

AGENDA

FLOWER MOUND TOWN COUNCIL WORK SESSION

4/21/22

FLOWER MOUND TOWN HALL, 2121 CROSS TIMBERS ROAD
FLOWER MOUND, TEXAS

6:00 P.M.

An agenda information packet is available online at flower-mound.com/AgendaCenter

Please silence all electronic devices in Jody Smith Hall
Comments regarding any agenda item can be sent to the
Town Council by emailing towncouncil@flower-mound.com or calling 972.874.6005.

A. CALL WORK SESSION TO ORDER

B. INVOCATION

C. PLEDGE OF ALLEGIANCE TO THE AMERICAN FLAG AND TO THE TEXAS FLAG “Honor the Texas flag; I pledge allegiance to thee, Texas, one state under God, one and indivisible.”

D. PUBLIC COMMENT

The purpose of this item is to allow the public an opportunity to address the Town Council regarding any item on this agenda that is not a "Public Hearing". Issues regarding daily operational or administrative matters should first be dealt with by calling Town Hall at 972.874.6000 during business hours.

In accordance with the Texas Open Meetings Act, the Town Council is restricted from discussing or acting on items not listed on the agenda.

To speak to Council during public comment, please fill out a [comment form](#).

- Speakers are limited to 3 minutes, a tone will sound at 30 seconds left and when time has expired, and times may be adjusted by the mayor
- Speakers must address their comments to the Town Council
- Please state your name and address when speaking

E. WORK SESSION ITEM

1. Presentation and discussion regarding the Trails and Bikeways Draft Master Plan.
2. Presentation and discussion on the Cross Timbers Conservation Development District.
3. Presentation and discussion regarding the final report for Tennis Center Feasibility Study.

F. ADJOURN WORK SESSION

I do hereby certify that the Notice of Meeting was posted on the bulletin board in Town Hall of the Town of Flower Mound, Texas, a place convenient and readily accessible to the general public at all times and said Notice was also posted on the Town's website in accordance with GC Section 551.056 on the following date and time: April 18, 2022, at 2:50 p.m., at least 72 hours prior to the scheduled time of said meeting.

Theresa Scott, Town Secretary

The Flower Mound Town Hall and Jody Smith Hall are wheelchair accessible. Requests for accommodations or interpretive services must be made 48 hours prior to this meeting by contacting Theresa Scott, Town Secretary, at 972.874.6076. Additional time limits will be provided to members of the public that need to address the Town Council through a translator.



TOWN COUNCIL AGENDA ITEM NO. 1

WORK SESSION ITEM

DATE: April 21, 2022

FROM: Chuck Jennings, Director of Park and Recreation

ITEM: Presentation and discussion regarding the Trails and Bikeways Draft Master Plan.

BACKGROUND INFORMATION: The Town adopted its first comprehensive parks and trails master plan in 1989, which was updated in 1994, 2001, 2010, and 2017. These plans briefly touched on trails and did not cover bikeways. This Trails and Bikeways Master Plan is a comprehensive study that is just focusing on these two areas. The plan will serve as a roadmap to guide short and long-range priorities for the trails and bikeways network in Flower Mound over the next 10+ years. As part of the planning process, an assessment of existing conditions and future needs was conducted for off-street trails, on-street bikeways, equestrian trails, and nature trails.

The Town of Flower Mound entered into a Professional Services Agreement with Halff Associates on February 1, 2021, which was broken into five phases: Phase 1 – Community Understanding, Phase 2 – Community Visioning, Phase 3 – Needs Assessment, Phase 4 – Proposed Network, and Phase 5 – Action Plan. Staff held a kickoff meeting on February 23, 2021, with Halff regarding the master plan and the consultant toured many of the Town's trails and bikeways in March and April of 2021.

Throughout the months of May and June 2021, the consulting team conducted a community input survey which had close to 1,000 responses. The team hosted visioning meetings on May 4 and 5 that included three stakeholder listening sessions, a Steering Committee meeting, Technical Working Group meeting, and a public open house at the Community Activity Center, where over 80 people attended including some from the Town Council and various Town Boards and Commissions. For residents that could not attend these meetings, the Town offered residents the opportunity to visit a virtual engagement room which mimicked the items discussed and questions asked at the public open house. Some questions that were asked of different groups and of the public at the different meetings included the following:

- What is your vision for the future of trails and bikeways in Flower Mound?
- What are some of the challenges related to trails and bikeways in Flower Mound today?
- In your opinion, what is the most important action item that should result from this plan?
- What one word would you use to describe Trails and Bikeways in Flower Mound Today?
- What one word would you use to describe how you envision Trails and Bikeways in Flower Mound in the Future?
- Where are trails and bikeways most needed in Flower Mound?
- Where do barriers to walking, running, cycling, or horseback riding exist in Flower Mound today?

Key take away from the public engagement included:

- Creating more of an east/west connection
- Filling in gaps in the system
- Providing a variety of trail types throughout the Town
- Providing more connections to the USACE trails
- More designated bikeway accommodations
- Additional trail access points, trailheads, and trail amenities
- Completing the loops for equestrian trails

Halff was also tasked with performing a deep assessment on five different corridors within Flower Mound. The consultant toured these areas in July and August to fully understand the opportunities, constraints, and feasibility of constructing trail or bikeways. The five areas studied were Cross Timbers E/W Connection, Shiloh Dr., Long Prairie Rd. (Veloweb corridor), Gaston Park/Long Prairie Rd., and Timber Creek trail connection. The study of the five corridors will be included in the overall master plan and will address crossings, overhead clearance, utility conflicts, property ownership and estimates of probable costs.

As part of the master plan process, Halff Associates contracted with Civic Brand to develop a project brand identity package to be used throughout the planning process and in marketing pieces. In addition to the project branding, Civic Brand was responsible for the creation and updating of the project webpage (www.flowermoundtrailsplan.com) and the production of three short, informative videos regarding trails and bikeways to generate excitement about the plan. Lastly, Civic Brand worked with staff to develop trail branding considerations. Signage is typically provided at trailheads and at key decision-making points along a trail. Signage can mark access points to the trail, provide directional and distance guidance for trail users, direct users to locations of key amenities along the trails, and provide brand recognition of the trail system. Halff has incorporated the recommendations into the draft master plan.

The draft master plan will be presented at various meetings throughout April with final approval occurring in June. The schedule below details previous and upcoming meeting dates:

- o April 7 Parks Board / Transportation Commission – Joint Work Session
- o April 21 Town Council – Work Session
- o April 25 Planning & Zoning Commission – Work Session
- o May 5 Parks Board – Public Hearing
- o May 10 Transportation Commission - – Public Hearing
- o May 23 Planning & Zoning Commission - Public Hearing
- o June 6 Town Council - Public Hearing for the approval of the Master Plan

To keep up with Flower Mound's growth, new development and redevelopment, and shifting demographic trends, developing a Trails and Bikeways Master Plan is essential to ensure that these facilities meet the needs of the community today and in the future.

BOARD REVIEW/CITIZEN FEEDBACK: The Parks Board and Transportation Commission held a joint work session at the April 7, 2022, regular Parks Board meeting.

ALTERNATIVES/OPTIONS: N/A

FISCAL IMPACT: N/A

LEGAL REVIEW: N/A

ATTACHMENTS:

1.Draft Trails and Bikeways Master Plan

DRAFT MOTION: This item is for discussion proposes only.

TRAILS & BIKEWAYS MASTER PLAN

FLOWER MOUND, TEXAS

ACKNOWLEDGMENTS

The following individuals are recognized for their significant contributions to the preparation of the Town of Flower Mound Trails and Bikeways Master Plan.

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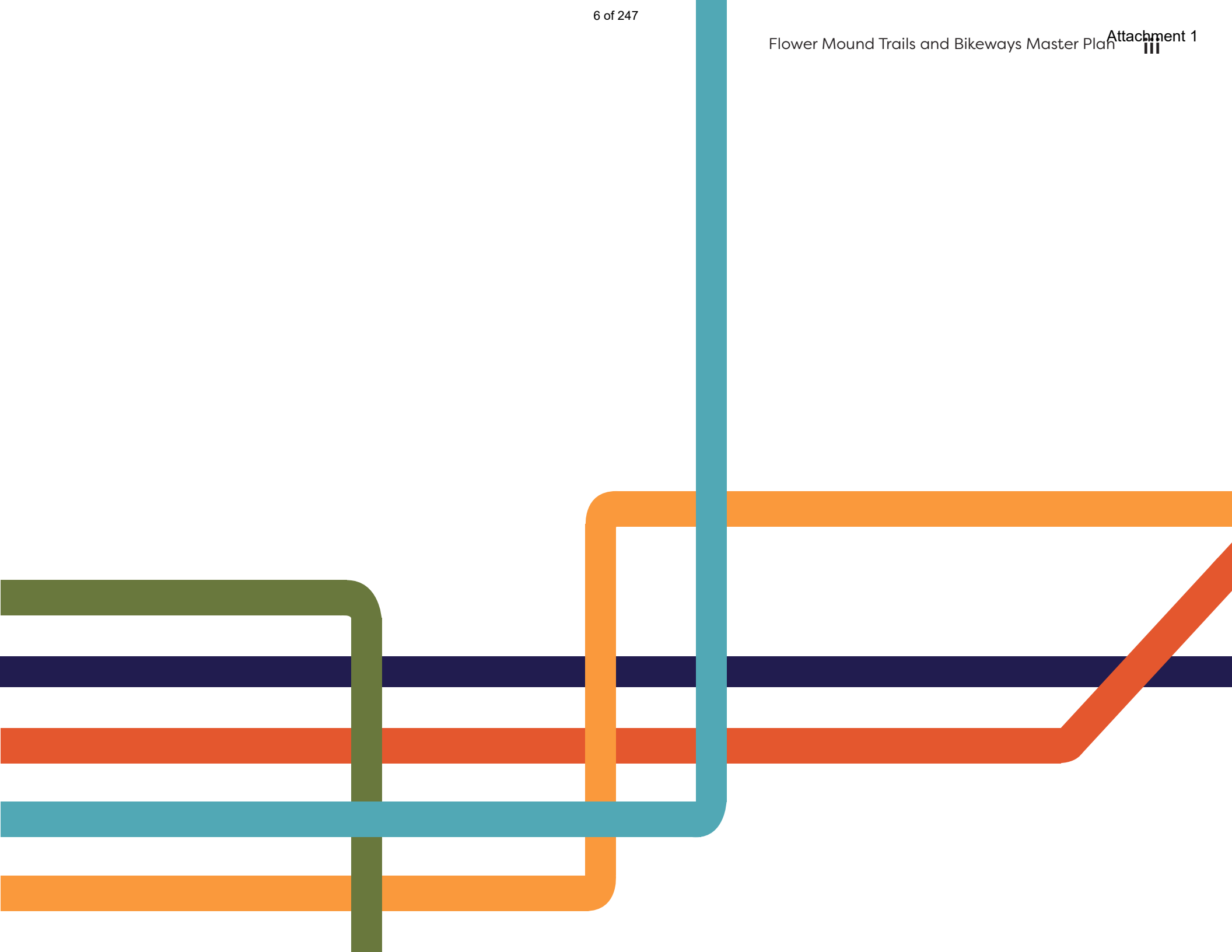
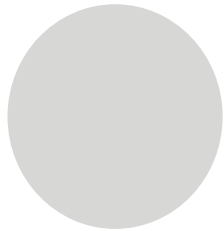


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LIST OF ACRONYMS

AASHTO: American Association of State Highway Transportation Officials
ACS: American Community Survey
ADA: Americans with Disabilities Act
ADAAG: Americans with Disabilities Act Accessibility Guidelines
CRIS: Crash Record Information System
CTETA: Cross Timbers Equestrian Trail Association
DFW: Dallas-Fort Worth
DORBA: Dallas Off-Road Bicycle Association
ESRI: Environmental Systems Research Institute
ISD: Independent School District
ITE: Institute of Transportation Engineers
LOS: Level of Service
NACTO: National Association of City Transportation Officials
NCTCOG: North Central Texas Council of Governments
PRMP: Parks and Recreation Master Plan
PROWAG: Public Rights-of-Way Accessibility Guidelines
ROW: Right-of-Way
RRFB: Rectangular Rapid Flashing Beacons
TAS: Texas Accessibility Standards
TMUTCD: Texas Manual on Uniform Traffic Control Devices
TTI: Texas Transportation Institute
TxDOT: Texas Department of Transportation
USACE: U.S. Army Corps of Engineers

Introduction
Plan Purpose
Benefits of Active Transportation
Planning Process
Plan Structure
Vision & Goals



01 INTRODUCTION





INTRODUCTION

The Town of Flower Mound Trails and Bikeways Master Plan serves as a blueprint for the future implementation of trail facilities and on-street bikeways throughout the town. The facilities recommended in this plan provide safe routes for cycling, walking, running, hiking, paddling, and horseback riding throughout the town and connecting to adjacent communities.

BACKGROUND

The Town of Flower Mound is located in Denton County. The town lies on the northern shore of Lake Grapevine, approximately 23 miles northwest of Dallas and 23 miles northeast of Fort Worth. With its proximity to the Dallas Fort Worth Airport, major employers and entertainment opportunities, a unique and cultivated environment, great schools, and high-quality public facilities, Flower Mound has become a desirable place to live in the Dallas-Fort Worth (DFW) Metroplex. The Town's population has grown 20% in the last 10 years and is projected to roughly double in size to 117,555 residents by 2045¹. While the eastern side of the town is primarily built out, there is an abundant amount of open space and vacant land in the western portion of Flower Mound. As the town continues to grow, the demand for a high-quality trails and bikeways system will continue to increase for both recreation and commuting purposes.

In 2017, the Town of Flower Mound updated their parks and recreation master plan. While this plan addressed trails, it did not provide the detailed guidance and implementation necessary to create a comprehensive system. The Town's intent was to later develop a trails and bikeways master plan to better assess the community's trail system needs today and in the future.

The trails and bikeways in Flower Mound today include a variety of branded trails named after wildflowers on the eastern side of town and soft surface trails used by hikers, mountain bikers, and equestrian users around Grapevine Lake. While these are great amenities and provide residents and visitors with active recreation opportunities, overall the trails are not well-connected and lack way-finding. This plan identifies key opportunities to expand and enhance the trails and bikeways system to connect residents to schools, parks, neighborhoods, entertainment centers, and adjacent communities.

¹ Source: NCTCOG Regional Data Center, 2020.

PLAN PURPOSE

The purpose of the Trails and Bikeways Master Plan is to guide the development of network recommendations, design guidelines, and implementation recommendations for a system of off-street trails and on-street bikeways that will connect users to key destinations within Flower Mound and provide connections to adjacent communities. This plan will augment previous planning efforts to create community and provide active and healthy lifestyle opportunities.

A key component of the Trails and Bikeways Master Plan is a needs assessment which determines the existing conditions of the trail system, compares it to similar communities, and explores opportunities to enhance the network. A corresponding implementation plan provides a guide for trail and bikeway development and design through the next decade.

KEY OBJECTIVES OF THIS PLAN:

- Create a *vision* for the trails and bikeways system based on a robust public engagement process;
- Conduct a *needs assessment* to determine how Flower Mound aligns with benchmark communities and where trails and bikeways are needed;
- Identify a *comprehensive and connected network* of trails and bikeways to be implemented over the next 20+ years;
- Provide *design standards and policy recommendations* for the system; and,
- Provide guidance necessary to *implement the plan* in short, mid, and long-range targets.

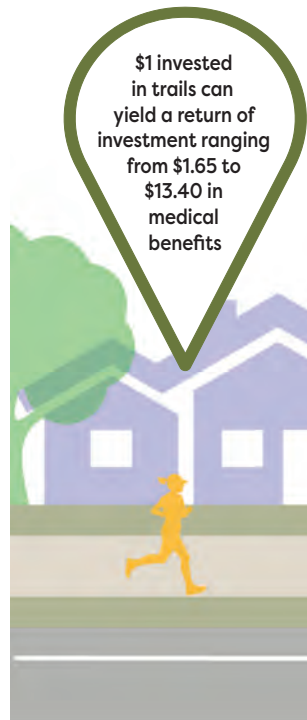


BENEFITS OF ACTIVE TRANSPORTATION

The benefits of active transportation are well documented and include: healthier lifestyles, economic benefits, safer spaces, and social benefits.

HEALTH BENEFITS

\$1 invested in trails can yield a return of investment ranging from \$1.65 to \$13.40 in medical benefits



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

ECONOMIC BENEFITS

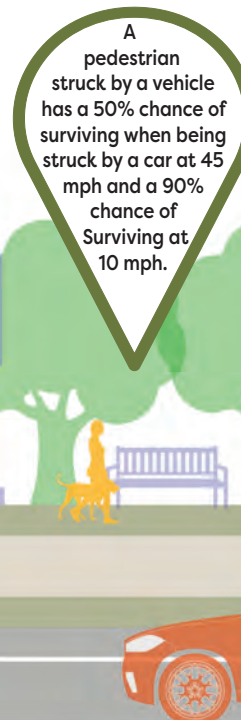
Estimated Costs:
Walking = \$0.02 per mile
Biking = \$0.05 per mile
Driving = \$1.22 per mile



Source: Active Transportation and Health Economic Impact Study, Southern California Association of Governments

SOCIAL BENEFITS

A pedestrian struck by a vehicle has a 50% chance of surviving when being struck by a car at 45 mph and a 90% chance of surviving at 10 mph.



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

SAFETY BENEFITS

2 miles of walking = 2/3 of the daily recommended physical Activity



Source: <https://www.saferoutespartnership.org/>

By providing a safe and connected trails and bikeways system, walking and biking becomes more convenient. It is easier to incorporate physical activity into daily life when there is an accessible system. Active transportation can help combat obesity, improve mental health, and improve moods.

Proximity to parks and trails can have a positive impact on property values. There has been an increased demand for walkable places in Flower Mound, as illustrated in the Town Plan. Walking and biking can reduce costs associated with vehicle ownership, like routine maintenance, gas, and wear and tear on tires.

Trails and bikeways can connect residents to neighborhoods, parks, schools, entertainment areas, and surrounding communities. By activating the public realm, you can create social spaces that encourage interaction, and increase safety along corridors. Trails and bikeways provide safe, equitable transportation options.

Roadways can be designed to be safer for all roadway users. Improvements include reduction in the number or width of travel lanes, widths, and speeds as well as intersection and mid-block crossing improvements. This can lead to less severe crashes, increased comfort, and usability of the roadway system for all users.

PLANNING PROCESS

The development of this plan spanned approximately 15 months, starting in February 2021 and concluding in April 2022. Throughout this process, Town staff, a designated steering committee, stakeholders, elected/appointed officials, and citizens were engaged to guide the master plan recommendations. The resulting community-driven vision forms the foundation for the future of trails and bikeways in Flower Mound for the next decade.

Phase 1: Community Understanding

The first step in any planning process is understanding the existing trails and bikeways system in the Town. This includes assessing the trails system, identifying strengths and opportunities, as well as gaining an understanding of the current population and relevant studies that may impact the Trails and Bikeways Master Plan.

Phase 2: Community Visioning

Engaging the community for their vision to create the overall system helps to create the vision and goals for plan. Engagement opportunities included virtual engagement rooms, public open houses, an online survey, interactive maps, and pop-up tents at community events.

Phase 3: Needs Assessment

An analysis of the needs and overall trails system compared to national best practices helps to identify recommendations for the proposed trails and bikeways network. This includes assessing the existing network, identifying safety issues and barriers, determining where gaps may exist, and assessing demand for new facilities.

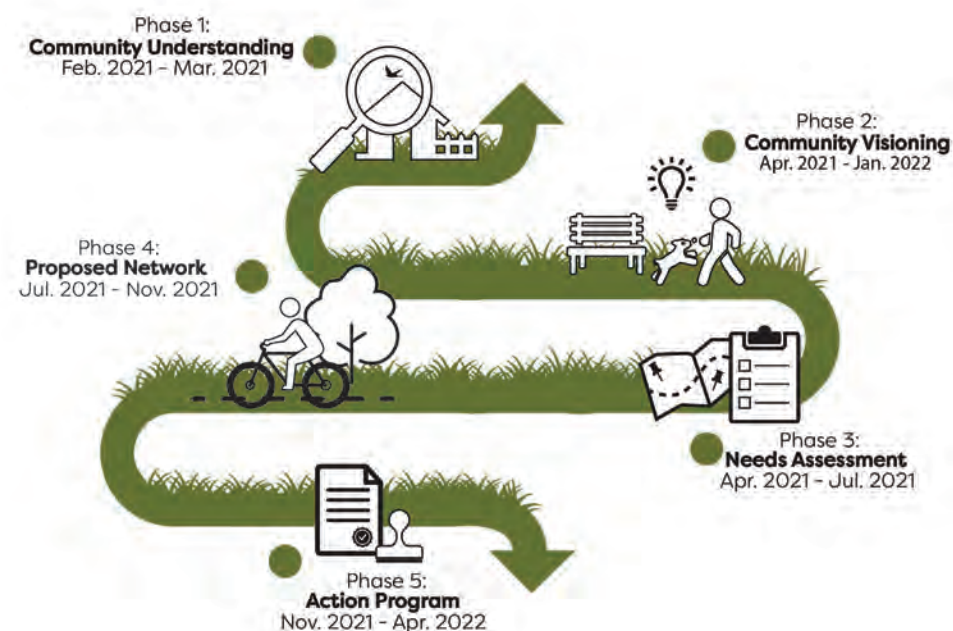
Phase 4: Proposed Network

Based on the needs assessment, a proposed network was created based on the barriers, opportunities, and desires of the community. The proposed network includes a variety of facility types, guidance on facility design standards, and policies related to bikeway and trail development.

Phase 5: Action Program

Finally, an action plan was developed to provide implementation strategies to create the proposed network. Recommendations for implementation are prioritized by short-term (1-5 years), mid-term (6-10 years), and long-term (10+ years) priorities.

FIGURE 1.1 PLANNING PROCESS



PUBLIC VISIONING EXERCISES

PLAN STRUCTURE

The Flower Mound Trails and Bikeways Master Plan is separated into seven chapters.

01

Introduction – Describes the plan purpose and background and provides the plan's vision and goals.

02

Community Context – Provides an overview of the Town of Flower Mound, including demographics, relevant plans and studies, and the existing trails and bikeways system.

03

Trails & Bikeways System Needs – Documents the analysis undertaken which determines the needs for additional trails and bikeways by determining the current level of service, community needs, and barriers and opportunities for the system.

04

Trails & Bikeways System Network – Creates a proposed network and facility hierarchy to connect neighborhoods to key destinations and to surrounding communities.

05

Trails & Bikeways Standards – Provides design guidelines for the creation of bikeway facilities, roadway crossing safety, trailheads and amenities, signage/way-finding, maintenance, and a framework for a branding system.

06

Implementation – Prioritizes projects and provides implementation strategies for short and long-term improvements. This chapter identifies policy recommendations, potential projects, and potential funding mechanisms and partnerships to develop the system.

