



CITY OF GRANBURY

ACTIVE TRANSPORTATION AND RECREATION PLAN

ADOPTED DECEMBER 6, 2022



ACKNOWLEDGMENTS

The following individuals are recognized for their significant contributions to the preparation of the City of Granbury Active Transportation and Recreation Plan.

CITY COUNCIL

Jim Jarratt - Mayor
Eddie Rodriguez - Place 2
Bruce Wadley - Place 3
Trish Reiner - Place 4, Mayor Pro Tem
Steven Vale - Place 5
Greg Corrigan - Place 6

PARKS BOARD

James Dickens - Chair
Barbara Boozer
Jayme Cornwell
Jon Curtner
Kali Kuban
Josh McGinnis
Christina Moon
Jone Snider
Kay Wasielewski

PARKS STAFF

Aaron McLain - Director of Internal Services
Angela Mastellar - Administrative Assistant

PLANNING AND ZONING COMMISSION

Reda Kay - Chair
Tim Hallman - Vice-Chair
Thomas Class
Earl Erdmann
John Grace
Richard Hoefs
Randall Moore
Kevin Watson

STEERING COMMITTEE

Bruce Wadley
Greg Corrigan
Jone Snider
Jon Curtner
Leonard Nuckolls
Jen Shelby
Crystal Chavez
Holly Martin
Jimmy Dawson
Ron Massingill
Beth Stanley

CONSULTANT TEAM

Halff Associates, Inc.
Lenny Hughes, PLA - Principal In-Charge
Kendall Howard, AICP - Project Manager
Kelsey McNiece - Deputy Project Manager
Aspen Wilkins - Planner



TABLE OF CONTENTS

1 INTRODUCTION

- 3 Why Plan Today?
- 6 Community Profile
- 9 Planning Process
- 11 Our Active Transportation & Recreation Vision

2 EXISTING SYSTEM

- 15 Existing System
- 25 System Users

3 NEEDS ASSESSMENT

- 29 System Needs
- 39 Community Input
- 41 Barriers & Opportunities
- 45 Implications

4 RECOMMENDATIONS

- 49 Facility Typologies
- 55 Recommended Network
- 63 Facility Design Standards & Policies

5 IMPLEMENTATION

- 73 Corridor Implementation
- 82 System Enhancements
- 83 Policy Program
- 84 Funding & Administration

APPENDIX

- 89 Glossary of Terms
- 91 Detailed Maps
- 95 Commonly Used Trail & Bikeway Signage
- 99 Funding Sources

LIST OF FIGURES, MAPS & TABLES

FIGURES

6	Figure 1.1: Regional Context
9	Figure 1.2: Planning Process
26	Figure 2.1: Willingness to Ride Spectrum
39	Figure 3.1: Preferred Amenities for Granbury
39	Figure 3.2: Expansion of Hike and Bike Trails
49	Figure 4.1: Recommended Facility Typologies
59	Figure 4.2: Range of Bikeway Accommodations
65	Figure 4.3: Prototypical Bike Lane
66	Figure 4.4: Prototypical Signed Route
67	Figure 4.5: Example of Bicycle Boulevard and Standard Traffic Calming Interventions
67	Figure 4.6: Prototypical Wide Shoulder
70	Figure 4.7: Typical Signalized Trail Crossing at Roadway Intersection
70	Figure 4.8: Typical Mid-Block Trail Crossing at Roadway

MAPS

8	Map 1.1: Population Density and Bicycle & Pedestrian Infrastructure
16	Map 2.1: Granbury Existing and Proposed Active Transportation and Recreation Network
18	Map 2.2: Existing Off-Street Trail Network
22	Map 2.3: Existing On-Street Bikeway Network
24	Map 2.4: Existing Sidewalks System
30	Map 3.1: Granbury Bicycle & Pedestrian Crash Locations (2016-2021)
32	Map 3.2: Granbury Pedestrian and Bicycle Trip Potential (2022)
34	Map 3.3: Granbury Bicycle Level of Comfort, Existing Roadways (2022)
35	Map 3.4: Granbury Pedestrian Level of Comfort, Existing Roadways (2022)
42	Map 3.5: Active Transportation and Recreation Barriers
44	Map 3.6: Active Transportation and Recreation Opportunities
56	Map 4.1: Recommended Active Transportation & Recreation Network
58	Map 4.2: Recommended Multi-Use Trail Network
60	Map 4.3: Recommended On-Street Bikeway Network

MAPS (continued)

62	Map 4.4: Recommended Pedestrian Network
76	Map 5.1: Multi-Use Trail Segment Prioritization
80	Map 5.2: On-Street Bikeway Segment Prioritization

TABLES

6	Table 1.1: Hood County Population
7	Table 1.2: Commuting Rates
15	Table 2.1: Existing Facility Inventory
29	Table 3.1: Granbury Bicycle and Pedestrian Crash Data (2016-2021)
55	Table 4.1: Recommended Active Transportation & Recreation Network Mileage
57	Table 4.2: Recommended Multi-Use Trail Mileage
59	Table 4.3: Recommended On-Street Bikeway Mileage
61	Table 4.4: Recommended Pedestrian Facility Mileage
75	Table 5.1: Multi-Use Trail Segments Prioritization
79	Table 5.2: On-Street Bikeway Implementation Considerations
81	Table 5.3: Recommended Pedestrian Network Segments
83	Table 5.4: Policy Program Details
84	Table 5.5: Typical Project Cost by Facility Type

LIST OF ACRONYMS

AASHTO – American Association of State Highway and Transportation Officials

ADAAG – Americans with Disabilities Act Accessibility Guidelines

CIP - Capital Improvement Plan

CRIS – Crash Record Information System

DFW – Dallas-Fort Worth

ETJ – Extraterritorial Jurisdiction

FHWA – Federal Highway Administration

HOA – Homeowner’s Association

ITE – Institute of Transportation Engineers

LOS – Level of Service

NACTO – National Association of City Transportation Officials

NCTCOG – North Central Texas Council of Governments

PROS – Parks, Recreation, and Open Space

ROW – Right-of-Way

TAS – Texas Accessibility Standards

TIP – Transportation Improvement Program

TMUTCD – Texas Manual on Uniform Traffic Control Devices

TTI – Texas Transportation Institute

TxDOT – Texas Department of Transportation

This page is intentionally blank.



CHAPTER 1 | INTRODUCTION



Why Plan Today?.....	3
Community Profile.....	6
Planning Process.....	9
Our Active Transportation and Recreation Vision.....	11

WHY PLAN TODAY?

Multi-use trails, sidewalks, and on-street bikeways are essential features in a city's sense of place and create an enjoyable user experience. Infrastructure built for pedestrians and cyclists help create a resilient, healthy, and quality environment. They also provide alternative forms of transportation to create connections between community centers, residential areas, schools, parks, and other destinations of a city. Leveraging trails, bikeways and sidewalks as vital elements of a city's infrastructure can increase quality of life and activate economic development for the enhancement of the community.

PROJECT BACKGROUND

The Granbury **Active Transportation & Recreation Plan** serves as the City's first comprehensive plan addressing mobility and recreational needs of the community through a network of active transportation infrastructure. Active transportation includes walking, biking, wheelchair use and all non-motorized means of travel for both transportation and recreation. This plan serves as a guide for the future implementation of various bicycle and pedestrian facilities including multi-use trails, on-street bikeways, and sidewalks. A shared vision for outlining implementation priorities and key recommendations for the community was developed through collaboration with residents, city staff, civic leaders, stakeholders, and appointed officials. The plan also provides policy recommendations, criteria-based measurements to guide investment, and a prioritized projects list with 'high level' planning cost estimates.

WHAT IS ACTIVE TRANSPORTATION?

Active transportation is human-powered transportation that engages people in healthy physical activity while they travel from place to place. People walking, bicycling, using strollers, wheelchairs/mobility devices, electric scooters, skateboarding, and roller-blading are all engaged in active transportation.





New Park Loop Trail in Lambert Branch Park

WHAT'S BEEN ACCOMPLISHED SO FAR

The City of Granbury recently adopted the Parks, Recreation, and Open Space (PROS) Master Plan (2020) to serve as a guide for future capital improvement projects, funding opportunities, and recommendations for expanding and improving the parks and recreation system to best serve the community. One of the goals and associated action items of this plan focused on 'System Connectivity,' which outline actions for improving trail and bicycle facilities.

Since adoption of the PROS Plan, the City has designed and constructed a new park loop trail and trail amenities, including educational signage, benches, and nature themed play elements in Lambert Branch Park. **The completion of this project demonstrates the existing momentum the City has for prioritizing active transportation and recreation projects.** This plan can build off of the momentum of the City's recent investment to propel the expansion of pedestrian and bicycle infrastructure and continue to support the implementation of future active transportation and recreation projects.



Educational Signage



Park Loop Trail and Landscaping



Nature Themed Play Elements

BENEFITS OF THE PLAN

Investing in a comprehensive system of facilities to support bicycling and walking provides transportation and recreation opportunities for everyone. Capturing a range of needs and interests from the avid bicyclist, to people using mobility assistance devices such as wheelchairs or walkers, or a resident taking a stroll in their neighborhood, provides equitable access to trails, bikeways and sidewalks for all residents and regional visitors. **The benefits of implementing active transportation can be outlined by economic drivers, safety, and health benefits.**

ECONOMIC DRIVERS

Investing in pedestrian and bicycle infrastructure provides economic opportunities for the city, homeowners, and business owners. Walkability and access to safe trail connections is associated with higher home values and activated corridors with comfortable bicycle facilities and pedestrian facilities attract customers to local businesses.

SAFETY

The primary concern users have when utilizing trails, sidewalks and bikeways is safety and level of comfort. Well planned active transportation facilities can lead to an increase in usage and community support for alternative modes of transportation. Safety improvements widening trails and sidewalks, introducing traffic calming solutions, improving crossing visibility, enhanced intersections and mid-block crossings, and legible signage and wayfinding tools.

HEALTH

Providing people equal access to active lifestyle choices like walking and biking generates a range of health benefits. These benefits range from decreased medical costs, improved cardiovascular health, physical health, and mental well-being.

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

41% chance of survival at 45 mph

87% chance of survival at 25 mph

Source: Tefft, Brian C., *Impact Speed and a Pedestrian's Risk of Severe Injury or Death*, AAA Foundation for Traffic Safety, 2011

COMMUNITY PROFILE

The City of Granbury is located 30 miles southwest of Fort Worth along US 377. **Figure 1.1** displays how the city is positioned within the region. As of 2022, Granbury is approximately 10,797 acres. The City's Extraterritorial Jurisdiction (ETJ) is approximately 30,719 acres. The city limits and the ETJ combined represent the planning area for this plan and outline where future growth is anticipated to occur.

The Dallas - Fort Worth (DFW) metroplex is one of the fastest growing regions in the nation. Granbury over the past decade has been impacted by changes in the metropolitan area, which is evidenced by population growth and increase in tourism. Today, the city's population is estimated to be 11,870 residents, growing 107.6 percent in the past 20 years. The forecasted population in the year 2040 is 20,037 residents. This is a 68.8 percent increase in residents over the next 20 years.

REGIONAL IMPORTANCE

The City of Granbury is recognized as one of the most iconic small towns in the nation, known for its historical importance. Its charming character attracts visitors from the region, state, and nation to experience its diverse offerings. **Serving as the county seat of Hood County makes Granbury a significant destination for the region, particularly for neighboring communities.** Granbury is responsible for providing many civic services that are utilized by Hood County residents especially park, recreation, and trail facilities; therefore, planning for the ongoing provision of these services requires consideration of the population beyond the city boundaries. **Table 1.1** shows the existing and projected population for Hood County, indicating that, as the county seat, Granbury will have an even larger population regularly dependent on active transportation and recreation infrastructure provided by the City.

Additionally, usage of the city's active transportation and recreation system will likely see an influx from tourism as Granbury continues to promote itself as a destination in North Central Texas.

Figure 1.1, Regional Context

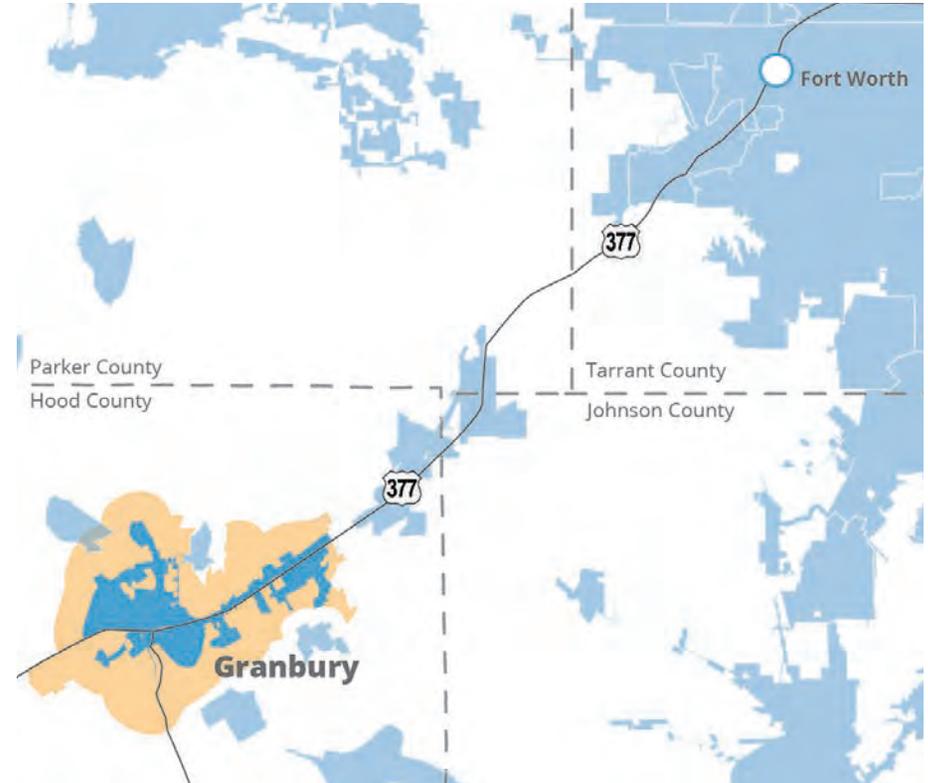


Table 1.1, Hood County Population

CURRENT POPULATION	61,598 ¹
PROJECTED POPULATION	95,153 ²

¹ U.S. Census ACS 5-year Population Estimates, 2020
² 2045 NCTCOG Demographic Forecast



Granbury Gateway Signage

COMMUTING RATES

Table 1.2 displays the current commuting rates of workers 16 years and over in the City of Granbury. Currently in Granbury most people use motorized vehicles as their main form of transportation. The residents who walk, bike, or use public transportation make up about 2.1 percent of the workers 16 years and over.

While this number seems low, this only reflects the percentage of the population who is currently in the work force. 49.7 percent of the residents of Granbury are either not 16 years of age or in the work force. In a 2017 Bicycle Opinion Survey report by the North Central Texas Council of Governments (NCTCOG), two-thirds of the respondents who consider themselves recreational bicycle riders agreed they wanted to bike more, while 85 percent of the utilitarian cyclists did.

Map 1.1 displays the population of Granbury and surrounding areas overlaid with the current location of trail and sidewalk infrastructure. Bicycling and walking infrastructure are more effective when they reach key destinations (households, schools, retail centers) and when multiple transportation options are available. Currently in the city the majority of trails and sidewalks are located in the core area of Granbury; the goal of this plan is to increase connectivity to encourage more people to walk, bike or roll in the community.

RECREATION SPENDING

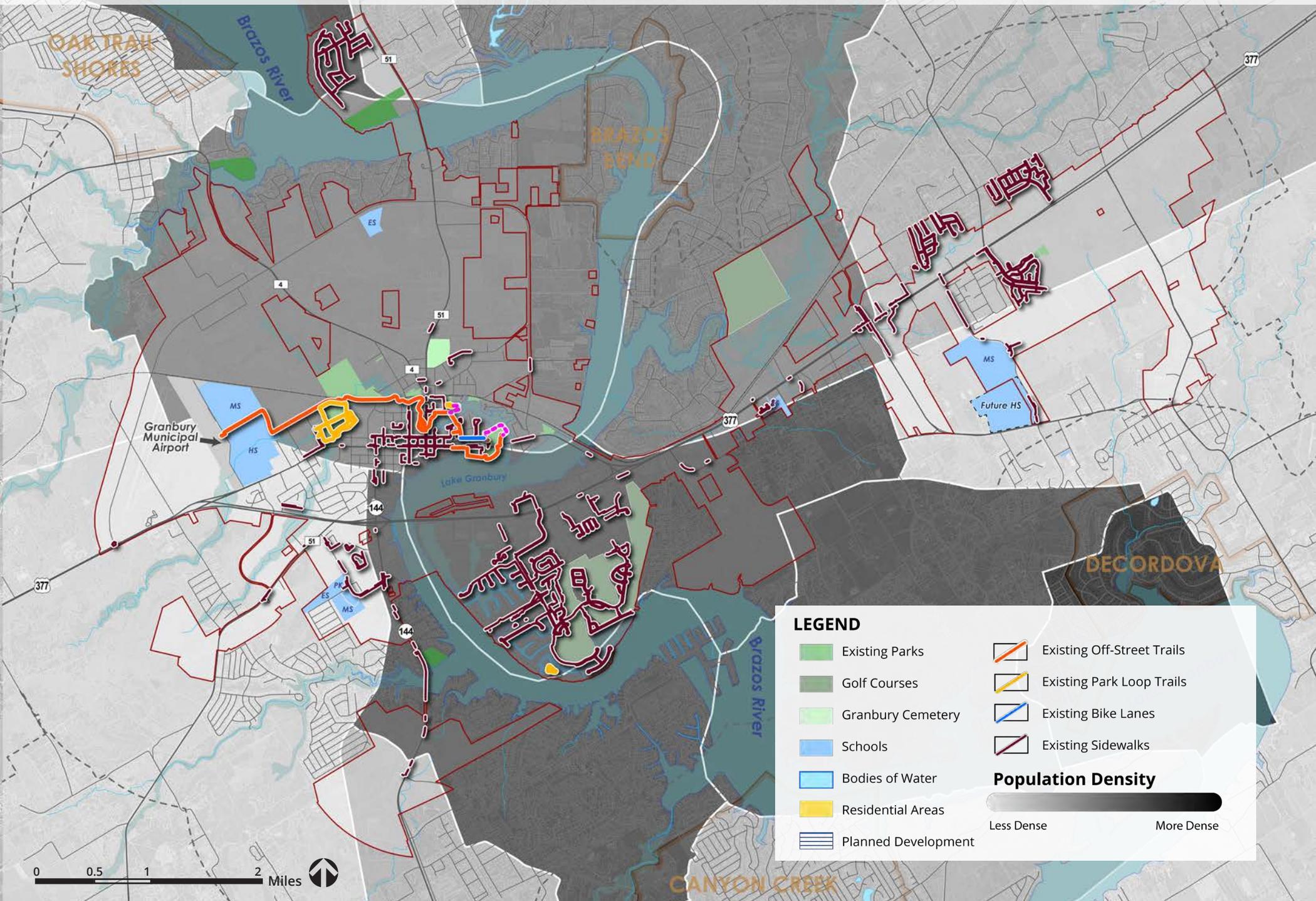
In the 2019 Consumer Expenditure Survey conducted by the Bureau of Labor Statistics, the three largest types of recreation expenditures spent by households in Granbury were TV/Video/Audio, entertainment fees and admissions, and sports, recreation and exercise equipment. On average each household in a year will spend about 200 dollars towards sports and exercise. This includes but is not limited to biking, sports equipment or anything involving recreation and exercise. This data on resident recreation spending reveal the importance of prioritizing quality infrastructure such as trails and bikeways in Granbury.

Table 1.2, Commuting Rates

	2010	2020
WORKERS 16 YEARS AND OVER	3,858	4,125
MOTORIZED VEHICLE	96%	95.9%
PUBLIC TRANSPORTATION	0.8%	0.3%
WALKED	1.3%	1.9%
OTHER MEANS	0.0%	0.4%
WORKED FROM HOME	2.5%	1.5%

Source: U.S Census ACS 5-year Population Estimates, 2020

Map 1.1, Population Density and Bicycle & Pedestrian Infrastructure



PLANNING PROCESS

The 9-month planning process incorporated engagement opportunities, data gathering, and high-level planning analysis and review. This process outlined recommendations for the city to guide the future of active transportation and recreation. The phases of the planning process are visually portrayed in [Figure 1.2](#) and described below.

Figure 1.2, Planning Process



Phase 1 | Data collection and inventory: In this initial phase, previous planning efforts, city code, and survey data were reviewed for a more comprehensive understanding of Granbury's existing trails, sidewalks, and bikeways.

Phase 2 | Community engagement: A steering committee was formed to guide the development of the plan and ensure it aligned with the community's vision. There was one public open house conducted for more community input. Input from these engagement efforts directly impacted the network routes and project prioritization.

Phase 3 | Needs assessment: To identify system needs, all the findings from data collection and public engagement efforts were summarized. Various analyses were conducted to address areas of improvements that relate to safety issues, major physical barriers, accessibility, and opportunities to increase comfort for the user.

Phase 4 | Development of recommendations: Public feedback and needs assessment results were used to review and refine a recommended network of pedestrian and bicycle facilities. New corridors correspond to the areas for opportunity outlined in the needs assessment.

Phase 5 | Implementation action plan: The focus of this plan is on recommendations that can be implemented over time through a phased approach. New bicycle and pedestrian corridors were prioritized based on criteria created through the guidance of stakeholder input. The action plan identifies short, medium, and long-term items to be implemented by the City and identified partnering agencies.

COMMUNITY ENGAGEMENT

The most important element of this plan is engaging with the community to ensure that the vision of Granbury is being accurately depicted. Meeting with the steering committee and the public open house helped benchmark the needs of the community regarding areas of improvement and opportunities within the existing bikeway and pedestrian network.

STEERING COMMITTEE

The steering committee is comprised of community leaders and key stakeholders that helped review and guide plan development. Those included on the steering committee are members of City Council, planning and transportation department leaders, Parks Board members, local business owners and avid trail users and bicyclists. This committee met twice during the planning process. The input from these meetings assisted in identifying active transportation and recreation needs, goals and objectives, network recommendations, and in garnering support for the final plan.

PUBLIC OPEN HOUSE

A public open house was held on August 18, 2022. Residents of Granbury were invited to listen to a brief presentation reviewing the planning process and preliminary recommendations and provide feedback at various interactive boards stationed around the room. The input received at this meeting helped to inform refinements made to the recommended active transportation and recreation network.



Granbury Public Open House

OUR ACTIVE TRANSPORTATION & RECREATION VISION...

The City of Granbury will be home to a well-connected, accessible, and safe trail and bikeway network that serves the active transportation, public health, economic development, and quality of life needs for the community.

ACTIVE TRANSPORTATION & RECREATION GOALS

1

COMMUNITY CONNECTIVITY

Develop a comprehensive network of trails, sidewalks, and bikeways that connect users to significant destinations throughout the city.

2

ACCESSIBILITY & SAFETY

Provide pedestrian and bicycle facilities that serve users of all ages and abilities and create a user experience that is comfortable, safe, and accessible.

3

IDENTITY

Create an active transportation and recreation system that reflects the character of Granbury and improves awareness and legibility of active transportation and recreation routes.

4

REGIONAL RECOGNITION

Become a regional leader in active transportation and recreation that serves and attracts users within and outside of Granbury.

5

PARTNERSHIP & FUNDING

Strengthen and pursue partnerships with outside communities and agencies to efficiently and strategically implement the trail and bikeway system.



The Moments-in-Time Trail at Lambert Branch Park



CHAPTER 2 | EXISTING SYSTEM



Existing System.....15

System Users.....25

EXISTING SYSTEM

Map 2.1 illustrates the planned and existing active transportation and recreation network in Granbury. **Table 2.1** inventories the existing and currently proposed pedestrian and bicycle facilities in Granbury as identified by the City. For the purposes of this inventory the following facility definitions are used:

Off-Street Trails – Shared-use facilities that are separated from motor vehicle traffic and serve pedestrians and bicyclists.

On-Street Bikeways – Designated bicycle accommodations within roadways that utilize pavement markings, signage, and physical features at varying implementation intensities.

Sidewalks – Pedestrian accommodations that range in width, typically 4 to 6 feet, and are located directly adjacent or separated from roadways and include pedestrian crosswalks.

Collectively, these types of facilities aim to serve recreation and non-motorized transportation needs of Granbury residents. The facilities that exist today are concentrated in pockets around the city such as in downtown and residential neighborhoods but lack citywide connectivity.

The off-street trail facilities that the City currently proposes are extensions of existing trails to connect trails within parks to surrounding sidewalks and the Moments-in-Time Hike & Bike Trail. Additional facilities will contribute to the active transportation and recreation network’s overall connectivity and accessibility and present more opportunities for users to take non-motorized routes for recreation, mobility, or leisure purposes.

