opinions by location.

Sidewalk Gap Location	All		Priority (Top 300)	
	Mileage	Cost Opinion	Mileage	Cost Opinion
Citywide	3,395	\$3,279,600,000	151	\$145,900,000
In Majority-Minority Areas (MMA)	2,212	\$2,137,100,000	149	\$144,400,000
In Super Majority-Minority Areas (75%+ minority)	1,437	\$1,387,900,000	138	\$133,600,000
In Neighborhood Profile Areas	1,535	\$1,483,200,000	90	\$87,400,000
Near Schools (1/4 mile)	879	\$849,600,000	55	\$53,600,000
Near Higher Education (1/2 mile)	135	\$130,700,000	12	\$11,400,000
Near Transit (1/4 mile)	1,218	\$1,176,800,000	105	\$101,800,000
In High Disability Areas (>13% people with disabilities)	1,013	\$979,000,000	104	\$100,700,000

Table 7. Sidewalk Project Cost Opinions

²⁸ City of Austin costs are used for flex posts because they were not itemized in the Fort Worth estimates.

Curb Ramps

ADA-compliant curb ramps are estimated to cost, on average, \$2,700 each based on information provided by the City of Fort Worth. There are approximately 92,850 missing curb ramps in Fort Worth.²⁹ See Table 18 displays estimated citywide curb ramp needs and cost opinions by location

Location	Number of Locations	Cost Opinion
Citywide	92,850	\$250,695,000
In Majority-Minority Areas	51,000	\$137,700,000
In Super Majority-Minority Areas (75%+ minority)	30,300	\$81,810,000
Near Transit (1/4 mile)	47,300	\$127,710,000
In High Disability Areas	39,200	\$105,840,000

Table 8. Curb Ramp Project Cost Opinions

Trails

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

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.

Sidepaths

A 10-foot wide, concrete sidepath is estimated to cost \$1.7 million per linear-mile based on information provided by the City of Fort Worth, including the cost of design, right-of-way acquisition, and contingency. The ATP recommends 685 miles of sidepath, 581 miles of which are anticipated to be included in the construction of new roadways associated with new private developments. The total cost opinion for the 104 miles of recommended sidepath on existing roads is \$179,600,000.

²⁹ Missing curb ramps were calculated based on City of Fort Worth curb ramp data and the Pedestrian Experience Index analysis, which identified intersection corners which lack a curb ramp. Non-compliant curb ramps are curb ramps which do not contain detectable warnings, according to City of Fort Worth data. These should be considered rough estimates.

On-Street Bicycle Facilities

Unit costs by bicycle facility type in both directions, based on information provided by the City of Fort Worth, are presented in See Table 19. Presented in Table 20 are mileage estimations for recommended on-street bicycle projects by bicycle facility type. The development of cost opinions consisted of high-level assignments for each project based on Fort Worth Master Thoroughfare Plan street types; available existing data related to traffic volume, travel lanes, and the presence of parking; and Level of Traffic Stress considerations. The actual mileage of facilities selected and implemented may vary from this estimation.

On-Street Bicycle Facility Type	Mileage	Cost Opinion
Street-Level SBL	267	\$38,200,000
Buffered Bike Lanes	35	\$1,800,000
Bike Lanes	5	\$200,000
Bicycle Route	136	\$300,000
Bicycle Facility Total	442	\$40,500,000

Table 9. On-Street Bicycle Facility Unit Cost Opinions

Bicycle Network	Mileage	Total Estimated Cost with Design (15%) and Contingency (20%)
Full Network	442	\$54,700,000
Top 20 Projects	21	\$3,900,000
Top 150 Projects	120	\$21,300,000

Table 10. On-Street Bicycle Facility Project Cost Opinions

Traffic Calming

Streets included in the ATP’s recommended bicycle network that may be considered for shared facilities (where motorists and bicyclists share travel space) may require traffic calming features, signs, markings, and intersection treatments to establish bicycle boulevards and to provide safe and comfortable environments for bicycling. The type, quantity, and placement of traffic calming features will vary based on traffic volumes, traffic speeds, intersections, and land use context. See Table 201 provides unit cost opinions for various traffic calming treatments.³⁰ Typical costs of bicycle boulevards vary from \$50,000 per mile to \$150,000 per mile.