07

Appendix – Provides additional data, graphics, and resources to support the Trails and Bikeways Master Plan.

PLAN VISION AND GOALS

Visioning was a substantial part of the public engagement process. In the first phase of the project, the Town hosted a variety of meetings among key stakeholders and the general public. During those meetings, attendees were asked how they envision walking, cycling, riding, and paddling in Flower Mound in the future. Input from the engagement helped shape the vision and goals for the Town of Flower Mound Trails and Bikeways Master Plan.

PLAN VISION

The Town of Flower Mound will have a connected, safe, and accessible system of trails and bikeways that promotes public health, economic development, and active transportation to improve overall quality of life for residents and visitors for generations to come.

GOAL 1: CONNECTED COMMUNITY

Create a complete trails and bikeways system that connects the community with active transportation options.

Objective 1.1: Increase trail level of service.

Objective 1.2: Provide trail and bikeway connections to key destinations.

Objective 1.3: Fill in gaps in the existing trail system.



**PUBLIC VISIONING EXERCISES:
ARTS FESTIVAL**

GOAL 2: SAFE AND ACCESSIBLE SYSTEM

Ensure the trails and bikeway system is safe, comfortable, and accessible for users of all abilities and ages.

Objective 2.1: Provide a variety of facility types appropriate for different abilities.

Objective 2.2: Improve overall safety and comfort of existing facilities.

Objective 2.3: Address areas identified as barriers within the existing trail system.

GOAL 3: USER FRIENDLY

Improve awareness, signage, and usability of the trails and bikeways system.

Objective 3.1: Increase awareness of the existing trail and bikeway system.

Objective 3.2: Create a consistent brand across the trails system so it is easily recognizable.

Objective 3.3: Install wayfinding signage to direct users to destinations along the trails.

GOAL 4: UNIQUE SYSTEM

Design and construct trails that support the health and wellness of the community and natural environment.

Objective 4.1: Provide for safe and convenient active transportation options.

Objective 4.2: Provide for interpretative and educational opportunities along trails.

Objective 4.3: Utilize an environmentally-friendly and context-sensitive approach to developing and maintaining trails.



INDIAN BLANKET TRAIL

GOAL 5: PARTNERSHIPS

Leverage partnerships between the Town and the community, internal and external organizations, and outside agencies to achieve a connected trails and bikeways system.

Objective 5.1: Pursue joint projects with surrounding cities, the County, NCTCOG, TxDOT, USACE, and utility providers.

Objective 5.2: Maintain relationships with user groups to solicit feedback on the trails and bikeways system.

Objective 5.3: Work with other departments to incorporate bicycle and pedestrian accommodations into ongoing or upcoming projects.

GOAL 6: FUNDING

Pursue a variety of funding sources for trails and bikeway development.

Objective 6.1: Apply for grant funding to implement trail and bikeway projects.

Objective 6.2: Continue to work with developers to ensure trails and bikeways are included with new development.

Objective 6.3: Coordinate with user and volunteer groups to help fund improvements to trails and bikeways.



LAKESIDE MIXED USE DEVELOPMENT

History
Demographics
Planning Guidelines
Existing Trails and Bikeways System



02 COMMUNITY CONTEXT



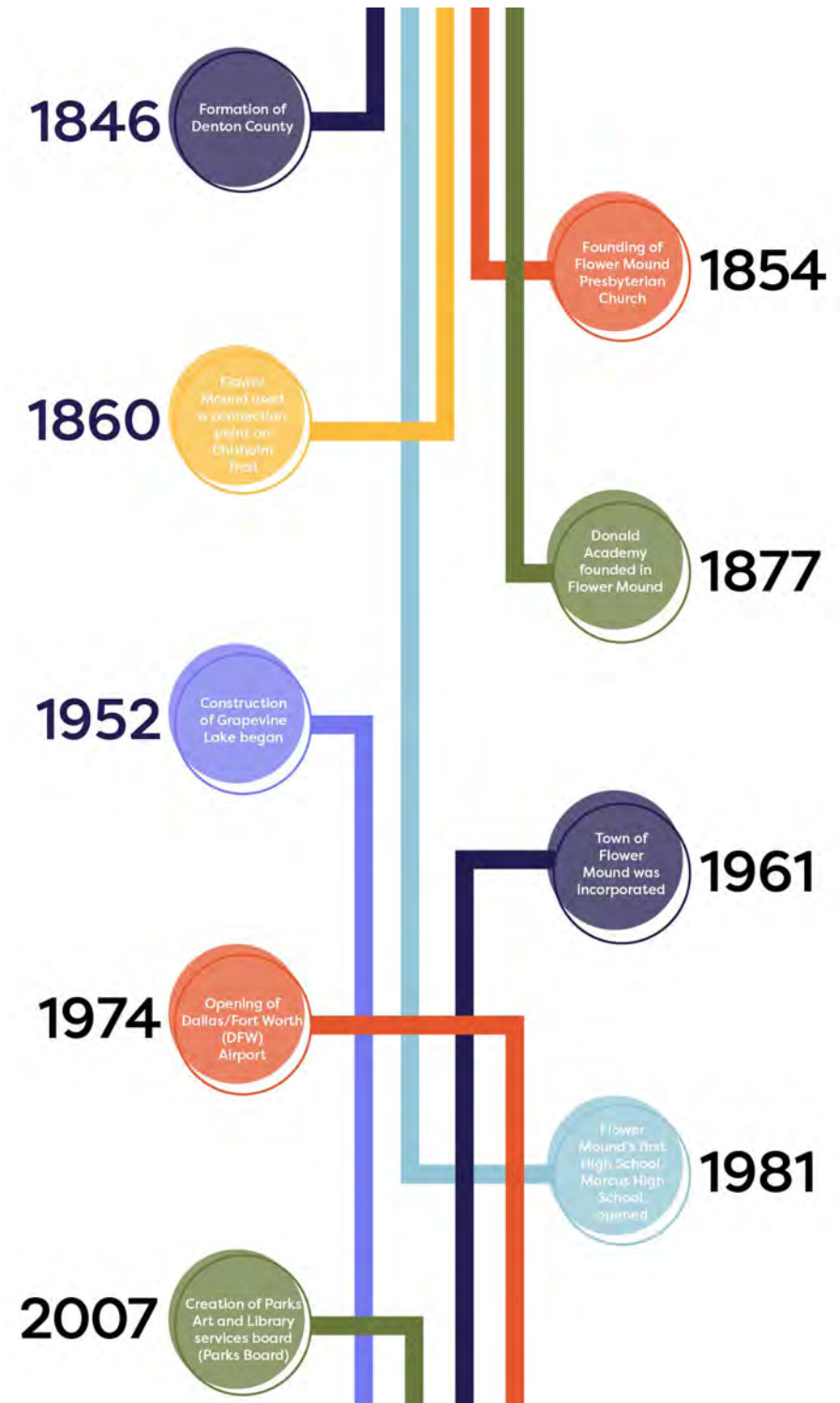
HISTORY

Based off archaeological surveys completed by the U.S. Army Corps of Engineers (USACE), people settled in Denton County as early as 4,000 – 2,500 B.C. However, in 1846 Denton County was officially formed in Texas. During the 1840s, the area of Flower Mound was used as religious camps and was permanently inhabited during the 1850s. In 1854, Flower Mound Presbyterian Church was founded. Flower Mound's most unique feature is its natural landscape. This made the area a great location for the Chisholm Trail. During the 1860s, along what would be Interstate 35 West (I-35W) today, the Chisholm Trail provided a network to over six million cattle during the 20-year period following the Civil War. In 1877, Donald Academy was founded in Flower Mound and was the largest rural school in Denton County. The school catered to grades first to tenth.

Transitioning into the 20th century, the landscape of Flower Mound began to truly take its form. In 1952, the construction of Grapevine Lake began and lasted for about a year. With the opening of road networks during the late 1950s like I-35 East, regional visitors could travel more easily throughout the Dallas-Fort Worth Area. To avoid being annexed by the City of Irving, in 1961 the Town of Flower Mound incorporated, and Bob Rheudasil became the first mayor of the Town. With the opening of Dallas/Fort Worth (DFW) Airport in 1974, Flower Mound's population boomed. During this decade, the first school in the Lewisville Independent School District opened in Flower Mound, Timber Creek Elementary. Then in 1981, Marcus High School, Flower Mound's first high school within the town boundaries, opened its doors to students. While the first traces of Flower Mound's Park Board dates before 1985, in 2007 the Town's Parks, Art and Library Services Board was created which is now readily recognized as today's parks board. Over the years, Flower Mound has continued to expand and build a community filled with recreation opportunities for its residents.



FIGURE 2.1: HISTORICAL TIMELINE OF FLOWER MOUND



DEMOGRAPHICS

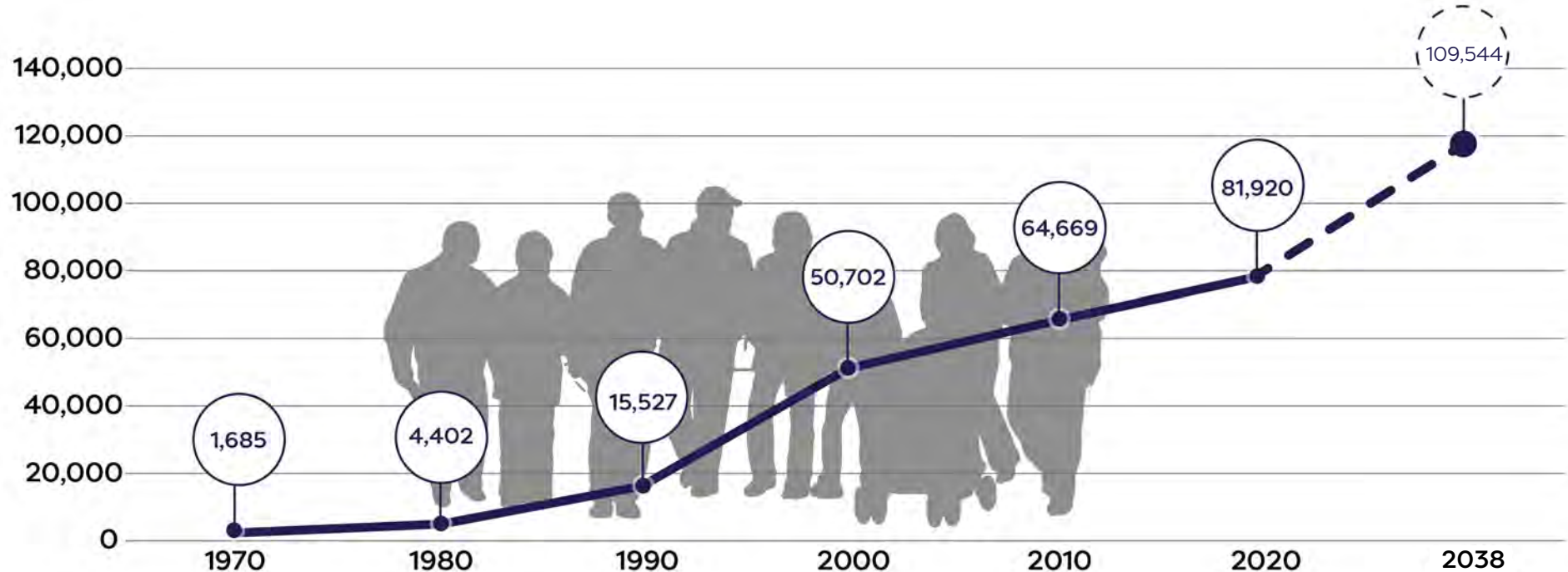
The demographic makeup of a community is significant in the beginning of the planning process. Demographic characteristics such as population growth, age, gender, race, and income help paint the landscape of a community and contribute to what the needs are for different trails and bikeways.

GROWTH TRENDS

Flower Mound experienced a significant increase in population during the 1970s. This corresponds with many neighboring communities as the entire region saw a huge population boom during this time with the opening of DFW Airport in 1974 and subsequent expansion of road networks and job opportunities. Over the next 30 years, Flower Mound's population would continue to expand exponentially, with the most significant growth period occurring during the 1980s. After the 1990s, Flower Mound's population growth began to plateau. However, the town has seen an increase in their population by 54 percent since 2000. Based off population projections by the Town of Flower Mound, by 2038 the Town will be built-out with a population of approximately 109,544 residents. This would be about a 50 percent increase over the next 20 years.



FIGURE 2.2: FLOWER MOUND POPULATION GROWTH



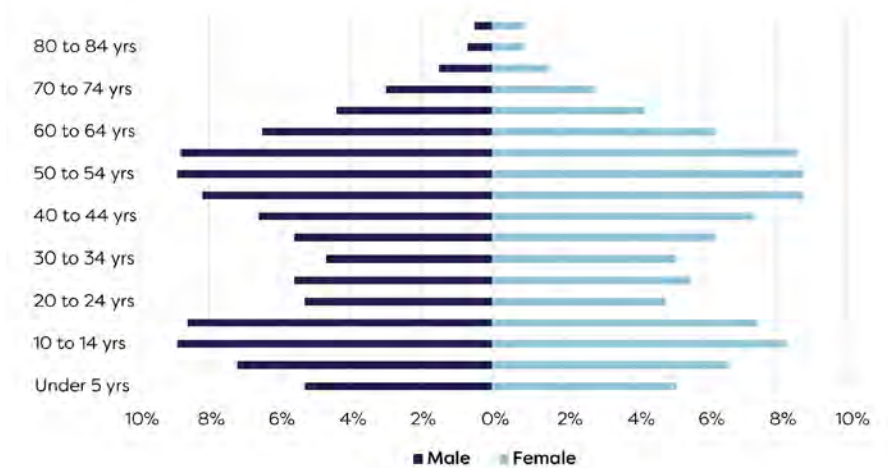
Source: Town of Flower Mound Planning Department

AGE AND GENDER CHARACTERISTICS

Flower Mound's population is characterized by two principal age groups: middle-aged adults and children. In 2020, individuals between the ages of 45-54 represented the largest portion of the population, equaling 17.4 percent. The next largest age group is between the ages of 55-64 making up 11 percent. The third largest group is younger adults between the ages of 10-14. Together these three cohorts reflect an older population being dominant in Flower Mound along with a strong presence of families. This idea can also be reinforced through the Town's median age of 39 years. This is older than both Denton County's median age of 35 and the state of Texas median age of 34.

Females make up 50.8 percent of the overall population. However, males in Flower Mound surpass their female counterparts between the ages of 5 to 24 and 50 to 74. The age groups where females surpass males is children under the age of 5 and individuals between the ages 30 to 49 and 70+.

FIGURE 2.3: AGE AND GENDER, 2020



RACE AND ETHNICITY CHARACTERISTICS

In 2020, 77.7 percent of Flower Mound's population identified as white, followed by 12.5 percent of residents identifying as Asian, and 4.4 percent identifying as Black. The percentage of residents that identify as Hispanic ethnicity is 9.9 percent. Over the past ten years, Flower Mound's overall population has increased by about 27 percent and during that time most racial and ethnic groups saw an increase as well. The group with the largest percent increase was the Asian population (85 percent increase from 2010 to 2020). The second group that saw the second largest increase was Black residents with a percent increase of 74 percent.

TABLE 2.1: RACE AND ETHNICITY CHARACTERISTICS

Race	2010	2020	Percent Change
Total Population	64,669	81,920	26.7%
White	83.8%	77.7%	- 17.3%
Black	3.2%	4.4%	74.4%
American Indian and Alaska Native	0.5%	0.5%	23.5%
Asian	8.6%	12.5%	85.4%
Native Hawaiian and Other Pacific Islander	0.1%	0.1%	45%
Other Race	1.6%	2.1%	62.9%
Two or More Races	2.2%	2.7%	59%
Ethnicity			
Hispanic or Latino (of any race)	8.4%	9.9%	49.7%

Source: U.S. Census Bureau, Census 2010 Summary File 1. ESRI forecasts for 2020.

HOUSEHOLD CHARACTERISTICS

The majority of Flower Mound's housing stock is occupied and owned. In 2020, 99 percent of housing units were occupied. Since 2010, this percentage has increased by 2 percent. Of the occupied housing units in Flower Mound, 83.9 percent are owned, meaning that the remaining 15.4 percent are rented. The remaining 0.8 percent represents vacant units. These housing characteristics have stayed relatively consistent since 2010. The average housing value is currently \$403,416, which is one of the highest average values in the DFW region. 51.1 percent of houses in Flower Mound fall within the value bracket of \$300,000 to \$499,999.

The median household income in Flower Mound is \$138,873. This is significantly higher than the median household income of Denton County (\$86,913) and the state (\$61,874). Of the residents that live in Flower Mound, 68.8 percent of the population make \$100,000 or more. These housing characteristics indicate that many households in Flower Mound have higher disposable incomes than other communities in the DFW region to spend on recreation and leisure.

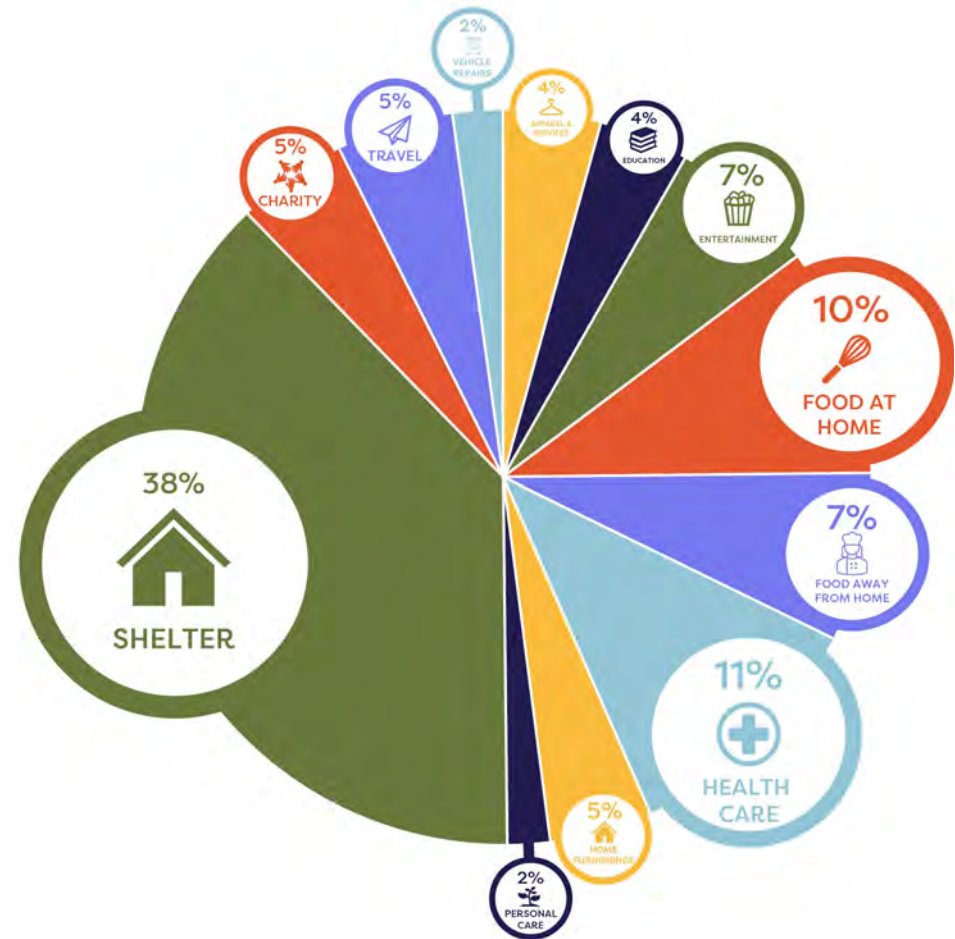
Figure 2.4 displays Flower Mound's consumer spending in 2020. Consumer spending shows the amount spent on a goods and services by households in Flower Mound in the year of 2020. The largest category individuals in Flower Mound spent money on was towards their houses (38 percent). The second largest category was spent towards health care costs (11 percent). Followed by food categories, such as food at home (10 percent) and food away from home (7 percent).

TABLE 2.2: HOUSEHOLD CHARACTERISTICS (2010-2020)

	2010	2020
Total Housing Units	43,097	51,244
Occupied Housing Units (%)	90.6%	91.1%
Vacant Housing Units (%)	9.4%	8.0%
Owner-Occupied Housing Units	18,488	22,747
Median Mortgage Cost	\$1,545	\$1,698
Renter-Occupied Housing Units	47.7%	46.7%
Median Rent	\$782	\$1,082
Total Households	95,794	126,100
Median Household Income	\$44,415	\$60,018

Source: 2015-2019 American Community Survey 5-Year Estimates; 2006-2010 American Community Survey 5-Year Estimates.

FIGURE 2.4: CONSUMER SPENDING



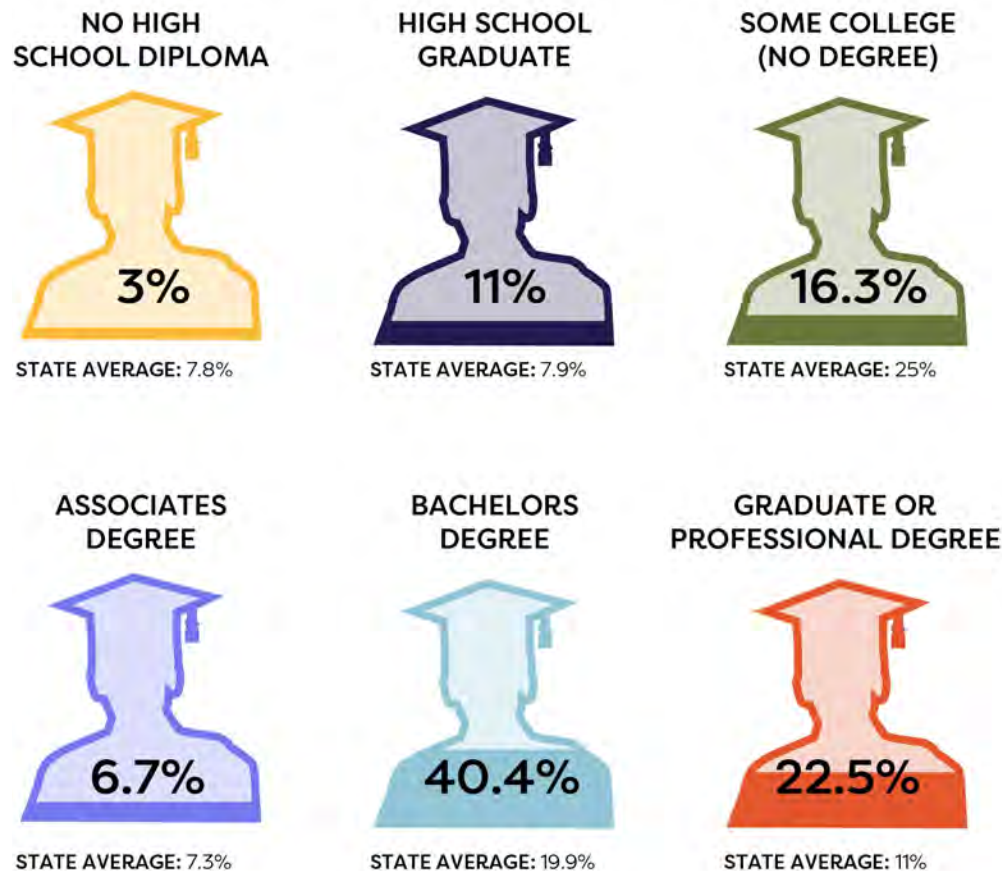
Source: U.S. Census Bureau, Census 2010 Summary File 1. ESRI forecasts for 2020.