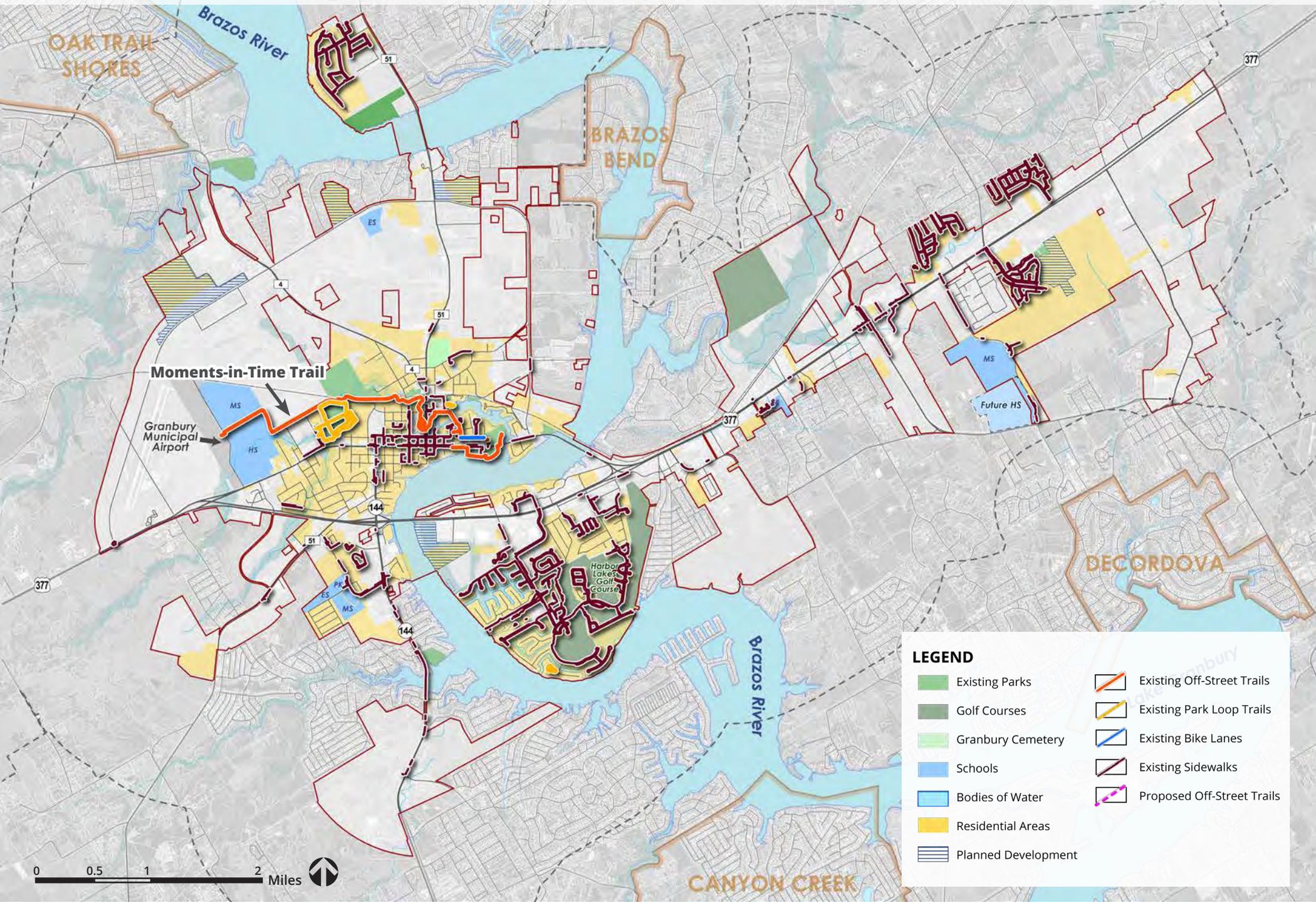
Table 2.1, Existing Facility Inventory

FACILITY TYPE	TOTAL LENGTH IN MILES
EXISTING OFF-STREET TRAILS	4.46
PROPOSED OFF-STREET TRAILS	0.43
EXISTING ON-STREET BIKEWAYS	0.18
EXISTING SIDEWALKS	4.54



Firefighter's Memorial Park along the Moments-in-Time Trail

Map 2.1, Granbury Existing and Proposed Active Transportation and Recreation Network

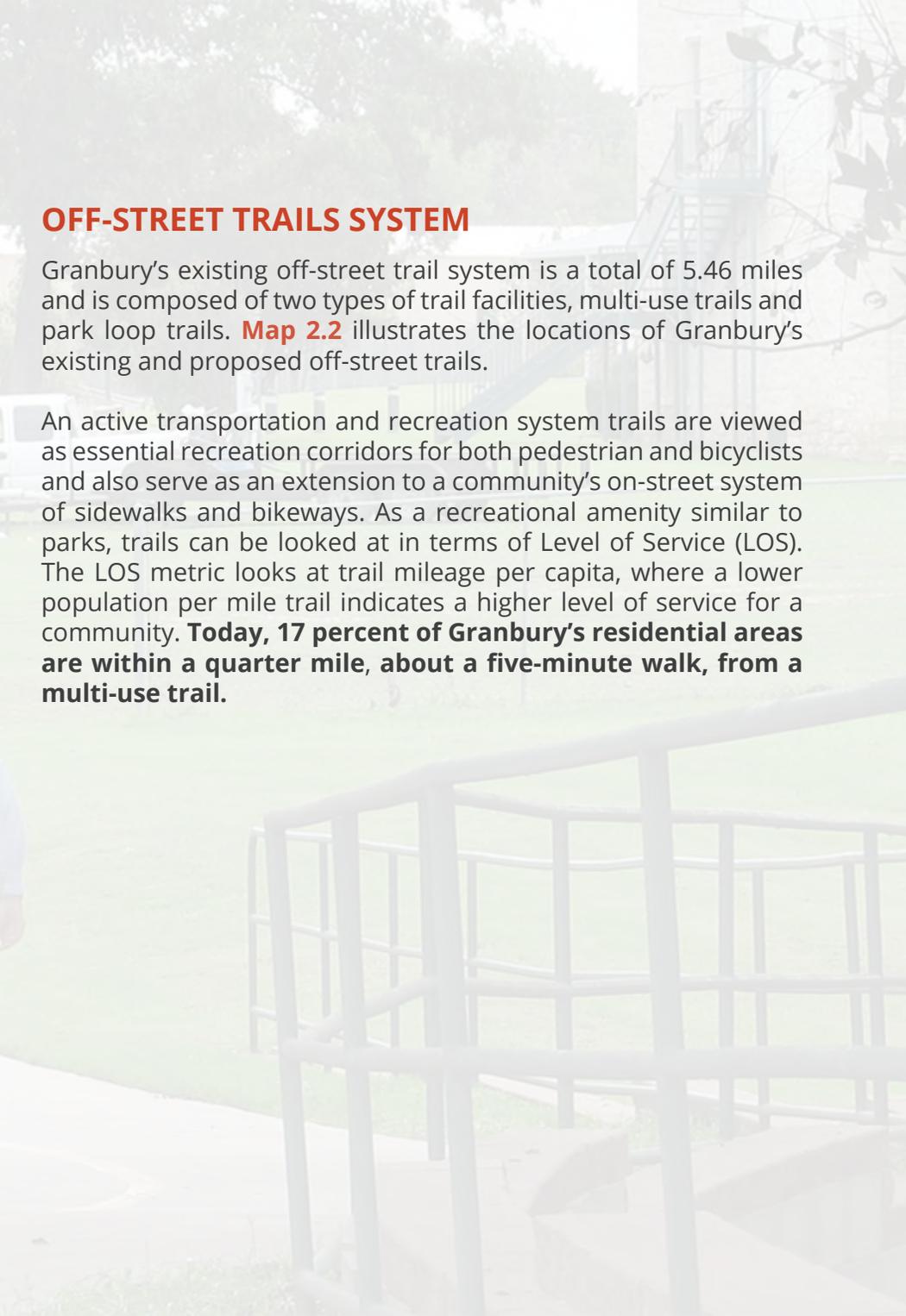




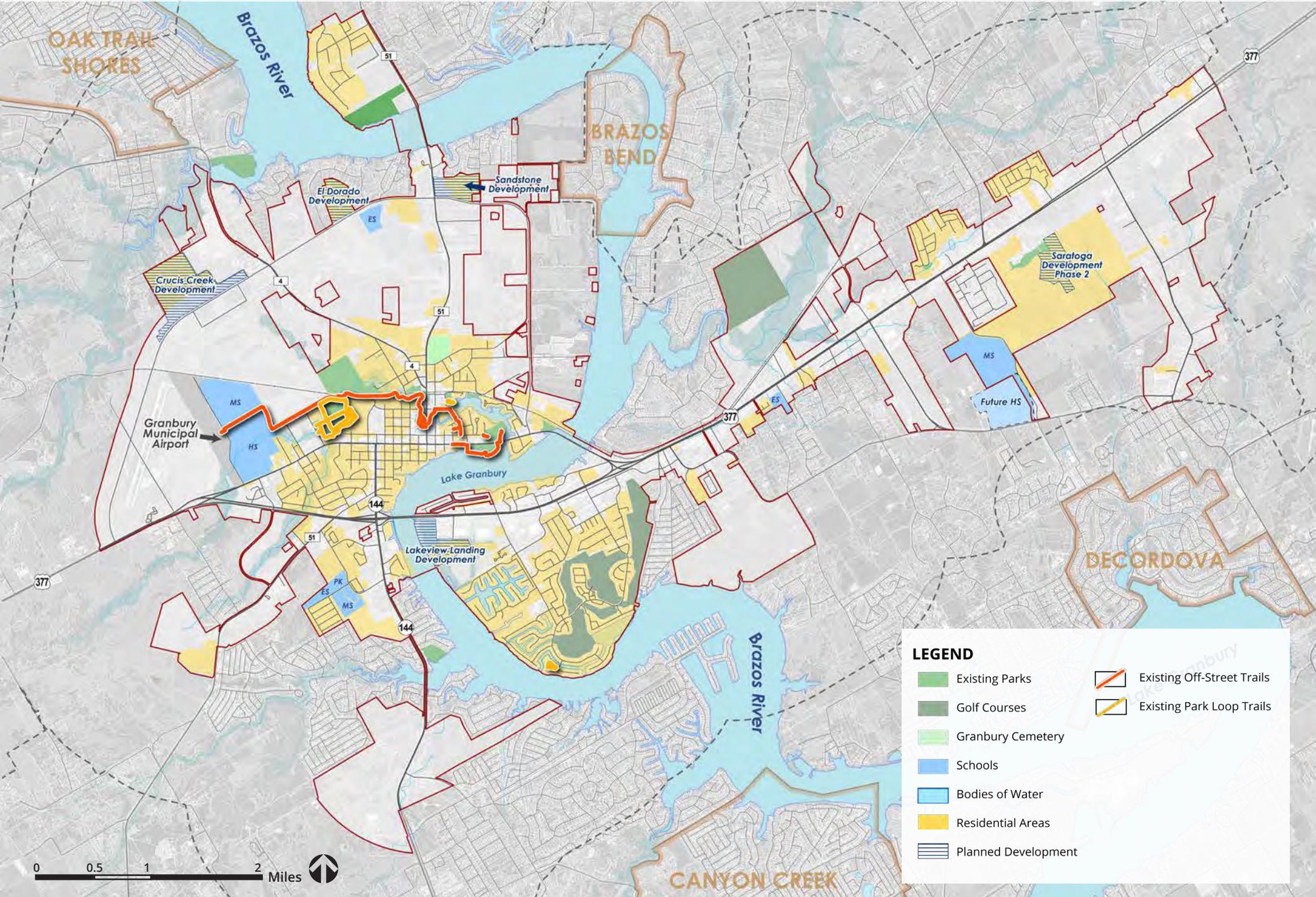
OFF-STREET TRAILS SYSTEM

Granbury's existing off-street trail system is a total of 5.46 miles and is composed of two types of trail facilities, multi-use trails and park loop trails. **Map 2.2** illustrates the locations of Granbury's existing and proposed off-street trails.

An active transportation and recreation system trails are viewed as essential recreation corridors for both pedestrian and bicyclists and also serve as an extension to a community's on-street system of sidewalks and bikeways. As a recreational amenity similar to parks, trails can be looked at in terms of Level of Service (LOS). The LOS metric looks at trail mileage per capita, where a lower population per mile trail indicates a higher level of service for a community. **Today, 17 percent of Granbury's residential areas are within a quarter mile, about a five-minute walk, from a multi-use trail.**

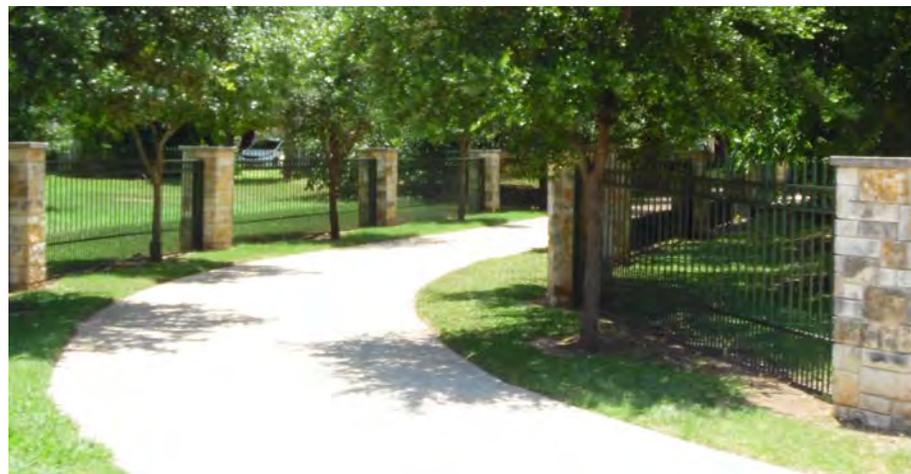


Map 2.2, Existing Off-Street Trail Network



MULTI-USE TRAILS

Granbury's multi-use trails are wider trail facilities that serve multiple user groups for recreation and transportation purposes. The Moments-In-Time Trail is the only existing multi-use trail in Granbury today and is approximately 3.46 miles in length. The trail is divided into three segments, the primary segment creates an east-west connection from the Granbury Municipal Airport to Hewlett Park and the second follows the lakeshore from Hewlett Park to the Convention Center on the south side of Pearl Street, and the third section is 0.4 miles of boardwalk around the Convention Center and in front of City Beach Park. The primary segment creates a spine through the center of the city that connects several points of interests including schools, most of the City's parks, and downtown. The City's current trails plan proposes 0.3 miles of multi-use trail along the perimeter of Hewlett Park, connecting the boardwalk and the residential area west of the park. The majority of the trail is 10 feet wide and narrows to 6 feet in some areas. Multi-use trails should be a minimum of 12 feet per current standards to provide comfortable facilities; however, a 10 feet wide trail can still support shared-uses.



Park Loop Trail in Hewlett Park

PARK LOOP TRAILS

Granbury's park loop trails are internal to parks and typically form limited, if any, external connections to other pedestrian or bicycle facilities, and are generally reserved for recreational uses. There are two miles of city owned park loop trails in Granbury today divided between two parks, Granbury City Park and Lambert Branch Park. Granbury City Park contains the majority of existing park loop trails totaling 1.7 miles, all of which are 8 feet wide. These trails create pathways to the various amenities found within the park and can be used for recreation or leisure purposes. The City has recently constructed a loop trail that is 6 feet wide in the northwest corner of Lambert Branch Park. This trail includes amenities such as interpretive signage, nature themed play elements, and benches. The City currently proposes an additional 0.1 miles of trail within Lambert Branch Park along the shoreline to connect the existing loop trail to the Moments-in-Times Trail on the south side of Rucker Street. Additionally, there is a park maintained by a homeowners association within Water's Edge with a 0.2-mile loop trail that serves the surrounding residents.



Granbury's Moments-in-Time Trail



LOOKING AT TRAILS WITH TWO LENSES: RECREATION AND ACTIVE TRANSPORTATION



TRAILS FOR RECREATION

Recreational trails are designed to support various recreation and fitness activities including, hiking, jogging, biking, and more. Although some recreational trails can be designed to support multiple types of users, many are custom designed to support a single user group. Granbury is a popular tourist destination for people in the area and has many great offerings including the lake fronts, parks and boardwalk. Recreational trails aim to connect to these community destinations, but their utility as a transportation facility is often limited or incidental.



TRAILS FOR ACTIVE TRANSPORTATION

Trails that are designed for active transportation provide pedestrian and bicycle infrastructure like enhanced sidewalks, multi-use trails, and bikeways (i.e., bicycle lanes, signed routes, bicycle boulevards). Trails designed for transportation help increase connectivity and serve non-motorized mobility.

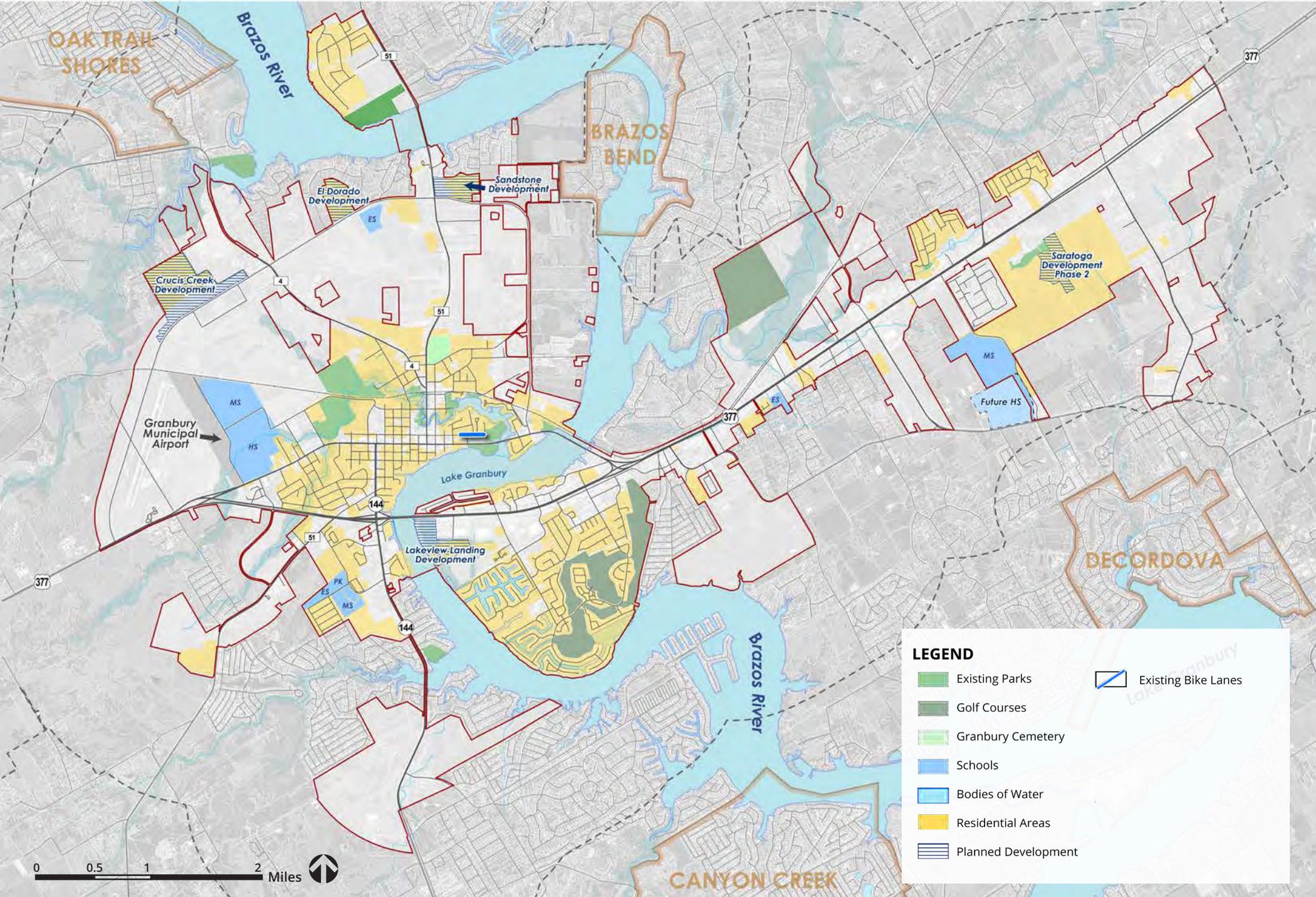


ON-STREET BIKEWAY SYSTEM

Map 2.3 illustrates the only dedicated bicycle facility that exists in Granbury, a 0.2-mile long bike lane on Bridge Street. The implementation of this type of facility came about because there was a need to connect an existing segment of the Moments-in-Time Trail to Hewlett Park along a roadway where trail facilities aren't feasible. This bike lane is 7 feet wide providing a comfortable user experience; however, due to its short distance does not provide an extensive protected bicycling experience.



Map 2.3, Existing On-Street Bikeway Network



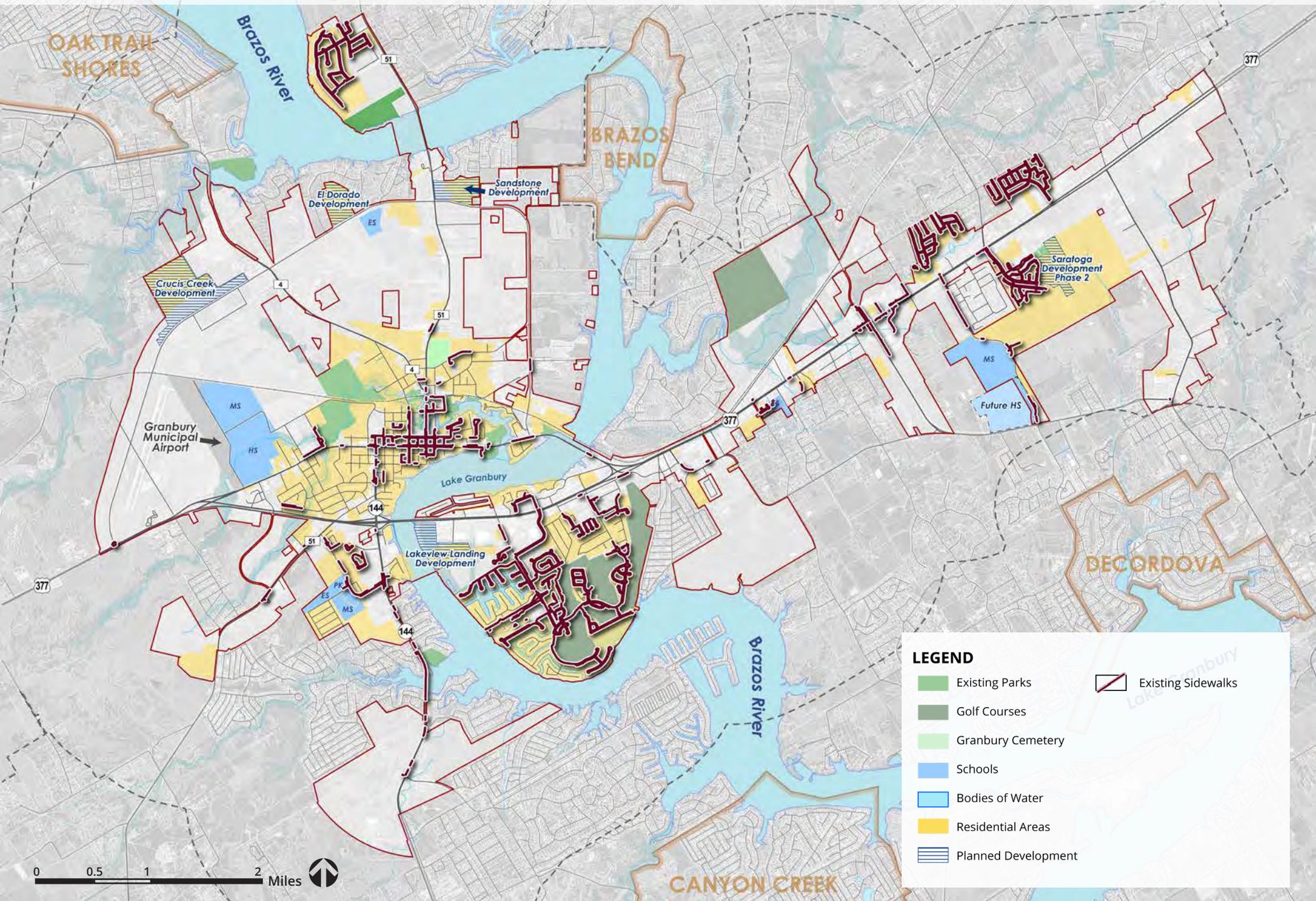


SIDEWALK SYSTEM

Granbury's existing sidewalk inventory totals to 48.4 miles, which results in only **37 percent of roadways having sidewalks**. Sidewalks are mainly found in residential neighborhoods, at some retail centers, and along major roadways in the historic downtown area. The sidewalks in residential areas are generally 4 feet wide and 5 feet wide in commercial areas. Around Granbury's Historic Square the widths of sidewalks significantly increase to better accommodate higher concentrations of pedestrian activity especially during community events that are hosted year-round.

Today, **92 percent of Granbury's residential areas are within a quarter mile, about a five-minute walk, from a sidewalk**, which is unsurprising as most of the city's sidewalks have been implemented in residential areas. Although a high percentage of existing sidewalks are in close proximity to residential areas, the current network contains substantial gaps, particularly in the historic parts of the city, along major thoroughfares, and leading outside of residential neighborhoods. **Map 2.4** depicts the current sidewalk network, and while it shows where sidewalks are present it doesn't reveal the quality of facilities.

Map 2.4, Existing Sidewalks System



SYSTEM USERS

An effective trail and bikeway system requires an understanding of the user groups utilizing these facilities for utilitarian, recreational, or leisure purposes. Each group has a unique set of preferences and needs to consider when implementing pedestrian and bicycle facilities. It is advantageous for the City to identify where the specific needs of multiple user groups overlap to provide an active transportation and recreation network with facilities that serve the most users possible.



WALKERS

This group utilizes facilities for recreational and mobility purposes. Recreational walkers utilize facilities such as trails, which provide convenient and affordable access to physical activity. Walking is also a means of commuting for the general public; therefore, it is critical that pedestrian and multi-use facilities create connections from neighborhoods to destinations such as parks, schools, places of employment, and key services.



JOGGERS & RUNNERS

This user group uses multi-use facilities for the sole purpose of recreation and exercise. They require facilities that are wide enough to allow them to safely pass slower moving facility users with minimal conflict as well as accommodate group recreation activities such as running groups. Jogger and runners seek routes that are continuous and encounter limited interruptions usually found on soft-surface or paved trails.



IN-LINE SKATERS & SKATEBOARDERS

These users seek paved shared-use facilities that are wide enough to be shared with a variety of users and share similar needs to those of pedestrians. Most utilize shared-use facilities for recreational or leisure purposes. When designing and constructing multi-use paths with these users in mind and the potential conflict between user groups, additional signage should be included to alert all users of facility etiquette and safety.



MOTORIZED DEVICES

In many communities there has been an increased use of motorized mobility devices such as electric bicycles, motorized scooters, and other electric-assisted vehicles, particularly for mobility purposes. State statutes and the development of a local ordinance can help a community manage appropriate use of these devices on active transportation and recreation facilities.

PEOPLE RIDING BICYCLES

People riding bicycles utilize both on-street and off-street facilities for recreation and mobility purposes and range in level of ability, comfort and interest, which greatly influences the types of facilities that should be implemented. When a community plans for people who ride bicycles, they should consider a 'willingness to ride' spectrum – **Strong and Fearless; Enthused and Confident; Interested but Concerned; No Way, No How.** Understanding their specific set of needs in order to ride on bicycle facilities helps to determine if the types of facilities, if implemented, will increase ridership.

The North Central Texas Council of Governments conducted a survey in 2017 across all 12 counties that constitute the Dallas-Fort Worth Region to capture the public's view on various bicycling aspects. **Figure 2.1** reflects the categories of attitudes towards bicycles of DFW residents.



Bicyclist riding on the Moments-in-Time Trail

The types of bicyclists presented in **Figure 2.1** provide planning guidance for determining facilities that if implemented will encourage and accommodate the most people. Typically, riders that fall into the 'Strong and Fearless' category are those that advocate the most for facilities, but those within the 'Interested but Concerned' category are those who would likely ride more if more comfortable facilities were provided. Balancing the needs of concerned riders and those of the more advanced can increase ridership from both a recreation and mobility standpoint.