Treatment	Unit Cost
Bike-Thru Medians	\$721 per foot
Chicanes	\$5,000 each
Neighborhood Traffic Circles	\$20,000 each
Curb Extensions	\$15,600 each
Median Refuge Island	\$21,580 each

Table 11. Traffic Calming Treatment Unit Cost Opinions

30 “Cost Analysis of Bicycle Facilities: Cases from cities in the Portland, OR region.” June 2013. Dill, McNeil, and Weigan

Summary

Cost opinions for recommended sidewalk, trail, sidepath, and on-street bicycle facility projects are provided in Table 22. On-street bicycle facilities are estimated using a mix of facility-types and should be considered very preliminary.

Facility Type	Mileage	Cost Opinion
Top 300 Sidewalk Projects	151	\$145,900,000
Top 20 Trail Projects	30	\$168,200,000
Top 150 Bicycle Projects: Sidepaths	21	\$36,400,000
Top 150 Bicycle Projects: On-Street Bicycle Facilities	120	\$21,300,000

Table 12. Active Transportation Network Cost Opinions

Conclusion

The pedestrian, bicycle, and trails networks were developed and prioritized using a balance of stakeholder input and detailed data analysis to compare hundreds—and in the case of sidewalks, thousands—of projects to one another.

The qualitative and quantitative process and resulting data and analysis will allow Fort Worth staff to make informed decisions during implementation and during future planning efforts, whether at the corridor, neighborhood, or citywide level.



Active transportation at work in Fort Worth. (Photo credit: Kenny Bergstrom)

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5

Policies and Procedures

Introduction

Clear policies and procedures ensure that the overarching vision and goals of the ATP lead to meaningful change after adoption. This chapter identifies the following key elements:

Implementers and stakeholders

Potential funding sources

A policy framework and recommendations

Amendment procedure

Implementers and Stakeholders

This section identifies who is responsible for carrying out the ATP's policies and projects. Each action in the policy section notes in parenthesis which stakeholder is primarily responsible for completing that task.

Decisions made during the planning process affect an array of agencies. For the purposes of this action plan, local organizations were divided into two groups based on their relationship to the policy framework's implementation strategies. Agencies can either be implementers (those directly responsible for implementing an action) or stakeholders (those not responsible for an action but directly impacted by it).

Implementers

Implementers are primarily responsible for implementing the ATP's projects and policies and for managing active transportation-related projects.

- City of Fort Worth (CFW)
 - Transportation & Public Works (TPW)
 - Planning & Development (P&D)
 - Park and Recreation (PARD)
 - ADA Coordinator (ADA, housed in HR)
 - Police (FWPD)
- North Central Texas Council of Governments (NCTCOG)
- Trinity Metro (TM)
- Tarrant County (TC)
- Texas Department of Transportation (TxDOT)
- Trinity River Water District (TRWD)
- Development Community



A person rides in the bike lane on West 7th Street.
(Photo credit: City of Fort Worth)

Stakeholders

Effective public engagement is crucial to every step in the transportation network development process, from the planning phase to the project phase.

During planning, public engagement ensures that community and agency stakeholders have a chance to participate in the development of broader policy and planning documents, such as comprehensive plans, transportation plans, and modal network plans. During project implementation, public engagement allows stakeholders to provide feedback on specific Complete Streets projects.

Moving forward, Fort Worth's potential stakeholders include:

- Facility users (all modes: transit, pedestrian, persons with disabilities, bicycle, freight, etc.,)
- Adjacent residents, neighborhood organizations, and places of worship
- Adjacent businesses and business associations
- Elected officials
- Transit authority (e.g., Trinity Metro)
- Boards and commissions (e.g., Pedestrian and Bicycle Advisory Commission, Mayor's Committee on Persons with Disabilities, Park & Recreation Advisory Board)
- Other city/county departments
- School districts, colleges, and universities
- North Central Texas Council of Governments
- State agencies (e.g., TxDOT, TPWD, SHPO)
- Federal agencies (e.g., FHWA, NPS, EPA)
- Tarrant Regional Water District
- Advocacy and special interest groups (e.g., Tarrant Transit Alliance, Streams & Valleys, bicycling organizations, preservation organizations, charities and non-profits such as Legal Aid, AARP, Blue Zones)
- Emergency responders (e.g., MedStar, FWFD, FWPD, TPW Stormwater)
- Utilities (e.g., Oncor and Atmos), and railroads



Active sidewalk in Fort Worth (Photo credit: City of Fort Worth)

Funding

This section provides information that the City of Fort Worth can use to develop a funding strategy for active transportation infrastructure and programs. Funding that is available for pedestrian or bicycle projects can be categorized based on the project phase, target user, and funding source. A project's type, such as roadway, bridge, intersection, trail, or wayside facility, can also affect which funding programs to target. Its location can affect this decision as well. When pursuing funding, smaller projects can often be grouped in with larger, more complex projects that may require a mix of funding sources.