EDUCATIONAL ATTAINMENT

Among the residents in Flower Mound who are over the age of 25, 40.4 percent have a bachelor's degree. This percentage is higher than the Denton County average at 30.8 percent and the state average at 19.9 percent. The next largest group is residents who earned their graduate or a professional degree, which make up 22.5 percent of Flower Mound's population. This percentage is also higher than the Denton County average of 15.4 percent and the state average of 11 percent. Overall, most of the population who are over the age of 25 have received a bachelor's degree or higher.

FIGURE 2.5: EDUCATIONAL ATTAINMENT, 2020



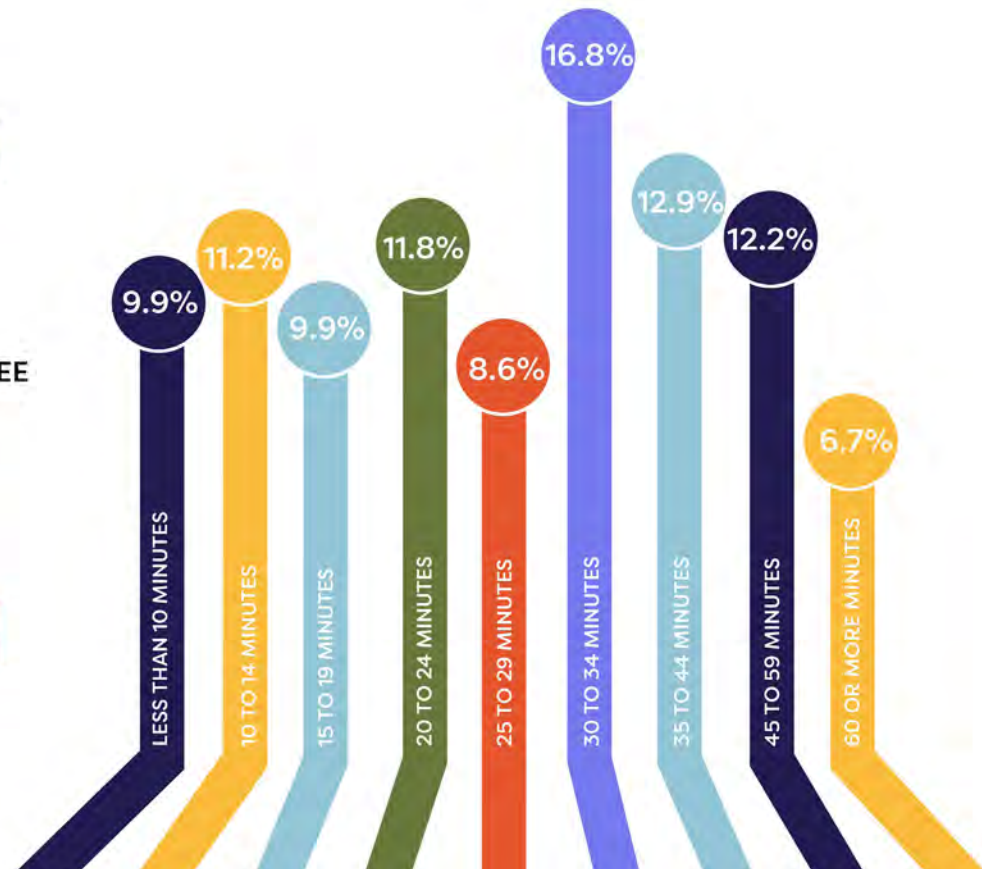
Source: U.S. Census Bureau, Census 2010 Summary File 1. ESRI forecasts for 2020.

COMMUTE TIME

According to the Census Bureau, the average commute time in 2019 was 28.4 minutes. Over the past five years, this number has decreased from 29.2 minutes and currently is at its lowest. For the working population over the age of 16, the most common commute time frame was between 30-34 minutes (16.8 percent). Additionally, 21.1 percent of the population in Flower Mound have a shorter commute time between 10-19 minutes and 25.1 percent of the population have a longer commute time between 35 – 59 minutes. In 2019, most of the population used a car, truck, or van as a means of transportation to work (86.6 percent). This number has fallen slightly since 2014. Over the past five years, Flower Mound has seen an increase of its population working from home and biking to work.

FIGURE 2.6: AVERAGE COMMUTE TIME, 2019

Source: U.S. Census Bureau, 2018 ACS 5-Year Estimates.

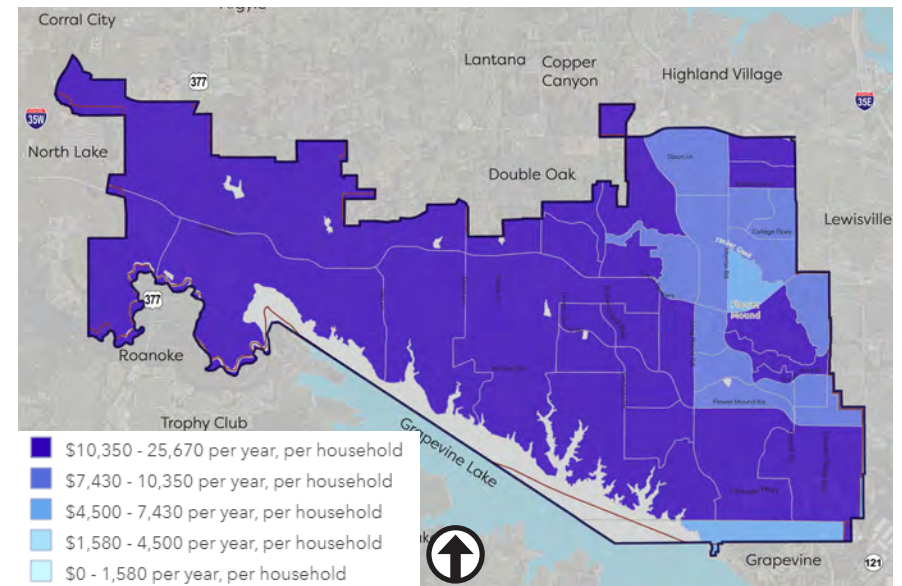


HEALTH

Figure 2.7 displays the average amount spent on healthcare per household in Flower Mound in 2021. All residents in the Town spend at least \$4,500 per year towards their health. However, the largest proportion of the Town spends in the highest bracket that ranges between \$10,350 - \$25,670 a year. This aligns with healthcare services being the second largest category of consumer spending for the Town.

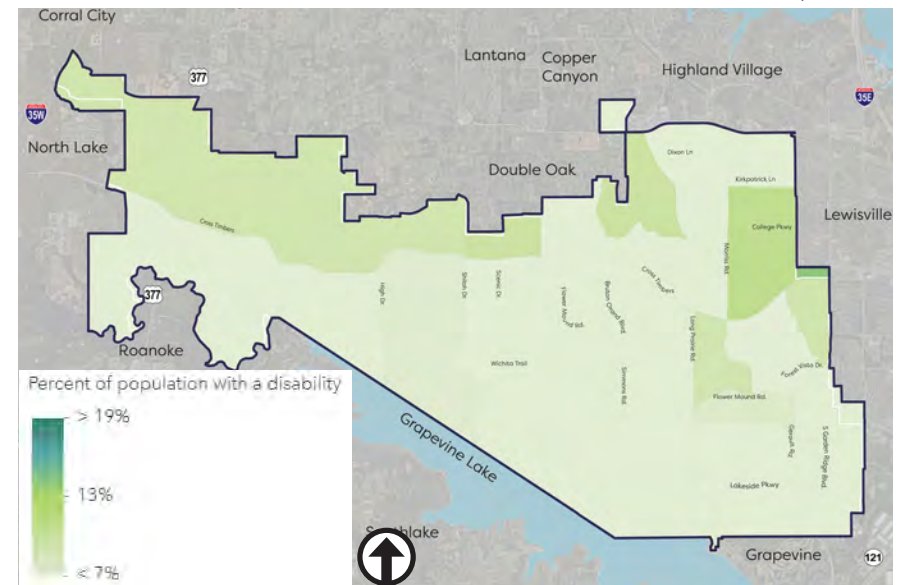
Figure 2.8 displays the percent of population with a disability, based off the six different types of disabilities: mobility/physical, visual, mental health, intellectual, hearing, and learning. Overall, Flower Mound has a low percentage of its population with a disability; in 2019, 5.8 percent of Flower Mound residents had a disability. The largest share of the population with a disability was residents over the age of 65 (55 percent). They are also concentrated on the east side of Flower Mound between Kirkpatrick St and Cross Timbers, primarily around the Pink Evening Primrose Trail.

FIGURE 2.7: HEALTH SPENDING, 2021



Source: ESRI's 2021 U.S. Consumer Spending Data in Census 2010 Geo-graphics, Business Analyst.

FIGURE 2.8: PERCENT OF POPULATION WITH A DISABILITY, 2014



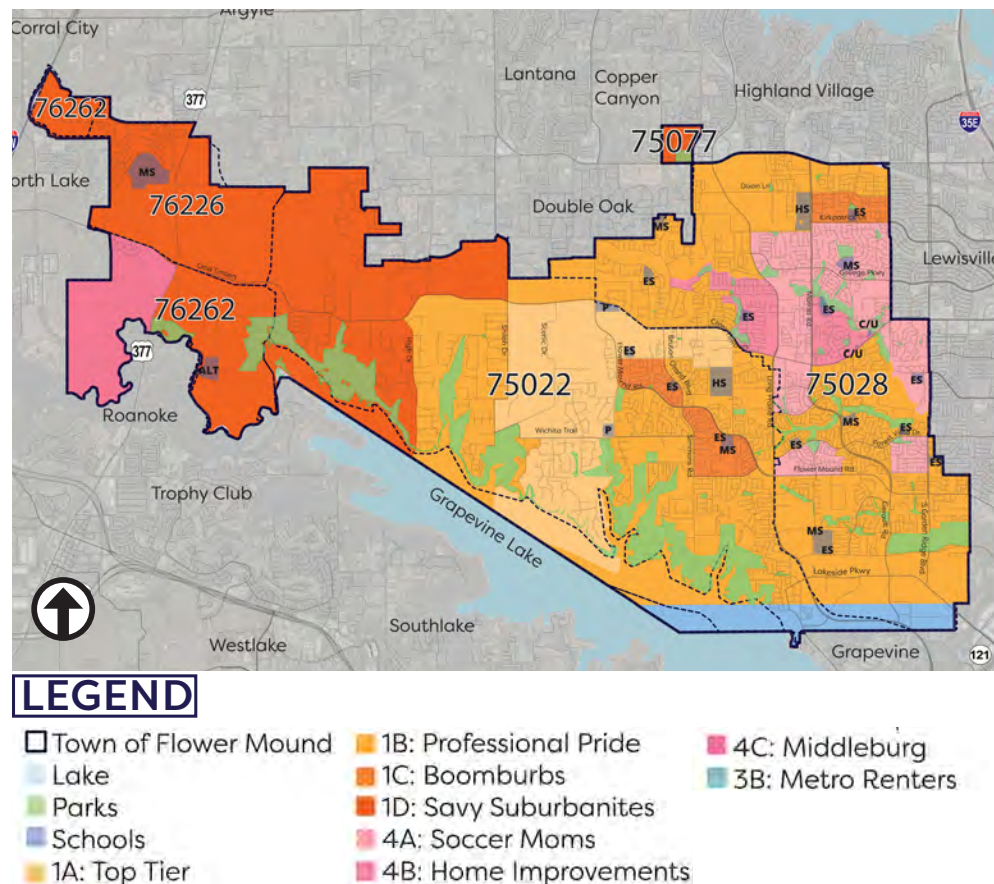
Source: 2010-2014 American Census Survey 5 year-data, Business Analyst.



ESRI TAPESTRY SEGMENTS

ESRI (Environmental Science and Research Institute) is a demographic and mapping company that uses spatial data to help inform communities. The ESRI tapestry market segmentation identifies markets in each community using its geographic, socioeconomic, and demographic characteristics. This helps communities better understand their consumer market. Based on Census block groups in Flower Mound, the top three most represented segments within Flower Mound are “Professional Pride,” “Soccer Moms,” and “Boomburbs.” Page 25 and 26 display all the segments that are represented within Flower Mound along with their associated characteristics and definitions. **Figure 2.9** displays the location of zip codes in Flower Mound and the associated tapestry segments.

FIGURE 2.9: ESRI TAPESTRY SEGMENTS





1A TOP TIER

This segment is considered the wealthiest Tapestry market; members earn more than three times the average US household income. They are also highly educated and more than one in three residents have a postgraduate degree. They are socially responsible consumers that aim for a balanced lifestyle and take interest in expanding their knowledge.

Median Household Income

\$173,200

Median Age

47.3

Average Household Size

2.84



1B PROFESSIONAL PRIDE

These residents are well-educated, career professionals that work in fields such as science, technology, law, or finance. They are goal-oriented and have well established families. Households in this segment like routine as a daily ingredient to their lifestyle.

Median Household Income

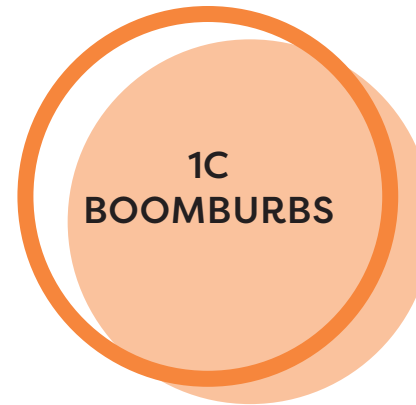
\$138,100

Median Age

40.8

Median Household Size

3.13



1C BOOMBURBS

This is a new growth market with many well-educated young professionals with new families. The unemployment in this segment is low and most households have more than two workers. They are well connected to the newest technology and trends. Physical fitness is a priority for this group and leisure activities include sports such as hiking, biking, and golf.

Median Household Income

\$113,400

Median Age

34

Median Household Size

3.25



1D SAVVY SUBURBANITES

This segment includes residents who are well educated and well capitalized. They are informed shoppers and do extensive research prior to making a purchase. They are in older neighborhoods and include families that have no children or adult children. Their suburban lifestyle has a focus on the outdoors like gardening or active pursuits.

Median Household Income

\$108,700

Median Age

45.1

Median Household Size

2.85



4A SOCCER MOMS

These residents are an affluent and family-oriented market. The neighborhoods have a country flavor that are in the suburban periphery of metropolitan areas. This group carries a higher level of debt with the largest proportion having only some college. They favor time saving services and purchases revolve around family-oriented products. Outdoor activities are an important aspect of this group's lifestyle.

Median Household Income

\$90,500

Median Age

37

Median Household Size

2.97

4B HOME IMPROVEMENT

This group is comprised of primarily married couple families that own a single-family home. They have high participation in the labor force and households typically have 2+ workers. Majority of incomes go towards paying off student loans, home mortgages, and eating out.

Median Household Income

\$72,100

Median Age

37.7

Median Household Size

2.88

4C MIDDLEBURG

These residents have transformed from the easy pace of country living to semi-rural subdivisions. They are family-oriented consumers and typically a younger demographic. 65 percent have a high school diploma or some college and have a labor force participation rate typical of a younger population. Outdoor activities popular with this segment include hunting, fishing, and baseball.

Median Household Income

\$59,800

Median Age

36.1

Median Household Size

2.75

3B METRO RENTERS

This segment is highly mobile and well educated with many still enrolled in college. Socializing is important to them as well as environmentally safe practices. They participate in leisure activities such as outdoor activities and yoga. They are very well connected and get a lot of their information via technology.

Median Household Income

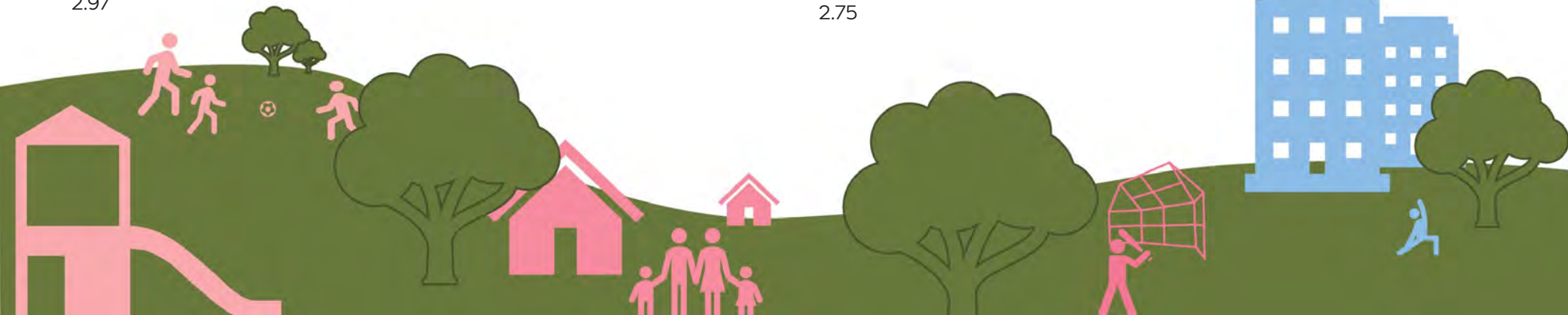
\$67,000

Median Age

32.5

Median Household Size

1.67



PLANNING GUIDANCE

PARKS AND RECREATION MASTER PLAN UPDATE

The 2017 Parks and Recreation Master Plan (PRMP) provides a framework for strategies regarding acquisition and development of recreation facilities for Flower Mound in the future. This plan focuses on the needs of the community within the next five to ten years and uses insights through engagement efforts as a foundation. The primary outcomes of the master plan were to identify a vision for the Parks and Recreation Department, determine the level of needs in current offerings, identify new opportunities that can be met by the department, complete initial testing on strategies for funding, and identify possible parks/facility components for new and future facilities. Finally, this plan identifies a variety of recommendations for the direction of the Parks and Recreation facilities for implementation.

According to the PRMP's level of service analysis, **paved multi-use trails were listed as the highest priority need** out of all parks and recreation amenities assessed as part of the plan. Nature trails and unpaved multi-use trails were also listed as a high priority. Additionally, the overall quality of walking/biking trails was identified as the highest-ranking response for survey takers when asked which services should receive the most attention over the next five years. Equestrian trails were ranked near the bottom in several questions related to identifying needs and priorities moving forward.

The strategic recommendations in the Parks and Recreation Master Plan outline action plans towards the community vision. There are four core community visions that are summarized by parkland and trails community mandates, facilities, programming, and operations and staffing. These four concepts each have a set of strategies that can be used as a road map for the future.

FIGURE 2.10: PRIORITIZED PROGRAM RANKING IN PARKS MASTER PLAN

Facility	Priority
Paved multi-use trails	High
Small neighborhood parks	
Nature trails (paved and unpaved)	
Large community parks	
Outdoor swimming pools/water parks	
Outdoor amphitheaters	
Off-leash dog park	
Unpaved multi-use trails	Medium
Community garden	
Outdoor water splash pads	
Picnic areas/pavilions	
Outdoor tennis courts	
Playground equipment	
Indoor gymnasiums	
Outdoor basketball courts	
Disc golf course	Low
Outdoor fishing areas	
Soccer fields	
Campgrounds	
Skate park	
Baseball & softball fields	
Football & lacrosse fields	
Boardwalks	
Cricket fields	
Equestrian trails	



BLUEBONNET TRAIL

ECONOMIC DEVELOPMENT PLAN

The mission of the economic development plan is to expand the commercial tax base and increase sales tax revenue through resiliency and sustainability efforts. This plan outlines goals, objectives, and strategies to create a diversified and regionally competitive economy within Flower Mound. One major goal outlined in this plan is to develop community resources that contribute to a business environment to encourage development. One example of a strategy that supports this concept is the prioritization of transportation and mobility planning to ensure the efficiency of the thoroughfare system. Another example is maintaining comprehensive park systems and preserving the natural environment that enhance the quality of life and support economic goals. Together, these strategies work to support the community in encouraging high-quality development and promote economic activity.



OPEN SPACE PLAN

A previous vision for Flower Mound identified that a key goal was focused on preservation. The open space plan creates the foundation of a vision for how to adequately produce strategies towards defining and conserving open spaces. These strategies provide an array of techniques to maintain the town's unique natural environment. The plan highlights that it is not to be used as simply an inventory but instead provides an appropriate menu of protection techniques for agricultural, natural, and scenic open spaces in Flower Mound. This plan also determines funding strategies with the best potential as well as voluntary and incentive opportunities for landowners. Finally, the plan does reference providing trail connections throughout open space areas, but also notes that paved recreational trails are not the primary intended use of open space in Flower Mound.



LAND USE PLAN

The Land Use Plan aims to promote more efficient uses of land within Flower Mound. The plan goals center around preservation of the unique natural environment, mitigation efforts of rapid urbanization, creation of a balanced tax base, and development efforts that have exemplary quality and design. These goals reflect Flower Mound's vision of the community and dictates the shape of the town and identifies strategies achieved. The specific land use categories can be found in this plan in more detail, along with specific details regarding six major planning areas which include: Lakeside Business District, Long Prairie District, Cross Timbers Protection Area, Cross Timbers Conservation Development District, Prairie Vista District and Denton Creek District.

The Lakeside Business District prioritizes commercial development to spark economic growth. Long Prairie District is 90 percent developed, however any future uses will comply with emphasizing quality of life and preserving remaining natural landscapes. The Cross Timbers Protection Area covers the areas within the Long Prairie District where Cross Timbers exist. The purpose is to preserve the remnants of the Cross Timbers that have been compromised due to urbanization and enact development standards to uphold the remaining Cross Timbers environmental character. The Cross Timbers Conservation Development District and the Prairie Vista District preserve the ecological area in central Flower Mound. Lastly, the Denton Creek District prioritizes future growth and economic opportunity through supporting uses such as commercial, industrial development, mixed office, retail, and residential uses.