Figure 2.1, Willingness to Ride Spectrum



Source: Dill and McNeil, *Revisiting the Four Types of Cyclists: Findings from a National Survey*, Transportation Research Record: Journal of the Transportation Research Board, 2587



CHAPTER 3 | NEEDS ASSESSMENT



System Needs.....	29
Community Input.....	39
Barriers & Opportunities.....	41
Implications.....	45

SYSTEM NEEDS

Assessing the needs of the pedestrian and bicycle system helps to uncover locations where there are opportunities to improve the existing pedestrian and bicycle network in a manner that provides the most benefit to current and future users. Several methods of analysis and datasets were reviewed for this needs assessment to paint a better picture of how well the current facilities accommodate pedestrians and bicyclists and where improvements or additional facilities would create the greatest impact. Analysis conducted for this plan include:

Crash Data: Identify locations that currently pose the biggest safety issues that could be resolved through implementation of dedicated walking and bicycle infrastructure.

Trip Potential Analysis: Identifies locations that could generate new walking and biking trips if facilities, perceived as safe and comfortable, were implemented to create additional connections. The analysis utilized a set of origins and destinations to determine where people are and where they want to go.

Level of Comfort Analysis: Identifies the level of comfort that pedestrians and bicyclists experience on a roadway, ultimately highlighting areas where improvements would provide better conditions for users.

Regulatory Review: A high-level review of Granbury's applicable regulatory documents to determine improvements that could be made to support the development of Granbury's active transportation network.

BICYCLE & PEDESTRIAN CRASH DATA

Evaluating pedestrian and bicyclist crash data helps to identify locations that pose a safety issue for people who are walking or biking where designated facilities may or may not exist. The data utilized for this analysis is from the Texas Department of Transportation (TxDOT) Crash Record Information System (CRIS) for the years 2016-2021. It should be noted that the crashes in **Map 3.1** only represent those that were reported. Unreported crashes are not represented in this dataset.

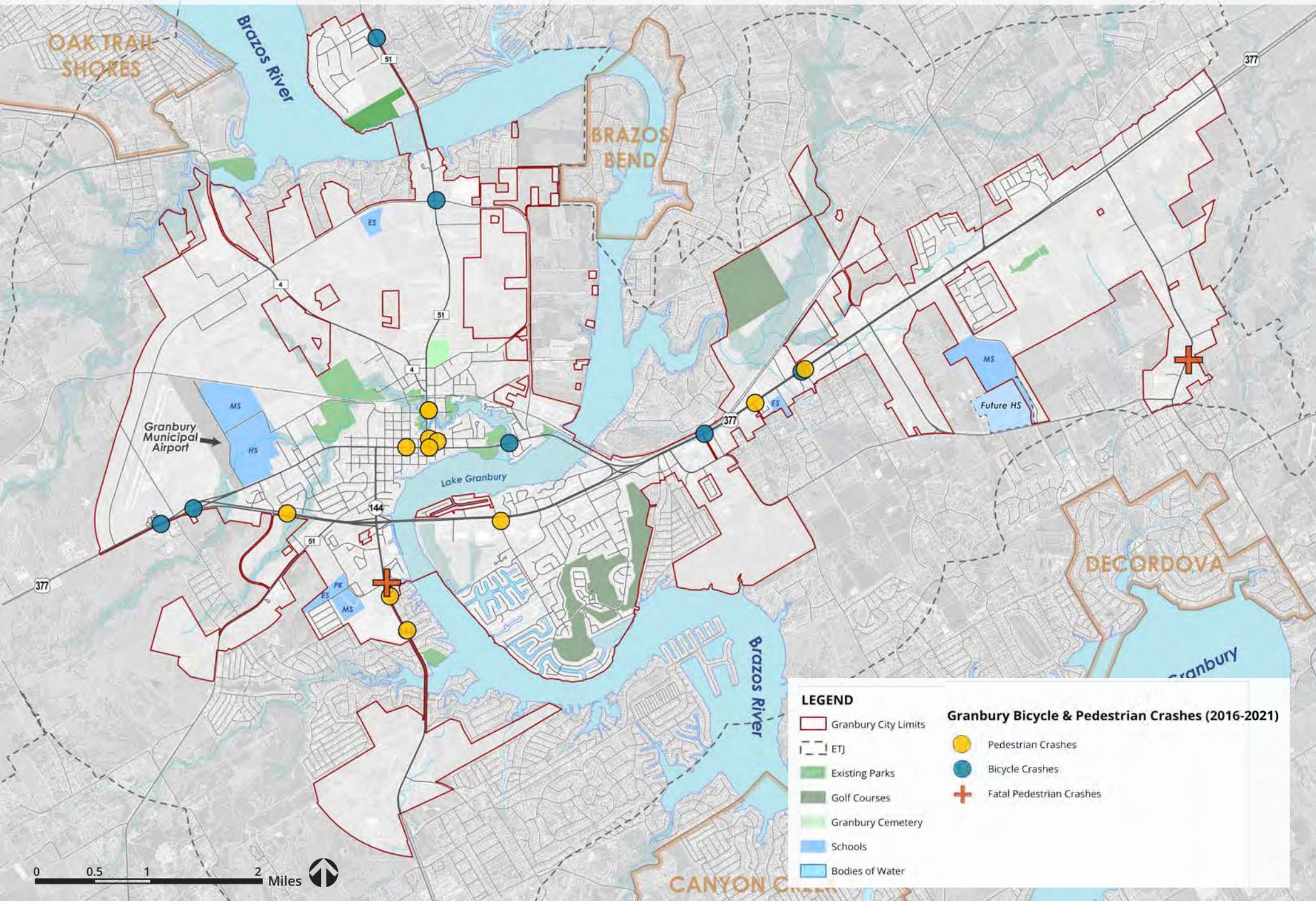
As shown in **Table 3.1**, during the six-year period reviewed only 22 crashes involving pedestrian and bicyclists occurred in Granbury, the majority of which were non-fatal accidents. A significant number of crashes occurred on major thoroughfares, particularly along US 377, Weatherford Highway, and Morgan Street which create crucial connections into and through Granbury. An area that has experienced a high volume of non-fatal pedestrian incidents is around Granbury's Historic Square where pedestrian activity is highest. A contributor to bicycle and pedestrian crashes is lack of adequate facilities for these user groups.

Table 3.1, Granbury Bicycle and Pedestrian Crash Data (2016-2021)

CRASH TYPE	NUMBER OF CRASHES
NON-FATAL BICYCLE CRASHES	7
FATAL BICYCLE CRASHES	0
NON-FATAL PEDESTRIAN CRASHES	13
FATAL PEDESTRIAN CRASHES	2

Source: Texas Department of Transportation (TxDOT) Crash Record Information System (CRIS)

Map 3.1, Granbury Bicycle and Pedestrian Crash Locations (2016-2021)



TRIP POTENTIAL ANALYSIS

The Trip Potential Analysis identifies destinations that would most likely generate trips if non-motorized routes were present and considers the proximity of these destinations to residential areas. The purpose of this analysis is to determine where future pedestrian and bicycle infrastructure should be prioritized by identifying areas where investments in these facilities would likely increase walking and bicycling trips for transportation or recreational activities. The following steps were taken to conduct this analysis:

- ‘Origins’ (i.e., residential areas) and ‘destinations’ (i.e., parks, schools, recreation facilities, lake Granbury, and Historic Granbury Square) were identified. The relationship between origins and destinations was the key component of this analysis.
- Quarter-mile walksheds, representing a five-minute walk, which is the estimated distance that people are willing to walk to reach a destination, were created around each origin and destination.
- Where the walksheds of the origins and destinations intersected were identified as locations with the most potential to generate future walking or bicycling trips.

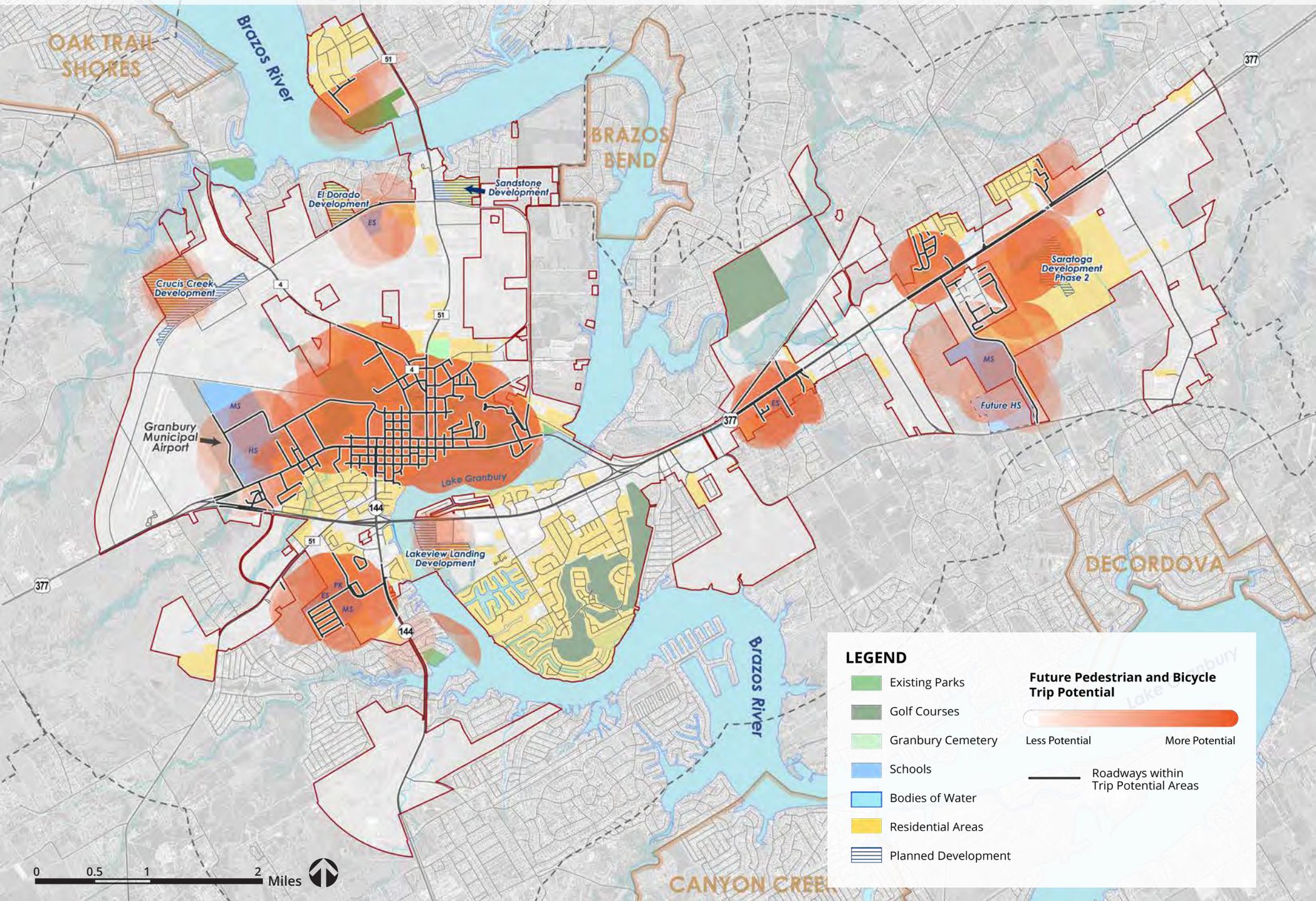
The result of the Trip Potential Analysis are depicted by the direct lines that extend between origin areas and community destinations. **These lines represent the potential for creating future walking and bicycling connectivity** between origins and destinations due to their proximity but do not assume that a feasible pathway exists today based on the City’s current transportation network.

The outcomes from the Trip Potential Analysis are illustrated in **Map 3.2**. The map suggests that the greatest potential for trip generation in the city center with a handful of pockets of potential on the edges of the city. The product of this analysis reflects historical patterns of development with many of the desirable destinations and the concentration of residential land uses found in the central part of the city. The density of trip potential demonstrates the importance of creating access from other areas of the city to the city center as this is where many public amenities and services are found. To encourage an increase in people choosing to walk or bike for short trips it is in the City’s best interest to prioritize implementation of facilities proposed within the highlighted areas. Areas that present low trip potential are still suitable for future infrastructure investments but depend on changes in land use patterns to increase the potential for future trips and prioritization.



City Beach Park and Lake Granbury Conference Center are important community destinations

Map 3.2, Granbury Pedestrian and Bicycle Trip Potential (2022)



LEVEL OF COMFORT

The Level of Comfort Analysis utilizes existing roadway conditions to determine the anticipated level of comfort that a pedestrian or bicyclist may feel if traveling along the corridor. Beyond identifying the level of comfort experienced on roadways this method of analysis highlights barriers to and opportunities for future connectivity. Additionally, the findings can be used to inform appropriate locations for new or improved pedestrian and bicycle infrastructure and the application of facility investments to enhance comfort, which increases safety and entices people to walk and bicycle. For Granbury, level of comfort for pedestrians and bicyclists was assessed separately as the conditions and needs for these user groups often differ.

The outcomes of the individual analyses conducted for both bicycle and pedestrian facilities present a similar picture as illustrated in **Map 3.3** and **Map 3.4**, respectively. Granbury's primary and secondary thoroughfares have created distinct pockets of high comfort roadways found mainly within residential neighborhoods and the historic part of the city. Most residents have access to higher comfort roadways within neighborhoods; however, there is limited access to adjacent areas or destinations in other parts of the city via comfortable routes due to the barriers created by low comfort roadways. High roadway speeds and the presence of multiple travel lanes are the primary contributors to low comfort roadways as they create conditions that necessitate greater separation of pedestrians and bicyclists from motor vehicles and increased protection at roadway crossings.

The Pedestrian Level of Comfort Analysis (see **Map 3.4** on page 35) produced more roadway corridors that were designated as high comfort due to the greater prevalence of sidewalks, which results in more frequent instances of higher pedestrian comfort.

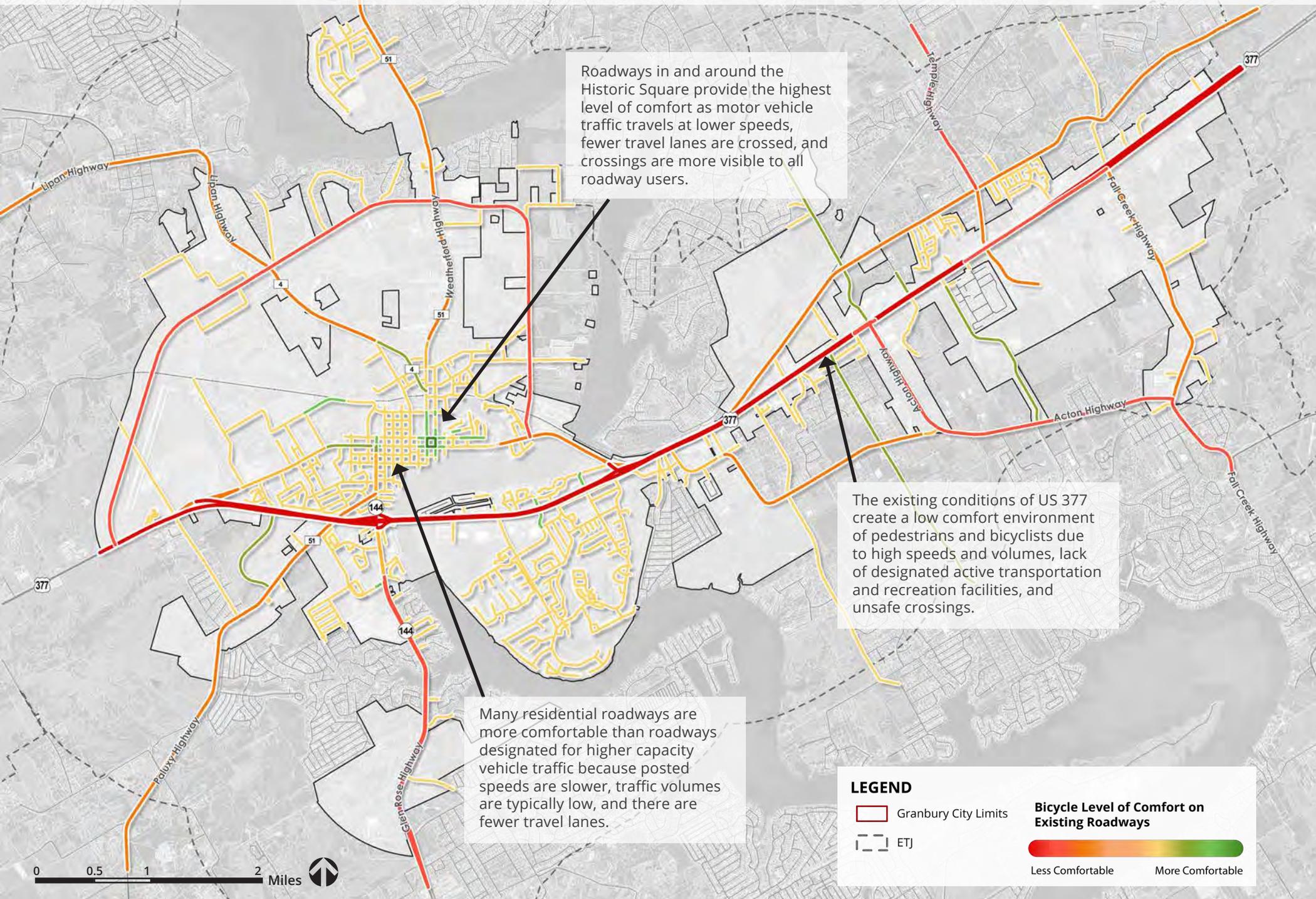


Gaps in sidewalk along Crockett Street represent a low-comfort facility

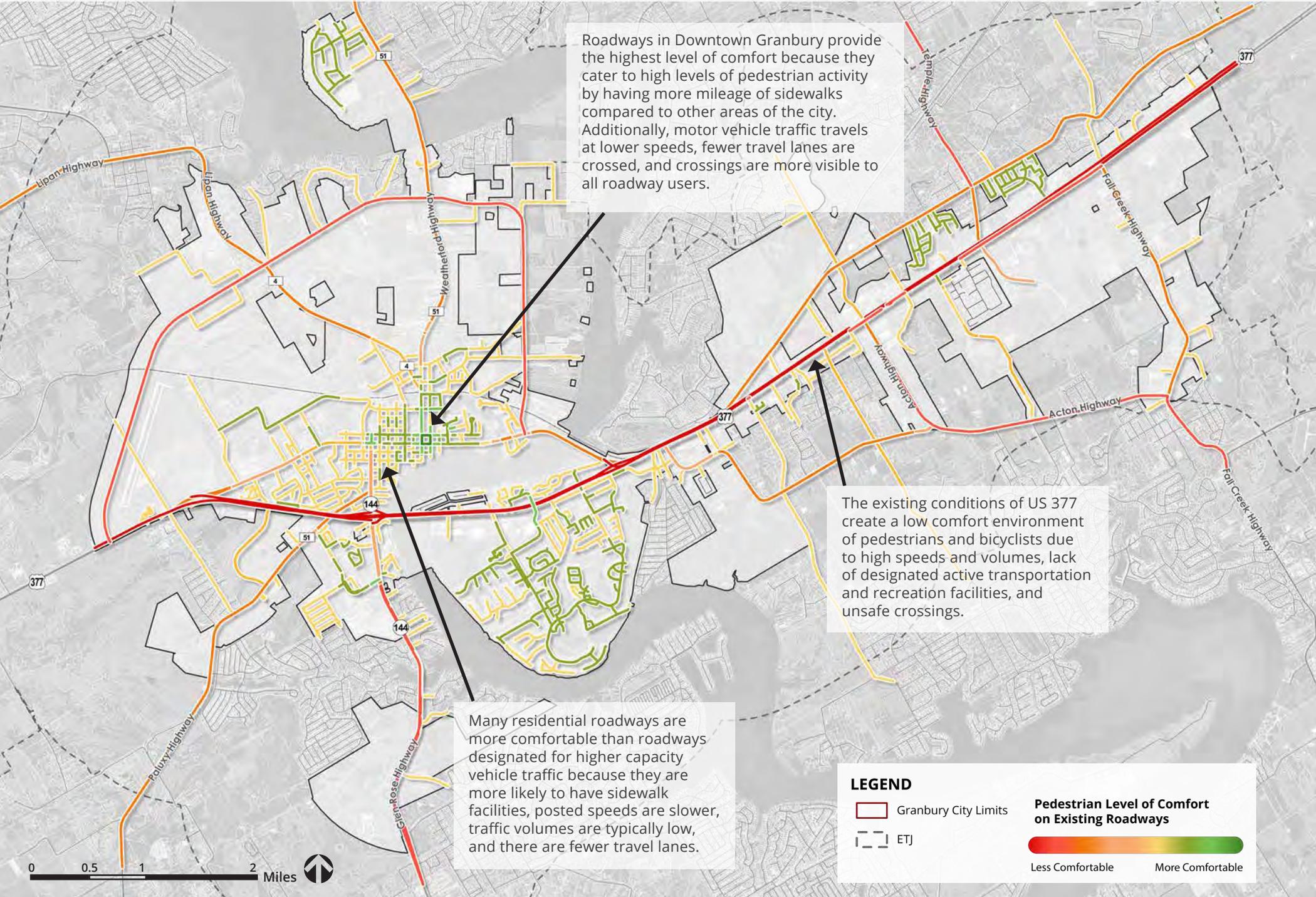


Sidewalks are present on just one side of Houston Street

Map 3.3, Granbury Bicycle Level of Comfort, Existing Roadways (2022)



Map 3.4, Granbury Pedestrian Level of Comfort, Existing Roadways (2022)





Off-street trails are a high-comfort facility for both pedestrians and cyclists as they provide greater separation from motor vehicle traffic.



Intersection crossings increase comfort for pedestrians because they better alert all roadway users of the presence of pedestrians.



Downtown represents a high-comfort area for both pedestrians and cyclists due to wide sidewalks and highly visible road crossings.



Designated bike routes alert motorists of the potential presence of bicyclists using the roadways.

REGULATORY REVIEW

The potential for constructing new active transportation and recreation facilities in Granbury will be greatly influenced by character and quality of future development and the regulatory tools that the City applies to the land development process. These regulations can either hinder or augment development of trail, sidewalk, and bicycle facilities depending on how they are written. Additionally, supporting regulatory tools that outline the use of these facilities is important to creating a usable and safe network. As part of this master planning process, a high-level review of applicable regulatory documents in Granbury was conducted to determine enhancements that could be made to further improve the active transportation network. The following sections were included in the review:

- Granbury Code of Ordinances
 - Chapter 10: Subdivision Regulations
 - Chapter 12: Traffic and Vehicles
 - Chapter 14: Zoning
- Policy for the Installation of Public & Private Improvements (2017)

Key themes that emerged from the regulatory review include the following:

1 TRAIL STANDARDS

There are currently no trail development standards included in the city's development regulations. Specific language is needed to guide development of trails that specifies minimum width, surface material, amenities, etc. The section should also reference this master plan, specifically the recommendations map (see page 56).

2 BIKEWAY FACILITIES

The current development code makes no reference to bicycle facilities or cyclists as a mode of transportation. Design standards should be developed for on-street bikeways such as bike lanes and shared-lane markings. This section should also include provisions to prohibit parking in or obstructing bike lanes, protections for cyclists against motor vehicle hostility, and outlining roadway conduct for cyclists. Supporting bicycle amenities such as bike rack should be included as these amenities encourage ridership.

3 MINIMUM SIDEWALK WIDTH

The current development code requires 4 feet sidewalks in residential areas and 5 feet sidewalks in commercial areas. To accommodate more usage and increase comfort for pedestrians, the City should consider increasing the minimum width to 5 feet in residential areas and 6' in commercial areas. There should also be discussion regarding avoiding placing utilities and other obstructions within the sidewalk to promote an uninterrupted pedestrian path.

4 SIDEWALK MAINTENANCE

Clarification is needed in the current development code regarding the entity responsible for repairing cracked, broken, or uneven sidewalks. The City could consider a cost-splitting mechanism in which property owners are responsible for material costs and the City is responsible for repair construction costs.

5 PARKING

Depending on how a roadway is designed, parked vehicles can often obstruct the path of pedestrians or cyclists riding along a sidewalk. Particularly in the downtown area, the City could consider requiring curb stops in each parking stall to prevent vehicles from jutting into the pedestrian realm.

6 SHADE

The City does have a tree preservation ordinance, but enhancements could be made to require additional shade trees to make a more comfortable pedestrian environment.

7 CONNECTIONS TO CITY PLANS

The City should consider introducing language throughout the development code to refer to the recommendations in this master plan, comprehensive plan, parks and recreation master plan, and other adopted planning documents. This can help demonstrate intent by tying initiatives and regulations back to plans and studies.

8 SUBDIVISION CONNECTIVITY

Sidewalks are currently required with new development but there could be additional language added to require that sidewalks in new subdivisions connect to the existing and proposed trail system. This will help improve overall citywide connectivity.

9 USER GROUPS

While primary trail users are typically pedestrians and cyclists, there may be other user groups such as wheelchair users and those on skateboards or scooters. Updates to the development codes should include language about where these types of devices are allowed to help prevent potential user conflicts.

ADDITIONAL CONSIDERATIONS

There are other variables that influence the development of an active transportation and recreation network to best serve the needs and interests of a community. When looking at developing a network the following variables are assessed to determine suitable locations for pedestrian and bicycle facilities:

Master Thoroughfare Plan: Local roadway classifications and their design and function help inform the implementation of future active transportation and recreation facilities. Thoroughfares with high use intensities would be candidates for clearly designated or separated pedestrian and bicycle facilities from vehicular traffic. Additionally, the master thoroughfare plan can identify future capital roadway projects for development and redevelopment of roadways, which can include enhancements to pedestrian and bicycle accommodate through strategic planning.

Community Context: The built environment of a community can inform the feasibility of implementing pedestrian and bicycle accommodates as well as the application of facility types. The relationship of land use, existing infrastructure, and population densities in the built environment informs the level of comfort and usage of new facilities may promote. It is crucial to understand how these relationships change between urban, suburban, and rural contexts.

Recreational Trails: Walking trails are one of the amenities listed as a type of recreational facility that can be implemented using the park development fee provided by developers when improving dedicated parkland. As a key recreational amenity for residents it is important to include trail facilities where appropriate.

COMMUNITY INPUT

Public outreach conducted as part of this and other recent planning efforts reveal strong community interest in trails and bikeways. Community engagement results from the 2020 parks master plan were also reviewed for trail and bikeway input pertinent to this planning effort.