The table on the following page presents a few of the most common sources of funding for active transportation projects.

Program Name	Funding Source	Description
Bond Programs	Local	The City of Fort Worth approved over \$15 million in bonds for sidewalk and on-street bicycle facilities and \$7.5 million for trails in May of 2018. Sidewalk and bike projects can also be funded through bonds.
General Funds, Annual Budget	Local	Any bicycle, pedestrian, or trails project could be funded through general funds, which other funds often match. General funds for bicycle projects add bicycle lanes and other markings when resurfacing and repaving streets.
Adopt-a-Path Program	Local	Maintenance of bicycle paths and trails can be funded by private community groups and non-profits. This is often done in exchange for public recognition, such as signs along the path saying, "Maintained by (name)."
Public Improvement Districts (PIDs) / Tax Increment Financing	Local	Bicycle and pedestrian improvements can often be included as part of larger efforts of business improvement and retail district beautification. Similar to benefit assessments, PIDs collect levies on businesses in order to fund area-wide improvements that benefit businesses and improve access for customers.
Private and Nonprofit Partnerships	Local	Many communities have developed innovative partnerships that bring in funding from private or nonprofit organizations to create bicycle, pedestrian, and trail projects. Fort Worth's Streams & Valleys is a key example.
Better Utilizing Investments to Leverage Development (BUILD)	U.S. Department of Transportation	Replacing the US Department of Transportation's TIGER grant program, BUILD grants provide \$1.5 billion in discretionary funds for transportation projects. Preference goes toward projects in rural areas, and projects are evaluated based on safety, economic competitiveness, quality of life, environmental protection, state of good repair, innovation, and opportunity for additional non-federal revenue.
Federal Funding	U.S. Department of Transportation	Federal funding for transportation improvements also comes from the FAST Act, which covers funding for projects from 2016-2020. Note that trails do not meet federal design requirements are not eligible to receive this funding. Federal programs that can fund active transportation projects include Transportation Alternatives (TA) and Congestion Mitigation and Air Quality (CMAQ).
Recreational Trail Program	Texas Department of Parks & Wildlife	The Recreational Trail Program provides grants of up to \$200,000 for non-motorized trail projects, funding up to 80% of the overall project cost. New trail construction, improvements to existing trails, trailhead and wayside facilities development, and trail corridor acquisition are all eligible for funding.

A full listing of federal funding sources available for pedestrian and bicycle improvements is available at:
https://www.fhwa.dot.gov/environment/bicycle_pedestrian/funding/funding_opportunities.cfm

Policies

The policy framework supports a policy vision statement based on input from stakeholders. There are nine subjects addressed in the policy statement that organize the actions necessary for implementation. Each subject has a set of actions associated with it, along with performance measures to track progress.

Policy Overview

The Fort Worth Active Transportation Plan aims to create a regionally coordinated and locally connected bicycle and pedestrian system that provides a safe, comfortable, accessible, and equitable network of trails, sidewalks, and on-street bicycle facilities for people of all ages and abilities that encourages a healthy lifestyle, economic development, and increases community awareness and funding for alternative modes of transportation.

In this policy framework, actions were divided into nine subjects:



1. Coordinated

Frequent coordination between regional entities is important to foster continuity and cohesiveness in active transportation efforts.



2. Connected

By connecting origins to destinations and building a network that is complete and continuous, more people will be attracted to active transportation modes.



3. Safe and Comfortable

A network must be safe and comfortable for it to be usable by pedestrians and bicyclists of all skill levels and abilities.



4. Accessible

The design of the network should be accessible to users of all ages and abilities. For users with limited mobility, it is important that there are no gaps in the accessible network.



5. Equitable

Adopting an Equity in Transportation policy is necessary to facilitate the ongoing identification and eradication of racial and cultural disparities in transportation affordability, access, and safety.



6. Healthy

Active transportation is a major part of maintaining a healthy lifestyle. By implementing programs to support the active transportation network, residents will have more incentive to make healthy choices.



7. Community Awareness and Culture

Community awareness of the active transportation network and programs is essential to increasing the number of users across the city.



8. Funding

Ideas cannot become a reality without the funding needed to make them happen. This plan supports efforts to obtain funding for the implementation of active transportation projects and programs.