FIGURE 2.11: DISTRIBUTION OF LAND USES FROM THE TOWN OF FLOWER MOUND'S MASTER PLAN

Land Use	Percentage of the Acreage	Flexibility Factor
Non-residential Uses*	45%	-25%
Public Uses	5%	±5%
Residential Uses**	45%	25%
Civic/Open Space (Public and Private)	5%	+10%
Total	100%	

**Non-residential uses shall include retail, office, hospitality, entertainment, etc.*

*** Residential uses above commercial uses shall not be included in the calculation of percentage of residential uses in the overall development*



WASTEWATER PLAN

WATER PLAN

**TOWN OF FLOWER MOUND
THOROUGHFARE PLAN**

THE TOWN OF
FLOWER MOUND
TEXAS

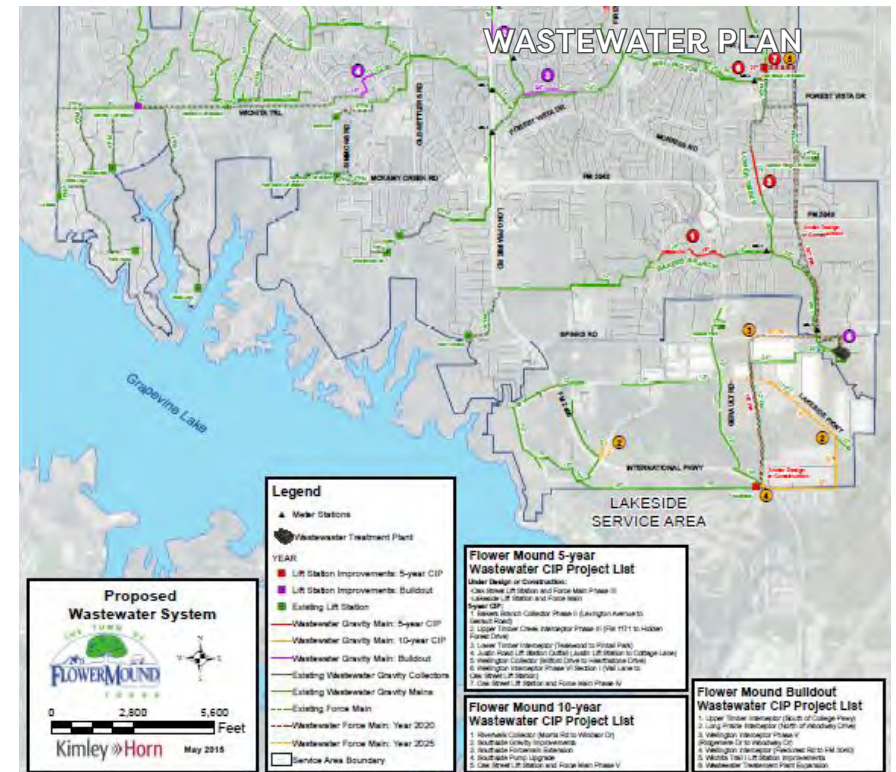
Scale in Feet
0 500 1000

Existing streets May 31, 2015

Functional Street Classifications

- Roundabout
- Arterial
- Collector
- Local
- Utility Right-of-Way
- Utility Right-of-Way with Lake
- Utility Right-of-Way with Flooded Parking
- Utility Right-of-Way
- Utility Right-of-Way (Proposed)
- Utility Collector
- Utility Local
- Utility Right-of-Way
- Utility Right-of-Way

THOROUGHFARE PLAN



URBAN DESIGN PLAN

The Flower Mound Urban Design Plan provides design guidelines for landscaping elements and architectural standards for non-residential buildings. This was created as part of the Flower Mound Master Plan and was reviewed via community engagement and focus groups. The purpose of the plan is to provide structure to establish community-wide architectural standards for non-residential projects and landscape, gateway, and intersection treatments in the five districts outlined in the land use plan. Each district has a distinct goal that aims to strengthen the community and character identity of the following districts:

- Lakeside Business District
- Long Prairie District
- Cross Timbers Conservation Development District
- Denton Creek District
- Prairie Vista District

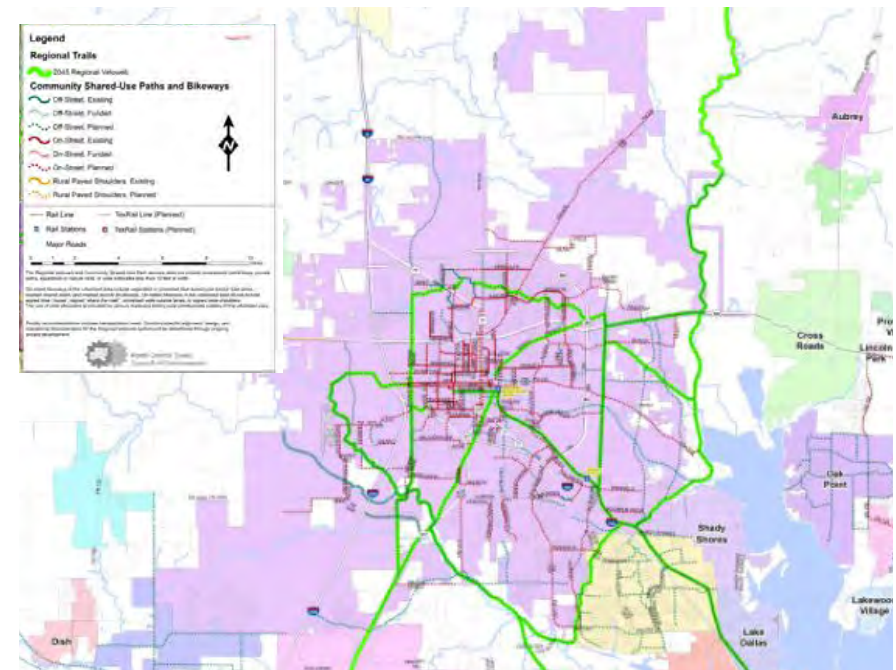


NCTCOG VELOWEB

The North Central Texas Council of Governments (NCTCOG) Regional Veloweb is a regional network of off-street shared use trails. These trails serve as a network of active transportation for multiple user groups including bicyclists, pedestrians, and other non-motorized modes of transportation. The Veloweb is updated by NCTCOG and the latest version of the regional network is included in the NCTCOG Mobility 2045 plan. This plan contains 1,876 miles of off-street trails that has planned connections in 10 counties and 105 cities in North Central Texas. Determining the alignments for the Veloweb trails are achieved through collaborative planning efforts between NCTCOG staff and local governments.

The Mobility 2045 Plan outlines the Veloweb trail segments as existing, funded and planned. Within the context of Flower Mound, all the Veloweb segments are categorized as 'planned' trails. Most of the planned trails are north to south making connections to neighboring communities.

FIGURE 2.12: NCTCOG VELOWEB REGIONAL MAP



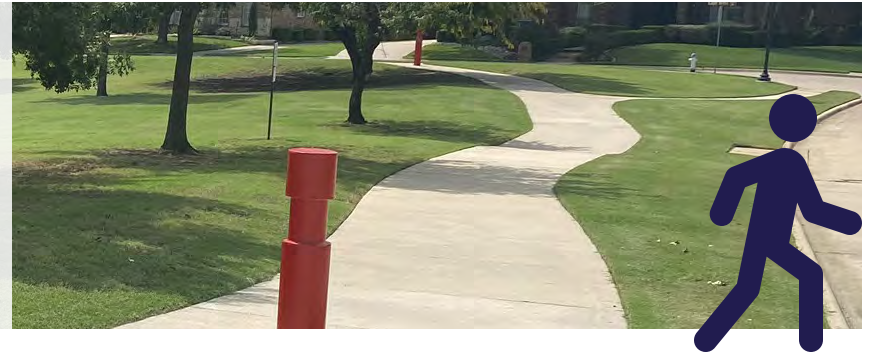
EXISTING TRAILS AND BIKEWAYS SYSTEM

The Flower Mound trail system has diverse offerings for its residents and visitors from across the region and beyond. These trails aim to connect residential neighborhoods to schools, parks, and commercial centers and expand mobility for its residents. Flower Mound has a unique natural landscape that adds to the overall experience of trail users. Currently, there are 62.2 miles of 8' or wider paved Town trails, 5.6 miles of on-street bikeways, 13 miles of equestrian trails, and 34.5 miles of trails owned and maintained by other entities within Flower Mound. **Figure 2.13** and **Table 2.3** displays Flower Mound's inventory of trails and on-street bikeways.

For the purpose of this inventory the following facility definitions are used:

Town Trails:

Trails that are owned and mostly maintained by the Town of Flower Mound. These trails include multi-use paved trails that are between 4-foot and 10-foot in width, soft-surface trails, and equestrian soft-surface trails that range between 15-foot to 50-foot. The Town has developed a trail naming system for much of the existing trail system; the majority of existing trails are named after various wildflowers. These trails are referred to as "branded trails".



Other Trails:

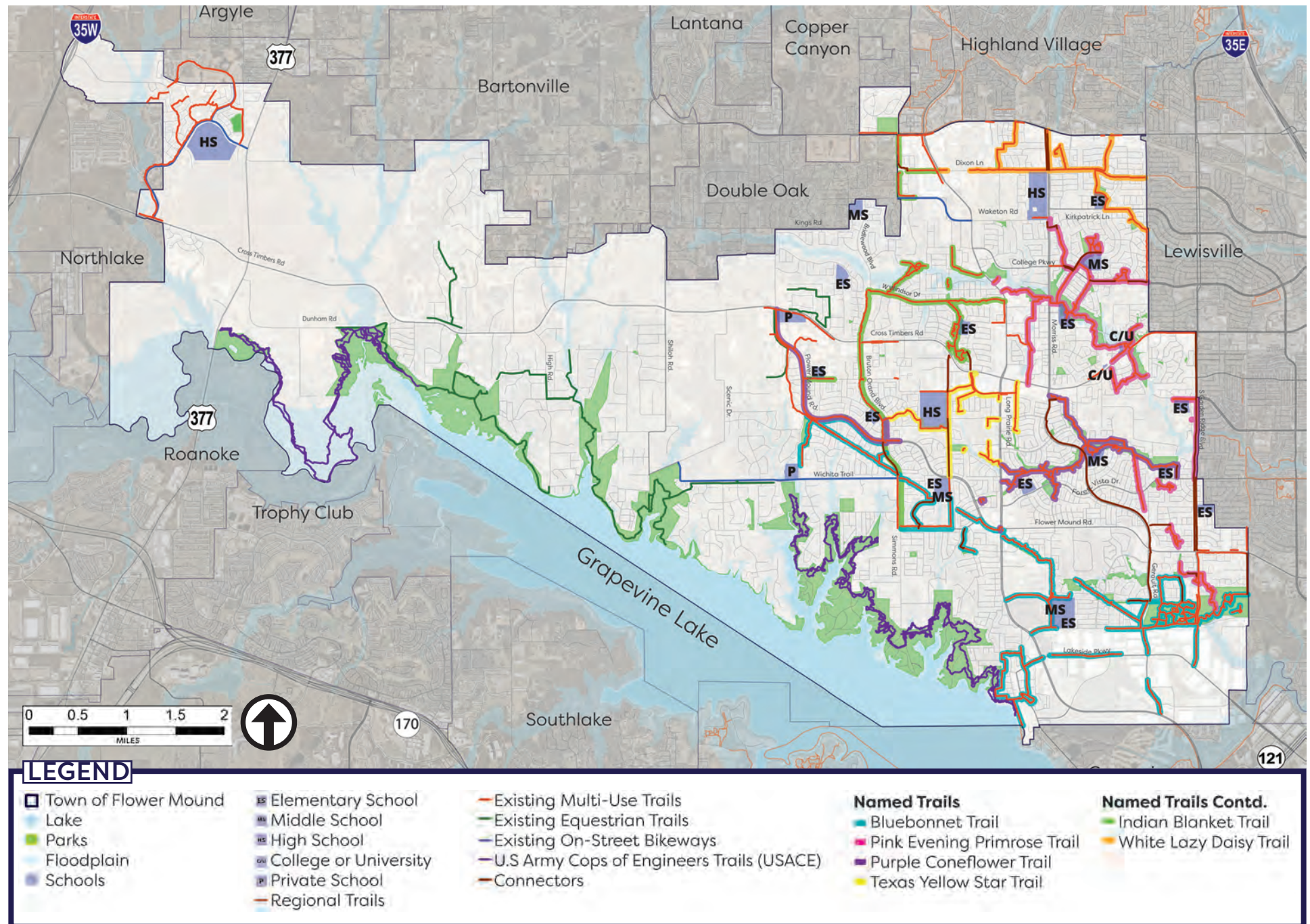
Multi-use soft-surface paths for hiking and mountain biking that are located within the Town of Flower Mound but are not owned or maintained by the Town. The Dallas Off-Road Bicycle Association (DORBA) maintains over 30 miles of soft-surface trails on USACE land along the shores of Grapevine Lake.



On-Street Bikeways:

Designated accommodations for bicyclists within a roadway such as bike lanes and shared-use lanes. There are existing on-street bikeways along Wichita, Waketon, and Canyon Falls in Flower Mound today.



FIGURE 2.13: EXISTING TRAILS

TOWN TRAILS

Flower Mound's town trails include paved multi-use, soft-surface, and equestrian trails. These trails are owned and mostly maintained by the Town of Flower Mound. Currently, there are 59.3 miles of multi-use trails within Flower Mound's trail system that are 8 feet or wider. 70.6 percent of those paved multi-use trails that are 8 feet or wider are within Flower Mound's designated branded trail network, which are named after wildflowers found in Texas. The Bluebonnet Trail has the most mileage out of all the branded multi-use trails and connects to the town's most prominent park, Heritage Park. There is one short segment of the Pink Evening Primrose trail that is made from decomposed granite. Another type of soft-surface trail maintained by the Town is the equestrian trails. There is a total of 14.6 miles of equestrian trails located in Flower Mound, most of which are located on U.S Army Corps of Engineers land and is not maintained by the city. 4.2 of those miles of equestrian trails are maintained by the city.

TABLE 2.3: TOWN TRAIL INVENTORY

Trail Name	Length (Miles)	Width (Feet)	Surface Type
Bluebonnet Trail	16.2	4'-10'	Concrete
Indian Blanket Trail	8.1	5'-10'	Concrete
Pink Evening Primrose Trail	12.5	4'-10'	Concrete/Soft-Surface
Purple Coneflower Trail	7.5	4'-8'	Concrete
Texas Yellow Star Trail	3.3	4'-8'	Concrete
White Lazy Daisy Trail	4.7	4'-10'	Concrete
Unnamed Multi-Use Trails	14.9	4'-10'	Concrete
Connectors (Unnamed)	6.4	4'	Concrete
Equestrian Trails	14.6	15'-50'	Soft-Surface
Total Length	77.8		
Total Length* (8ft or wider) (*Does not include equestrian or soft-surface trails)	59.3		
Total Length* (Less 8ft) (*Does not include equestrian or soft-surface trails)	5.4		

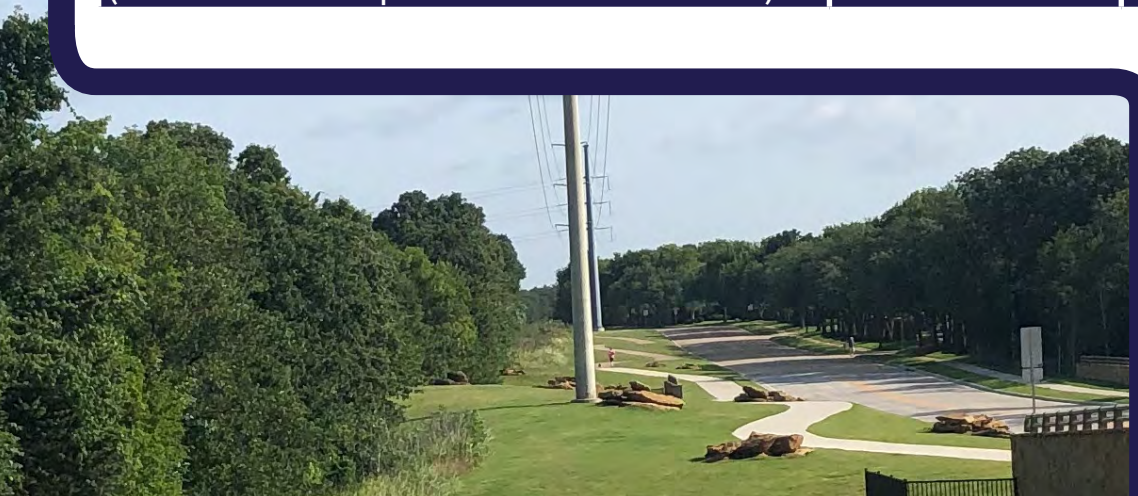


FIGURE 2.14: EXISTING TOWN TRAILS

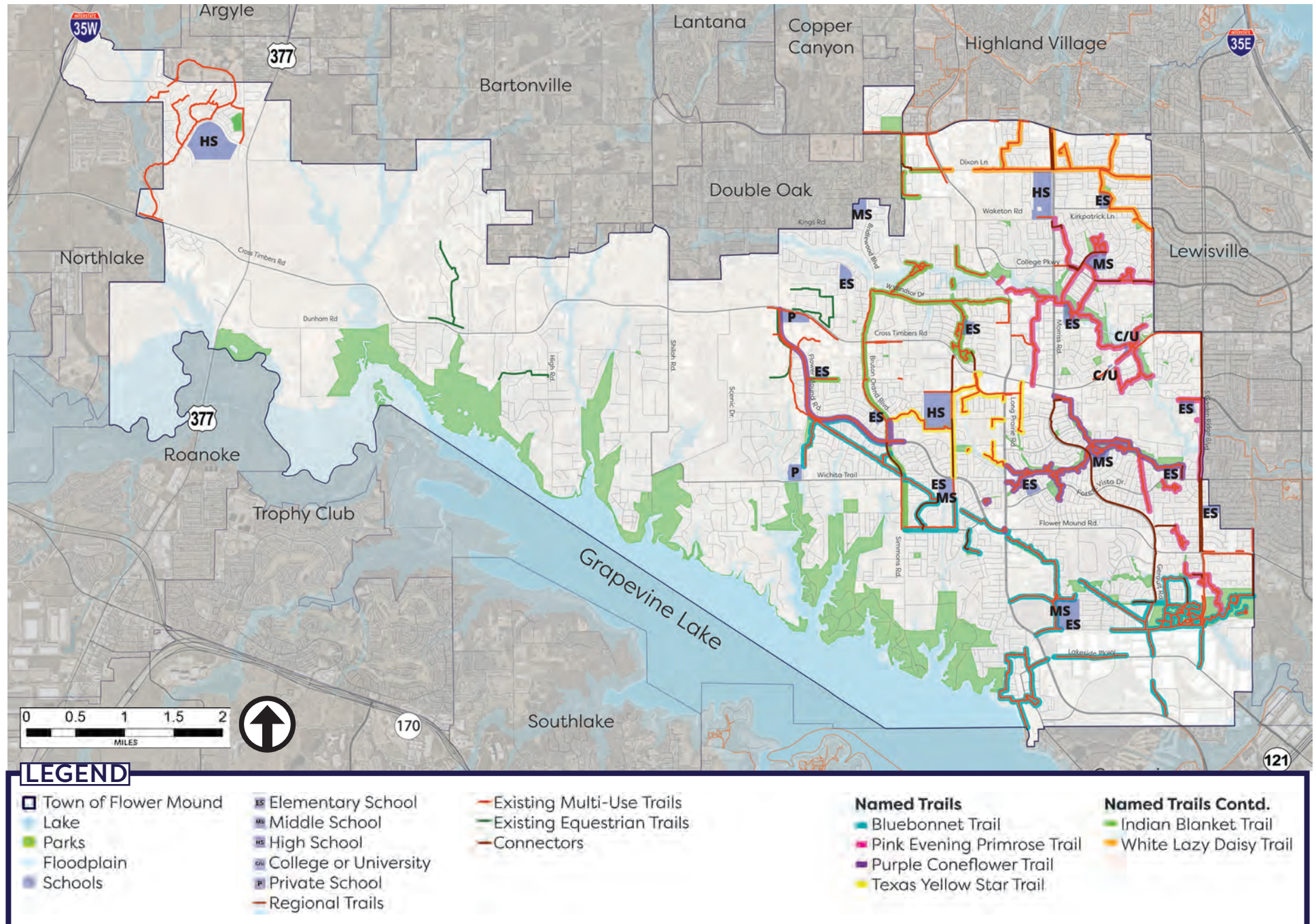


TABLE 6.1: * Map as of April 2022, Trails built

31 Flower Mound Trails and Bikeways Master Plan

While there are segments of the existing branded trails that are 4-foot – 6-foot in width, to be considered multi-use trails, the facilities should be at least 8-foot wide, but preferably 10-foot. **Figure 2.15** depicts the breakdown of the widths of existing town trail facilities not including equestrian widths. Segments that depict 8-foot – 10-foot widths reflect the town multi-use trails and segments under 8-foot reflect connectors in the towns trail system.