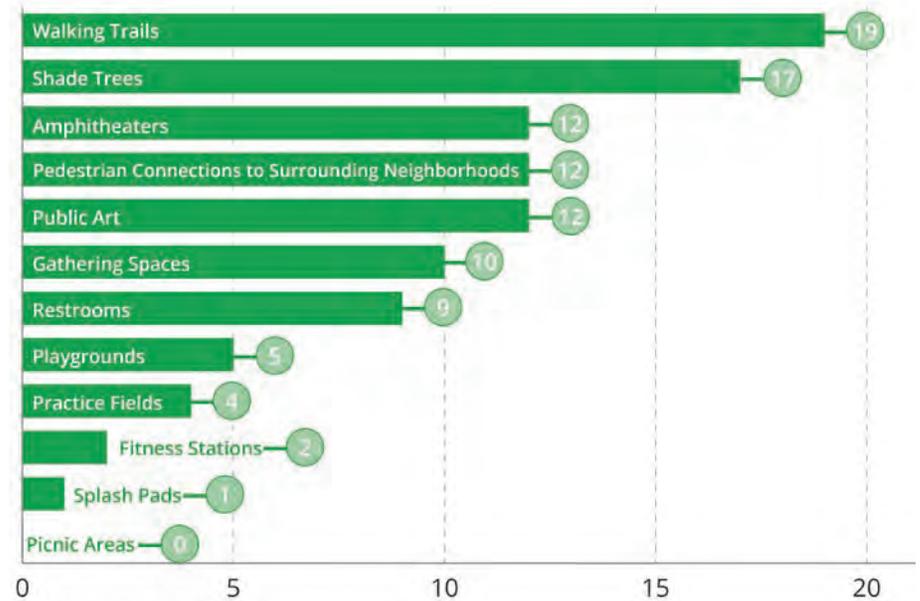
RELEVANT FINDINGS FROM THE 2020 PARKS, RECREATION, AND OPEN SPACE PLAN

In 2020, the City of Granbury adopted a parks, recreation, and open space master plan. This plan provides guidance for the next 10 years on the enhancement of parks and open space in the community. Throughout the planning process there were public meetings and surveys facilitated to capture the community's feedback on needs for Granbury.

Based on the previous plan community engagement, trails were at the top of the list for what people liked about Granbury's parks and a preferred amenity for their lifestyle. Residents also voiced wanting more trail amenities such as lighting, bike rentals, wayfinding, and safer bicycle infrastructure. A community survey was also conducted; key results included that most residents expressed the expansion of multi-use trails as important. Specific findings included:

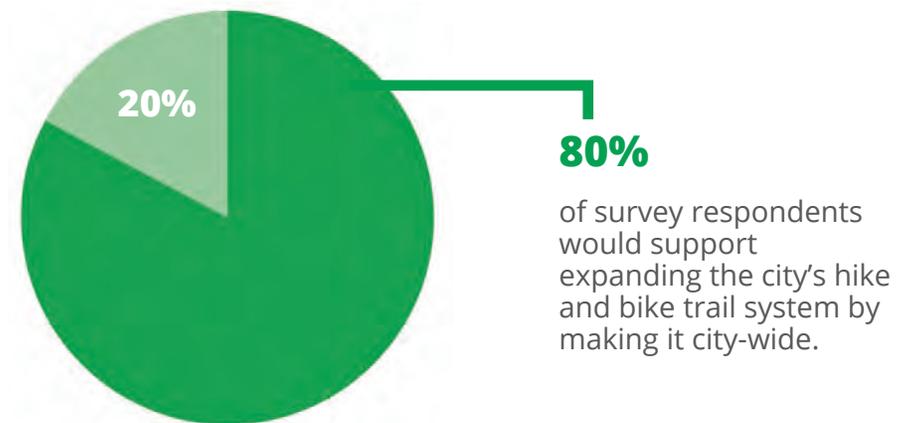
- Approximately 80 percent of survey respondents would support expanding the City's hike and bike trail system by making it city-wide.
- Survey respondents prioritized multi-use trails as either very important or important for Granbury moving forward.
- Walking trails were ranked as the top desired amenity by the public meeting attendees

Figure 3.1, Preferred Amenities for Granbury



Source: Granbury Parks, Recreation, Open Space Master Plan, 2020

Figure 3.2, Expansion of Hike and Bike Trails



Source: Granbury Parks, Recreation, Open Space Master Plan, 2020

OPEN HOUSE

A public open house was held on August 18, 2022. Granbury residents were invited to listen to a brief presentation reviewing the plan process and the work that had been conducted to develop the active transportation and recreation plan. Following the presentations, attendees were invited to visit the various stations around the room and provide input on the draft plan goals and objectives and the preliminary recommendations via interactive presentation boards.

The feedback obtained from the open house informed the refinement of plan recommendations and proposed locations of new or improved active transportation and recreation facilities.



Open house attend reviewing presentation boards that outlined the needs assessment process conducted



Open house attendees reviewing presentation boards with background information on the plan process



Residents reviewing network recommendation map at the Open House

BARRIERS & OPPORTUNITIES

When determining future needs for the active transportation and recreation system, it is important to identify what barriers to achieving connectivity exist as well as what opportunities are available to provide more systemwide connectivity.

BARRIERS

Connectivity was a theme identified in the 2020 Parks, Recreation, and Open Space Master Plan and identified throughout recent engagement efforts. Use of pedestrian and bicycle facilities is encouraged when the infrastructure is accessible and provides a safe user environment. Today in Granbury, there are barriers that limit users to access existing trail, sidewalk, and bikeway facilities.

The major barriers that are depicted on [Map 3.5](#) are:

Major Roads: The major roads of Granbury limit safe connectivity for users of trails, sidewalks, and bikeway facilities. Although US 377 is a major thoroughfare that provides regional access to and from Granbury it also bisects the city creating an obstacle when trying to connect the north and south parts of the city. Loop 567, Weatherford Highway, Paluxy Road and Glen Rose Highway are other major thoroughfares that are impediments to accessibility of facilities. Since safety is a major component of encouraging usage of facilities, comfortable crossings at these major thoroughfares should be a main focus for improving pedestrian or bicyclist infrastructure.

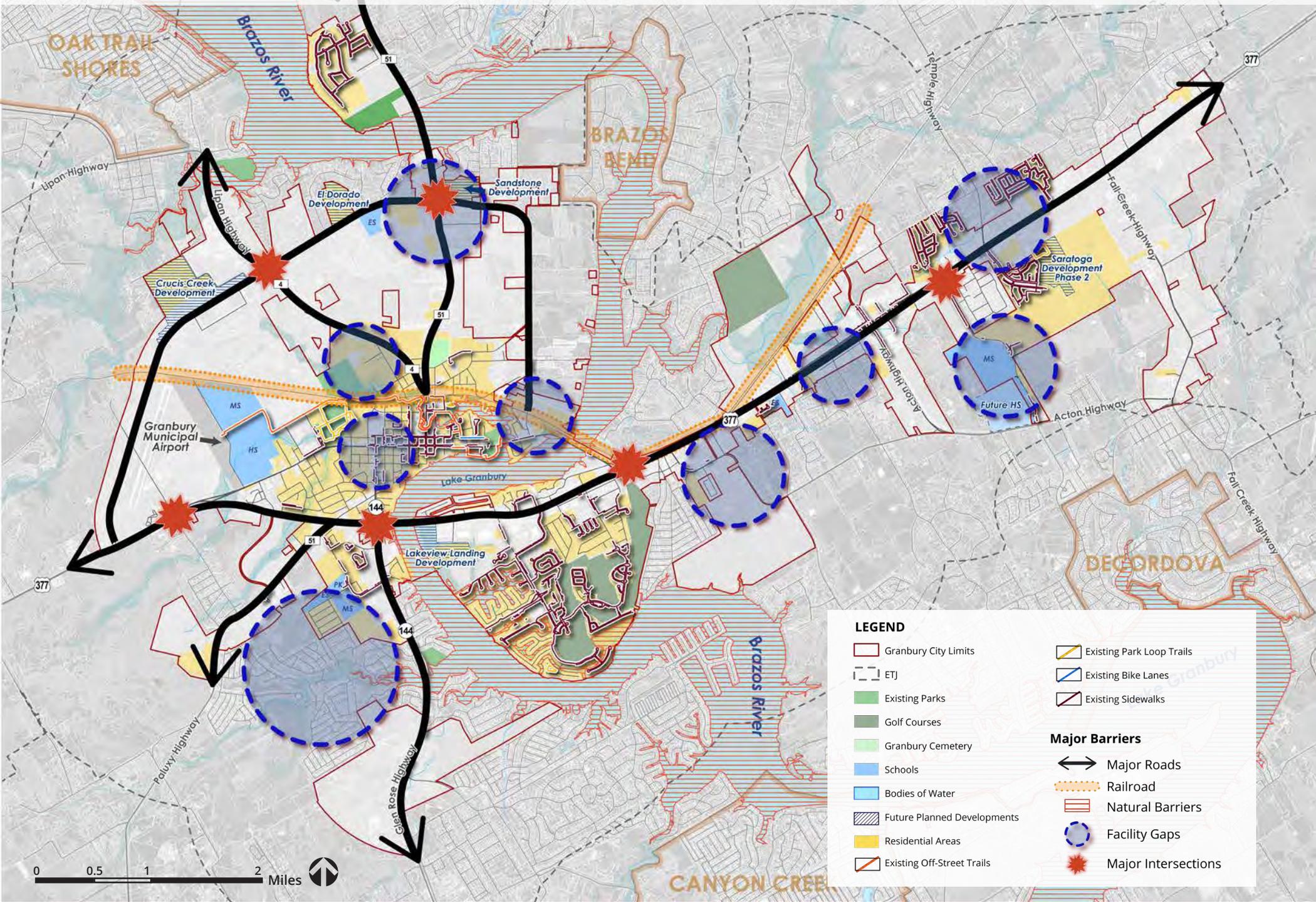
Railroad: Includes the railroad that runs through the northern part of Granbury. This area of Granbury is expecting growth over the next few years with the addition of new residential areas.

Natural Barriers: The Brazos River is a beautiful asset within Granbury that gives unique experiences at the shore front. Existing trails along the waterfront give users access to the water while enjoying an active transportation facility. Although the river is an opportunity for unique user experience it can limit connection points when many of the residential areas near the water directly back up to the river, making extensions of the trail difficult.

Gaps in existing trail, sidewalk, and bikeway network: Granbury's current network is segmented throughout the city. Trails and bikeways are primarily found in downtown Granbury and sidewalks are primarily in residential areas. Continuous segments of pedestrian and bikeway facilities help promote mobility. Dead-end sidewalks, short segments, and lack of connecting networks deter users from switching transportation modes and cause limited access from residential areas.

Major Intersections: Most pedestrian and bicycle crashes occur at intersections. Page 29 displays the number of pedestrian and cyclist crashes that have occurred from 2016 to 2021. Unsafe crossings inhibit a positive user experience and limit comfort when interacting with a trail, sidewalk, or bikeway at an intersection. Intersections are vital to providing connectivity between trails, sidewalks and bike facilities however can be obstacles without the appropriate infrastructure to ensure safety.

Map 3.5, Active Transportation and Recreation Barriers



LEGEND

Granbury City Limits	Existing Park Loop Trails
ETJ	Existing Bike Lanes
Existing Parks	Existing Sidewalks
Golf Courses	
Granbury Cemetery	
Schools	
Bodies of Water	
Future Planned Developments	
Residential Areas	
Existing Off-Street Trails	

Major Barriers

Major Roads
Railroad
Natural Barriers
Facility Gaps
Major Intersections

0 0.5 1 2 Miles

OPPORTUNITIES

Opportunities provide an initial framework for recommendations that guide the future of trails, sidewalks, and bikeways for the community (See Chapter 4 for recommendations). Opportunities aim to identify areas for expanding pedestrian and bikeway networks and strategic areas to alleviate barriers identified on page 41. Based on feedback from the community and the existing system, **Map 3.6** depicts areas where bicycle and pedestrian facility investments could substantially improve connectivity and accessibility including:

Opportunities depicted on **Map 3.6** include the following:

Key Destinations: Downtown Granbury, the boardwalk, and the city beach capture consistent pedestrian activity from not only the residents but also regional visitors. Schools are also key destinations that see consistent usage throughout the year. Together these places are prime locations for future trail, sidewalk, and bike facilities to provide connectivity and mobility throughout the community.

Major Corridors: Include key downtown streets and along US 377. Although these roadways were identified as barriers, these corridors have retail, key destinations, and future residential growth along them that could benefit from increased pedestrian and bicycle facilities.

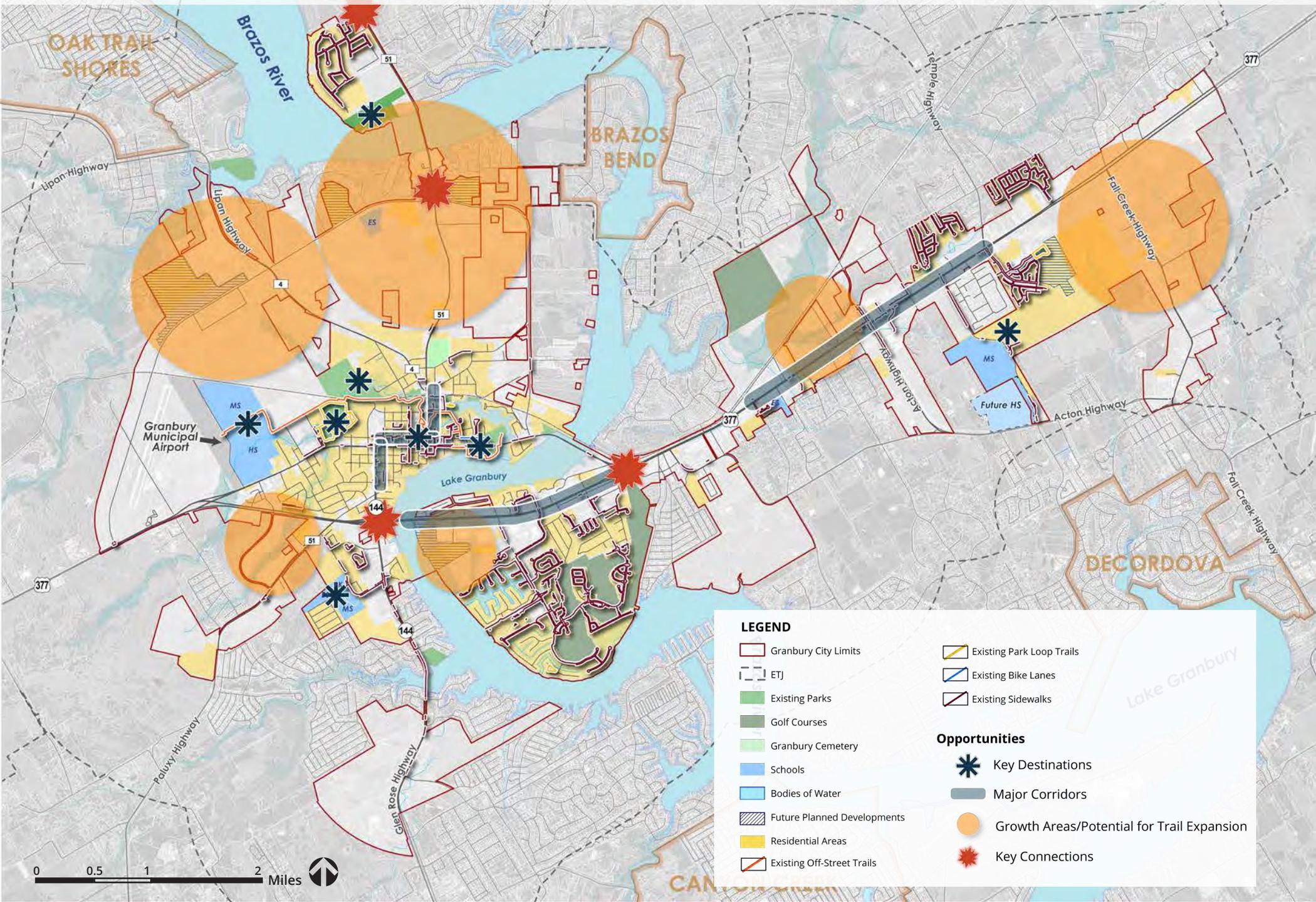
Growth Areas & Potential for Trail Expansion: Granbury is predicted to grow by about 8,000 people by 2040. Growth areas depicted in **Map 3.6** are expected to see an increase in development in the near future. Planning for this growth while making recommendations to the pedestrian and bicycle network can help increase mobility and connectivity.

Key Connections: **Map 3.6** identifies key connections and intersections that could benefit from improved intersection crossings. Intersection enhancements that improve user comfort and experience include signalized crossings, appropriate signage, and pedestrian refuge islands where appropriate.



Downtown Granbury

Map 3.6, Active Transportation and Recreation Opportunities



IMPLICATIONS

Granbury's active transportation and recreation network presents the opportunity to expand its coverage and diversify offerings to better serve the active transportation and recreation needs of residents. The City is in a great position to facilitate and enable long-term network expansion and enhancement as the current system has yet to reach its full potential and considerable development is anticipated.

Through an assessment of system needs, identification of network barriers and opportunities, and review of community input the following areas of focus were determined as essential for achieving a comprehensive pedestrian and bicycle network:

Accessibility & Connectivity

Granbury's active transportation and recreation network has significant gaps in terms of user access and overall connections created throughout the city; however, there is immense potential to expand and improve the system to better serve users in the future. The City should strategically implement pedestrian and bicycle infrastructure that encourages users to choose to walk or bike for more trips or for recreational purposes.

Comfort & Education

What a user perceives as a comfortable active transportation and recreation facility varies based on factors such as physical location, ability, physical health, and socioeconomic status. It is therefore important for the City to focus on diverse and appropriate application of bicycle and pedestrian infrastructure. Additionally, educating all roadway users on how to appropriately interact with the various transportation modes that are present within the roadway is a key part of creating a comfortable environment for all.

Policies & Regulations

The key to implementing pedestrian and bicycle facilities that are comfortable, accessible, and well-connected is having guidelines that promote high standards of design and feasibility. The City should prioritize updating policies and regulations regarding application, design, and construction of active transportation and recreation infrastructure to better support walking and biking in Granbury and establish consistency in improvement and implementation of future facilities.

Community Support

Having the support of the community is crucial for implementation of future pedestrian and bicycle facilities as it influences decision making regarding City spending. When facilities and amenities are viewed as priorities by residents, they become priorities for near term investments. Additionally, buy in from residents informs what type of facilities are most desired and where the facilities would be most used.

Pursuing Opportunities & Overcoming Barriers

A robust active transportation and recreation network can be achieved by finding solutions to erase barriers and leveraging opportunities for growth and improvement. The overall connectedness and accessibility of a high-quality network can be diminished when barriers are present. The City should use the opportunities that have been identified to address barriers and provide facilities that better connect users to destinations, provide routes along critical corridors, and create a safer environment for users.

Page intentionally left blank.



CHAPTER 4 | RECOMMENDATIONS



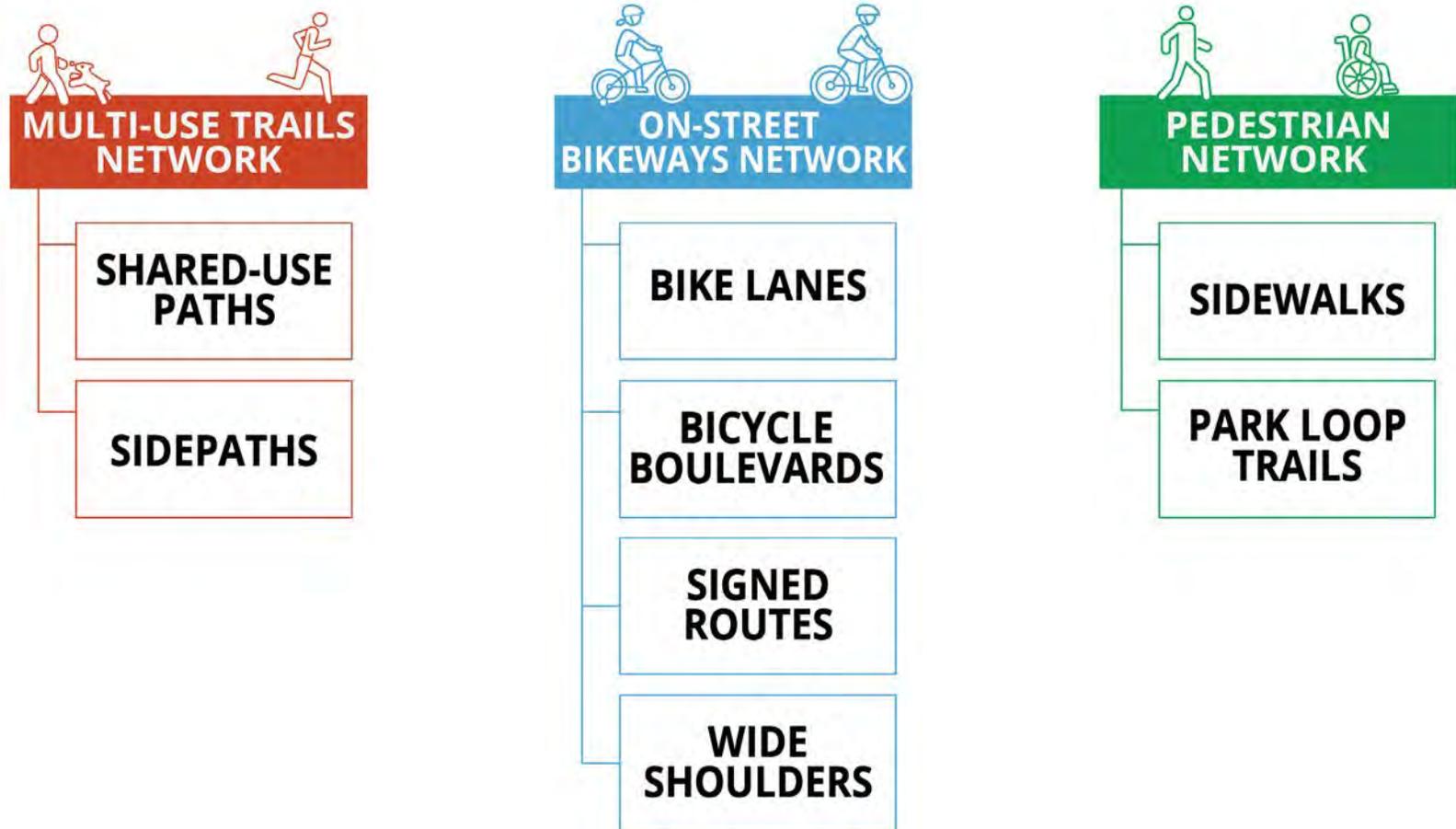
Facility Typologies.....	49
Recommended Network.....	55
Facility Design Standards & Policies.....	63

FACILITY TYPOLOGIES

Granbury's Active Transportation and Recreation Network is comprised of multiple recommended pedestrian and bicycle facility types. These facilities have been divided into three categories based on the user groups they serve: **Multi-Use Trails Network**, **On-Street Bikeways Network**, and **Pedestrian Network**, as shown in **Figure 4.1**. This hierarchy expands upon the existing facilities in Granbury presented in **Chapter 2**.

Each category contains a list of facilities that accommodate the needs of their target users. The active transportation and recreation facilities are defined by where they are located, facility width, and designated user groups. Collectively, the pedestrian and bicycle infrastructure in Granbury creates a comprehensive network presenting recreation and mobility opportunities for residents and visitors. This section defines the characteristics of the types of active transportation and recreation facilities recommended for Granbury in more detail.

Figure 4.1, Recommended Facility Typologies



MULTI-USE TRAIL NETWORK

SHARED-USE PATH



These facilities are multi-use trails that provide a highly comfortable environment for users as they are removed from motor vehicle traffic and are typically found in off-street corridors such as greenbelts, utility easements, or rail corridors. Shared-use paths should be wide enough to be used jointly by pedestrians and bicyclists and allow for recreational, leisure, and mobility uses. User groups include but are not limited to: bicyclists, pedestrians, and other human-powered recreation and transportation modes (e.g. wheelchairs, in-line-skating, skateboarding, etc.).



Shared-use path located in a greenbelt corridor

SIDEPATH



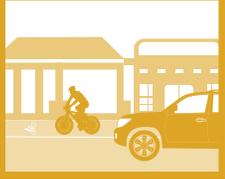
These multi-use trails are wide enough to be utilized by pedestrian and bicyclists simultaneously without conflict. Sidepaths are adjacent to roadways but provide a physical separation from motor vehicle traffic. Where there are constraints the side with the greatest right-of-way (ROW) should accommodate the sidepath and a minimum 5-foot sidewalk should be implemented on the opposite side. The location of sidepaths along roadways requires safety considerations for crossing driveways and intersections. User groups include but are not limited to: bicyclists, pedestrians, and other human-powered recreation and transportation modes (e.g. wheelchairs, in-line-skating, skateboarding, etc.).



Sidepath adjacent to a neighborhood roadway

ON-STREET BIKEWAY NETWORK

BIKE LANE



Bike lanes demarcate a portion of a roadway for the exclusive use of bicyclists separated from motor vehicle traffic, typically implemented on roadways with moderate speeds and volumes of vehicle

traffic. Bike lanes can be implemented as standard, buffered, or separated. Each type of bike lane is designated by a lane stripe, pavement markings, and signage.



Bike lane with pavement markings and roadside signage

BICYCLE BOULEVARD



Bicycle boulevards are streets that typically have low vehicular traffic speeds and volumes, such as residential streets. These bikeways utilize an integrated series of signage, pavement markings, and physical

features in the roadway to prioritize bicycle travel and create a more comfortable user environment. These routes should be continuous and may require alterations to traffic patterns to support short and long-distance bicycle trips.



Roadway with a bicycle boulevard prioritizing bicycle traffic

SIGNED ROUTE



Signed bicycle routes are cost-effective bicycle network treatments that can be established through strategic pavement markings and associated signage to delineate a designated bicycle route.

Signage informs bicyclists of the route and alerts motorists of the presence of bicyclists. This type of bicycle facility is best suited for roadways that are defined by low vehicular traffic speeds and volumes.



Bike lane with pavement markings and roadside signage

WIDE SHOULDER



Wide shoulders are facilities that can be utilized by bicyclists and are typically found on rural roadways that have higher speed traffic and volumes. These facilities create long continuous routes that connect to

destinations beyond municipal limits and are often used by more experienced bicyclists on long-distance rides. This facility type has been recommended by TxDOT as appropriate to support long-range bicycle use if they are paved, striped, and between 8 and 10 feet wide. Additionally, directional signage and safety signage should be implemented to inform motorists of the presence of bicyclists.



Wide shoulder accommodating a bicycle route

PEDESTRIAN NETWORK

SIDEWALKS



Sidewalks are an essential part of a well-connected network and they should be constructed to provide increased accessibility specifically for pedestrians. These pedestrian pathways are found adjacent to roadways and create connections to local destinations such as parks, schools, services, and employment sectors. User groups include but are not limited to: bicyclists, pedestrians, and other human-powered recreation and transportation modes (e.g. wheelchairs, in-line-skating, skateboarding, etc.).