9. Economic Vitality

When transportation and economic development work well together, the result is stronger development and efficient infrastructure for all residents.



1. Coordinated

Frequent coordination between regional entities is important for fostering continuity and cohesiveness in active transportation efforts.

Policy Actions

- 1.1. Implement the Complete Streets Implementation Plan to ensure interdepartmental and interagency coordination during project scoping and consideration of all users and modes, connected travel networks, and nearby land uses. [TPW, P&D]
- 1.2. On TxDOT projects, continue to coordinate with TxDOT to ensure comfortable sidewalks and appropriate bicycle facilities are included in all projects for the land use context where identified in this plan. [TPW, TxDOT]
- 1.3. Coordinate with local and state agencies to investigate the cause of pedestrian-related crashes at high crash locations and work to proactively identify targeted solutions. [CFW, TxDOT, TC, TM, NCTCOG]
- 1.4. Support changes to the Texas Transportation Code to strengthen pedestrian right-of-way in crosswalks by changing 'Yield' to 'Stop'. [CFW]
- 1.5. Coordinate with railroads to build ADA accessible pedestrian crossings across railroad tracks. [TPW]
- 1.6. Coordinate with Trinity Metro to improve pedestrian access to transit with updated design standards. [TM, P&D, TPW]
- 1.7. Adopt the North Central Texas Council of Governments (NCTCOG) School Siting in North Central Texas Guide. [P&D, TPW]
- 1.8. Work with school districts to encourage the development of a Safe Routes to School Program. [CFW]
- 1.9. Work with partner agencies, schools, and jurisdictions to actively promote land use and development principles that contribute to a safe and comfortable walking and bicycling environment. [P&D]
- 1.10. Develop a complete street review checklist for departments involved in the street design review process. [CFW]
- 1.11. Develop a prioritization strategy for corridor planning efforts across all City departments. [TPW]



2. Connected

By connecting origins to destinations and building a network that is complete and continuous, more users will be attracted to active transportation modes.

Policy Actions

- 2.1. Continue to prioritize opportunities that create a complete transportation network that provides connected facilities to serve all people and modes of travel now, and in the future. Use project selection criteria that supports Complete Streets projects. [TPW, P&D]
- 2.2. Promote street system patterns that provide greater connectivity between streets and developments to reduce traffic demands on arterial streets, improve emergency access, and make bicycling and walking more attractive transportation options. [P&D, TPW]
- 2.3. Review current procedure and design standards for installing crosswalks across arterials. [TPW]
- 2.4. Establish a yearly target for closing sidewalk gaps identified in the pedestrian experience analysis. [TPW,]
- 2.5. Prioritize improvements in pedestrian and bicycle facilities through intersections. [TPW]
- 2.6. Develop guidelines to ensure that projects are continuous and do not terminate without providing a safe route for people walking or biking. [TPW, PARD]
- 2.7. Update development requirements to include easement dedication for trails, and require pedestrian and bicycle connectivity to new development. [P&D]



3. Safe and Comfortable

A network must be safe and comfortable for it to be usable by pedestrians and bicyclists of all skill levels and abilities.

Policy Actions

- 3.1. Develop traffic signal timing and actuation along transit, bicycle, and heavy pedestrian use areas. [TPW]
- 3.2. Develop a Vision Zero Policy and Implementation Plan. [CFW]
- 3.3. Improve pedestrian scale street lighting within identified Neighborhood Profile Areas identified by the Fort Worth Task Force on Race and Culture and create pedestrian lighting design guidelines to mitigate crash rates on dark streets. [TPW]
- 3.4. Improve pedestrian crossings, especially in areas identified in the ATP as high demand short trip areas. [TPW]
- 3.5. Develop Trail Design standards for facility separation and trail width. [CFW, TRWD]
- 3.6. Develop Trail Design standards for lighting and amenities such as benches, trash cans, bike racks, and other features. [CFW, TRWD, S&V]
- 3.7. Identify characteristics of corridors and intersections with a disproportionate number of pedestrian and bicycle crashes and injuries (annually) and prioritize corrections. [FWPD, TPW, P&D]
- 3.8. Support efforts in lowering speed limits in areas where bicyclist and pedestrian safety is a priority. [CFW]
- 3.9. Support the use of bicycle police patrols along the trail network to increase safety. [CFW, FWPD]
- 3.10. Develop a Low Water Crossing Indication System for the Spine Network [CFW, TRWD]



4. Accessible

The design of the network should be accessible to users of all ages and abilities. For users with limited mobility, it is important that there are no gaps in the accessible network.