FIGURE 2.15: EXISTING TOWN TRAIL FACILITIES BY WIDTH

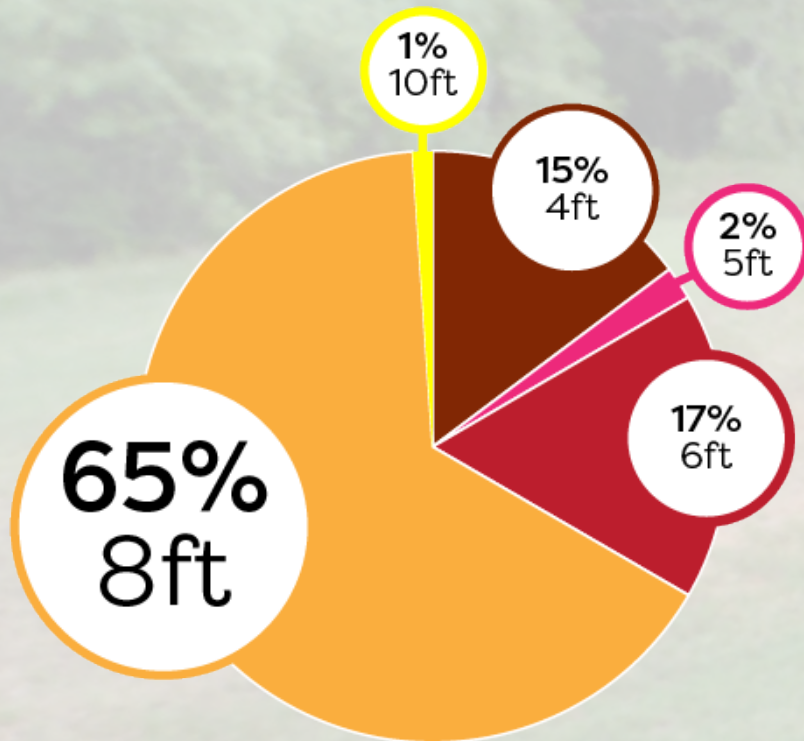
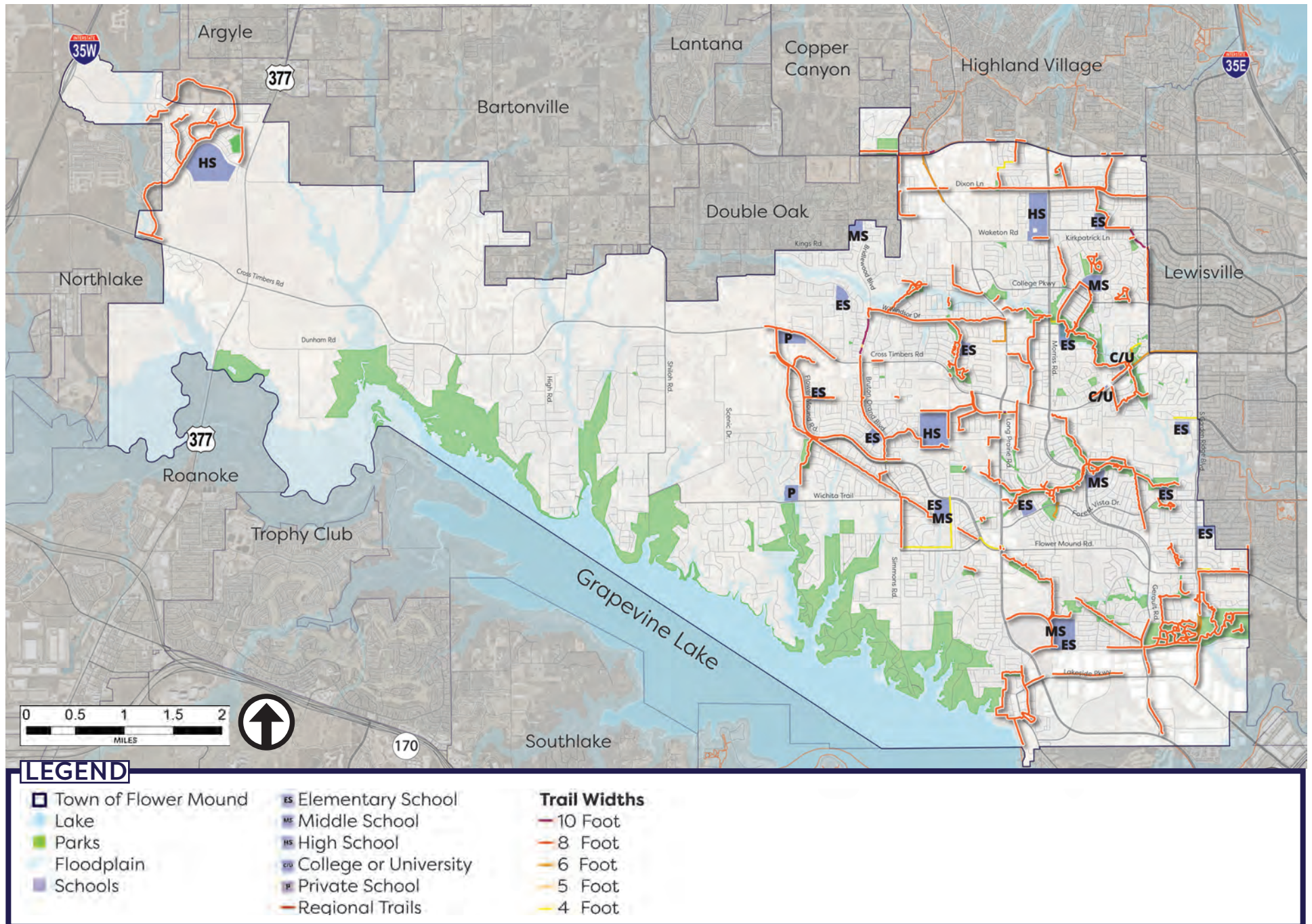


FIGURE 2.16: EXISTING TOWN TRAIL FACILITIES BY WIDTH

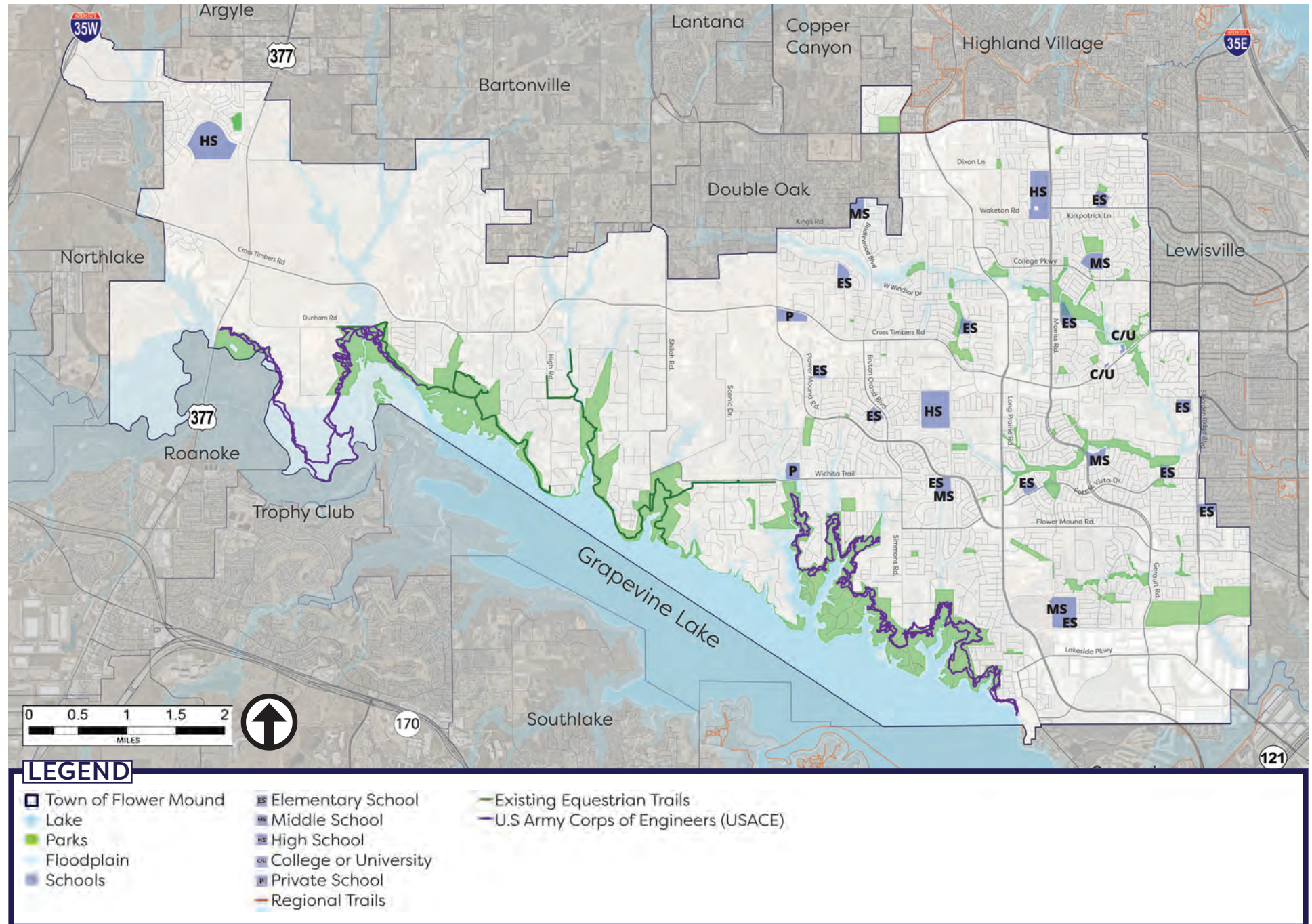
OTHER TRAILS

Flower Mound's proximity to Grapevine Lake adds to the natural landscape of the town. Many of the soft-surface trails in Flower Mound are located along the northern shore of Grapevine Lake on the Town's southern border. These trails are located on United States Army Corps of Engineers (USACE) property and are maintained by DORBA (Dallas Off-Road Bicycle Association). The USACE trails are primarily used for mountain biking, hiking, and, where designated, equestrian use.

TABLE 2.4: OTHER TRAILS INVENTORY

Trail Name	Length (Miles)	Width (Feet)	Surface Type
Blue Diamond	0.6	6'	Soft-Surface
Boy Scout Loop	3.0	6'	Soft-Surface
Knob Hill	12.9	6'	Soft-Surface
MAAD East Loop	3.5	6'	Soft-Surface
MAAD West Loop	3.3	6'	Soft-Surface
Murrell Loop	3.3	6'	Soft-Surface
North Shore Far West	2.7	6'	Soft-Surface
Rockledge Loop	2.3	6'	Soft-Surface
Twin Coves Loop	2.7	6'	Soft-Surface
Undesignated	0.2	N/A	Soft-Surface
Total Length	34.5		



FIGURE 2.17: EXISTING OTHER TRAILS

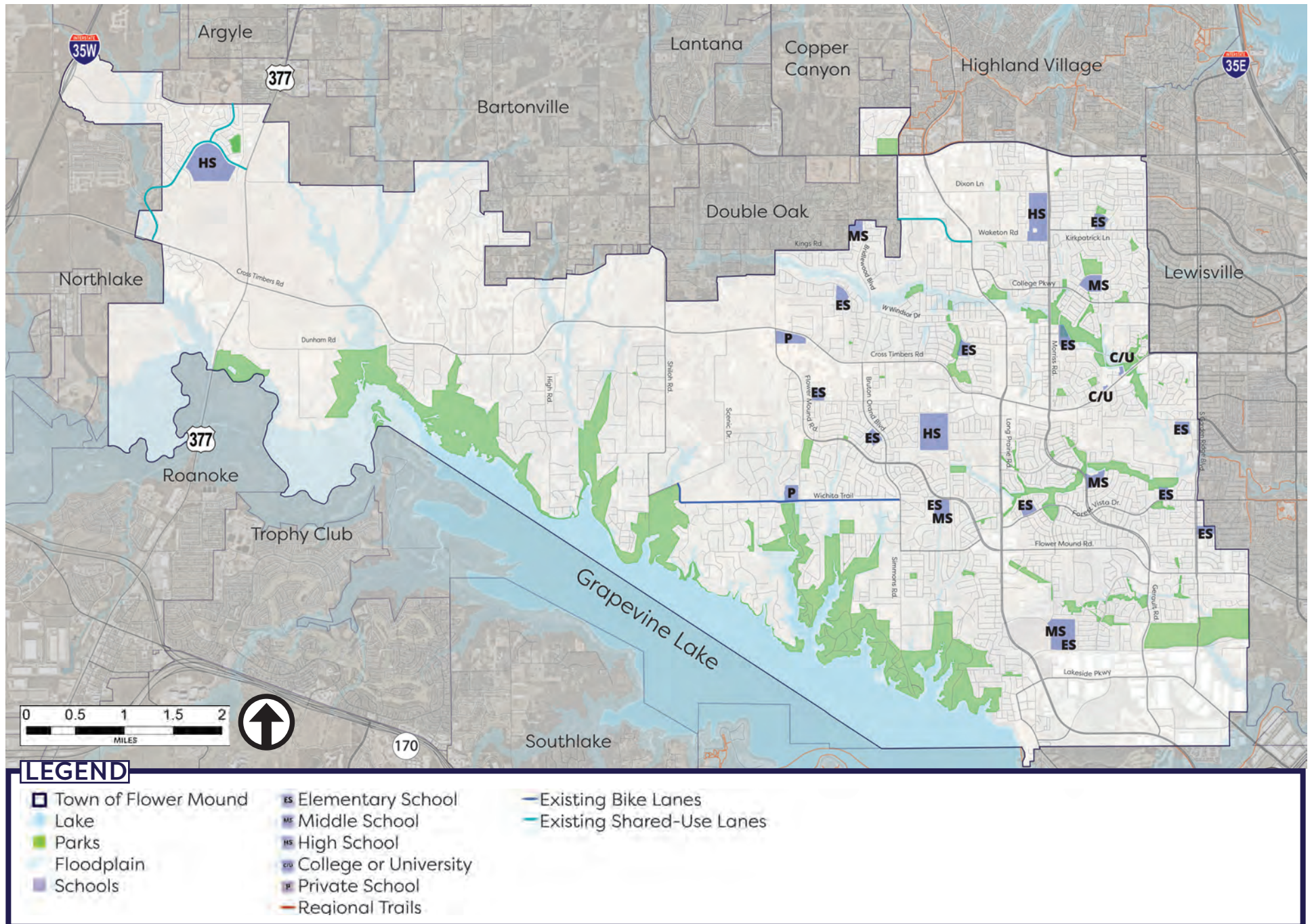
ON-STREET BIKEWAYS

Flower Mound currently has a limited offering for existing on-street bikeways. The types of on-street bikeways in Flower Mound are primarily designated bike lanes that are located on Wichita Trail and Canyon Falls Drive. There are also shared lane markings on Prairie Ridge Road and Waketon Street.

TABLE 2.5: ON-STREET BIKEWAY INVENTORY

Bikeway Name	Length (Miles)	Accommodation
Canyon Falls Drive	1.9	Bike Lane
Prairie Ridge Road	0.5	Shared Lane Markings
Waketon Street	0.8	Shared Lane Markings
Wichita Trail	2.4	Bike Lane
Total Length	5.6	



FIGURE 2.18: EXISTING ON-STREET BIKEWAYS

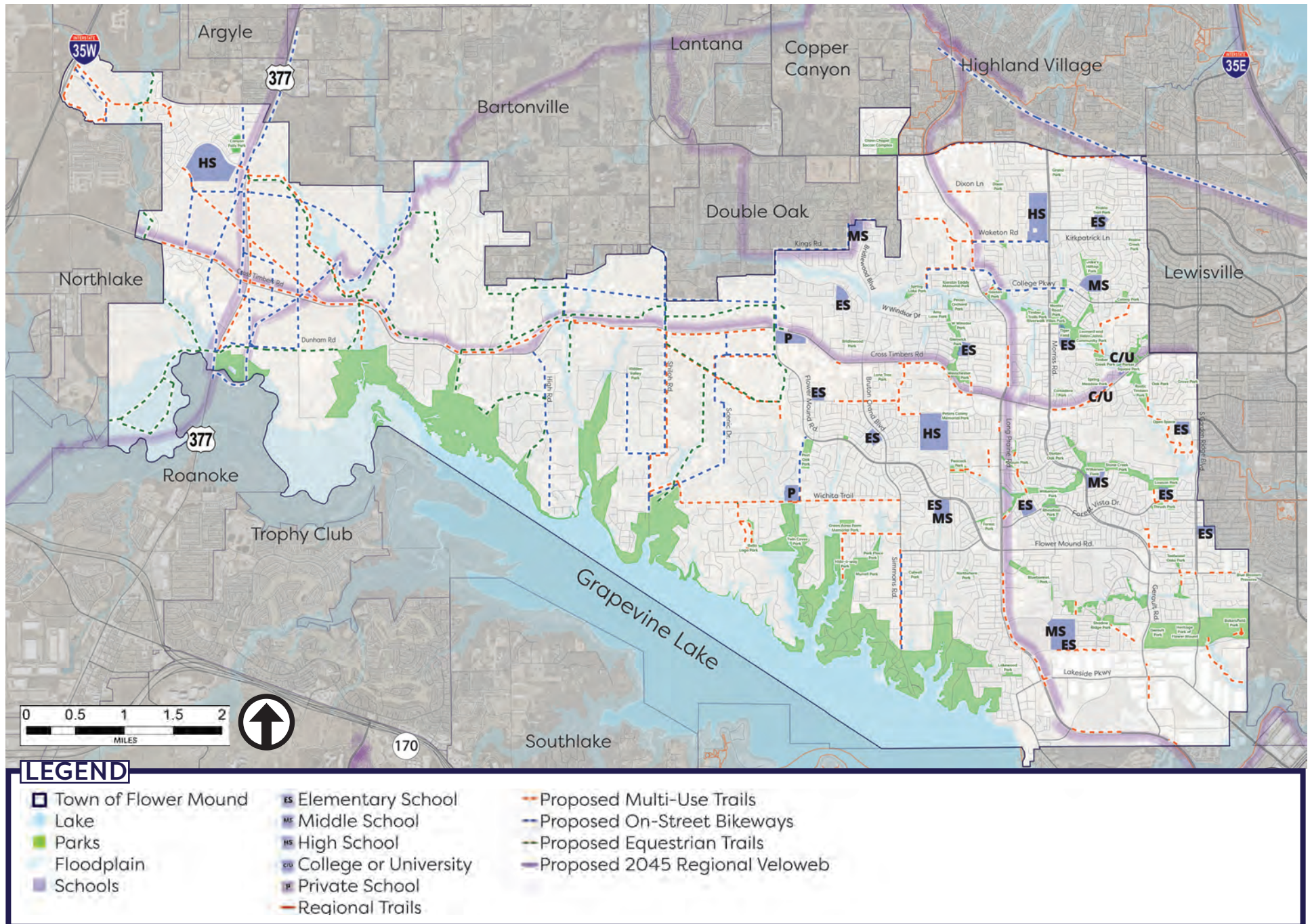
CURRENTLY PLANNED SYSTEM

The 2017 Park and Trails Plan established a network of planned trails and bikeways for the town. This plan identified over 50 miles of additional Town Trails and nearly 30 miles of additional on-street bikeways. These planned routes aim to fill gaps in the current trails system in Flower Mound and increase regional and internal connectivity. The currently planned trails will be reviewed as part of this planning effort to determine if they are still warranted and feasible.

TABLE 2.6: EXISTING & CURRENTLY PLANNED SYSTEM

Facility Type	Existing Length (miles)	Planned Length (miles)
Town Trails (8' or wider)	62.2	53.4
On-Street Bikeways	5.6	29.0
Equestrian Trails	13.0	22.7
Total Length	80.8	105.1



FIGURE 2.19: 2017 MASTER PLAN PROPOSED TRAILS & BIKEWAYS

**System Users
Community Input
Needs Assessment
Barriers & Opportunities**



03 TRAILS AND BIKEWAYS SYSTEM NEEDS



41 Flower Mound Trails and Bikeways Master Plan

A comprehensive trails and bikeways system is designed based on the needs of the community, the opportunities that exist, and the barriers that may prevent connections. This chapter describes Flower Mound's identified needs based on existing conditions, safety issues, standards, and benchmarking. This chapter also identifies needs based on community engagement, existing barriers in the trail system, and opportunities for new trail and bikeway corridors.

SYSTEM USERS

Trails and bikeways can be designed to serve a range of users that express and exhibit different needs, interests, and abilities. Communities that recognize and acknowledge the overlapping needs and preferences of their residents are best able to develop a trails and bikeways system that efficiently accommodates multiple user groups.



PEDESTRIANS

A large number of people use trails for recreational purposes and some use them for commuting purposes as well. Walking is a great option for passive recreation because it is affordable and accessible for most people. It is also important to provide pedestrian connections for residents without access to a vehicle. Therefore, it is crucial that trails provide connectivity between neighborhoods and nearby destinations to encourage walking. When developing trails for pedestrians it is important to design them to be safe, enjoyable, and comfortable.



RUNNERS/JOGGERS

Trail systems are great locations for runners and joggers who seek opportunities for sports, leisure, and fitness since they provide a safe, off-street environment away from motor vehicles. Multi-use trails provide adequate space for runners and joggers to safely and comfortably pass other users and provides enough space for running groups and meet-ups. Runners prefer either paved or soft-surface trails, so providing options for both is important.



BICYCLISTS

Bicyclists consist of three groups: the occasional rider (children and seniors); the recreational rider (basic); and, the more experienced rider (advanced).

Children and Seniors

Children and seniors represent some of a community's most vulnerable demographic groups and therefore require easily accessible trail routes that are simple and easy to navigate. When developing trails and bikeways, it is important to provide spaces that are safe and comfortable for children and seniors. These groups typically prefer to ride on an off-street trail that is located away from the roadway to minimize potential interaction with motorists.

Basic

Bicyclists who fall within the basic skill category typically ride for leisure and prefer off-street trails or sidepaths adjacent to roadways. This user group is less likely to cycle as a mode of transportation since they are generally less confident riders. However, they are more likely to ride on-street within residential neighborhoods with low traffic speeds and within parks.

Advanced

Experienced bicyclists typically view cycling as a mode of transportation and are more comfortable using on-street facilities. These bicyclists are confident on roadways and undeterred by various roadway conditions, including sharing lanes with motor vehicle traffic. Users within this group may be part of a cycling organization or view cycling as a viable commuting option for some of their weekly trips. If advanced riders use trails, implementing speed control elements is recommended to reduce the potential for conflict with slower trail users.



MOUNTAIN BIKERS

Mountain bikers use soft-surface off-road trails for recreation and fitness purposes. Soft-surface trails can incorporate features such as jumps, ramps, and grade changes to add obstacles for the trail users. These narrow trails can be designed for beginners through advanced riders and typically attract visitors from outside of the community.



HIKERS

Hikers use soft-surface off-road trails for recreation, leisure, and fitness purposes. Hikers enjoy physical activity in a more natural setting. Hiking trails can be designed with grade changes and switch backs to add variation for beginners to advanced hikers.



EQUESTRIAN USERS

Equestrian trails are enjoyed by people on horseback as a way to explore nature and ride in a different environment than arena riding. These trails are often soft-surface and natural. Equestrian trails may be designed primarily for horseback riding, or they may be shared for soft-surface walking, jogging, and biking. If multiple users are allowed, the trails should provide etiquette on sharing the trail for all users.



PADDLE SPORTS

Kayakers and canoers utilize a network of waterway trails. These trails, sometimes called paddling trails or blueways, are accessed through launch points along a river, creek, lake, or other body of water. Paddlers may consist of people in kayaks, canoes, small non-motorized boats, or paddle boards and may have varying experience levels.



COMMUNITY INPUT

Engaging with current and future trail system users to collaborate on the vision and goals of the trail system is a crucial part of the planning process. Establishing engagement sessions that reach a variety of residents in Flower Mound help the Town benchmark needs of the community regarding opportunities and barriers in the existing trails system. Various engagement methods were utilized that involved a variety of stakeholders and the community. These engagement efforts included a steering committee representing a diverse selection of community members and interests, a technical working group comprised of town staff, listening sessions, and in-person and online public engagement.

STEERING COMMITTEE

The Steering Committee is comprised of community leaders and key community stakeholders to review and guide the plan development. Members included representatives from cycling, running, and riding groups, boards and commissions, Lewisville ISD, and students. This committee met three times during the process to help with identifying trails and bikeways needs, visioning, reviewing findings and preliminary recommendations, and recommending approval of the final plan.



TECHNICAL WORKING GROUP

The Technical Working Group is comprised of town staff members from various departments to assist with review and development of the plan. During the planning process, the group met three times to discuss current and future needs, review preliminary recommendations, and provide final guidance on the draft plan. Having input from different departments throughout the process helped to ensure that the recommendations were feasible.



STAKEHOLDER LISTENING SESSIONS

During the initial phase of the project, visioning meetings with community organizations and key community representatives were conducted to solicit feedback on the strengths and weaknesses of the Town's existing trails and bikeways system. These meetings were designed to assess the needs and desires for the trails and bikeways system in the Town. Invited groups included governmental agencies, trail and bikeway user groups, economic development groups, and education groups.