Sidewalk along a residential roadway

PARK LOOP TRAILS



Park loop trails are paved pedestrian pathways found within park spaces and primarily serve recreation and leisure purposes. These facilities should be a minimum of 8 feet wide to accommodate two-way pedestrian traffic to minimize conflict when users need to pass one another. Park loop trails are important to a community because they provide an affordable and accessible recreation opportunity to residents. As these facilities are contained within parks, they do not contribute to connectivity to key destinations except to amenities found within the park located along the trail. User groups include but are not limited to: pedestrians, people utilizing mobility devices such as wheelchairs, and bicyclists.



Recreation trail within a park

Page intentionally left blank.

RECOMMENDED NETWORK

Granbury's recommended active transportation and recreation network touches every key area of the city. This ensures that residents throughout Granbury have access to facilities that support bicycling and walking. Residents and visitors will benefit from improved walkability and access to recreational opportunities by addressing critical trail and sidewalk gaps and intersection improvements. As shown in **Table 4.1**, this plan recommends over **67.8 miles of new active transportation and recreation facilities** over time to create a more connected city-wide network. **Chapter 5** describes how these recommendations can be implemented over time.

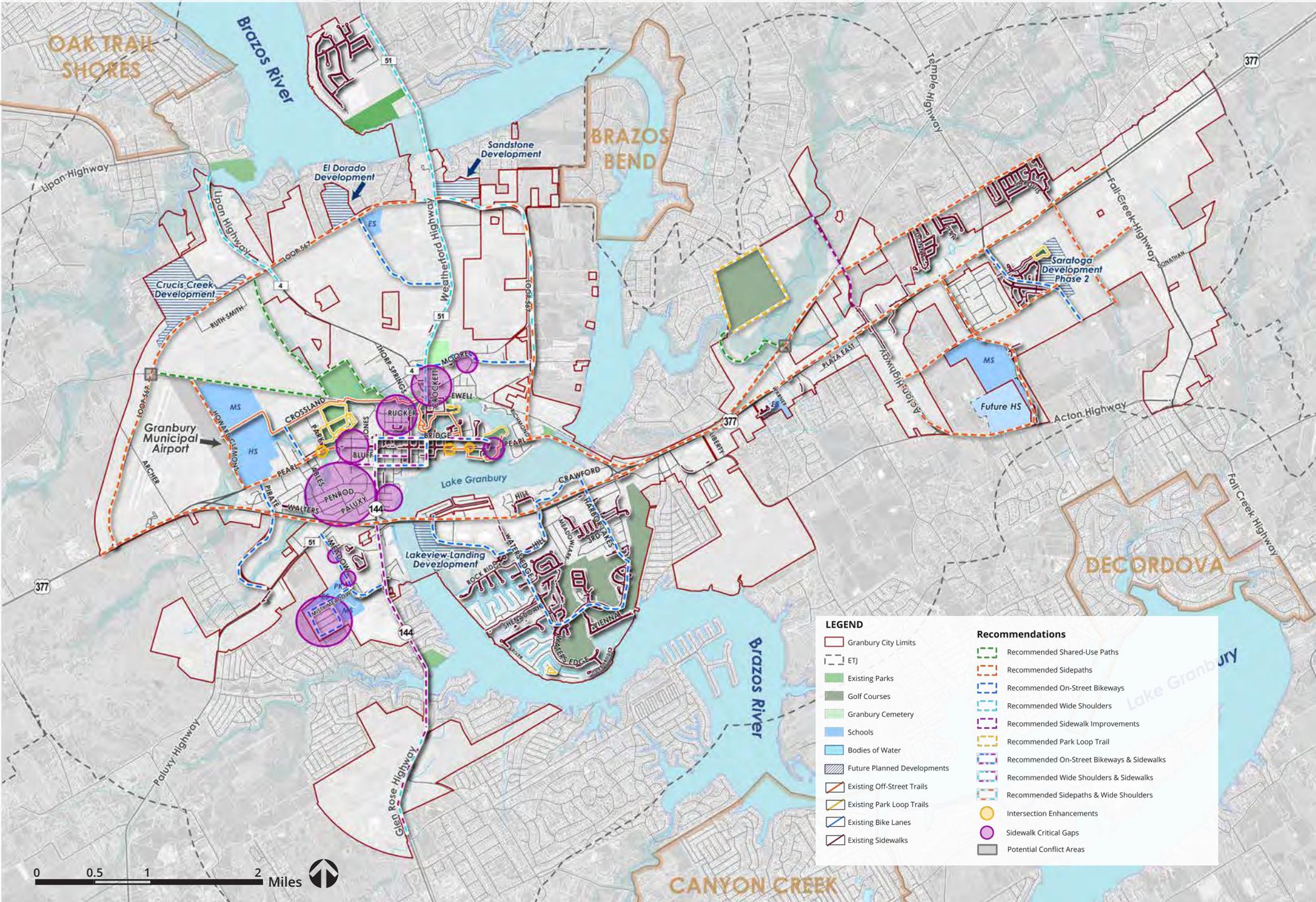
Table 4.1, Recommended Active Transportation & Recreation Network Mileage

NETWORK TYPE	CURRENT MILEAGE	RECOMMENDED MILEAGE	PROPOSED BUILD-OUT MILEAGE
MULTI-USE TRAILS	3.5	40.9	44.4
ON-STREET BIKEWAYS	0.2	18.5	18.7
PEDESTRIAN NETWORK	50.1	8.4	58.5
TOTAL	53.8	67.8	121.6

HOW TO USE THE MAP

Map 4.1 illustrates Granbury's recommended city-wide active transportation and recreation network. The map serves as a comprehensive visual guide for staff and developers for implementing future trail and bikeway accommodations. Adherence to the following parameters will help facilitate implementation:

- When new development or redevelopment occurs, the developer is responsible for reserving easements and building the facilities the proposed multi-use trail or pedestrian recommendation that falls within the proposed development.
- Where a future bikeway is recommended, the specific facility type is not specified. This is deliberate to ensure that the City has flexibility to implement an appropriate solution whenever a roadway is widened, improved, or reconstructed.
- Areas identified as 'critical sidewalk gaps' represent priority areas for new sidewalks as funding is available. The City will be responsible for implementing sidewalks in these built-out areas unless redevelopment occurs. See page 59 for additional guidance.
- If future changes to the Thoroughfare Map occur, proposed sidepaths and on-street bikeways along these corridors will be modified to align with changes to the thoroughfare alignment.



MULTI-USE TRAIL NETWORK

Map 4.2 represents the proposed multi-use trails accommodations, which include shared-use paths and sidepaths.

Shared-Use Paths

Key recommendations for shared-use paths include:

- Extending the Moments in Time Trail through Hewlett Park and around the perimeter of the disc golf course. While these recommendations are for shared-use paths, they support both mobility and recreational purposes.
- Connecting the disc golf course to Loop 567 to provide a direct connection for residents to the north to the Moments in Time Trail through the center of the City.
- Exploring a connection along the railroad corridor north of the middle school and airport as a longer-term recommendation.

Sidepaths

Key recommendations for sidepaths include:

- Constructing 10-foot sidepaths on both sides of US 377 as part of the TxDOT-led reconstruction of the highway through Granbury.
- Providing a sidepath on the north side of Loop 567 as an alternative transportation route to the growing portions of the community in the north.
- Providing a sidepath along Old Granbury Road to provide an alternative route to US 377 and along roadways within the Saratoga development as it continues to grow.

Table 4.2, Recommended Multi-Use Trail Mileage

FACILITY TYPE	RECOMMENDED MILEAGE
SHARED-USE PATH	5.9
SIDEPATH	35
TOTAL	40.9

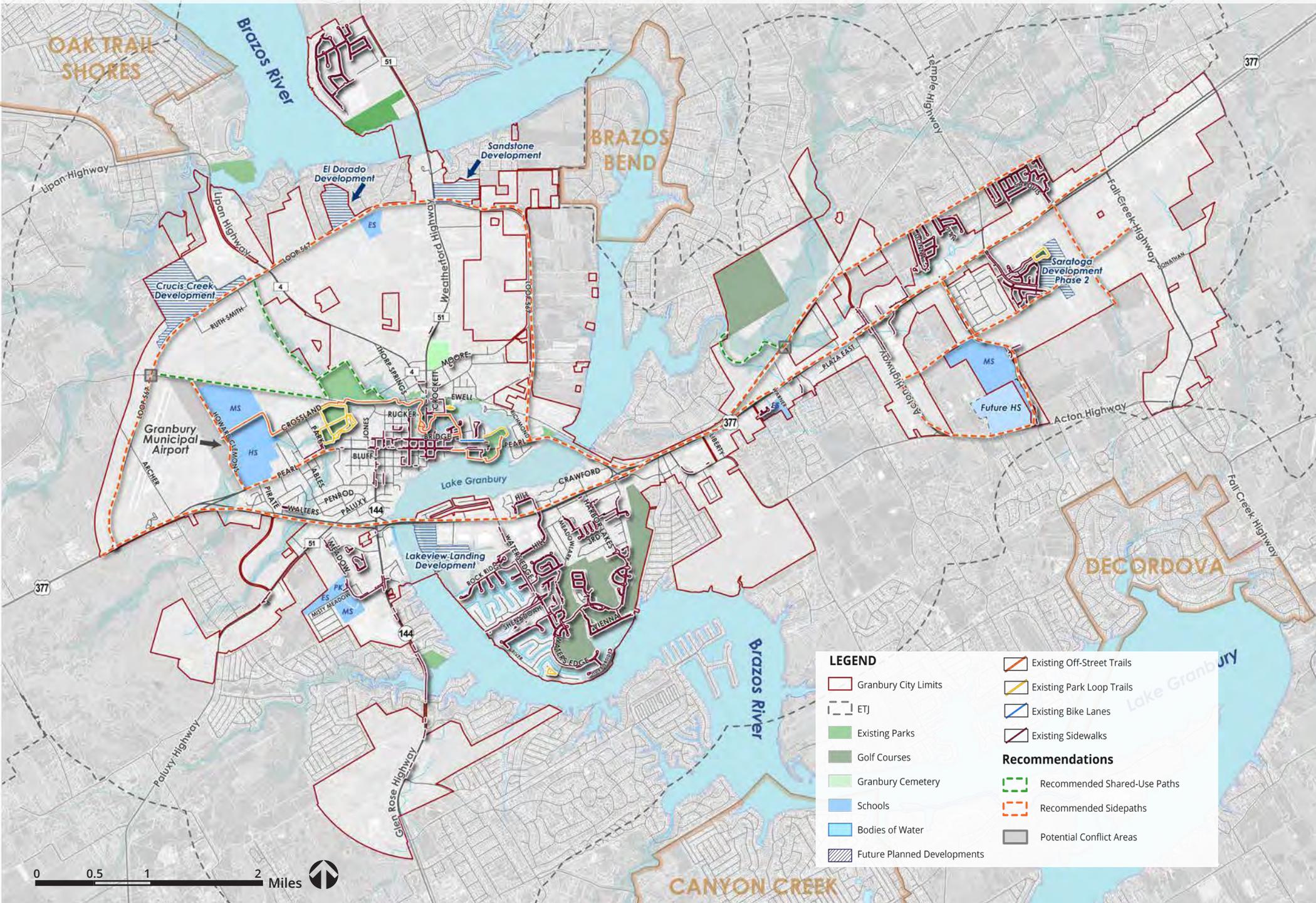
RAILS WITH TRAILS CORRIDORS

Across the country there are instances of trail corridors along abandoned rail lines, and in some cases, active rail corridors. In the DFW area, the Cotton Belt trail travels from North Richland Hills to Grapevine along the TEXRail commuter rail line, which is an active passenger rail line. Throughout the duration of the corridor, there is at least a 25 foot buffer between the rail line and the trail as well as a fence to prevent trail users from accessing the rail corridor.



Trail along the TEXRail corridor in Grapevine, TX

The proposed trail corridor along the active railroad in Granbury is a long-term vision that would require extensive coordination with the railroad to ensure safe crossings and access points.



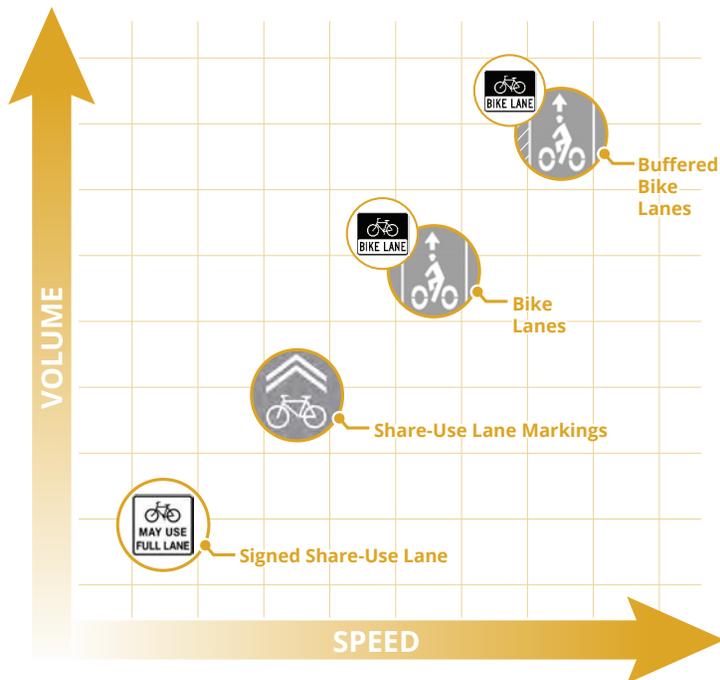
LEGEND

Granbury City Limits	Existing Off-Street Trails
ETJ	Existing Park Loop Trails
Existing Parks	Existing Bike Lanes
Golf Courses	Existing Sidewalks
Granbury Cemetery	Recommendations
Schools	Recommended Shared-Use Paths
Bodies of Water	Recommended Sidepaths
Future Planned Developments	Potential Conflict Areas

ON-STREET BIKEWAY NETWORK

Map 4.3 depicts Granbury's proposed on-street bikeway network, which include wide shoulders and candidate corridors for other bicycle facilities. As discussed on page 37, besides wide shoulders, the specific type of bicycle facility is not specified to give flexibility moving forward. Generally, a bicycle boulevard would be appropriate on less-traveled neighborhood streets, a shared-use lane would be appropriate on low-volume collectors with low speeds, and a bike lane would be appropriate on slightly higher volume roadways with appropriate separation. **Figure 4.2** shows that as speeds and volumes increase, the type of bikeway accommodation should become more protected and separated.

Figure 4.2, Range of Bikeway Accommodations



Graphic based on FHWA Bikeway Selection Guide

Wide Shoulders

Wide shoulders are recommended for portions of Lipan Highway, Weatherford Highway, Loop 567, and Glen Rose Highway. Coordination with surrounding communities and TxDOT should occur to create more continuous routes for long-distance cyclists traveling through Granbury.

Candidate Corridors

Corridors recommended for an on-street bikeway treatment (either bike lane, signed route, or bicycle boulevard) include residential and commercial areas south of US 377, within Downtown, and within the Saratoga development.

Table 4.3, Recommended On-Street Bikeway Mileage

FACILITY TYPE	RECOMMENDED MILEAGE
WIDE SHOULDERS	6.8
CANDIDATE CORRIDORS*	11.7
TOTAL	18.5

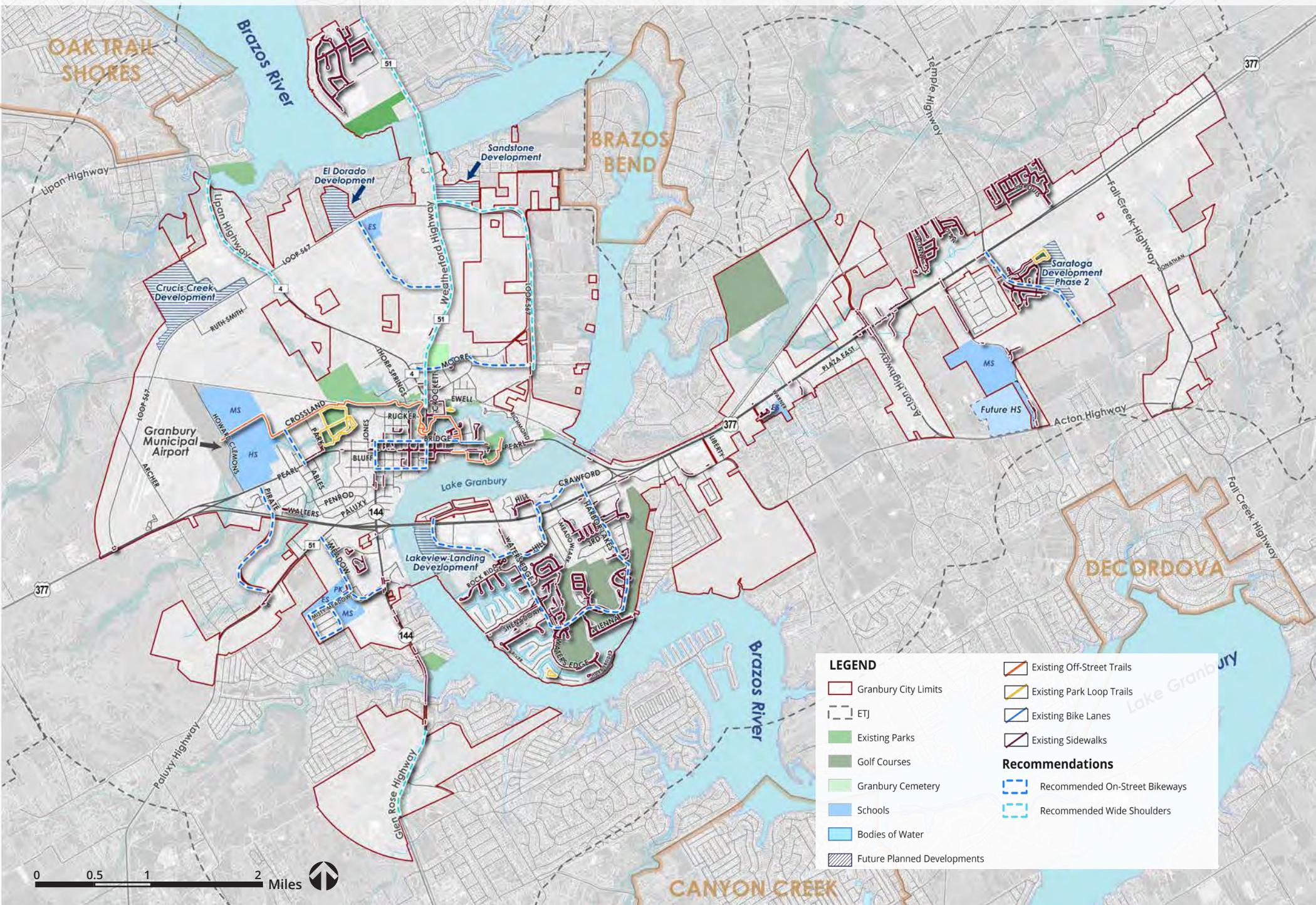
*Represent roadways that would be appropriate for an on-street bikeway treatment to be determined.



Example of a buffered bike lane along a busy roadway

Map 4.3, Recommended On-Street Bikeway Network

*Refer to appendix for detailed map of downtown



PEDESTRIAN NETWORK

Map 4.4 depicts Granbury's recommended Pedestrian Network, including sidewalks and park loop trails. Improvements to Granbury's sidewalk network fall within three categories: **safety improvements**; **critical gaps**; and, **future connections**.

Safety Improvements

This category is reserved for existing segments of sidewalks that would benefit from some form of intervention to improve the current condition. The majority of sidewalk safety issues are related to intersection crossings, as evidenced by the corresponding concentration of accidents involving a pedestrian (see pages 29-30). These safety issues can be improved by enhancing intersection crossing features such as pedestrian signals, crosswalks, and median refuge islands. Additional discussion on these potential intersection treatments is included on pages 69-70.

Critical Gaps

This category focuses on areas of the City where connectivity is impaired due to disconnected segments or where sidewalks are completely lacking. Given that areas of the city were developed at different times, this has resulted in gaps in the sidewalk network. **Map 4.4** identifies critical gaps in the pedestrian network that should be a priority for installing sidewalks. Since these areas are already built out, the City would need to need to allocate public funds for sidewalk construction unless redevelopment occurs.

Table 4.4, Recommended Pedestrian Facility Mileage

FACILITY TYPE	RECOMMENDED MILEAGE
SIDEWALKS*	5.7
PARK LOOP TRAILS	2.7
TOTAL	8.4

*Represent only proposed new sidewalk facilities.

Critical sidewalk gaps in the pedestrian network include:

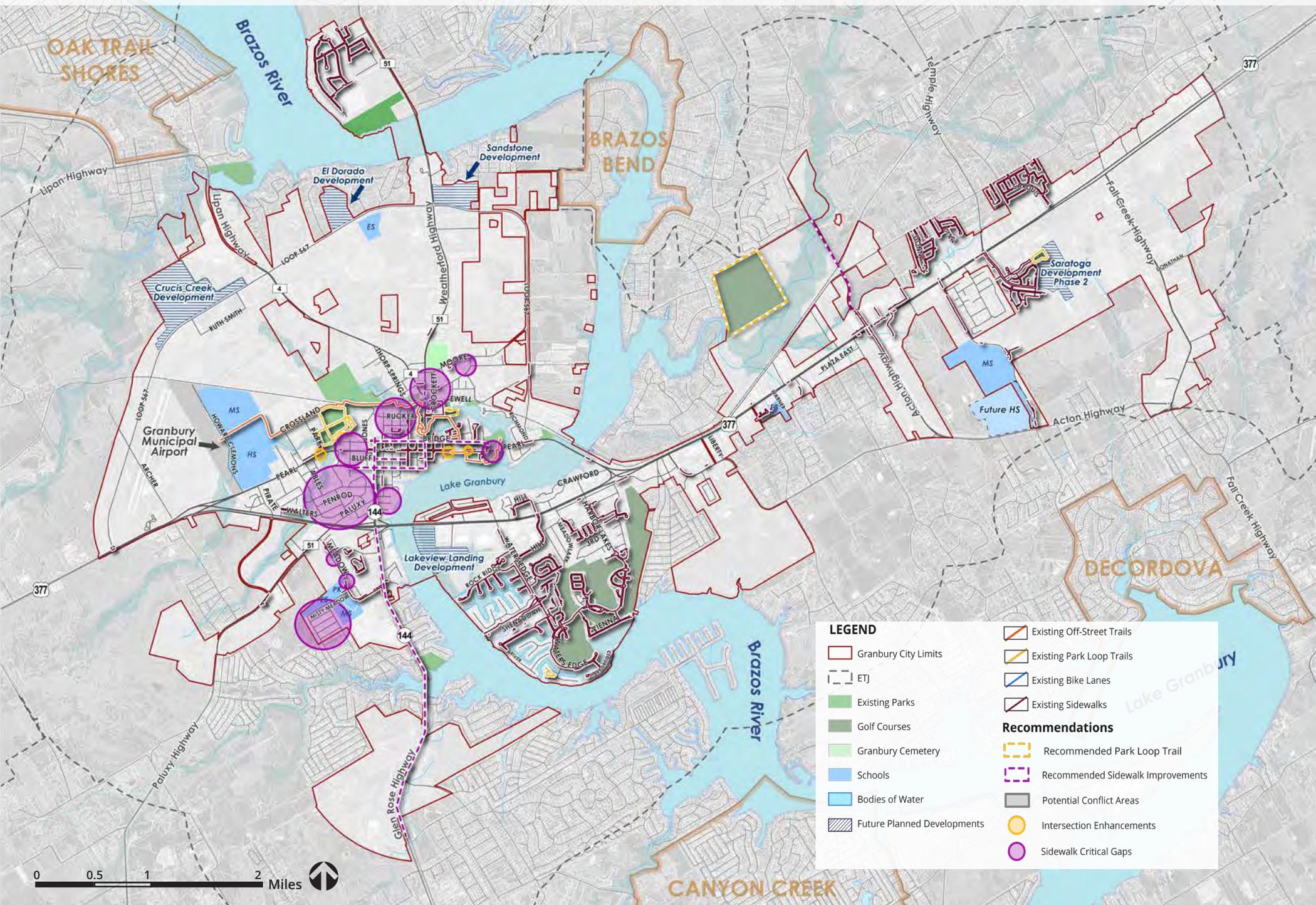
- Eastern and western extents of Pearl Street approaching the Historic Granbury Square
- Residential neighborhoods west of Morgan Street and north of US 377; directly north of the Historic Granbury Square; and, near Brawner Elementary School
- Commercial/industrial area along Crockett Street
- Area near the Hood County Senior Center

Future Connections

This category considers where growth is anticipated and how supporting policies and regulations can ensure facilities are implemented as development happens. The recommendations for additional sidewalks are focused on the downtown area and major commercial corridors. The Historic Granbury Square has good sidewalk connectivity but the immediately surrounding areas are lacking. Therefore, sidewalks are recommended for portions of Bridge Street, Doyle Street, Houston Street, and Morgan Street. Additionally, Morgan Street south of downtown is a key commercial corridor that lacks sidewalks today. Where right-of-way is available, additional sidewalks are recommended. See page 68 for a list of supporting policies to improve the overall sidewalk connectivity within the City.

Park Loop Trails

This category includes recreational trail opportunities within parkland. Additional park loop trails are recommended around the perimeter of the former golf course and Lambert Branch Park.



FACILITY DESIGN STANDARDS & POLICIES

The following section provides an overview of the design principles for multi-use trails, on-street bikeways, and pedestrian facilities. When updates are made to the City's regulatory documents the design principles in this section should be incorporated.