Policy Actions

- 4.1. Adopt ADA infrastructure standards for all infrastructure types in the active transportation network. [ADA, TPW]
- 4.2. Inventory and prioritize corrections to accessibility barriers at traffic signals, such as lack of curb ramps, or presence of physical barriers in the pedestrian right of way as defined in the ADA Transition Plan. Update and implement the ADA Transition Plan. [ADA, TPW, P&D]
- 4.3. Install high visibility crosswalk markings with advance stop markings or yield lines where pedestrian and bicycle crashes are most frequent. [TPW]
- 4.4. Establish regular staff and contractor training on practices for safety and accessibility in work zones. [CFW]
- 4.5. Establish regular staff training programs and educational materials on accessible design. [CFW,]
- 4.6. Adopt Public Right-of-Way Accessibility Guidelines (PROWAG). [CFW]



5. Equitable

Adopting an Equity in Transportation policy is necessary to facilitate the ongoing identification and eradication of racial and cultural disparities in transportation affordability, access, and safety.

Policy Actions

- 5.1. Achieve the sidewalk condition and gap-filling targets established in the Race and Culture Task Force final report. [P&D, TPW]
- 5.2. Adopt an Equity in Transportation Action Plan to facilitate the ongoing identification and eradication of racial and cultural disparities in transportation affordability, access, and safety. [CFW]
- 5.3. Institute routine reviews between involved agencies for all pedestrian and bicycle crashes for which police reports are written after the crash report has been submitted. [TPW, FWPD]
- 5.4. Include Equity as a prioritization measure in all projects. [CFW]



6. Healthy

Active transportation is a major part of keeping a healthy lifestyle. By implementing programs to support the active transportation network, residents will have more incentive to make healthy choices.

Policy Actions

- 6.1. Improve citywide connections between bus shelters, bus stops, and medical facilities. [TM, TPW, P&D]
- 6.2. Add bicycle parking and accommodations in the design of transit station areas, along roadways leading to the stations, along the transit corridors. [TM, P&D]
- 6.3. Create a Healthy Community Development Guide to incorporate active living practices into future community development projects. [P&D]
- 6.4. Continue programs that encourage events related to active transportation modes such as “Walking Moias (social support groups),” walking challenges, employer incentives, hospital collaborations, and Safe Routes to School. [Blue Zones]



7. Community Awareness and Culture

Community awareness of the active transportation network and programs is essential to increasing the number of users across the city.

Policy Actions

- 7.1. Continue to educate the public on safe behavior and interaction on the roads between all road users including people walking, bicycling, using transit, and driving. [CFW]
- 7.2. Incorporate an educational component to Complete Streets Projects, to ensure that all people using the transportation system understand and can safely navigate Complete Streets. [TPW PARD]
- 7.3. Promote major bicycling events such as Bike to Work Day that encourage bicycling and the City’s efforts to become a bicycle friendly community. [CFW]
- 7.4. Regularly update the online citywide bicycle map to inform the public of existing bicycle facilities and destinations. [TPW]
- 7.5. 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. [P&D]
- 7.6. Invest in educational materials for distribution at community events focused on multimodal usage. [community engagement office]
- 7.7. Expand bicycle and pedestrian count programs and publish results. [TPW]
- 7.8. Require training in Complete streets annually for City Staff, and as a prerequisite or requirement of design contracts. [TPW]
- 7.9. Encourage enforcement efforts of traffic laws and target unsafe behaviors to improve safety and reduce collisions and conflicts between motorists, bicyclists, and pedestrians. [FWPD]
- 7.10. Create a staffing plan to implement the Active Transportation Plan. The staffing plan should include updates to policies, creating new programs, planning and designing of facilities, and construction. [TPW, PARD]



8. Funding

Ideas cannot become a reality without the funding needed to make them happen. This plan supports efforts to obtain funding for the implementation of active transportation projects and programs.

Policy Actions

- 8.1. Continue to coordinate with school districts to create and implement Safe Routes to School (SRTS) plans. [TPW]
- 8.2. Utilize the Active Transportation Plan priorities when developing the CIP. [TPW, P&D]
- 8.3. Set aside designated funding each year specifically for ADA and accessibility related projects. [CFW]
- 8.4. Create developer incentives for walkable development. [P&D]
- 8.5. Pursue local funding sources such as bond programs, gas well revenues, tax-increment financing, and public improvement districts. [TPW]
- 8.6. 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. [TPW, PARD]
- 8.7. Perform proper maintenance and sweeping of on-street bikeways at an estimated cost of approximately \$10,000 per mile per year. [TPW]
- 8.8. Fund regular and on-demand bike lane striping maintenance. [TPW]
- 8.9. Review and update policy on sidewalk maintenance responsibility. [TPW]



9. Economic Vitality

When transportation and economic development work well together, the result is stronger development and efficient infrastructure for all residents.