OPEN HOUSE

Two public open houses were offered to solicit feedback from the community during the planning process. The first was conducted in person and virtually to determine the needs and vision of the community for the trails and bikeways system. The second meeting was held at the end of the project to allow the community to review and provide feedback on the draft master plan.



POP-UP EVENTS

The team attended Town of Flower Mound events to increase awareness of upcoming engagement opportunities (discussed on page 45) and to collect information about the existing trails and bikeways system in Flower Mound. The pop-up events included the Arts in the Park inaugural event and a Friday night concert series event in Heritage Park.



BOARD & COMMISSION MEETINGS

Presentations to the Parks Board, Transportation Commission, Planning & Zoning Commission, and Town Council during the process allowed the team to gather additional input and review draft recommendations for the plan.

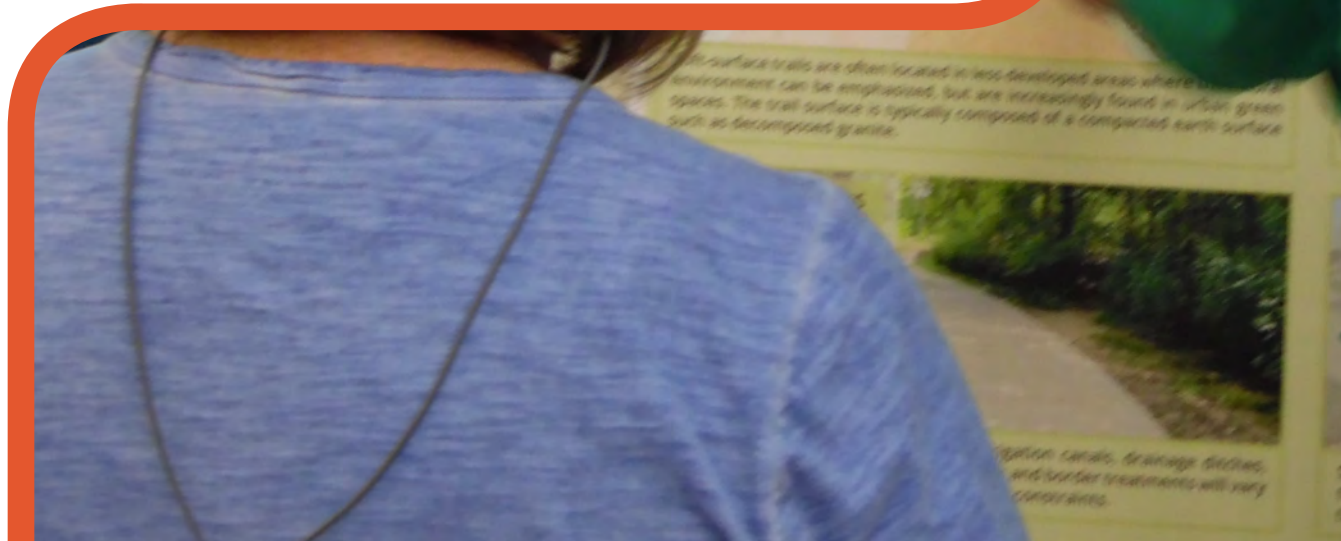


45 Flower Mound Trails and Bikeways Master Plan

ONLINE ENGAGEMENT

Several online engagement methods were used to reach people who weren't able to attend events in person.

- The **Project Website** was established to advertise upcoming meetings, update the community on the status of the project, allow for input, access virtual engagement rooms and community surveys, and share data and reports created through the process.
- A **Community-wide Online Survey** was conducted early in the process to garner feedback on the community's trails and bikeways system. There were a total of 947 responses received between May and June 2021.
- A **Virtual Public Engagement Room** was developed to mimic the activities conducted at the first public open house in May 2021 in an online setting. The site generated roughly 1,300 views and nearly 100 people provided input via the virtual public engagement room stations.
- An **Interactive Map** was developed to allow residents to give location-specific input on needed connections within the system.
- A series of **Educational Videos** were developed about the Flower Mound trails and bikeways system and the master plan initiative. The videos outlined the plan process, reviewed the current conditions and plan goals, and provided an overview of the plan recommendations.



PUBLIC OPEN HOUSE

ENGAGEMENT RESULTS:

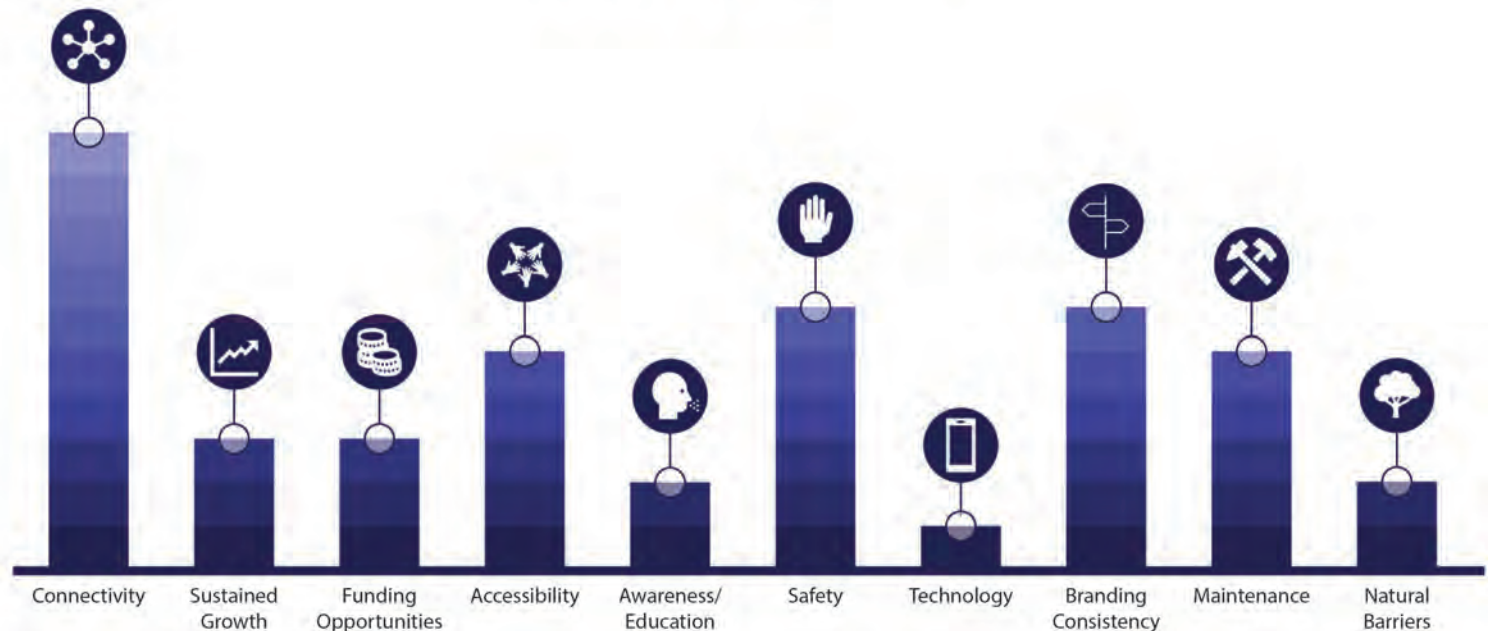
Steering Committee, Technical Working Group, and Stakeholder Listening Sessions

The following questions were asked during our visioning sessions in May 2021. The following graphics are a summary of the questions that were posed to the Steering Committee, Technical Working Group, and stakeholder listening sessions.

WHAT IS YOUR
VISION FOR
THE FUTURE
OF TRAILS AND
BIKEWAYS IN
FLOWER MOUND?

SCENIC USERS
EQUESTRIAN INTERNAL
REGIONAL APP LIGHTING
UNIQUE SAFETY FRIENDLY
CONNECTIONS NATURAL
BIKE TRAILS PRESERVE
WAY-FINDING LOCAL
AWARENESS COMMUNITY
DESTINATIONS ACCESS
SIGNAGE LANES
AWARD-WINNING

WHAT ARE SOME OF
THE CHALLENGES
RELATED TO TRAILS
AND BIKEWAYS IN
FLOWER MOUND
TODAY?



ENGAGEMENT RESULTS:

Public Open House & Virtual Public Engagement Room

The following questions were asked during the first public open house in May 2021 and within the virtual public engagement room that was available immediately following the open house. The following graphics are a summary of the feedback that was received during those meetings.

WHAT ONE WORD
WOULD YOU USE TO
DESCRIBE TRAILS
AND BIKEWAYS IN
FLOWER MOUND
TODAY?



WHAT ONE WORD
WOULD YOU USE TO
DESCRIBE HOW YOU
ENVISION TRAILS
AND BIKEWAYS IN
FLOWER MOUND IN
THE FUTURE?

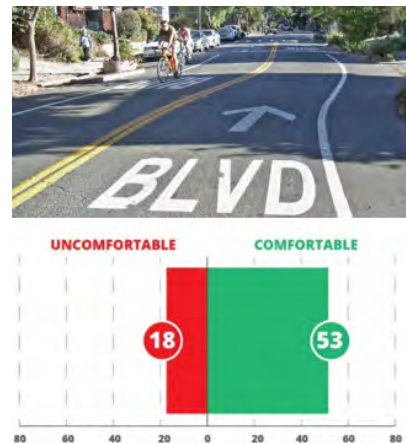


ENGAGEMENT RESULTS:

Public Open House & Virtual Public Engagement Room

The following graphics summarize feedback received during the public open house and virtual public engagement room. Participants were asked to choose if they would feel comfortable or uncomfortable using the depicted facility. The number below each picture show the total responses for each.

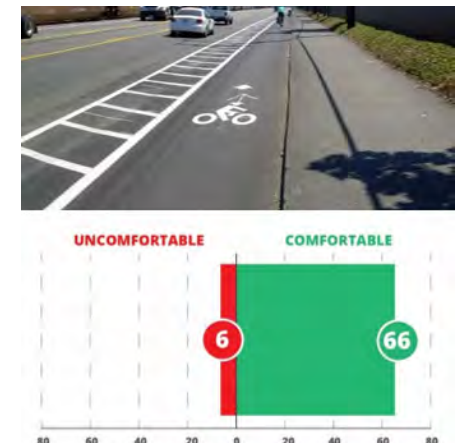
WHAT IS YOUR
LEVEL OF
COMFORT WITH
THE FOLLOWING
TYPES OF ON-
STREET BICYCLE
FACILITIES?
(TOP 3 OF 6)



**WIDE
SHOULDER**



CYCLE TRACK



**BUFFERED
BIKE LANE**

WHAT IS YOUR
LEVEL OF COMFORT
WITH THE
FOLLOWING TYPES
OF
OFF-STREET
TRAILS?
(TOP 3 OF 6)



**SHARED-USE
PATH
(PAVED)**



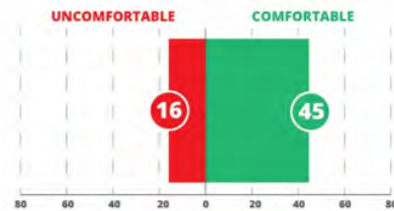
**SIDEPATH
(PAVED)**



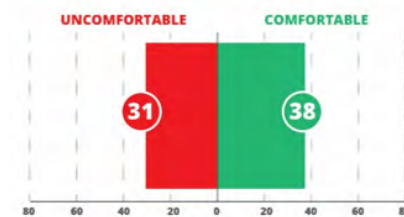
**SHARED-USE
PATH
(SOFT SURFACE)**

ENGAGEMENT RESULTS: Public Open House & Virtual Public Engagement Room

WHAT IS YOUR
LEVEL OF
COMFORT WITH
THE FOLLOWING
TYPES OF
EQUESTRIAN
PATHS?



**SOFT-SURFACE
(AWAY FROM ROAD)**



**SOFT-SURFACE
(ADJACENT TO ROAD)**

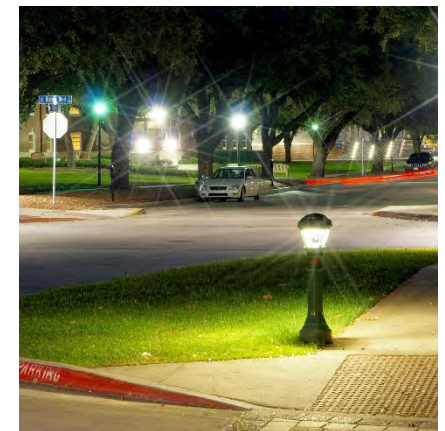
WHAT ARE YOUR
TOP THREE
PREFERRED TRAIL
AMENITIES THAT
YOU WOULD LIKE
TO SEE ALONG
TRAILS IN FLOWER
MOUND?



**WAYFINDING
SIGNAGE**



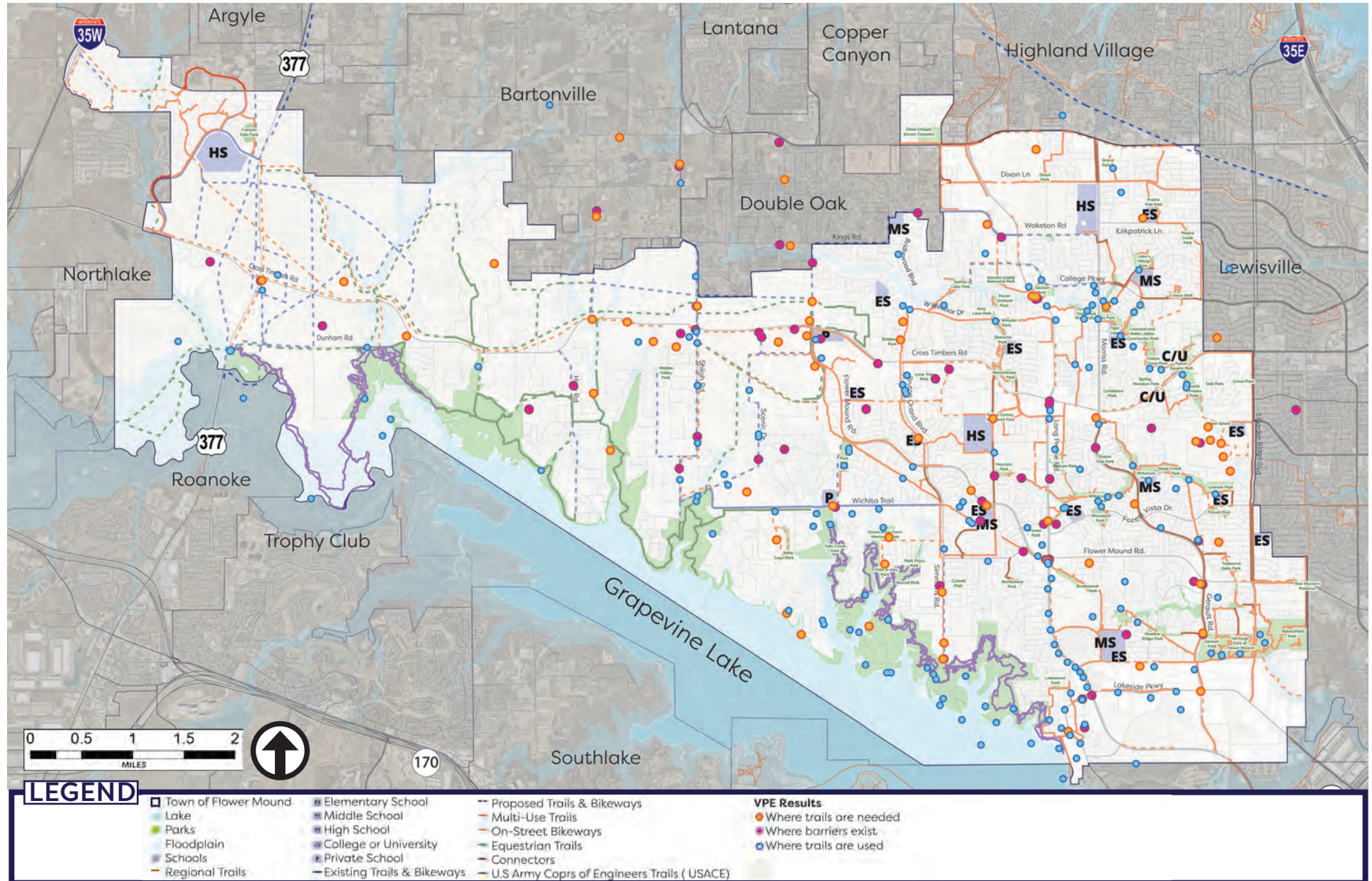
PARKING



LIGHTING

ENGAGEMENT RESULTS: Virtual Public Engagement Room

FIGURE 3.1: VIRTUAL ENGAGEMENT ROOM RESULTS

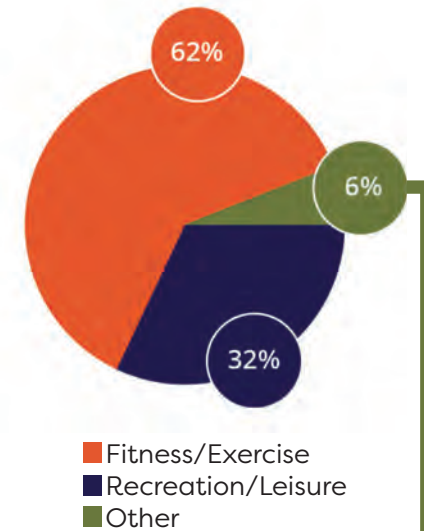


ENGAGEMENT RESULTS: Public Open House & Virtual Public Engagement Room

WHAT TYPE
OF TRAIL OR
BIKEWAY
IN FLOWER
MOUND DO
YOU GENERALLY
USE?



WHAT IS YOUR
PRIMARY
PURPOSE FOR
USING A TRAIL
OR BIKEWAY IN
FLOWER MOUND?



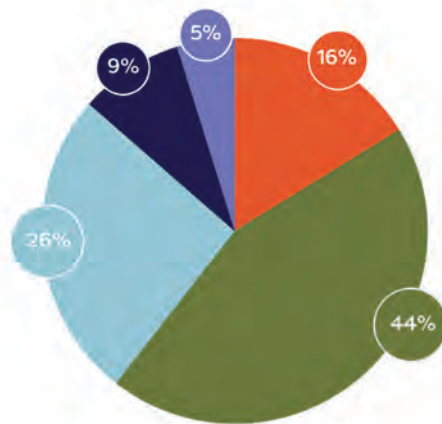
Other (6%) Breakdown



Commuter to work/school	(20%)
Trips in neighborhood	(18%)
Run errands	(6%)
Visit friends/family	(8%)
I do not use a trail/bikeway	(18%)
Other	(31%)

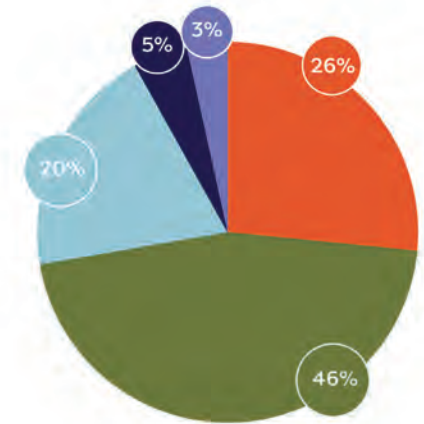
ENGAGEMENT RESULTS: Public Open House & Virtual Public Engagement Room

HOW OFTEN DID YOU USE TRAILS OR BIKEWAYS IN FLOWER MOUND PRE-COVID?



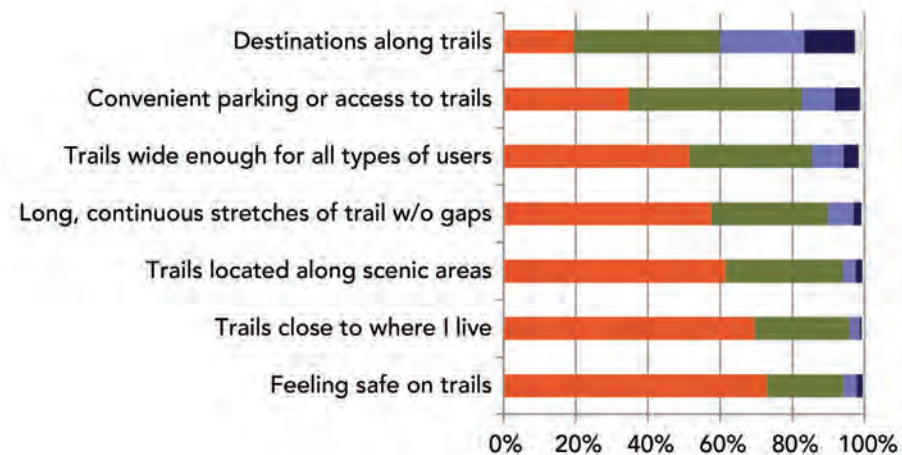
■ Daily
■ A few times a week
■ A few times a month
■ A few times a year
■ Never

HOW OFTEN DID YOU USE TRAILS OR BIKEWAYS IN FLOWER MOUND DURING COVID?