The recommended standards in this section comply with guidelines and regulations from the following entities:

- **AASHTO:** American Association of State Highway and Transportation Officials
- **ADAAG:** Americans with Disabilities Act Accessibility Guidelines
- **ITE:** Institute of Transportation Engineers
- **NACTO:** National Association of City Transportation Officials
- **TAS:** Texas Accessibility Standards
- **TMUTCD:** Texas Manual on Uniform Traffic Control Devices
- **TTI:** Texas Transportation Institute
- **TxDOT:** Texas Department of Transportation
- **NCTCOG:** North Central Texas Council of Governments

MULTI-USE TRAIL DESIGN

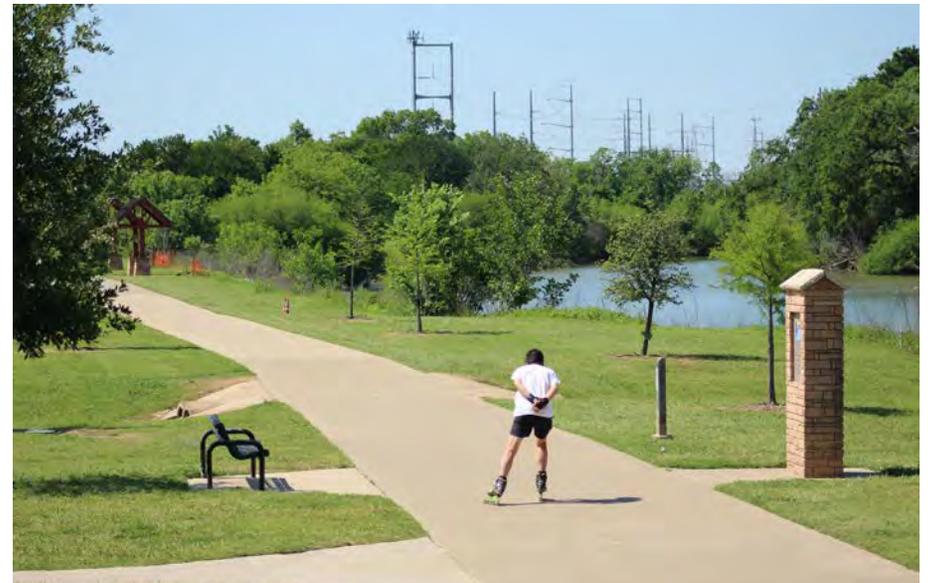
The following **design principles** should be followed for future construction and implementation of **shared-use paths** and **sidepaths**:

- Shared-use paths should be implemented in off-street corridors including but not limited to greenbelts, railroad corridors, utility easements, and floodplains through planned coordination with necessary agencies and adherence to local and national safety regulations.
- Shared-use paths should be a minimum of 10 feet and a preferred width of 12 feet where feasible to comfortably accommodate multiple users and bi-directional traffic.
- Easement requirements for constructing trails within utility corridors, railroad corridors, and in natural areas should be outlined to adhere to the specifications of the partnering agency potential partnering agency or to minimize environmental impact.
- Sidepaths should be located adjacent to roadways within or parallel to the right-of-way. To align with AASHTO guidelines there should be a minimum 5-foot buffer between the path and the roadway to make it clear that the sidepath operates independently from the roadway.
- Sidepaths should be a minimum of 10 feet to adequately accommodate multiple user groups simultaneously. In areas where a connection is critical, but right-of-way is constrained, paths may be reduced to 8 feet in width.

- Landscape buffers should be implemented between sidepaths and motor vehicle travel lanes to increase physical and visual separation of users from motor vehicle traffic.
- Interruptions to sidepaths caused by driveways should be avoided or limited when possible.
- Wayfinding and directional signage should be implemented along multi-use trails to help users navigate the network.
- Shared-use paths and sidepaths should be ADA compliant especially when facilities cross roadways.
- Signage should be incorporated when trails intersect with roadways to adequately alert drivers and trail users as they approach the crossing point.
- Center lane markings should be incorporated into all sidepaths to emphasize their role as a transportation facility.

The following **policies** should be implemented to help support the development of a well-connected **multi-use trail network**:

- Acceptable and prohibited uses on shared-use paths and sidepaths should be clearly outlined in Granbury's Code of Ordinances, including micro-mobility devices such as personal electric scooters.
- A standard list of amenities that may be found at trailheads or trail access points should be established.
- Explore establishing a trail dedication ordinance and trail fees-in-lieu to require developers to implement shared-use paths as development occurs or serve as a funding mechanism to aid future construction.



Shared-use path along a greenbelt corridor utilized for recreation opportunities



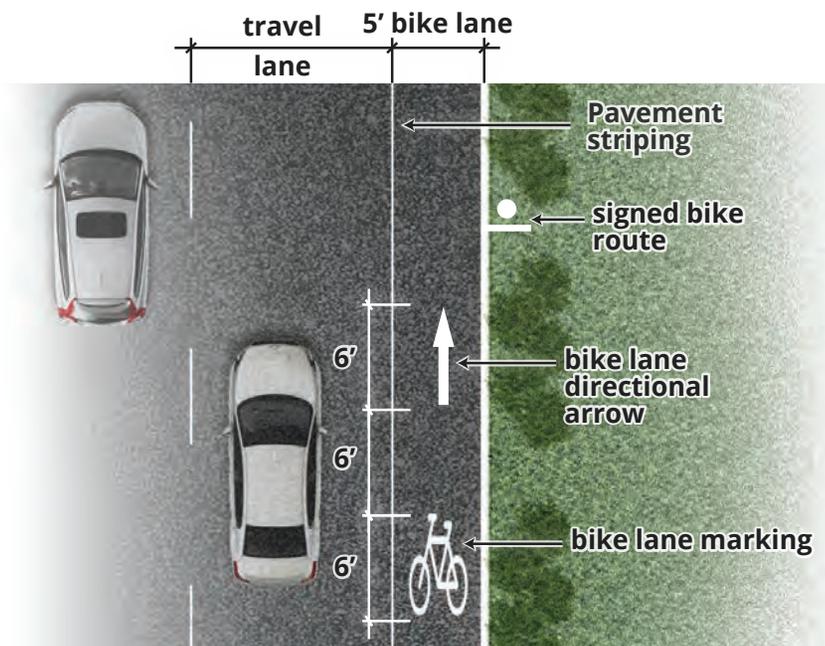
Sidepath adjacent to a major arterial roadway

ON-STREET BIKEWAY DESIGN

The following **design principles** should be followed for future construction and implementation of **on-street bicycle facilities**:

- As depicted in **Figure 4.3**, standard bike lanes should be a minimum of 5 feet in width (preferred 6 feet) with a 6-inch painted stripe to demarcate the portion of the roadway designated for bicycle traffic. If right-of-way allows for a buffered bike lane an additional 3-foot buffer is required.
- Separated (also called protected) bike lanes should include a physical barrier such as a landscape median between the travel lane and bike lane.

Figure 4.3, Prototypical Bike Lane



- Signed bicycle routes (See **Figure 4.4** on page 66) should include pavement markings and signage such as “Bicycle May Use Full Lane” to alert all roadway users of the traffic laws and the potential presence of bicyclists.
- Bicycle Boulevards (see **Figure 4.5** on page 67) should be implemented on low speed, low volume, residential or local roadways. This bicycle facility employs a variety of traffic calming measures, pavement markings, and signage outlined in NACTO's Urban Bikeway Design Guide.
- Wide shoulders (see **Figure 4.6** on page 67) identified as bicycle routes should follow the guidance and standards set forth in TxDOT's Bicycle Tourism Study , including that the shoulder must be paved and between 8 and 10 feet (see facing page for more details).
- Wayfinding and directional signage should be implemented throughout the on-street bikeway network to help users navigate the network.

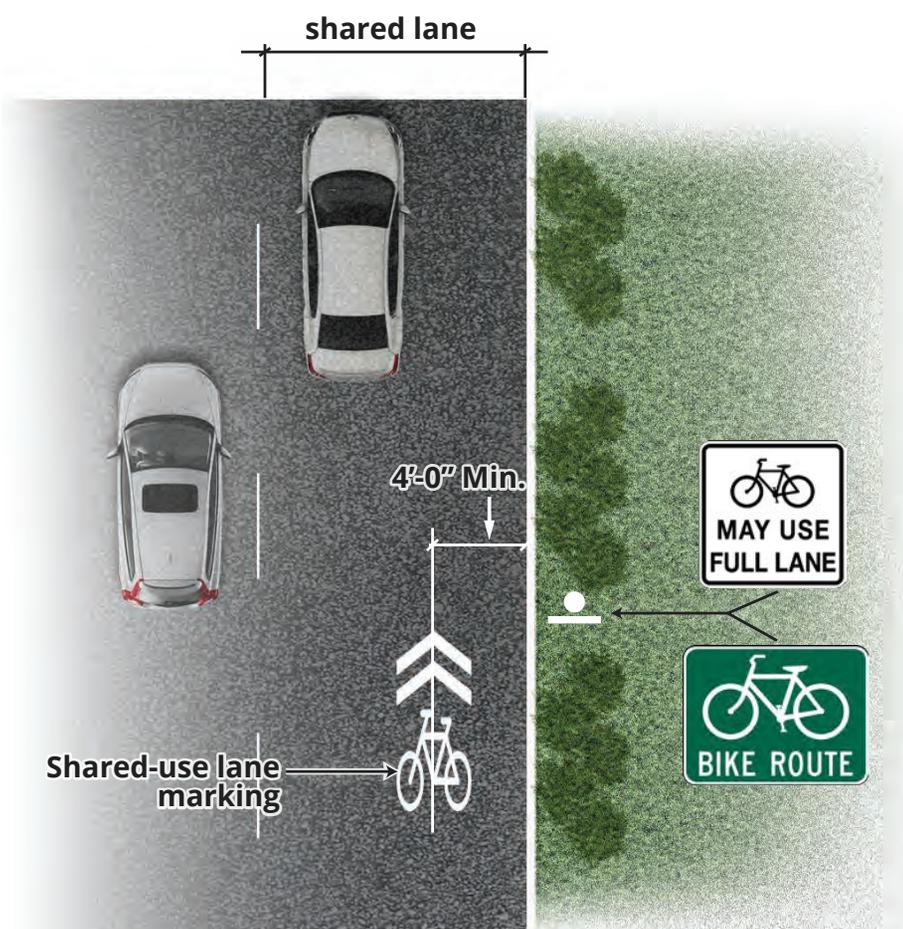
The following **policies** should be implemented to help support the development of **on-street bicycle facilities**:

- Language in the development code should identify what uses are acceptable and prohibited to operate on bicycle facilities.
- Programs or policies focused on implementing bicycle amenities such as bike racks and bike parking in retail and commercial areas should be explored to encourage bicycle usage

TXDOT BICYCLE TOURISM STUDY

- Consider implementing a bicycle education and etiquette campaign to educate both motorists and cyclists about proper interactions on roadways.

Figure 4.4, Prototypical Signed Route



First initiated in 2005, TxDOT conducted a study to assess potential bicycle tourism routes to connect the state and highlight natural and historic areas. According to the study, the tourism trails have the potential to 'attract bicyclists from around the world, showcase communities across the state, and boost economic development'.



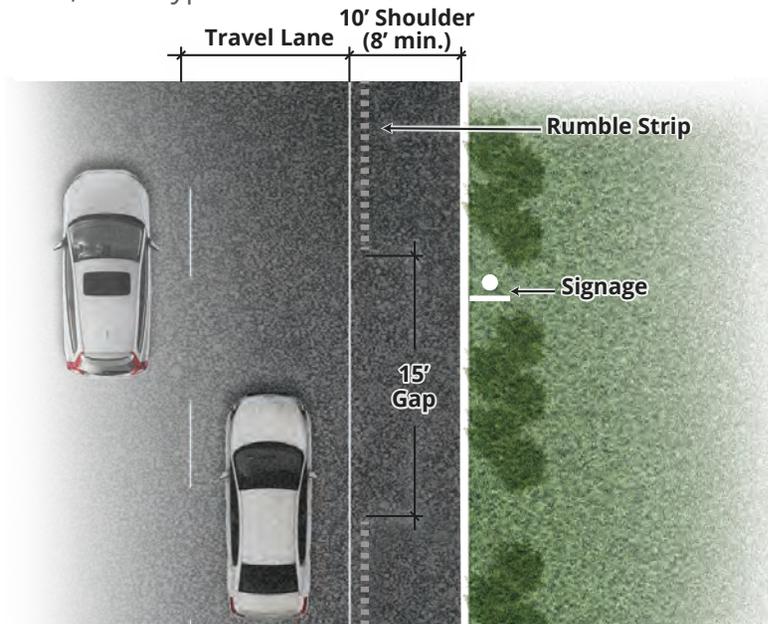
Bicyclists utilizing a shared-use path

Implementation of the segments are intended to be pursued in partnerships with local governments, private partners, and non-profits. While there are currently no routes shown through Granbury, local leaders could work with TxDOT to recommend routes through the Historic Granbury Square.

Figure 4.5, Example of Bicycle Boulevard and Standard Traffic Calming Interventions



Figure 4.6, Prototypical Wide Shoulder



SIDEWALK DESIGN

The following **design principles** should be applied to sidewalk facility improvements in Granbury:

- Pedestrian facilities should be located within or parallel to a street right-of-way and with an appropriate buffer (minimum 3 feet) from motor vehicle traffic.
- The required width of sidewalks should be a minimum of 5 feet in residential areas and 6 feet in commercial areas.
- Sidewalks are intended for pedestrian use only; these facilities are too narrow to accommodate both cyclists and pedestrians since these user groups travel at different speeds.
- In order to meet ADAAG and TAS requirements, barrier free ramps should be placed at curb ramps including intersections and driveways.
- Utility furnishings should not be permitted in the pedestrian realm as they pose obstructions to the path of travel.
- Highly visible 'zebra' pavement striping is recommended at crosswalks as they better alert motor vehicles to yield to crossing pedestrians. Regular maintenance of the crosswalk striping is recommended to ensure they remain visible over time.
- Sidewalks should be set back from the curb to avoid crossing driveway aprons in order to maintain existing cross slopes and to meet ADA requirements.
- Sidewalks in new subdivisions should connect to the existing and proposed trail system to enhance city-wide connectivity.

The following **policies** should be implemented to help support the development of a connected **sidewalk network**:

- Increase minimum sidewalk width to 5 feet in residential areas and 6 feet in commercial areas.
- Include to ensure avoiding placement of utilities and other obstructions within the sidewalk path.
- Clarify responsible entities for repairing cracked, broken, or uneven sidewalks.
- Add language to subdivision regulations requiring sidewalks in new subdivisions to connect to the existing and proposed trail system.
- Update sidewalk policy of the Granbury Code of Ordinances to be more stringent in requiring developers to build sidewalks with new development or redevelopment.
- Consider purchasing sidewalk data layer from NCTCOG to have a more complete inventory of existing sidewalks.
- Conduct a sidewalk conditions audit to document the condition of existing sidewalks and prioritize future improvements.



Sidewalk in a residential area



Wide sidewalk that meanders and has a landscape buffer from roadway

INTERSECTION CONSIDERATIONS

For all facility types, there are instances where the facility will cross a roadway or a driveway. This often poses challenges to active transportation users due to the variability of roadway design, traffic volumes, speeds, and motorist behavior. Intersection treatments vary depending on whether it is a traffic-controlled intersection, a mid-block crossing, or a driveway. The following sections describe key design principles for intersections. Updates to the subdivision regulations and other applicable documents should follow adoption of this master plan to ensure that future active transportation facilities meet these design principles. There are several design interventions that should be considered whenever a facility crosses a roadway.

- **Crosswalks:** Painted 'zebra' crosswalks at each corner of an intersection provides a safe and predictable space for active transportation users to cross the roadway. Pavement markings should be highly visible through the length of the crosswalk; routine maintenance should also be conducted to ensure that the marking stay visible over time.
- **Median Refuge Island:** In instances where facility users must cross several lanes of traffic, a median refuge island should be constructed. This is a protected space within the median of a roadway for a facility user to pause while crossing. These refuge islands reduce the overall crossing length for facility users.

- **Signage:** All signage should be consistent with TMUTCD requirements. Signage should direct facility users of the approaching intersection and should direct motorists of to not block the crosswalk and yield to facility users so they can safely cross. **Figure 4.7** depicts typical signage recommended for signalized intersections. It is important to note that too many signs or other traffic control devices at one intersection can be overwhelming to the users and ultimately lose their impact.
- **Pedestrian Signals:** Since mid-block crossings occur away from a signalized intersection, a pedestrian-activated signal is preferred to allow facility users to alert motorists to crossing facility users. A rectangular rapid-flashing beacon (RRFB) is a safety countermeasure that accompanies warning signs to indicate when a facility user is crossing the roadway. Motorists are required to stop when the signals are flashing. Additional warning features can be installed such as in-pavement flashers to increase visibility. **Figure 4.8** depicts a typical layout of a mid-block crossing intersection.



Trail mid-block crossing with designated crosswalk

Figure 4.7, Typical Signalized Trail Crossing at Roadway Intersection

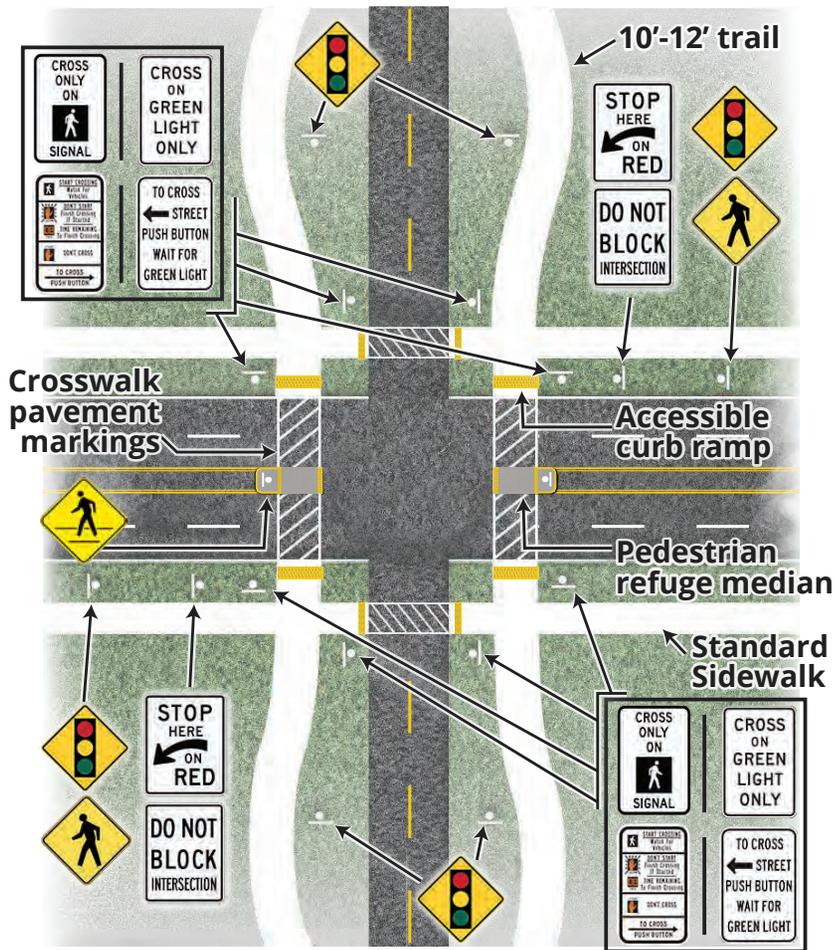
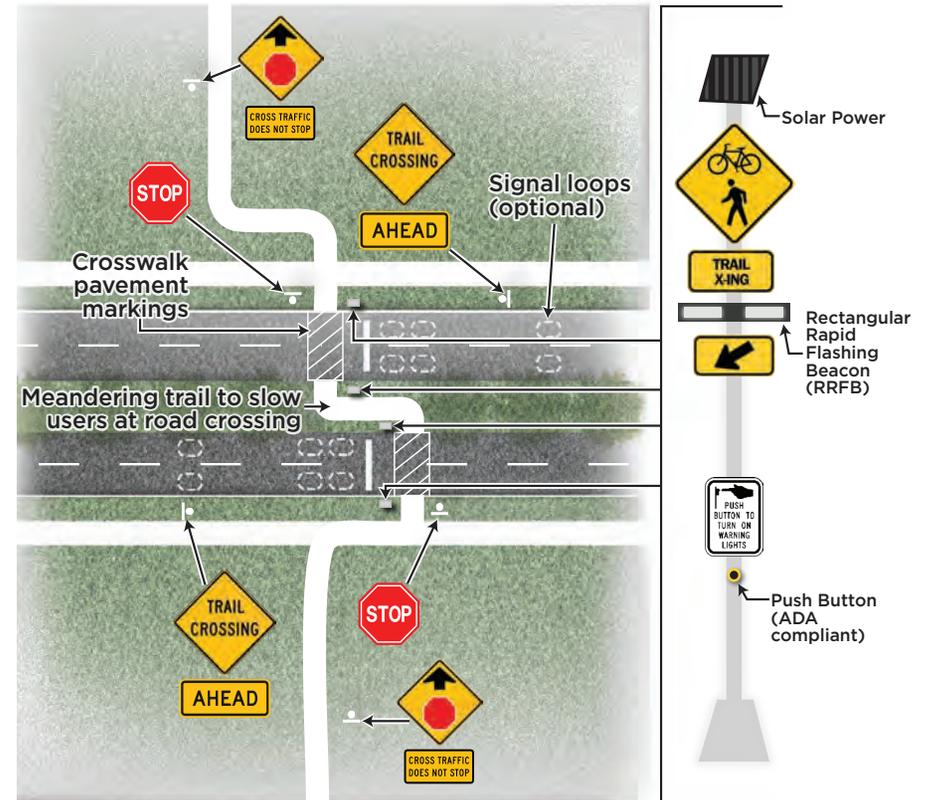


Figure 4.8, Typical Mid-Block Trail Crossing at Roadway Intersection





CHAPTER 5 | IMPLEMENTATION



Corridor Implementation	73
System Enhancements.....	82
Policy Program.....	83
Funding & Administration.....	84

CORRIDOR IMPLEMENTATION

The corridor and facility recommendations presented in Chapter 4 represent a comprehensive active transportation and recreation network to be implemented over time. Factors that impact when portions of the network can be constructed include project complexity, funding, adjacent development, and changing community preferences. This chapter presents a tiered approach to implementing the network recommendations identified in this plan.

MULTI-USE TRAIL NETWORK

The following criteria were used to prioritize future shared use path and sidepath projects in Granbury:



Connects to key destinations

Assesses how many key destinations the proposed facility connects to, including parks, recreational facilities, the Lake Granbury Conference Center, and the Historic Granbury Square.



Connects to an existing trail or bikeway facility

Determines if the proposed facility ties into an existing facility forming a longer active transportation or recreation route.



Solves a safety issue or overcomes a barrier

Assesses whether the proposed facility provides a safer route for bicyclists and/or pedestrians.



Improves the existing system

Determines if the proposed facility is improved from its existing condition.



Connectivity to schools

Determines if the preferred facility provides a safer route to a school.



Proximity to residential areas

Assesses if the proposed facility is located within a quarter mile of a residential area, therefore increasing the number of possible trips.



Public interest

Identifies the degree to which the proposed facility is desired by the community as evidenced by public feedback.



Feasibility of implementation

Determines the degree of difficulty to construct the facility based on available right-of-way, property ownership, and easements.



Amount of environmentally sensitive areas disturbed

Considers the amount of environmentally sensitive lands (i.e. floodplain, natural habitats) the proposed facility would disrupt.

MULTI-USE TRAIL PRIORITIZATION

Based on the application of the prioritization criteria, the facility recommendations were divided into three tiers representing the intended sequence of implementation. These tiers will assist with integration of projects into Granbury's capital improvement plan (CIP).

Tier One trail segments represent 4.3 miles of shared-use and sidepath recommendations to be constructed as part of the City's initial phase of trail development. Tier One projects focus on extending and filling in the existing trail network in central Granbury.

Tier Two trail segments represent 12.7 miles of shared-use and sidepath recommendations to be constructed after the Tier One segments are completed. Tier Two projects focus on expanding connections to areas where development is occurring or anticipated and connecting the edges of the city.

Tier Three trail segments represent 23.9 miles of shared-use and sidepath recommendations to be constructed after the Tier One and Tier Two segments are completed. Tier Three projects focus on longer-term, visionary projects that are more complicated to implement.

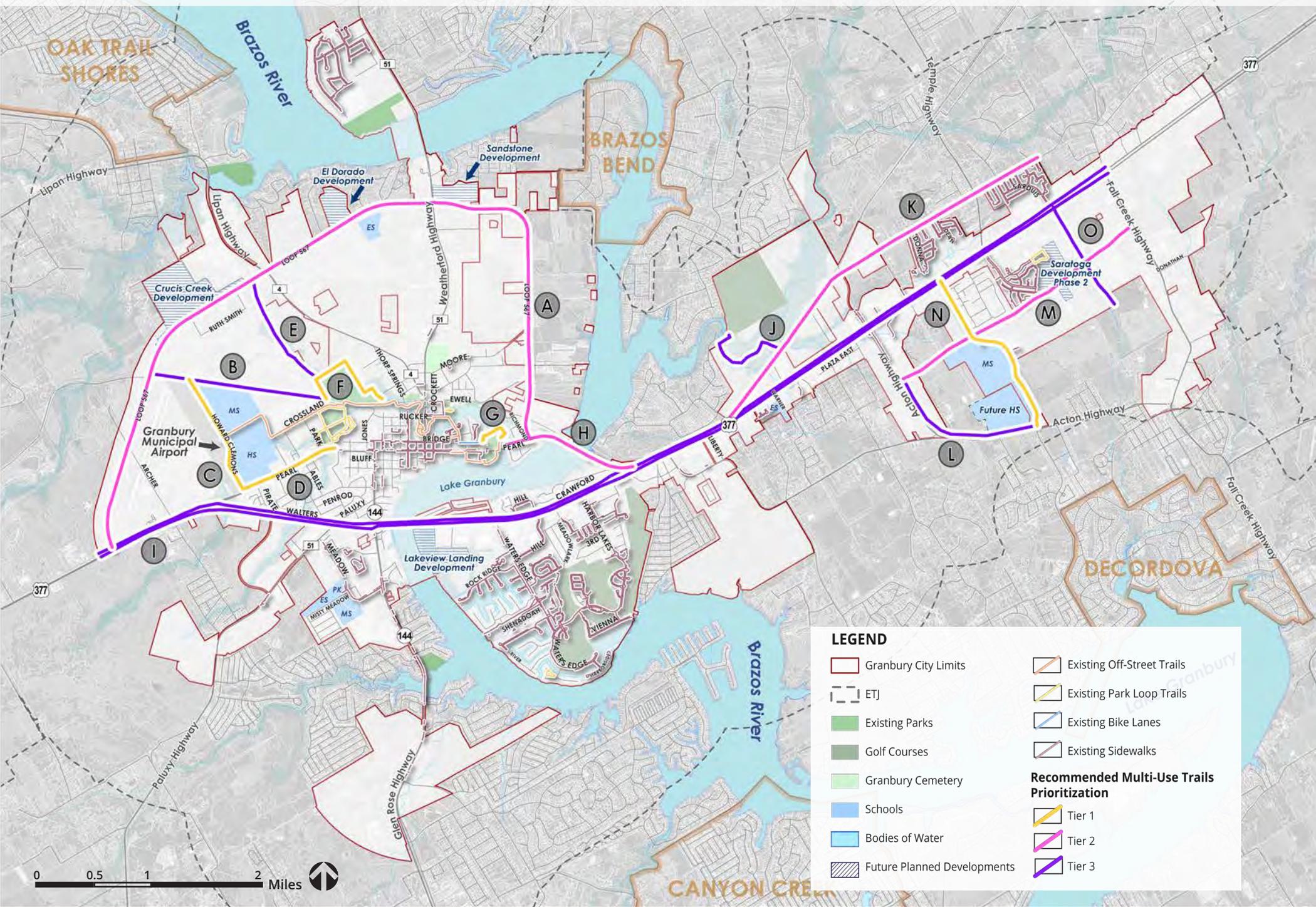
The prioritized segments for multi-use trails are summarized in **Table 5.1** and illustrated in **Map 5.1** on the following pages.