Policy Actions

- 9.1. Work closely with developers of new economic development to provide multimodal access to transportation for future residents/visitors. [TM, Economic Development]
- 9.2. Identify job centers that lack transportation access and work with Trinity Metro to determine if additional routes are needed. Work with employers in the area to see if ride sharing or company-paid transportation are feasible. [TM, CFW]
- 9.3. Update subdivision ordinance to require dedication of easement along planned trail corridors during platting between subdivision and destinations (schools, parks, shopping, etc.). [P&D]
- 9.4. Improve transportation infrastructure around areas of weaker economic vitality to revitalize the area and attract new tenants. [TPW, Economic development]

Top Policies

The ATP stakeholder group was surveyed to determine the relative importance of the Plan's policies. The policies listed below are policies that more than half of respondents believed should be prioritized in the implementation process. The table shows the top 13 policies, the implementers in charge of them, and the recommended timeline for completing them.

Subject	Policy	Implementers	Timeline	
Coordinated	1.1	Implement the Complete Streets Implementation Plan to ensure interdepartmental and interagency coordination during project scoping and consideration of all users and modes, connected travel networks, and nearby land uses.	Transportation / Public Works, Planning & Development	1-2 years
	1.2	On TxDOT projects, continue to coordinate with TxDOT to ensure comfortable sidewalks and appropriate bicycle facilities are included in all projects for the land use context where identified in this plan.	Transportation / Public Works, Planning & Development, Park and Recreation	1-2 years
Connected	2.1	Continue to prioritize opportunities that create a complete transportation network that provides connected facilities to serve all people and modes of travel now, and in the future. Use project selection criteria that supports Complete Streets projects.	Transportation / Public Works, Planning & Development	Ongoing
	2.2	Promote street system patterns that provide greater connectivity between streets and developments to reduce traffic demands on arterial streets, improve emergency access, and make bicycling and walking more attractive transportation options.	Transportation / Public Works, Planning & Development	1-2 years
Safe and Comfortable	3.1	Develop traffic signal timing and actuation along transit, bicycle, and heavy pedestrian use areas.	Transportation / Public Works, Planning & Development, Park and Recreation	2-3 years
Accessible	4.1	Adopt ADA infrastructure standards for all infrastructure types in the active transportation network.	Transportation / Public Works	2-3 years
	4.2	Inventory and prioritize corrections to accessibility barriers at traffic signals, such as lack of curb ramps, or presence of physical barriers in the pedestrian right of way as defined in the ADA Transition Plan. Update and implement the ADA Transition Plan.	ADA Coordinator, Transportation / Public Works, Planning & Development	5 years
Equitable	5.1	Achieve the sidewalk condition and gap-filling targets established in the Race and Culture Task Force final report.	Transportation / Public Works, Planning & Development	5 years
Healthy	6.1	Improve citywide connections between bus shelters, bus stops, and medical facilities.	Trinity Metro, Transportation / Public Works, Planning & Development	2-3 years
	6.2	Add bicycle parking and accommodations in the design of transit station areas, along roadways leading to the stations, and along the transit corridors.	Transportation / Public Works, Planning & Development	2-3 years
Community Awareness and Culture	7.1	Continue to educate the public on safe behavior and interaction on the roads between all road users including people walking, bicycling, using transit, and driving.	Planning & Development, Fort Worth Police Department	1-2 years
Funding	8.1	Continue to coordinate with school districts to create and implement Safe Routes to School plans.	Transportation / Public Works	Ongoing
Economic Vitality	9.1	Work closely with developers of new economic development to provide multimodal access to transportation for future residents/visitors.	Transportation / Public Works, Planning & Development	Ongoing

Performance Measures

Performance measures were developed to help the City of Fort Worth track its progress on key aspects of the ATP. To achieve the objectives, the Active Transportation Plan recommends implementing the policies, programs, and infrastructure improvements within this plan. The following table presents measures of success, current conditions of each measure, with target improvements. An annual scorecard will be posted at www.fortworthtexas.gov/atp.