■ Daily
■ A few times a week
■ A few times a month
■ A few times a year
■ Never

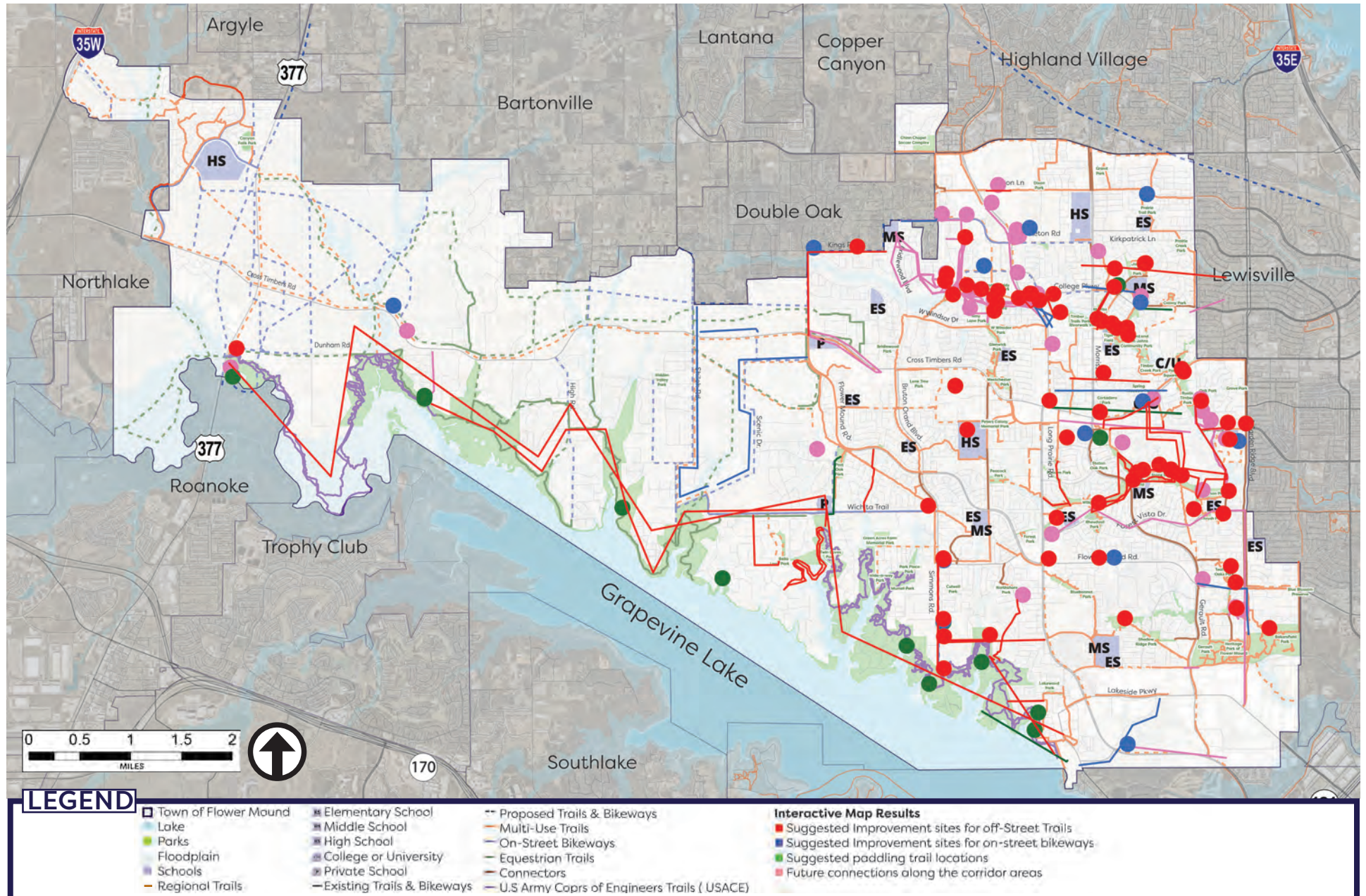
HOW IMPORTANT ARE EACH OF THE FOLLOWING FEATURES OF TRAIL FACILITIES?



■ Very important
■ Important
■ No opinion
■ Not very important
■ Not Important at all

ENGAGEMENT RESULTS: Interactive Online Map

FIGURE 3.2: INTERACTIVE ONLINE ENGAGEMENT MAP



ENGAGEMENT KEY TAKEAWAYS:

- Filling in gaps in the system for overall better connectivity is needed.
- Wayfinding and directional signage is needed to help users identify what trail they are on and where they are going.
- Intersection crossings should be improved in many areas.
- Additional amenities, such as lighting, parking, and drinking fountains, are desired throughout the trail system.
- Off-street trails are preferred by a majority of respondents to roadside trails.



PURPLE CONEFLOWER TRAIL

NEEDS ASSESSMENT

As indicated in the previous section, the residents of Flower Mound have established that trails and bikeways are very important to their community. As the population in the town continues to increase, an additional burden will be placed on existing trail and bikeway facilities. This section provides the current state of Flower Mound's trails and bikeways today and projected into the future.

To evaluate the needs of the community, assessments of the existing system were conducted. Based on the assessment findings, recommendations for the future network can be proposed to ensure users of all ages and abilities are considered. Assessments are based on community input, trail evaluations, trail level of service, comparison to benchmark communities, opportunities and barriers, roadway characteristics, and potential corridor assessments.

TRAIL EVALUATION

This planning process evaluated the existing named trails in the Flower Mound system. The assessment considered trail surface conditions, railway clearance, grades and slopes, roadside clearance, street intersections/trail crossings, constructed railway features, safety/security, signage and wayfinding, and trailheads. This section provides the key findings from each of the evaluations.



PINK EVENING PRIMROSE TRAIL



KNOB HILLS TRAIL

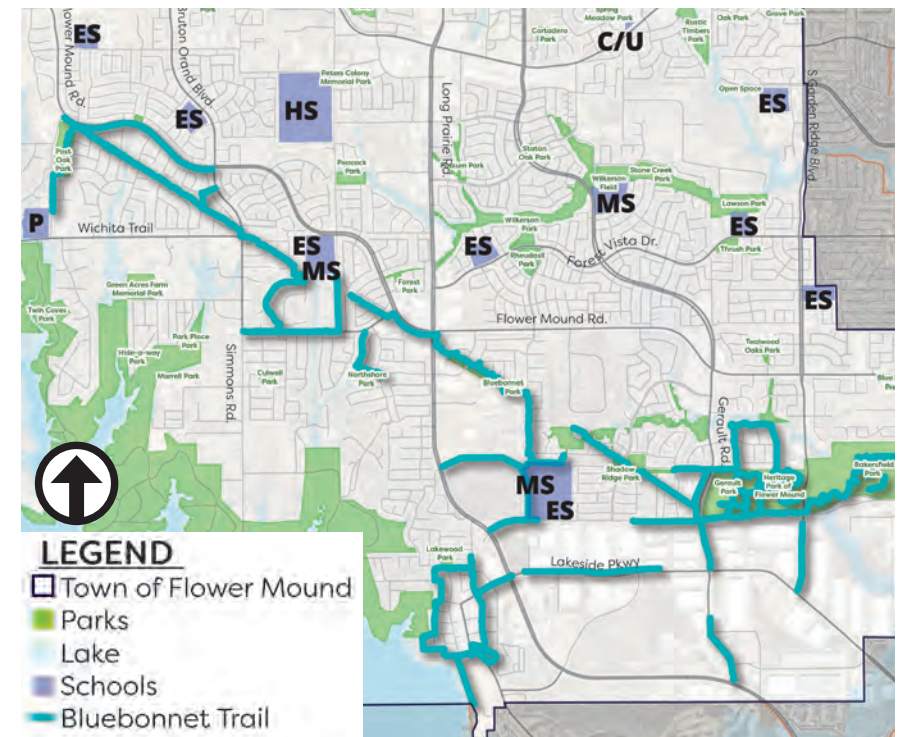
BLUEBONNET TRAIL

Length: 18.07 miles

The Bluebonnet Trail runs from Bakersfield Park in the far southeastern corner of the town to the northwest ending at Post Oak Park. The trail is the longest of all the six branded trails (see page 27). There are numerous neighborhood connections to the trail; while the trail provides access to residents, it is disconnected in areas and features some segments that are only 4' in width. The trail is generally in good condition with adequate vertical and horizontal clearance. Most of the trail is designed at a grade and slope that is comfortable. However, the segment along Winding Oaks Drive and Pasadena Place includes switchbacks and a slope that may not be ADA accessible.

Improvements to intersection crossings are needed, both within the neighborhoods and along major corridors such as FM 2499. There are benches, waste receptacles, and pet waste stations scattered along the trail, however additional facilities such as water fountains, bike racks, and bike repair stations would improve the overall user experience. Additional signage and trail branding are needed for wayfinding and safety. Finally, the trail connects to many parks, schools, and other named trails, but additional segments would better connect the community.

FIGURE 3.3: BLUEBONNET TRAIL KEY MAP



Trail marker in a neighborhood



Trail within a power line easement



Retaining wall adjacent to trail



Trailhead marker

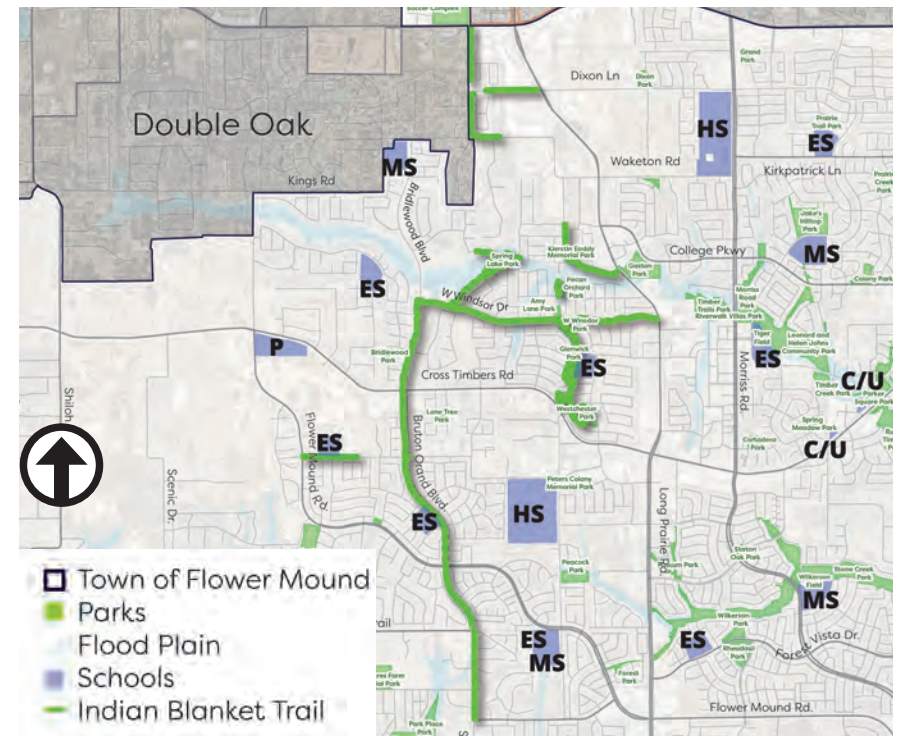
INDIAN BLANKET TRAIL

Length: 8.33 miles

The Indian Blanket Trail runs along West Windsor Drive, south to Simmons Road, connects Westchester Park to Spring Lake Park, and eventually connects to the Bluebonnet Trail. The trail segments north of Windsor Drive are largely disconnected, and there are portions of the trail that are only 4'-6' in width. The trail is generally in good condition with adequate vertical and horizontal clearance and designed at a grade and slope that is comfortable.

Improvements to intersection crossings are needed throughout the trail corridor. There are benches, waste receptacles, and pet waste stations, however additional facilities such as water fountains and bike racks could improve the overall user experience. Additional signage is needed for wayfinding and safety. The addition of trailheads would better identify the branding and location of the trail. Finally, the trail provides good access to neighborhoods, but aside from parks and schools there are not many destinations accessible from the trail.

FIGURE 3.4: INDIAN BLANKET TRAIL KEY MAP



Trail adjacent to roadway



Signalized pedestrian crossing



8' trail segment



Amphitheater in Park

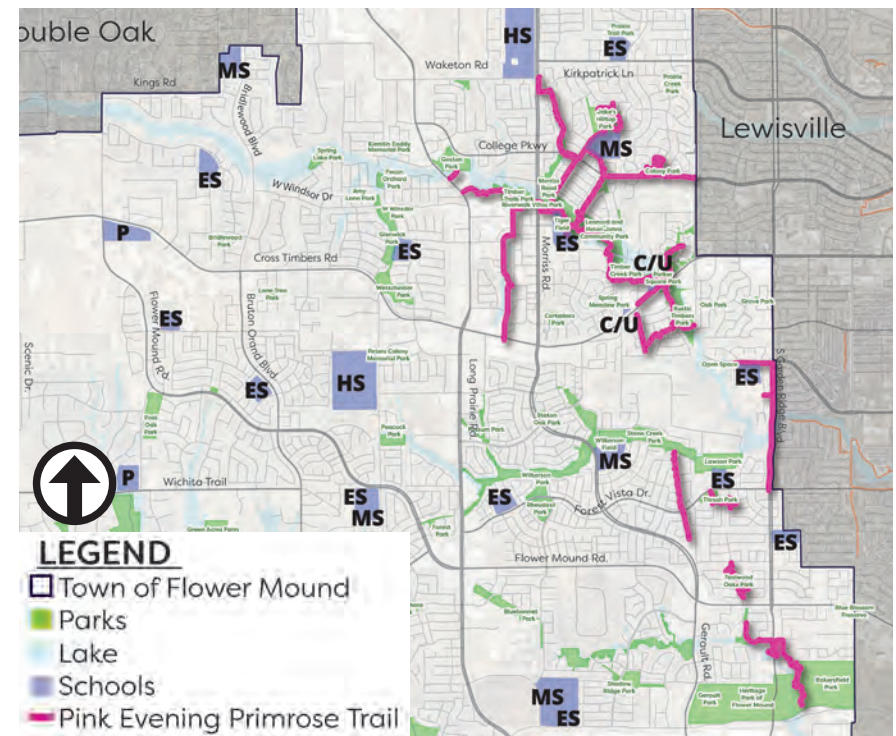
PINK EVENING PRIMROSE TRAIL

Length: 12.18 miles

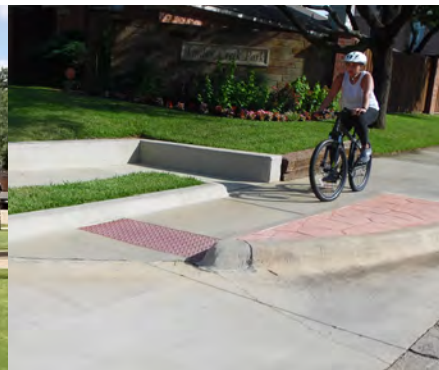
The Pink Evening Primrose Trail is a north-south trail corridor in the far eastern portion of Flower Mound. The trail runs through numerous neighborhoods and connects to schools, parks, and the Bluebonnet Trail. The trail width varies from 6' to 8'. The trail is generally in good condition with adequate vertical clearance, however in some areas trees, vegetation, and retaining walls present horizontal clearance constraints. Most of the trail is designed at a grade and slope that is ADA accessible, but there are a few areas along the trail that are a little steep. The trail includes a few pedestrian activated signals, but additional improvements to intersection crossings are needed. The trail also travels under two major roadways: Morriss Road near the Riverwalk and Cross Timbers Road (FM 1171). Both undercrossings would be safer if they were wider and if they had more cautionary signage to ensure users slow down when approaching the bridge. There are many segmented parts of the overall trail that could be better connected.

There are benches, waste receptacles, fitness stations, and pet waste stations located along the trail, however those facilities are mainly around the Timber Trails Park. Additional facilities such as water fountains, bike racks, and bike repair stations installed along the trail would improve the experience for trail users. Additional signage is needed for wayfinding and safety. Some of the corners and bends in the trail are difficult to navigate and views of oncoming traffic by trail users are obscured. There are also older bridges that should be assessed by a structural engineer to ensure their safety. Finally, the trail connects parks and schools but filling the gaps in the overall corridor would improve connectivity to schools, parks, and key destinations such as Riverwalk.

FIGURE 3.5: PINK EVENING PRIMROSE TRAIL KEY MAP



Red bollards designating trail



Intersection ramp



Trail bridge near Riverside



Fitness station along trail

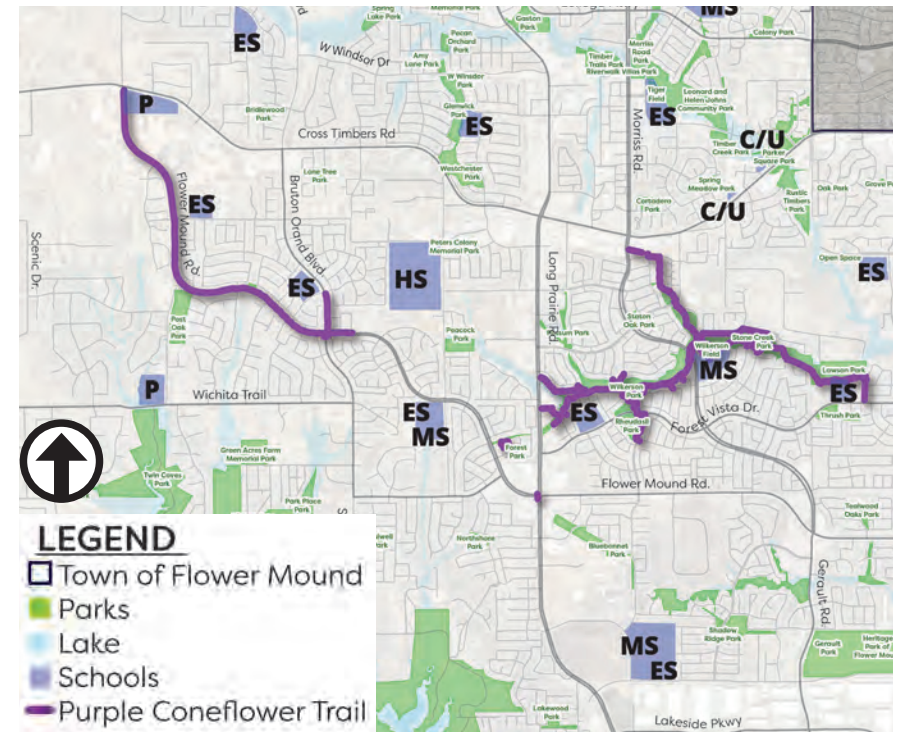
PURPLE CONEFLOWER TRAIL

Length: 11.93 miles

The Purple Coneflower Trail is an east/west corridor located north of the Bluebonnet Trail and connects the Tree Farm to Liberty Elementary School. While the trail provides access to numerous residents, it is disconnected in areas and has segments that are 4' to 6' in width in neighborhood loops. Additionally, the segment located along Flower Mound Road is only 4' wide. It is generally in good condition with adequate vertical and horizontal clearance. Most of the trail is designed at a grade and slope that is comfortable, but a few segments have steep slopes and grading issues. Improvements to some intersection crossings are needed as there are fewer pedestrian activated signals along this trail compared to others within the town. Long Prairie Road (FM 2499) poses a significant barrier as the only way to get across now is at a signalized intersection.

There are standard amenities such as benches, waste receptacles, and pet waste stations, but enhancements to the amenities such as water fountains, lighting, and bike repair stations could improve trail experiences. Red bollards are prevalent along the trail, and there are two larger trailheads. Additional signage is needed for wayfinding and safety. Finally, the trail connects parks and schools, but additional routes or segments would better connect the community to other trails and destinations.

FIGURE 3.6: PURPLE CONEFLOWER TRAIL KEY MAP



Pedestrian bridge over creek

Red bollards within a neighborhood

Trail leading to a park

Trailhead

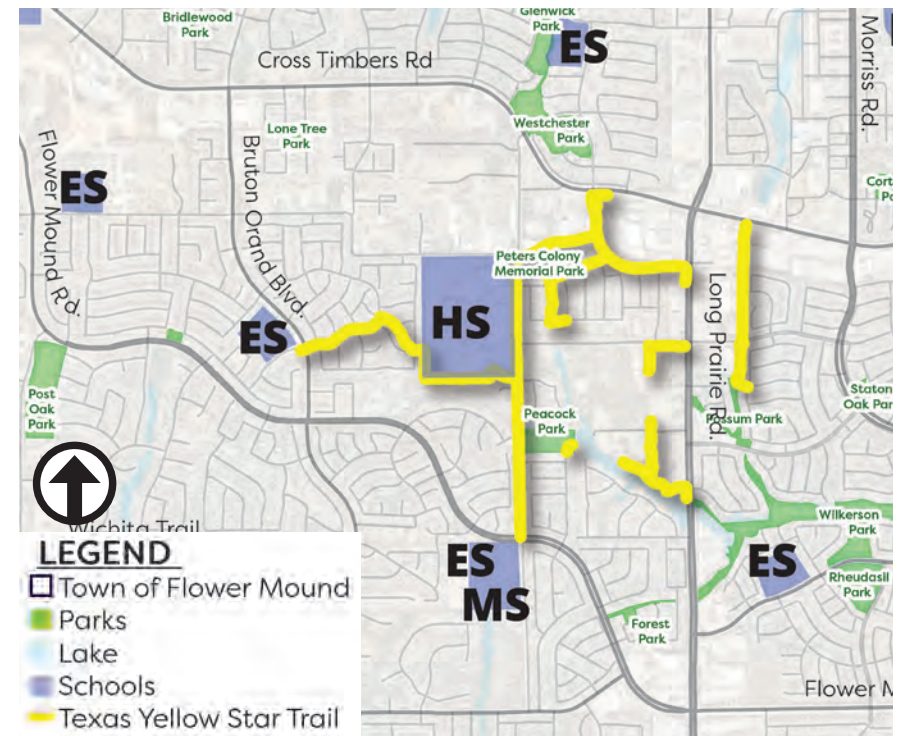
TEXAS YELLOW STAR TRAIL

Length: 4.73 miles

The Texas Yellow Star Trail is a shorter trail corridor in central Flower Mound. It links Wellington Elementary School and Flower Mound High School to the surrounding community. The trail is in good condition, with most segments being 8'-10' in width, and primarily runs adjacent to Old Settlers Road. Newer sections of trail that have been built with recent development are in very good condition. Much of the landscape is maintained by non-municipal entities such as homeowner associations.

The trail has adequate vertical and horizontal clearance and is designed at a grade and slope that is accessible for most users. Improvements to intersection crossings are needed. There are minimal amenities along the trail so additional trail amenities would improve the trail experience. Additional signage is needed for wayfinding and safety. The trail connects parks and schools, but additional routes or segments would better connect the community.

FIGURE 3.7: TEXAS YELLOW STAR TRAIL KEY MAP



Red bollards within a neighborhood

Trail near the high school

Overgrowth along trail

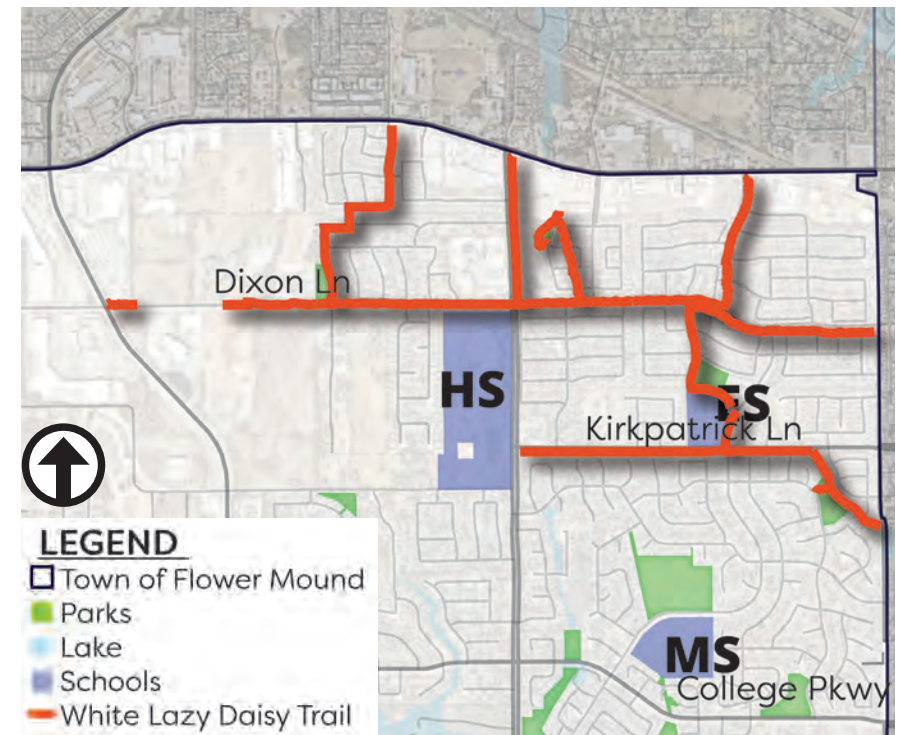
Neighborhood access point

WHITE LAZY DAISY TRAIL

Length: 5.78 miles

The White Lazy Daisy Trail is located in northern Flower Mound and connects Dixon Park to Prairie Trail Elementary School. There are numerous neighborhood connectors to the trail. The trail is in good condition, is mostly 8' in width, and runs adjacent to the roadway with some shade provided by vegetation. There is adequate vertical and horizontal clearance, with some vegetation encroachment. Most of the trail is designed at a grade and slope that is comfortable, however, portions along Valley Ridge Boulevard are steep and may not allow for ADA accessibility. Improvements to intersection crossings are needed as crosswalks, signage, improved ramps, and lighting is lacking along the corridor. There are limited amenities along the trail. Additional signage is needed for wayfinding and safety.