Table 5.1, Multi-Use Trail Segment Prioritization

MAP ID	SEGMENT LOCATION	FACILITY TYPE ¹	LIMITS FROM	LIMITS TO	DISTANCE (MILES)
TIER 1 SEGMENTS					
C	HOWARD CLEMMONS RD	SIDEPATH	PEARL STREET	FORT WORTH & RIO GRANDE RAIL CORRIDOR	0.92
D	PEARL STREET	SIDEPATH	EAST OF PARK DRIVE	HOWARD CLEMMONS RD	0.76
F	GRANBURY CITY PARK	SHARED-USE PATH	GRANBURY BARK PARK	FORT WORTH & RIO GRANDE RAIL CORRIDOR	0.90
G	HEWLETT PARK	SHARED-USE PATH	BRIDGE STREET	MOMENTS-IN-TIME TRAIL	0.29
N	JAMES ROAD	SIDEPATH	ACTON HIGHWAY	US 377	1.43
TIER 2 SEGMENTS					
A	LOOP 567	SIDEPATH	PEARL STREET	WEST US 377	6.46
H	PEARL STREET BRIDGE	SIDEPATH	US 377	WEST OF BRAZOS HARBOR DRIVE	1.03
K	OLD GRANBURY ROAD	SIDEPATH	OPAL COURT	US 377	3.17
M	FUTURE THOROUGHFARE (HURRICANE FLY)	SIDEPATH	FALL CREEK HIGHWAY	ACTON HIGHWAY	2.09
TIER 3 SEGMENTS					
B	FORT WORTH & RIO GRANDE RAIL CORRIDOR	SHARED-USE PATH	PEARL STREET	WEST US 377	1.27
E	UNDEVELOPED LAND	SHARED-USE PATH	GRANBURY CITY PARK	LOOP 567	0.89
I	US 377	SIDEPATH	FALL CREEK HIGHWAY	ARCHER DRIVE	17.10
J	GREENBELT TO FORMER GOLF COURSE	SHARED-USE PATH	OLD GRANBURY ROAD	PERIMETER OF GOLF COURSE PROPERTY	2.58
L	ACTON HIGHWAY	SIDEPATH	JAMES ROAD	FUTURE THOROUGHFARE (HURRICANE FLY)	1.23
O	FUTURE THOROUGHFARE	SIDEPATH	SOUTH CITY LIMITS	US 377	0.88

¹ Descriptions of multi-use trail facilities can be found on page 50.

Map 5.1, Multi-Use Trail Segment Prioritization



ON-STREET BIKEWAY NETWORK

Similar to Granbury's multi-use trail network, a series of ten prioritization criteria was established to determine the recommended sequencing of constructing new on-street bikeways in the city. The following criteria were used to prioritize future candidate corridors and wide shoulder projects in Granbury:



1 Connects to key destinations

Assesses how many key destinations the proposed facility connects to, including parks, schools, recreational facilities, the Lake Granbury Conference Center, and the Historic Granbury Square.



2 Connects to an existing trail or bikeway facility

Determines if the proposed facility ties into an existing facility making a longer active transportation or recreation route.



3 Solves a safety issue or overcomes a barrier

Assesses whether the proposed facility provides a safer route for bicyclists.



4 Improves the existing system

Determines if the proposed facility is improved from its existing condition.



5 Connectivity to schools

Determines if the proposed facility allows for a safer route to a school.



6 Proximity to residential areas

Assesses if the proposed facility is located within a quarter mile of a residential area, therefore increasing the number of possible trips.



Supports long-distance bicycle rides.

Identifies if the proposed facility would allow for a more continuous, long-distance route for avid cyclists.



Public interest

Identifies to what degree the proposed facility is desired by the community as evidenced by public engagement for this plan.



Feasibility of implementation

Determines the degree of difficulty to implement the facility based on available ROW, property ownership, and easements.



Level of comfort

Assesses the perceived comfort of the proposed facility based on posted speed limit, number of lanes, presence of trail or bikeway facilities, and intersection signalization.

ON-STREET BIKEWAY PRIORITIZATION

The resulting prioritization scores and identified roadway characteristics shown in **Table 5.2** should be used as a decision tool to help determine the type of accommodation that is most appropriate for Granbury's roadway corridors as opportunities arise for implementation. **Map 5.2** illustrates the locations of these recommended investments.

Based on the application of the prioritization criteria, the proposed recommendations were divided into three tiers representing the intended timeframe for implementation. These tiers will assist with integration of projects into the community capital improvement plan (CIP).

Tier One bikeways segments represent 2.4 miles of candidate corridor recommendations to be constructed as part of the City's initial phase of bikeway development. These Tier One projects focus on providing neighborhood connections to surrounding community destinations.

Tier Two bikeway segments represent 9.9 miles of candidate corridor and wide shoulder recommendations to be constructed after the Tier One segments are completed. These Tier Two projects focus on expanding connections to areas where development is occurring or anticipated and supporting long-distance bicycle rides.

Tier Three bikeway segments represent 6.2 miles of candidate corridor and wide shoulder recommendations to be constructed after the Tier One and Tier Two segments are completed. These Tier Three projects focus on longer-term, visionary projects that are more complicated to implement.

Tiers may be modified as redevelopment of existing roadways or development of new roadways occur, or as other community conditions change.

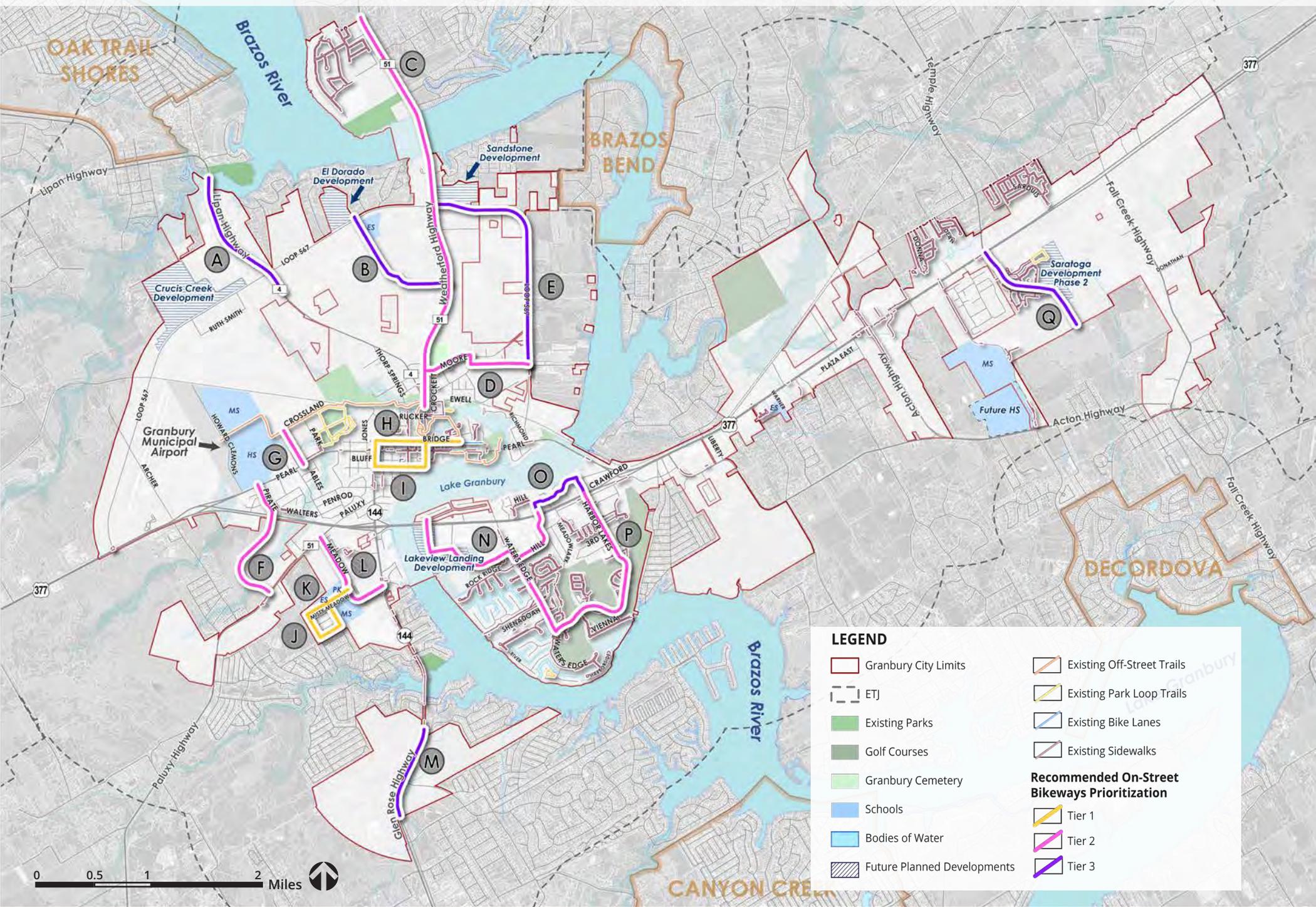
Table 5.2, On-Street Bikeway Implementation Considerations

MAP ID	ROADWAY	FACILITY TYPE ¹	DISTANCE (MILES)	POSTED SPEEDS	LEVEL OF COMFORT ²
TIER 1 SEGMENTS					
H	BRIDGE STREET	CANDIDATE CORRIDOR	0.64	LOW	HIGH
I	MORGAN ST-DOYLE ST-HOUSTON ST	CANDIDATE CORRIDOR	0.78	LOW	HIGH
J	SPANISH TRAIL DR-BERRY PATCH DR -SPANISH OAK DR	CANDIDATE CORRIDOR	0.58	LOW	HIGH
K	MISTY MEADOW DRIVE	CANDIDATE CORRIDOR	0.37	LOW	HIGH
TIER 2 SEGMENTS					
C	WEATHERFORD HIGHWAY	WIDE SHOULDER	3.16	HIGH	LOW
D	REUNION COURT-MOORE STREET	CANDIDATE CORRIDOR	0.88	LOW	HIGH
F	PIRATE DRIVE	CANDIDATE CORRIDOR	1.08	LOW	HIGH
G	DEPUTY LARRY MILLER DR	CANDIDATE CORRIDOR	0.29	LOW	HIGH
L	MEADOWS DRIVE	CANDIDATE CORRIDOR	0.79	LOW	HIGH
N	OVERSTREET EXTENSION- HILL BOULEVARD	CANDIDATE CORRIDOR	1.52	LOW	HIGH
P	HARBOR LAKES DR-WATERS EDGE DR	CANDIDATE CORRIDOR	2.20	LOW	LOW
TIER 3 SEGMENTS					
A	LIPAN HIGHWAY	WIDE SHOULDER	1.10	HIGH	LOW
B	FUTURE THOROUGHFARE	CANDIDATE CORRIDOR	0.99	MEDIUM	MEDIUM
E	LOOP 567	WIDE SHOULDER	1.83	HIGH	LOW
M	MORGAN STREET	WIDE SHOULDER	0.70	MEDIUM	LOW
O	HILL BLVD-CRAWFORD AVE- HARBOR LAKES DR	CANDIDATE CORRIDOR	0.61	LOW	HIGH
Q	SARATOGA BOULEVARD	CANDIDATE CORRIDOR	0.96	LOW	HIGH

¹Descriptions of on-street bikeway facilities can be found on pages 51-52

²Refer to page 33 for details about Level of Comfort and Map 3.4 on page 35 which illustrates Bicycle Level of Comfort for Granbury roadways.

Map 5.2, On-Street Bikeway Segment Prioritization



LEGEND

Granbury City Limits	Existing Off-Street Trails
ETJ	Existing Park Loop Trails
Existing Parks	Existing Bike Lanes
Golf Courses	Existing Sidewalks
Granbury Cemetery	Recommended On-Street Bikeways Prioritization
Schools	Tier 1
Bodies of Water	Tier 2
Future Planned Developments	Tier 3

PEDESTRIAN NETWORK

The proposed pedestrian network is comprised of sidewalks and park loop trails. There are no prioritization criteria for the pedestrian network, rather the recommendations should be implemented as development or redevelopment occurs or as the associated roadways are reconstructed. **Table 5.3** depicts the pedestrian network recommendations by segment. There is a total of 5.7 miles of sidewalk improvements and 2.7 miles of park loop trails recommended for Granbury. For the park loop trails, the path extension at Lambert Branch Park should be implemented in the near-term to extend the existing path and the perimeter trail at the former golf course should be implemented longer-term.

Table 5.3, Recommended Pedestrian Network Segments

SEGMENT	FACILITY TYPE	LIMITS FROM	LIMITS TO	DISTANCE (MILES)
BRIDGE STREET	SIDEWALK	MORGAN STREET	HEWLETT PARK	0.86
BLUFF STREET	SIDEWALK	MORGAN STREET	TRAVIS STREET	0.22
MORGAN STREET	SIDEWALK	BRIDGE STREET	ELIZABETH BOULEVARD	0.41
MORGAN STREET	SIDEWALK	NORTH OF ATCHLEY DRIVE	US 377	0.20
MORGAN STREET	SIDEWALK	US 377	SOUTHERN CITY LIMITS	2.48
DOYLE STREET	SIDEWALK	LANCASTER STREET	HOUSTON STREET	0.58
HOUSTON STREET	SIDEWALK	BRIDGE STREET	DOYLE STREET	0.19
MEANDER ROAD	SIDEWALK	HIDEAWAY BAY	TERMINATED SIDEWALKS BEHIND RETAIL DEVELOPMENT ON MEANDER WAY	0.80
LAMBERT BRANCH PARK	PARK LOOP TRAIL	RECENTLY CONSTRUCTED TRAIL WITHIN PARK	MOMENTS-IN-TIME TRAIL ALONG RUCKER STREET	0.14
FORMER HIDDEN OAKS GOLF COURSE	PARK LOOP TRAIL	PERIMETER OF GOLF COURSE	PERIMETER OF GOLF COURSE	2.58

Note: Refer to page 62 for the Pedestrian Network Map

SYSTEM ENHANCEMENTS

In addition to constructing new multi-use trail and on-street bikeway segments there are opportunities to enhance existing facilities which will improve the overall network connectivity and user experience. Although not all inclusive, the following projects should be considered for inclusion in the City's capital budget and implemented as feasible.

MOMENTS-IN-TIME HIKE & BIKE TRAIL IMPROVEMENTS

Granbury's Moments-in-Time Trail is the City's primary multi-use trail. Improvements to the trail include establishing a regular maintenance schedule to address aging infrastructure, expanding access to the trail network to connect further into the community, and incorporating amenities that will enhance the user experience.

- **Regular Maintenance.** Create a program that identifies trail maintenance issues to ensure necessary repairs are made to reduce barriers to usability and safety. For example, sections of the trail that require debris removal following major weather events should be identified.
- **Trail Access.** Improve trail access by constructing access points and trail spurs extending from the existing trail into the surrounding residential neighborhoods and downtown. The Moments-in-Time Trail creates strong connections to key community destinations and additional access points and trail extensions will better connect residents to destinations, ultimately promoting non-motorized transportation trips in Granbury.
- **Trail Amenities.** Improve user comfort through implementing trail amenities that increase safety, legibility of the trail network, and enhance overall user experience. Examples of the types of amenities to consider for the Moments-in-Time Trail include trail lighting, shade trees and structures, rest areas, and wayfinding signage.

SIDEWALK NETWORK IMPROVEMENTS

Sidewalks are an essential part of the pedestrian network and through several identified improvements can better serve residents. Sidewalk improvements include upgrading facilities to address aging or substandard infrastructure, extending existing facilities to fill in gaps in connectivity, and creating safer pedestrian crossing environments particularly at intersections.

- **Sidewalk Conditions Assessment.** An inventory of existing sidewalk facilities in Granbury should be reviewed to identify areas that would benefit from upgrades. Locations where sidewalks are cracked, or present other safety issues should be prioritized for upgrades. Additionally, where feasible, existing sidewalks should be widened, aligning with the recommendation made in Chapter 4, to better support users especially in areas that generate high volumes of pedestrian traffic.
- **Sidewalk Expansion Program.** There are several locations, particularly around downtown, where sidewalks terminate or gaps in facilities occur. The City should create a program for identifying and prioritizing locations where it is possible to extend facilities, fill network gaps, and create needed pedestrian connections especially to community destinations, which can inform future capital improvement budgeting.
- **Intersection Safety Assessment.** A major safety issue that pedestrians face when using sidewalk facilities is a lack of safety countermeasures at roadway crossings. An assessment of the level of comfort of intersections throughout Granbury should be conducted to determine where and what type of safety enhancements are most needed.

POLICY PROGRAM

Chapter 4 identified both design principles and policy considerations for multi-use trails, on-street bikeways, and the pedestrian network. **Table 5.4** gives more details on those policies that can help promote the development of active transportation and recreation facilities and increase their usage.

Table 5.4, Policy Implementation Program

POLICY/PROGRAM/INITIATIVE ¹	RESPONSIBLE PARTY	LEVEL OF EFFORT
Update the Code of Ordinances to include both acceptable and prohibited uses along trails and bicycle facilities.	Community Development Department	Low
Develop a standard list of amenities to be found at trailheads and trail access points.	Parks & Recreation Department	Low
Purchase sidewalk data layer from NCTCOG to have a more complete inventory of existing sidewalks.	City Manager	Low
Encourage bike racks and bike parking amenities in retail and commercial areas.	Historic Granbury Merchant's Association	Medium
Implement a bicycle education and etiquette campaign.	Communications, Public Works, Parks & Recreation Departments, NCTCOG	Medium
Increase minimum sidewalk width to 5 feet in residential areas and 6 feet in commercial areas.	Community Development Department	Medium
Avoid placement of utilities and other obstructions within the sidewalk path.	Public Works	Medium
Formalize entities responsible for repairing cracked, broken, or uneven sidewalks.	City Manager	Medium
Update subdivision regulations to require sidewalks in new subdivisions to connect to the existing and proposed trail system.	Community Development Department	Medium
Update sidewalk policy to be more stringent in requiring developers to build sidewalks with new development or redevelopment.	Community Development Department	High
Establish a trail dedication ordinance to require implementation of shared-use paths.	Community Development, Parks & Recreation Departments	High
Conduct a sidewalk conditions audit to document condition of existing sidewalks and prioritize future improvements.	Parks & Recreation, Public Works Departments	High

¹ Source: Details on the policies that support the active transportation and recreation network can be found on pages 63-67

FUNDING & ADMINISTRATION

PLANNING-LEVEL COSTS

Table 5.5 identifies typical costs associated with various active transportation facilities. The costs were informed by recent project bids, current market trends, and engineering standards and design methods. These estimates should be used to guide near and long-term budgeting to plan for project implementation. These estimates are at a pre-design level, and therefore will vary as additional planning, design, and engineering occurs.

The Cost Considerations column in **Table 5.5** detail the items that inform the potential cost ranges. The higher end of the range considers projects that might encounter obstacles such as utility lines and roadway conditions providing enhanced safety countermeasures, particularly at intersection crossings.

Table 5.5. Typical Project Cost by Facility Type

FACILITY TYPE	PARAMETERS	POTENTIAL COST RANGE ¹	COST CONSIDERATIONS
Shared-Use Path	10'-12' wide paved concrete path	\$1.35M - \$1.9M per mile	Concrete paving, Demolition ² , Utilities ² , Grading & Earthwork, Signage, Crosswalks & ADA ramps
Sidepath	8'-10' wide concrete path adjacent to a roadway	\$1.35M - \$1.9M per mile	Concrete paving, Demolition ² , Utilities ² , Grading & Earthwork, Signage, Crosswalks & ADA ramps
Signed Route	Regulatory and directional signage adjacent to roadways	\$50,000 - \$75,000 per mile	Signage
Bicycle Boulevard	Regulatory and directional signage, pavement markings, traffic calming Interventions	Varies based on chosen interventions ²	Varies based on chosen interventions ²
Bike Lanes	Lane Striping, pavement markings, existing pavement sections (both sides of street)	\$50,000 - \$95,000 per mile	Lane striping, Pavement markings, Signage, Enhanced signalization ² , Preparing ROW
Wide Shoulders	Existing pavement sections (8'-10'), regulatory and directional signage adjacent to roadways	\$50,000 (no additional pavement needed) - \$1.9M per mile	Lane Striping, Signage, Preparing ROW
Sidewalks	Pathways (5'-6') within rights-of-ways	\$1M - \$1.6M per mile	Concrete paving, Demolition ² , Utilities ² , Grading & Earthwork, Signage, Crosswalks & ADA ramps

¹Costs for a specific trail or bikeway facility will vary based on site conditions and as additional planning, design, and engineering occurs. An inflation of 5%-8% per year should be factored into any project cost. Chapter 4 includes typical cross sections and additional design considerations for these facility types.

²Cost Considerations items are dependent of site conditions or chosen design interventions.

FUNDING STRATEGIES

A range of federal, state, and local funding sources are available to communities such as Granbury. Exploring these resources aids in the feasibility of implementing or improving trail and bikeway facilities. A list of potential funding sources are described in the Appendix.

PLAN ADMINISTRATION

The City of Granbury and the partners identified in the Policy Program reference page are collectively responsible for administering the plan. It is the obligation of the City to oversee the implementation of the plan, monitor progress, and incorporate recommendations into annual planning and budgeting decisions.

ANNUAL PROGRESS REPORT

Preparing an annual progress report will allow elected and appointed officials to discuss plan achievements and amendments to the plan necessitated by recent development or major changes. As recommendations are implemented, the City should review remaining items to ensure future budgets and work programs incorporate remaining recommendations in subsequent years after plan adoption.

FIVE-YEAR UPDATE

Following the first five years after plan adoption staff should conduct a review to update trail, bikeway, and sidewalk inventory, incorporate growth and changes in trends and demographics, and track accomplishments regarding implementation of new infrastructure or policy and regulatory changes. This review informs staff of the pace of progress and provides an understanding of what should be prioritized in the next five years.

TEN-YEAR UPDATE

Ten years following plan adoption, the City should expect significant changes and updates to the active transportation and recreation network as well as the increased growth and development of Granbury. It is good practice to update a city's plan every 10 years to remain current with community needs and national trends. If a revised master plan is not feasible, an alternative is a compiled summary of accomplishments since plan adoption, an updated inventory of facilities, documented changes in demographics, opportunities for the public to provide feedback, reprioritization of recommendations to account for accomplishments, and updates to plan goals, objectives, and maps.

CONCLUSION

This active transportation and recreation plan serves as a guide for future budgetary, programming and capital expenditures for the network. The recommendations for trail, bikeway, and sidewalk facilities identified in this plan reflect the input received during the public and stakeholder input process, observations made during needs assessments, and reflect the vision of the community. In partnership with various city departments and public and private entities, the City can successfully implement the recommendations in the years following adoption.

Page intentionally left blank.



APPENDIX



Glossary of Terms.....	89
Detailed Maps.....	91
Commonly Used Trail & Bikeway Signage.....	95
Funding Sources.....	99

GLOSSARY OF TERMS

Bicycle: Every vehicle propelled solely by human power upon which any person may ride, having two tandem wheels, except scooters and similar devices. The term “bicycle” in this planning process also includes three and four-wheeled human-powered vehicles, but not tricycles for children.

Bicycle Accommodations/Facilities: A general term denoting a variety of improvements and provisions that are made by public agencies to accommodate or encourage bicycling, including bike lanes, shared-use pathways, signed bike routes, and bicycle parking and storage facilities.

Bicycle Boulevard: A roadway designated for the mix of bicycle and motor vehicle traffic, which creates a comfortable shared-use environment through a combination of traffic calming measures, pavement markings, and signage.

Bike Lane: A portion of a roadway that has been designated by striping, signing, and pavement markings for the preferential or exclusive use of bicyclists.

Bikeway: A generic term for any road, street, path, trail, or way that, in some manner, is specifically designated for bicycle travel, regardless of whether such facilities are designated for the exclusive use of bicycles or are to be shared with other transportation modes.

Buffer: The portion of the a highway, road or street between the curb-face or edge of the pavement and the sidewalk that provides a spatial buffer between vehicular traffic and pedestrians on sidewalks. Buffers often include landscape plantings such as grass, trees or shrubs, or utility poles, and may also be referred to as the “planting strip,” “landscape buffer,” “tree buffer,” or “tree box.” Buffers can also include barriers such as highway guide rails (guardrails) or bollards. In rural or suburban areas the buffer may be a grassy swale or drainage ditch. In urban areas, downtowns, the buffer may also include street furniture, street signs, fire hydrants, vending boxes, lighting poles, etc.

Critical Gaps: This category focuses on areas of the City where connectivity is impaired due to disconnected segments or where sidewalks are completely lacking.

Crosswalk: The horizontal portion of roadways, usually at intersections, reserved for pedestrian crossing; it may be marked or unmarked. Three marking patterns using white striping are most common: 1) Double parallel lines, 2) “zebra stripes:” white cross hatches perpendicular to the pedestrian direction of travel, or 3) “Ladder:” perpendicular white cross hatches combined with double parallel lines on the outside edges.

Intersection Treatment: The design of intersections to reduce conflict between pedestrians, cyclists, and motorists that occurs at roadway and trail intersections. The purpose of these treatments is to increase awareness for all users, achieved through the implementation of visual or physical indicators such as specialized signals, changes in pavement material, pavement markings, and the addition of refuge medians on wide roadways.

Multi-Use Trail: A paved path that is wide enough to support multiple user groups. Multi-use trails are typically found in off-street corridors such as greenways and utility easements or adjacent to roadways within the right-of-way with a buffer separating trail users from motor vehicle traffic.

Park Loop Trails: Paved pedestrian pathways found within park spaces and primarily serve recreation and leisure purposes.

Pedestrian: A person walking or traveling by means of a wheelchair, electric scooter, crutches, or other walking devices or mobility aids. Use of the term pedestrian is meant to include all disabled individuals regardless of which equipment they may use to assist their self-directed locomotion (unless they are using a bicycle). It also includes runner, joggers, those pulling or pushing strollers, carriages, carts and wagons, and those walking bicycles.

Rectangular Rapid Flashing Beacon (RRFB): Flashing pedestrian signage implemented at uncontrolled crosswalks to increase driver awareness of presence of pedestrians in roadways. RRFB consist of two, rectangular shaped yellow indications that emit light and flash when activated by a pedestrian.