Improve safety and access to sidewalks, bikeways, and trails			
Measure	Baseline	Target	Data Source
Eliminate pedestrian and bicyclist fatalities on Fort Worth roadways	Average annual bicycle fatalities*: 1 Average annual pedestrian fatalities*: 22.4	Zero Fatalities by 2030	Fort Worth Police Department
Decrease the percent of missing curb ramps in Super MMAs	32,800 curb ramps (68.6%) are missing in Super MMAs (2017)	20% point reduction (68.6% to 48.6%) by 2025	TPW Asset Management Database/ US Census
Decrease percent of missing or poor condition sidewalks in Super MMAs**	1,437 miles of sidewalks (67%) in Super MMAs are poor condition or missing (2017)	20% point reduction (67% to 47%) by 2023**	TPW Asset Management Database/ US Census
Decrease in percent of Fort Worth residents 18 or older who are overweight or obese	68.1% of Fort Worth residents are considered overweight or obese (2015)	10% reduction (68.1% to 61.3%) by 2030	Tarrant County Behavioral Risk Factor Surveillance System (BRFSS) (available every five years)
Increase percent of majority-minority land area within half-mile access of trails or bike lanes	34% of majority-minority land area is within a half mile of a trail or bike lane. (2018)	10% increase (34% to 44%) by 2025	City of Fort Worth/US Census

Increase funding dedicated to new sidewalks, bikeways, and trails		
Measure	Baseline	Target
Sidewalks and Pedestrian Safety	2014 Bond Funded - \$10.0 million 2018 Bond Funded - \$17.0 million***	Next Bond Program - \$34 million Subsequent Bond Program \$68 million
On-Street Bicycle Facilities	2014 Bond Funded - \$1.2 million 2018 Bond Funded - \$3.0 million	Next Bond Program - \$6 million Subsequent Bond Program - \$12 million General Fund (new bike lanes) - \$250,000 annually by 2022
Trails	2014 Bond Funded - \$1.9 million 2018 Bond Funded - \$7.5 million	Next Bond Program - \$14 million Subsequent Bond Program - \$28 million

* 2014-2018

** Race and Culture Task Force Recommended Target

*** \$12 million for sidewalks, \$5 million for School/Neighborhood Safety

Notes:

The goal of eliminating pedestrian and bicycle fatalities is consistent with the ATP recommendation to develop a Vision Zero Policy and Implementation Plan. In order to achieve this objective, a Vision Zero Plan must be completed and implemented.

The baseline measure of curb ramps is based on the ATP's Pedestrian Experience Index data analysis. The PEI identified up to four corners at each intersection in the city and measured whether or not each corner contained a curb ramp, based on CFW data. If all four corners contain a curb ramp, that intersection is considered to have "full ramp coverage." If one or more intersection does not have a curb ramp, the intersection is considered to have "less than full ramp coverage." The reduction target is based on recommended targets from the final Race and Culture Task Force.

The sidewalk missing and poor condition reduction target is consistent with the Fort Worth Race and Culture Final Recommendation success measures.

It is recommended the City continue to collect sidewalk data through regular inventory and condition assessments. Super Majority Minority areas were calculated using 2011 ACS five year population data of census block groups that were more than 75 percent minority population.

The share of residents in MMAs with a half mile access to existing trails and bike lanes was calculated using 2011 ACS five year population data of census block groups that were more than 50 percent minority population.

Although maintenance is not listed as a performance measure, the City should

- Continue to program at least 1% of its capital budget for trail maintenance;
- Maintain striping on bicycle facilities and crosswalks at a minimum of a five year cycle; and

Continue to prioritize and respond to street sweeping requests on roadways with bicycle facilities

Pre- and Post-Project Evaluation Process

The first step in project evaluation is establishing its purpose. The purpose then shapes the desired outcome and how to measure success, both of which allow the project to be easily shared and promoted by transportation officials, key stakeholders, and the public.

An existing conditions evaluation can bring to light constraints and opportunities for improvements. After identifying a viable candidate corridor for pedestrian or bicycle improvements and exploring existing opportunities, various concepts can be developed. These concepts can help both the public and stakeholders envision potential improvements and drive the decision-making process.

In addition to these pre-project steps, a post-project evaluation is key to ensuring that opportunities were capitalized on and conditions were, in fact, improved.

To help track success, the following data points should be collected before and after the construction or implementation of an active transportation project. Some criteria may not be appropriate for each project. For example, daily traffic volumes may not exist on an off-network trail. However, criteria should be tracked where possible.