Shared-Use Path: A bicycle and pedestrian path separated from motorized vehicular traffic by an open space barrier or curb. Shared-use paths may be within the highway right-of-way (often termed “sidepaths”) or within an independent right-of-way, such as on an abandoned railroad bed or along a stream valley park. Shared use paths typically accommodate two-way travel and are open to pedestrians, in-line skaters, wheelchair users, joggers and other non-motorized path users. They are typically surfaced in asphalt or concrete, but may have hard-packed/all weather gravel or dirt surfaces as well.

Shoulder: Any pavement of a roadway to the right of the right-most travel lane, but not including curbs, planting buffers, and sidewalks. Shoulders can have variety of surface treatments including pavement, gravel, or grass. Depending on their width and surface, they serve a variety of purposes, including providing space for vehicles to slow and turn right, accommodation of stopped or broken-down vehicles, to allow emergency vehicles to pass, for structural support of the roadbed, or for bicycle and pedestrian travel.

Sidepath: These multi-use trails are wide enough to be utilized by pedestrian and bicyclists simultaneously without conflict. Sidepaths are adjacent to roadways but provide a physical separation from motor vehicle traffic.

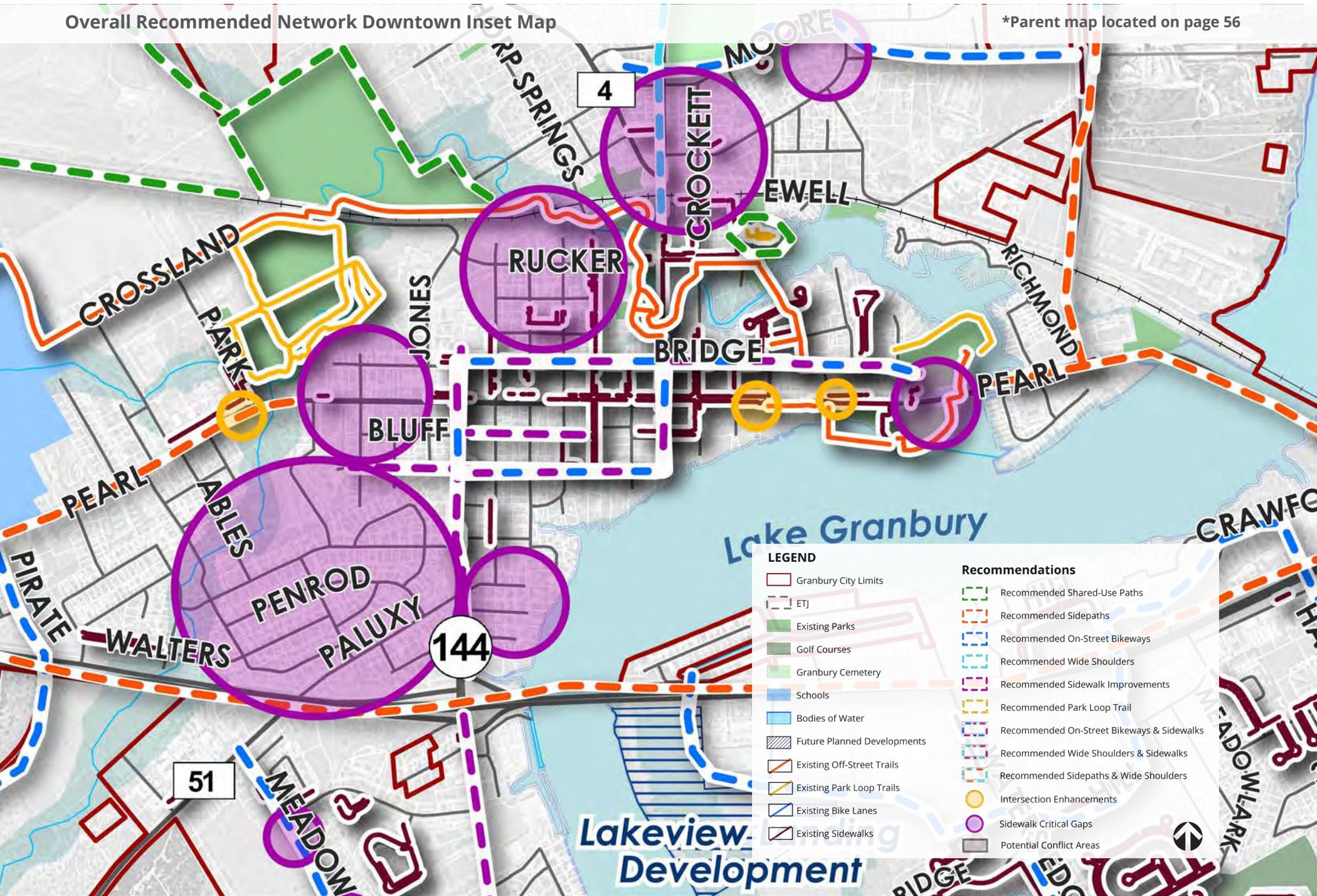
Signed Route: Signed bicycle routes are cost-effective bicycle network treatments that can be established through strategic pavement markings and associated signage to delineate a designated bicycle route. Signage informs bicyclists of the route and alerts motorists of the presence of bicyclists. This type of bicycle facility is best suited for roadways that are defined by low vehicular traffic speeds and volumes.

Trail: The word “trail” has come to mean a wide variety of facilities types, including everything from a “marked or beaten path, as through woods or wilderness” to a paved “multi-use trail.” For this reason, this planning process will not use the word “trail” to reference a facility intended for bicycle transportation. We urge use of the term shared-use path in place of multi-use trail. Note: Several of these definitions are taken from the American Association of State Highway and Transportation Officials (AASHTO) “Guide for the Development of Bicycle Facilities,” 1999 Edition.

DETAILED MAPS

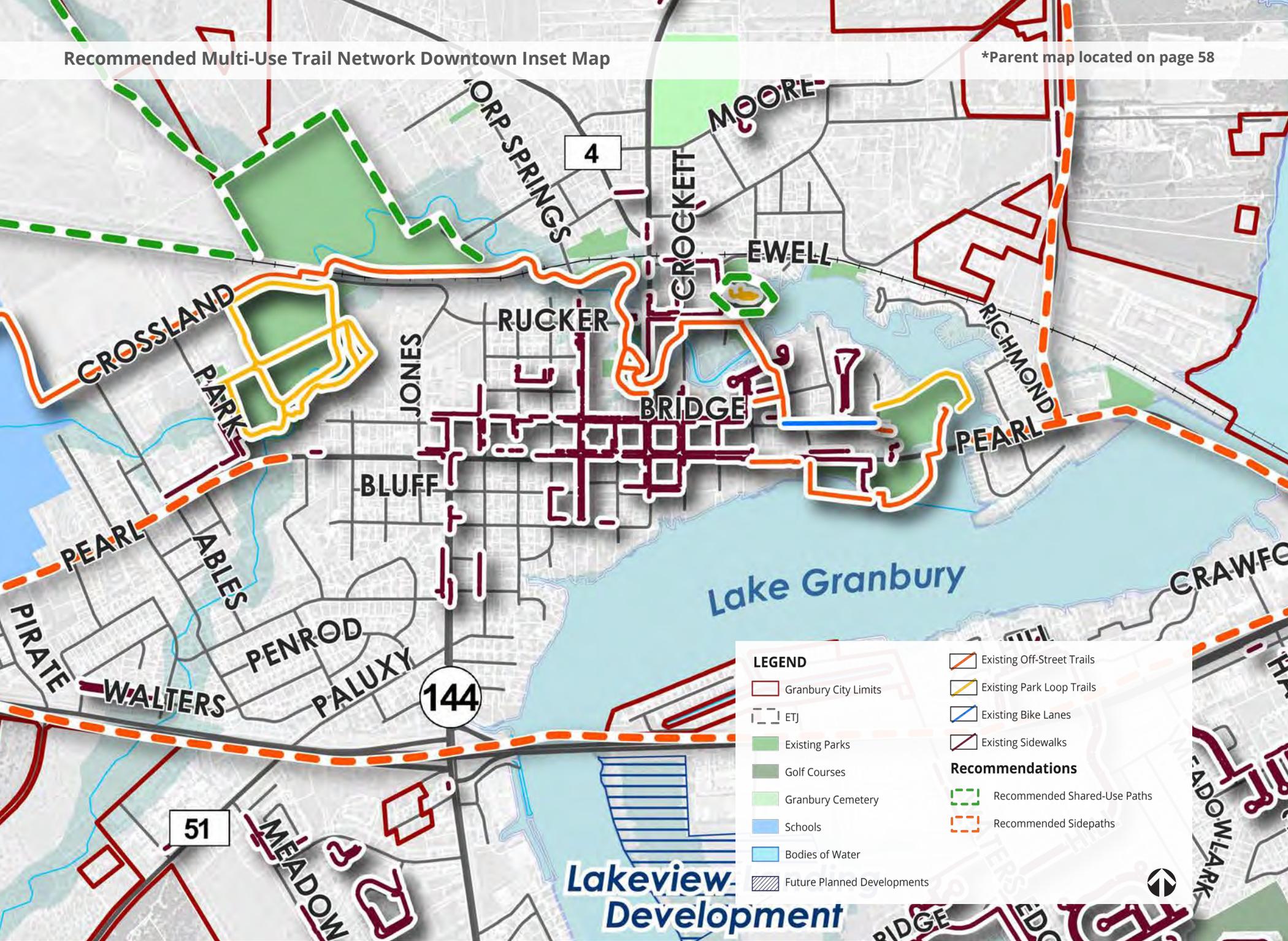
Overall Recommended Network Downtown Inset Map

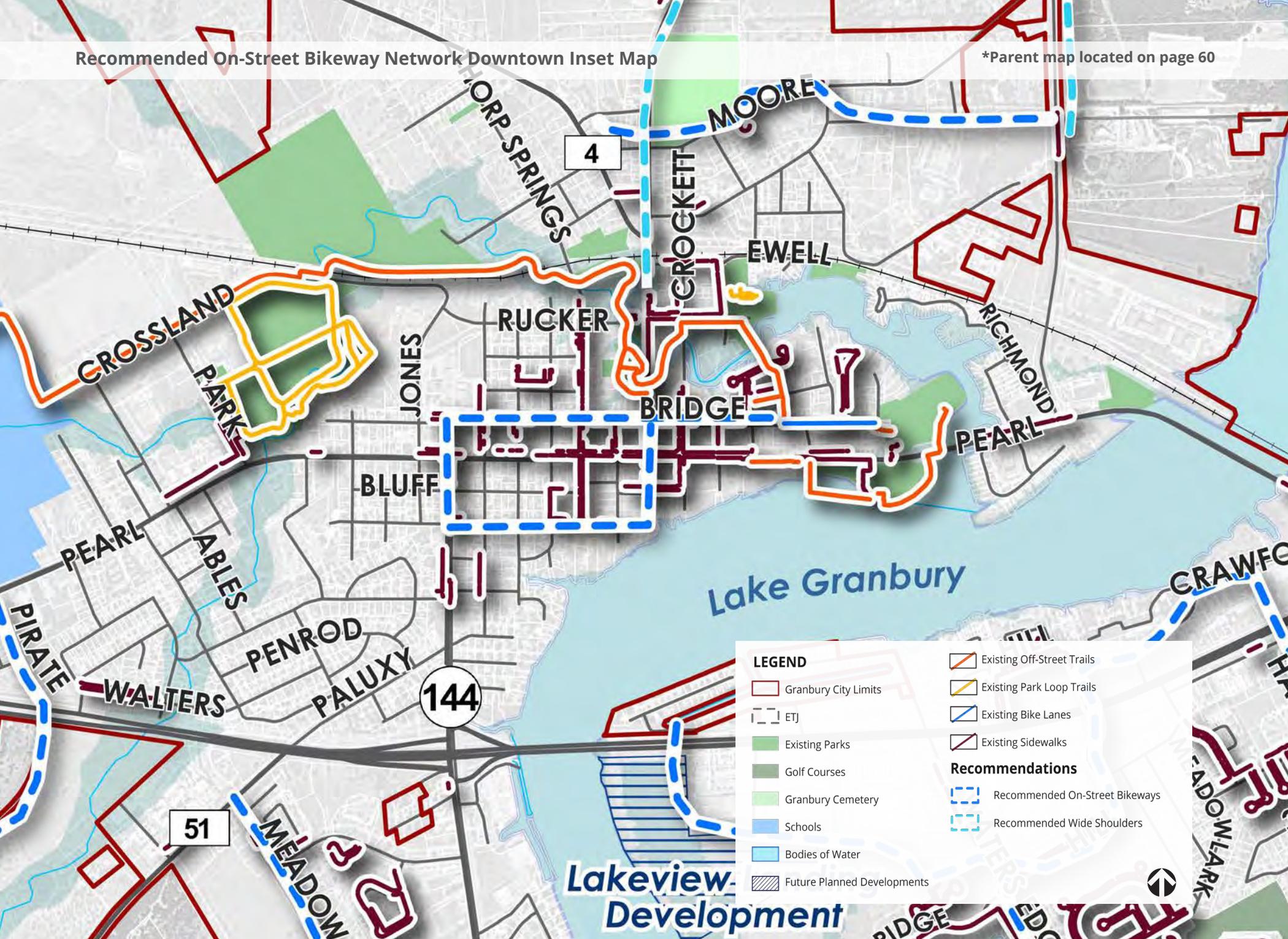
*Parent map located on page 56

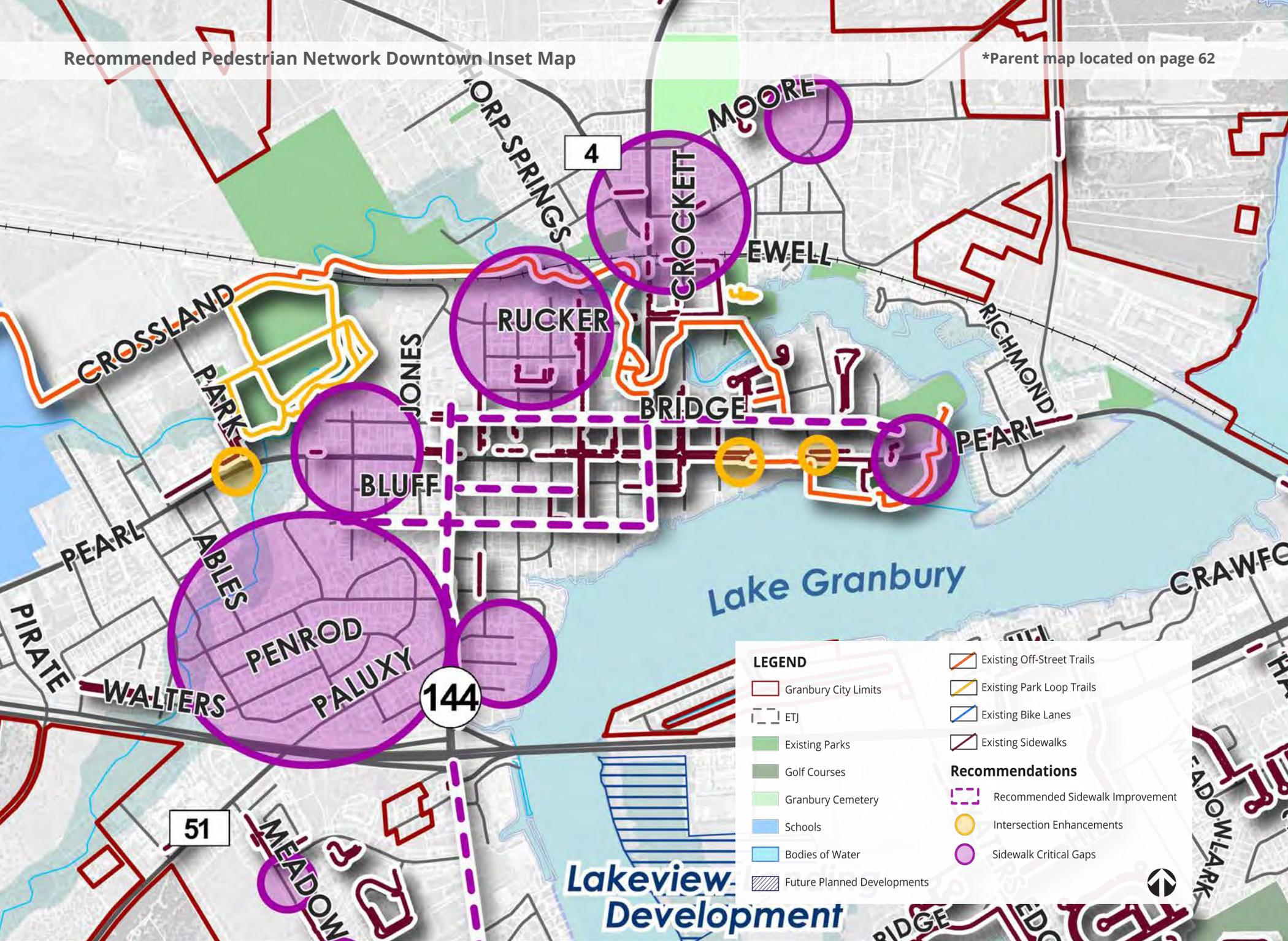


LEGEND	
	Granbury City Limits
	ETJ
	Existing Parks
	Golf Courses
	Granbury Cemetery
	Schools
	Bodies of Water
	Future Planned Developments
	Existing Off-Street Trails
	Existing Park Loop Trails
	Existing Bike Lanes
	Existing Sidewalks
	Recommended Shared-Use Paths
	Recommended Sidepaths
	Recommended On-Street Bikeways
	Recommended Wide Shoulders
	Recommended Sidewalk Improvements
	Recommended Park Loop Trail
	Recommended On-Street Bikeways & Sidewalks
	Recommended Wide Shoulders & Sidewalks
	Recommended Sidepaths & Wide Shoulders
	Intersection Enhancements
	Sidewalk Critical Gaps
	Potential Conflict Areas









LEGEND

	Granbury City Limits		Existing Off-Street Trails
	ETJ		Existing Park Loop Trails
	Existing Parks		Existing Bike Lanes
	Golf Courses		Existing Sidewalks
	Granbury Cemetery		Recommendations
	Schools		Recommended Sidewalk Improvement
	Bodies of Water		Intersection Enhancements
	Future Planned Developments		Sidewalk Critical Gaps

COMMONLY USED TRAIL & BIKEWAY SIGNAGE^{1,2}



R9-7
THE SHARED-USE PATH RESTRICTION

Location: Installed on facilities that are to be shared by pedestrians and bicyclists



R9-6
BICYCLE YIELD TO PEDESTRIAN

Location: At crosswalk
Size: 12" x 18" (min. for trails)



D4-3
BICYCLE PARKING AREA

Location: Installed where it is desirable to show the direction to a designated bicycle parking area. The arrow may be reversed as appropriate



D11-1
BIKE ROUTE

Location: At beginning of each route and at intersections
Size: 24" x 18" (min. for trails)



R9-5
USED PEDESTRIAN SIGNAL

Location: At crosswalk
Size: 12" x 18" (min. for trails)



R3-17
BIKE LANE

Location: Sign spacing should be determined by engineering judgment based on prevailing speed of bicycle and other traffic, block length, distances from adjacent intersections, and other considerations.

¹ Source: MUTCD and AASHTO Guide for the Development of Bicycle Facilities

² This inventory is not all-inclusive and application is subject to the advice of engineering and design professionals



**R3-17A
AHEAD**

Location: Should be mounted directly below a R3-17 sign in advance of the beginning of a marked bicycle lane



**M4-11, 12, 13, M7-1, 2, 3, 4, 5, 6, 7
BIKE ROUTE SUPPLEMENTAL PLAQUES**

Location: Where bike lanes begin, end, or change direction
Size: 12"x4", 12"x9" (min. for trails)



**R3-17B
ENDS**

Location: Should be mounted directly below a R3-17 sign at the end of a marked bicycle lane



BIKE MAY USE FULL LANE



**D1-1B, D3-1
DIRECTIONAL SIGNS**

Location: At intersections where access to destinations are available
Size: 24"x6" (min. for trails)



**R5-3
NO MOTOR VEHICLE**

Location: Entrance to trail
Size: 24"x24" (min. for trails)



**W16-1
SHARE THE ROAD**

Location: Where there is a need to warn motorists to watch for bicyclists traveling along the highway



**R1-1
STOP**

Location: At trail intersections and crossings
Size: 18"x18" (min. for trails)



**W11-1
BICYCLE WARNING**

Location: Orientated toward motorists at trail crossing
Size: 18"x18" (min. for trails)



**R1-2
YIELD**

Location: At trail intersections and crossings
Size: 18"x18"x18" (min. for trails)



**W11-2
PEDESTRIAN WARNING**

Location: Orientated toward motorists at trail crossing
Size: 18"x18" (min. for trails)



**W3-1
STOP AHEAD**

Location: Where stop sign visibility is obscured
Size: 18"x18" (min. for trails)



**W3-2
YIELD AHEAD**

Location: Where yield sign visibility is obscured
Size: 18"x18" (min. for trails)



**W3-3
SIGNAL AHEAD**

Location: Where traffic signal visibility is obscured
Size: 18"x18" (min. for trails)



**W1-1,2,3,4,5
TURN & CURVE WARNING**

Location: At turns and curves which exceed design speed criteria
Size: 18"x18" (min. for trails)



**W2-1,2,3,4,5
TRAIL INTERSECTION WARNING**

Location: At trail intersections where no stop or yield sign is required; locations with limited sight lines
Size: 18"x18" (min. for trails)



PLEASE STAY ON TRAIL

Location: In environmentally-sensitive areas of where the trail travels near wildlife and heavy vegetation
Size: 12" x 18" (minimum dimensions for trails)

TRAIL CLOSED: NO ENTRY UNTIL MADE ACCESSIBLE & SAFE FOR PUBLIC USE

Location: Where trail or access points are closed due to hazardous conditions or construction
Size : 18" x 18" (minimum dimensions for trails)

TRAIL REGULATIONS/RULES OF THE TRAIL

Location: Entrances to trail
Size : 18" x 18" (minimum dimensions for trails)

FUNDING SOURCES

The following section provides a list of local, state, and federal funding sources that can be explored by Granbury. This list is not all-inclusive but provides examples of available resources that can help propel the implementation of future active transportation and recreation facilities.

CITY OF GRANBURY

General Fund Expenditure. Primarily used for improvements or repairs to existing facilities. Typical general fund expenditures are for smaller repair and replacement efforts.

Bond Fund. Voter-approved debt financing that is paid back over time for large capital expenditures. This funding strategy is primarily targeted for new facilities.

Partnerships. May be established for trails within utility easements or railroad corridors. This partnership typically does not involve monetary contributions. Rather, it includes use agreements for easements held by utility companies.

STATE & REGIONAL

Recreational Trail Grants. Funds can be utilized on both motorized and non-motorized recreation trail projects, such as the construction of new recreational trails, improvements to existing trails, to develop trailheads or trailside facilities and to acquire trail corridors. The grants can be up to 80 percent of project cost with a maximum of \$300,000 for non-motorized trail grants and a maximum of \$600,000 for motorized trail grants.

Outdoor Recreation Grants. Provide 50 percent matching grant funds to cities, counties, Municipal Utility Districts (MUDs), and other special districts to acquire and may specify that these funds can be used for the development of trails. There is one funding cycle per year, with a maximum grant amount of \$750,000 for populations under 500,000.

Community Outdoor Outreach Program (CO-OP) Grants. Provide funding to local governments and non-profit organizations for programming that introduces under-served populations to environmental and conservation programs as well as TPWD mission-oriented outdoor activities. This is not a land acquisition or construction grant; this is only for programs. Grants are awarded to non-profit organizations, schools, municipalities, counties, cities and other tax-exempt groups. Individual grant requests may be between \$5,000 and \$50,000.

Transportation Alternatives. Administered through both TxDOT and local MPOs to provide funding for pedestrian- and bike-oriented infrastructure that facilitates walking and biking for short trips. Projects should have rights-of-way and easements settled, be able to advance to construction within three years, and show connections to multiple locations.

FEDERAL

RAISE Transportation Discretionary Grant Program. Rebuilding American Infrastructure with Sustainability and Equity grants focus on projects that provide significant economic benefits while also improving safe transportation options. Funding can be used for, but is not limited to, bicycle lanes, crosswalks, lighting, and bridges. Most bicycle and pedestrian projects will only be competitive under this program if they are part of a larger project with proven economic, equity and safety benefits at a regional level.

Surface Transportation Block Grant Program (STBG). Provides funds that are eligible for bicycle and pedestrian improvement projects. Federal funds are sub-allocated to the local level based on population and TxDOT then prioritizes projects and administers STBG funds.

Congestion Mitigation and Air Quality Improvement Program (CMAQ). Federal Highway Administration (FHWA) funds that are apportioned to states. CMAQ funds are intended to fund projects that improve air quality and reduce congestion. CMAQ funds may be used on projects related to pedestrian and bicycle infrastructure such as bicycle lanes, sidewalks, shared use paths, and signage. In Texas, CMAQ funds are included within TxDOT's Category 5 funding.

Federal Transit Administration (FTA). Provides funds for bicycle and pedestrian investment as they relate to transit. FTA funds may be used to fund improvements such as bicycle lanes, bicycle parking, bus shelters/benches, sidewalks, and lighting among others. To qualify for FTA funds, projects must provide or improve access to existing or planned transit facilities such as stops and stations.

The Community Development Block Grants (CDBG). Provides money for streetscape revitalization, which may be largely comprised of pedestrian improvements. Federal CDBG grantees may use the funds for real property, public facility improvements and planning. Trail master plan projects that enhance accessibility are a good fit for this funding source. CDBG funds could also be used to write an ADA Transition Plan for the city or support design and construction of projects. These funds are administered through the Texas Department of Agriculture and MPOs and must benefit low to moderate income households.

The Rivers, Trails, and Conservation Assistance Program (RTCA). A National Parks Service (NPS) program providing technical assistance via direct NPS staff involvement to establish and restore greenways, rivers, trails, watersheds, and open space. The RTCA program provides only for planning assistance - there are no implementation funds available. This program may benefit trail development throughout the region indirectly through technical assistance, particularly for community organizations, but should not be considered a future capital funding source.

Reconnecting Communities. A USDOT program that supports pedestrian and other transportation related infrastructure for large, impactful projects that reconnect communities that have been divided by transportation corridors. Equity, supportive stakeholders, and safety are key considerations.

OTHER FUNDING SOURCES

Aside from local, state, and federal funding, other organizations can provide funding or volunteer services to support improvements to the multi-use trail, sidewalk, and on-street bikeway networks. These groups include friends of the trail groups, service groups, youth service providers, and private corporate sponsorships.

CITY OF GRANBURY

ACTIVE TRANSPORTATION AND RECREATION PLAN

ADOPTED DECEMBER 6, 2022