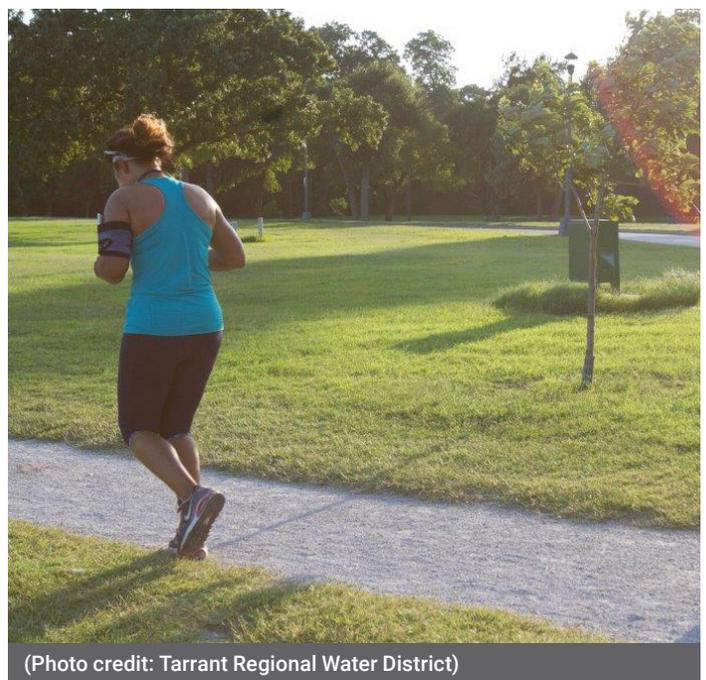
- Number of bicycle trips
- Number of pedestrian trips
- Transit schedule reliability
- Crash data
- Average vehicular speed and delay
- Daily traffic volume
- Level of Traffic Stress (LTS)
- Pedestrian Experience Index (PEI) score
- Number of accessibility barriers removed
- Freight movement

Neighborhood Trail Connectivity

To ensure that the subdivision ordinance supports active transportation connectivity, Section 31-102 Streets and Block Arrangement of the Subdivision Ordinance should be revised to provide adequate access from all neighborhoods to the proposed Active Transportation Plan network and promote the connectivity of the trail network to community destinations with neighborhoods.

Consideration should be given that:

- Subdivisions demonstrate connectivity for pedestrians and bicyclists to adjacent ATP facilities and between adjacent neighborhoods. Either as cul-de-sac easements or connected streets.
- 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.



(Photo credit: Tarrant Regional Water District)

Amendment Procedure

The Active Transportation Plan is intended to create a regionally coordinated and locally connected bicycle and pedestrian system that provides a safe, comfortable, accessible, and equitable network of trails, sidewalks, and on-street bicycle facilities for people of all ages and abilities. The proposed network was designed to achieve this vision. However, unforeseen circumstances occur that may require modifications and amendments to this plan. This process was developed to accommodate these amendments in an effective and efficient manner. As a result, staff has the administrative ability to approve amendments that still meet the vision on page 8. For amendments that might impact this vision, the Pedestrian and Bicycle Advisory Commission will be the review authority. The procedures and conditions required for making changes to the ATP are listed in the table below:

Actions Triggering ATP Processes				
Action	Amendment Process			Notes
	Full Update	Amendment PABAC*	Admin	
5-10 years since last full update	●			
New facility(ies) to be added to the network			●	
Network segments to be removed from the network		●		
Route change for ATP facilities				
Route moves to an adjacent facility within 1,000 feet of the original route			●	Route changes must make the same connections as previously planned.
Route moves to an adjacent facility greater than 1,000 feet of the original route		●		
Facility Type change for ATP facilities				
Facility changing classification affecting design requirements (Rib ↔ Spine, Connector ↔ Rib)		●		Applies to trails and bicycle facilities. If design of the cross section is the only change, then admin can handle it. Facility downgrades require full amendment to the plan by PABAC.
Facility cross-section change			●	
Reallocation of space within MTP ROW for non-established thoroughfares to accommodate ATP Facilities.			●	Use Established Thoroughfare principles and width ranges
Sidewalk not provided with adjacent development			●	Follow TPW process
Sidewalk width changes with adjacent development			●	Follow and reference the TPW process

*Pedestrian and Bicycle Advisory Commission

Note: Refer to MTP amendment process for thoroughfares.

Fort Worth Active Transportation Plan

April 2019



North Central Texas
Council of Governments