FIGURE 3.8: WHITE LAZY DAISY TRAIL KEY MAP



Curb ramp

Trail between houses

Trail adjacent to a school

Intersection crossing

OVERALL TRAIL EVALUATION KEY FINDINGS

- Wayfinding and directional signage along the trail system is needed.
- Four-foot wide segments should not be considered “trails”, instead they should be denoted as connectors to the trail system.
- Roadway crossings need to be improved to increase the safety for trail users, especially at major intersections that are identified as barriers to the system.
- Additional amenities along the trail are needed, such as bike racks, and lighting.
- Maps located at trailheads are outdated and with a rapidly growing system will likely continue to be. Alternatives such as QR codes that link to an online map should be explored.
- Emergency call boxes, lighting, cameras, and other safety factors should be included to increase safety and comfort.
- An overall ADA assessment of the trail system would confirm where trails are not ADA accessible.



TRAIL LEVEL OF SERVICE

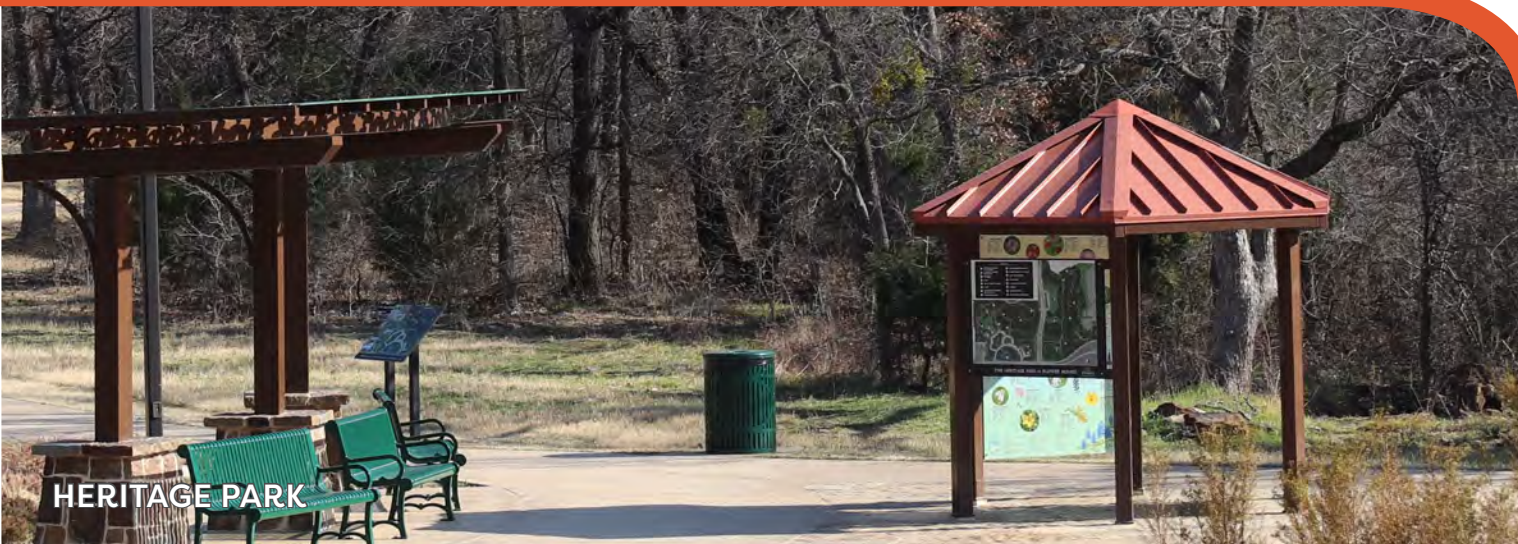
Level of Service (LOS) is a metric used to compare the miles of trail within a community with the total population. The LOS analysis includes an assessment of existing and proposed trails and compares it to existing and future populations. **Table 3.1** below shows the level of service for 6-foot and wider paths and 8-foot and wider paths. In order to compare to other communities, the LOS figures for trails 8-foot or wider is recommended to meet regional standards. The Future LOS represents the level of service if no additional trails were built between now and 2038, indicating that the level of service would decrease with expected additional population growth. A target LOS is defined in **Chapter 4**.

TABLE 3.1: TRAIL LEVEL OF SERVICE

2020 Population* (Current Population)		78,080	
2038 Population** (Projected Build-Out Population)		109,544	
Trails = 6' or wider multi-use paths		Trails = 8' or wider multi-use paths	
Current LOS - 2020	1 mile per 867 residents (1.15 miles per 1,000)	Current LOS- 2020	1 mile per 1,251 residents (0.80 miles per 1,000)
Future LOS - 2038 (No additional trails built)	1 mile per 1,217 residents (0.82 miles per 1,000)	Future LOS -2038 (No additional trails built)	1 mile per 1,756 residents (0.57 miles per 1,000)
Future LOS - 2038 (All currently proposed trails built)	1 mile per 769 residents (1.30 miles per 1,000)	Future LOS-2038 (All currently proposed trails built)	1 mile per 947 residents (1.06 miles per 1,000)

*Source: NCTCOG Regional Data Center, 2020.

**Source: Town of Flower Mound.



BENCHMARK COMMUNITIES

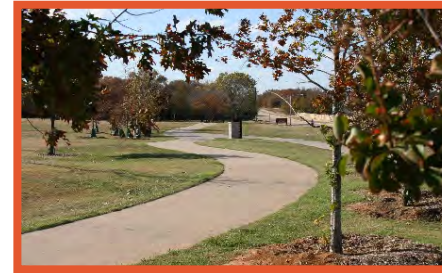
When analyzing the current LOS for Flower Mound, it is important to consider how it compares to cities of similar size and demographic composition in the DFW region. The population-per-mile benchmark is used to compare to the different cities; the lower the population-per-mile, the higher the LOS is for the trail system. Based on an average of many DFW communities, a regional benchmark of 1 mile of trail for every 1,200 residents has been established. The following communities are frequently used by Flower Mound to compare amenity and facility offerings. The following comparison only considers existing paved trails that are 8' or greater in width. Flower Mound has a current (2021) LOS of 1 mile per 1,251 residents. This ratio is better than the other identified benchmark communities, which indicates that Flower Mound has more trails per resident than the other communities but does not indicate the connectivity and accessibility of the overall system by comparison. Additionally, LOS just looks at the quantity of trails, not at the quality or condition of trails.



COLLEYVILLE

1 mile per 1,330 residents

Population: 26,462
Existing Trail Miles: 20
City Area: 8,384 Acres



LEWISVILLE

1 mile per 5,172 residents

Population: 106,386
Existing Trail Miles: 21
City Area: 23,488 Acres



GRAPEVINE

1 mile per 2,424 residents

Population: 53,317
Existing Trail Miles: 22
City Area: 20,480 Acres



MCKINNEY

1 mile per 3,515 residents

Population: 182,055
Existing Trail Miles: 52
City Area: 40,320 Acres



KELLER

1 mile per 2,783 residents

Population: 46,813
Existing Trail Miles: 17
City Area: 11,840 Acres



FLOWER MOUND

1 mile per 1,251 residents

Population: 78,080
Existing Trail Miles: 62.4*
City Area: 27,776

**Includes paved multi-use paths 8' or wider*

BICYCLE AND PEDESTRIAN CRASH DATA

To identify potential safety issues for the existing bicycle and pedestrian network in Flower Mound, bicycle and pedestrian crash data was evaluated. The database used for this section is the Texas Department of Transportation (TxDOT) Crash Record Information System (CRIS) 2016-2020 bicycle and pedestrian crash data. Only reported crashes are represented in the data, so if a minor crash occurs that was not reported to the police, this data would not reflect it. The points displayed in **Table 3.2** represent the number of crash types in Flower Mound. **Figure 3.9** represents the locations of bicycle and pedestrian crashes separated by user type (bicycle or pedestrian) and crash type (fatal or non-fatal).

Of all crashes involving a bicyclist and/or pedestrian between 2016-2020, sixty-five percent involved bicycles and were mostly non-fatal. Thirty five percent involved pedestrians and were mostly non-fatal. A common thread for the crashes is that they occurred along major roadways mainly at intersections where the trail system exists on at least one side of the road. The crashes can be contributed to gaps in the system and unsafe, unidentified, or non-existent pedestrian crossings. The fatal pedestrian crash was in the same location as a non-fatal bicycle crash and a non-fatal pedestrian crash, indicating that the intersection may need improvements. The fatal bicycle crash occurred on a six-lane major thoroughfare between two existing neighborhoods and close to Heritage Park. Without appropriate signage and advanced warning, motorized vehicles may not be aware of pedestrians and bicyclists crossing roadways or using facilities along roadways.

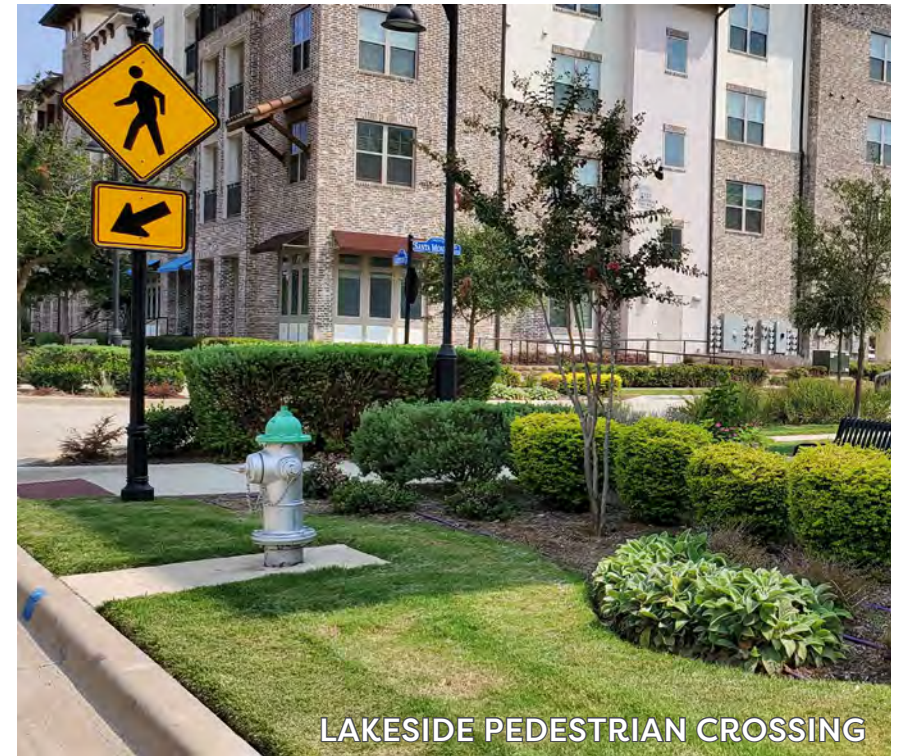
TRAIL USAGE

Strava is a Global Positioning System (GPS) application that allows runners, cyclists, and walkers to track their preferred routes or discover popular routes used by other users. Recent Strava data for Flower Mound is shown as a heat map in **Figure 3.10** on page 67 to indicate the most frequently used trail facilities while **Figure 3.11** on page 67 displays the most frequently used bikeway facilities. Strava data was used to show where people are biking and walking in Flower Mound today. As illustrated by Figures 3.12 and 3.13, major trails are heavily used, as well as sidewalks along major roadways and within neighborhoods. Sidewalks, bike lanes, and trails are more prevalent and used in the eastern part of Flower Mound. Both figures illustrate the locations of gaps in the system, where barriers may exist, and where trails and bikeways can be added.

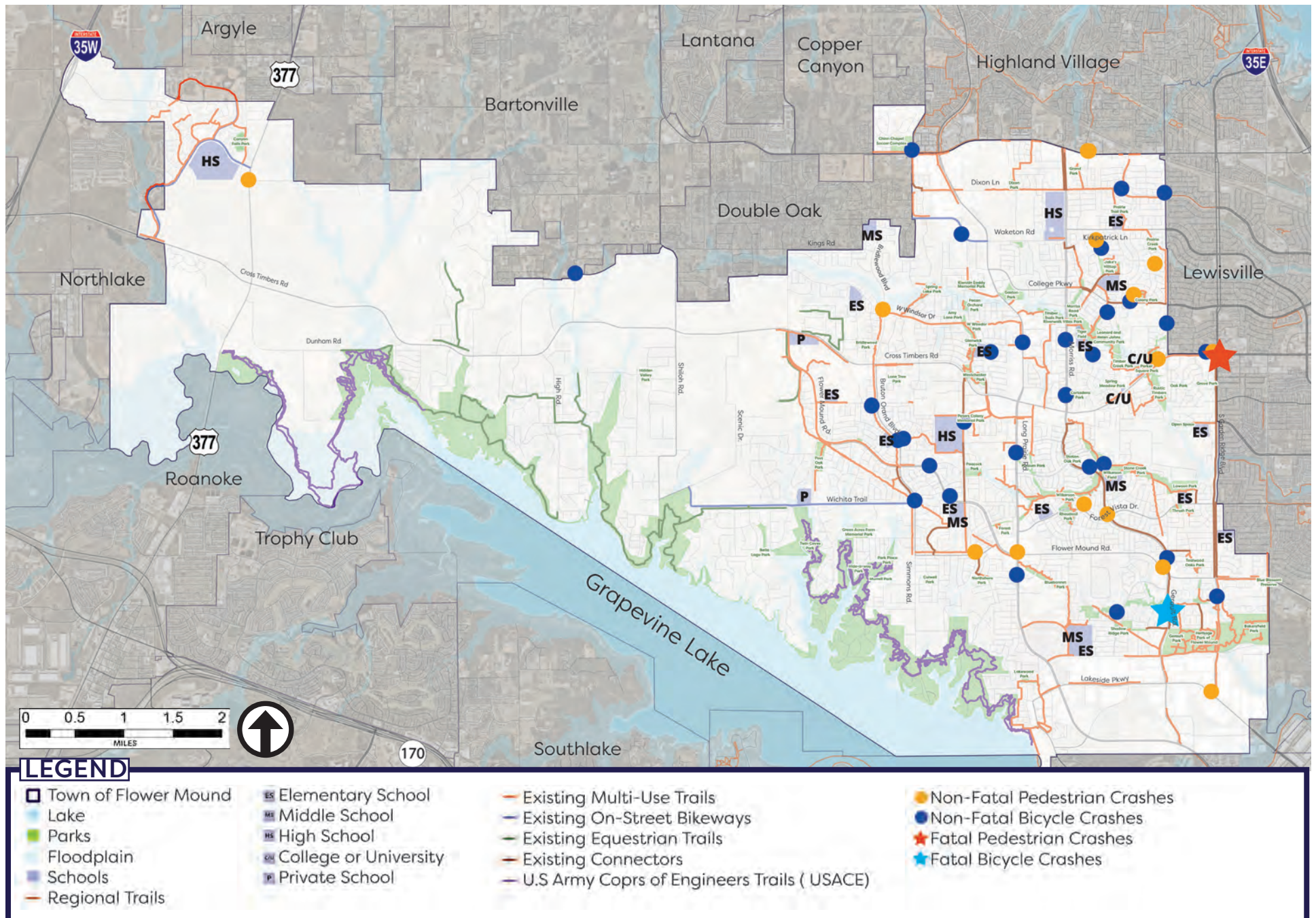
TABLE 3.2: BICYCLE AND PEDESTRIAN CRASH DATA

Crash Type	Number of Crashes
Non-Fatal Bicycle	31
Fatal Bicycle	1
Non-Fatal Pedestrian	16
Fatal Pedestrian	1

Source: TxDOT Motor Vehicle Crash Data for Flower Mound, 2016-2020



LAKESIDE PEDESTRIAN CROSSING

FIGURE 3.9: BICYCLE AND PEDESTRIAN CRASH MAP, 2016 - 2020

Source: TxDOT Motor Vehicle Crash Data for Flower Mound, 2016-2020

ON-STREET BIKEWAY ASSESSMENT

The goal of recommending new bikeway designations is to provide safe on-street bicycle routes throughout Flower Mound that increase connectivity between neighborhoods and to regional destinations. The three types of on-street bikeway accommodations that are preferred by planning participants are shared-use lanes, standard bike lanes, and buffered bike lanes. These accommodations were determined by examining multiple attributes of Flower Mound's existing roadway system such as speed limit, existing traffic volumes, available capacity, and right-of-way widths. Examples of these facilities can be found on page 48 in the engagement section. As a reminder, bicyclists can also use sidepaths or off-street trails if they do not wish to ride in the street.

SHARED – USE LANES

Shared-use lanes are the easiest to implement and are proposed for roadways with low speeds and volumes since cyclists share the lane with motor vehicles. Utilizing these bikeway accommodations along Flower Mound's local and collector roads provides opportunities to expand upon the existing network and connect key areas.

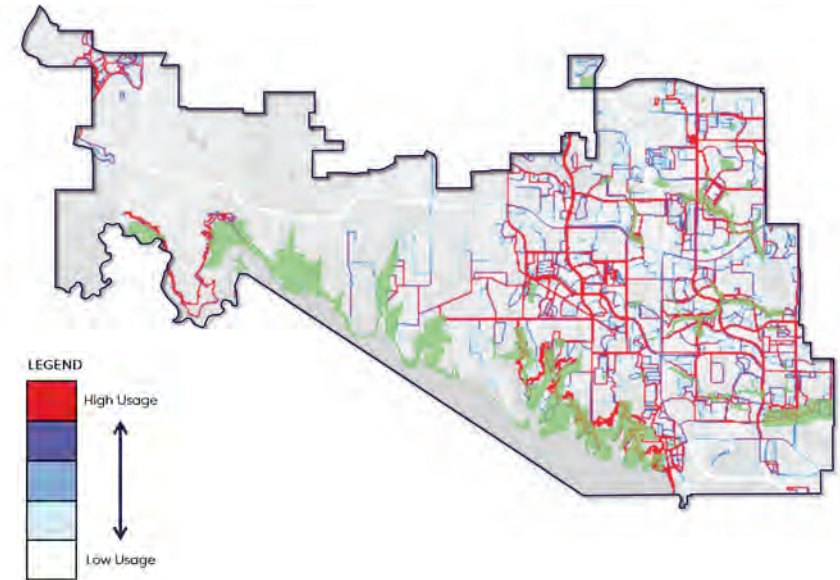
STANDARD BIKE LANES

Standard bike lanes are recommended along roadways that have slightly higher speeds and volumes for the safety of the user. These designations are also recommended on roadways that have the available width to accommodate modifications. Standard bike lanes offer increased comfort for cyclists and can encourage use by those that don't feel comfortable in a shared lane.

BUFFERED BIKE LANE

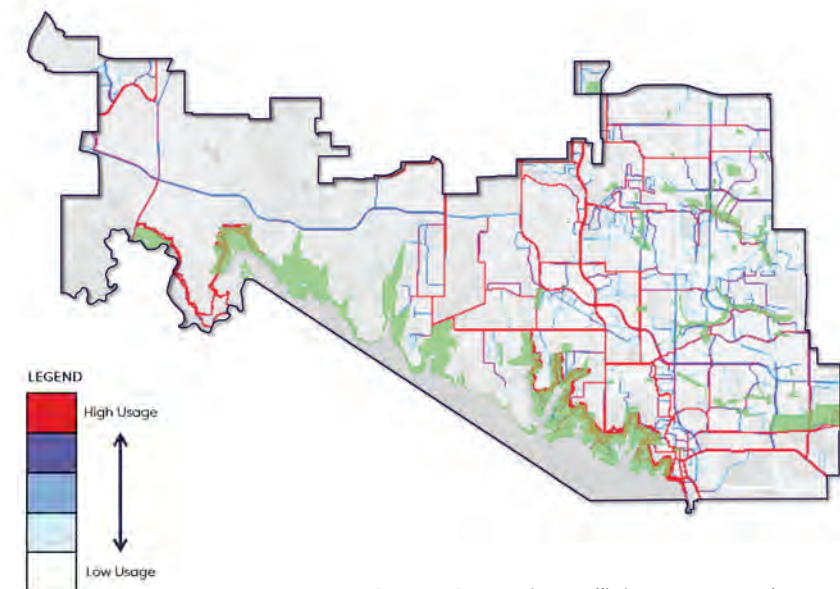
Similar to standard bike lanes, buffered bike lanes are offered along roadways that have higher speeds and volumes that need a spatial separation from the motor vehicles. However, these act as a major arterial for the bikeway network of a community. A buffered bike lane is used to connect major destinations and are proposed along major arterials in a community.

FIGURE 3.10: STRAVA PEDESTRIAN HEAT MAP, MAY 2021



Source: Strava, <https://labs.strava.com/>

FIGURE 3.11: STRAVA BICYCLE HEAT MAP, MAY 2021



Source: Strava, <https://labs.strava.com/>

BARRIERS AND OPPORTUNITIES

Based on the needs assessment and public input described earlier in this chapter, a series of barriers and opportunities were identified to help further expand the trails and bikeways system.

BARRIERS

The major barriers that exist in Flower Mound today can be divided into the following four categories and are shown in **Figure 3.12** on page 69.



SAFETY ISSUES

This type of barrier includes major safety concerns along the trails such as lack of cautionary signage, unsafe roadway crossings, steep slopes or drop-offs, and poor visibility. Safety issues may discourage use of trails and bikeways because a user cannot cross roadways or maneuver trails safely. Improved roadway crossings throughout the system could improve safety for trail and bikeway users. Slope concerns exist along the Texas Yellow Star Trail and the White Lazy Daisy Trail. There is a need for additional cautionary signage at each of the trail crossings under roadway bridges.



PHYSICAL BARRIERS

This type of barrier includes major roadways, rail lines, and water features which may present difficulties to connect the trail system. Intersections with Flower Mound Road, Cross Timbers Road, Gerault Road, and Long Prairie Road present major challenges to the safety and accessibility of the trails and bikeways system. Flower Mound Road is a major physical barrier along the entire system, as it is a six-lane, heavily traveled roadway with high posted speed limits.



ACCESSIBILITY

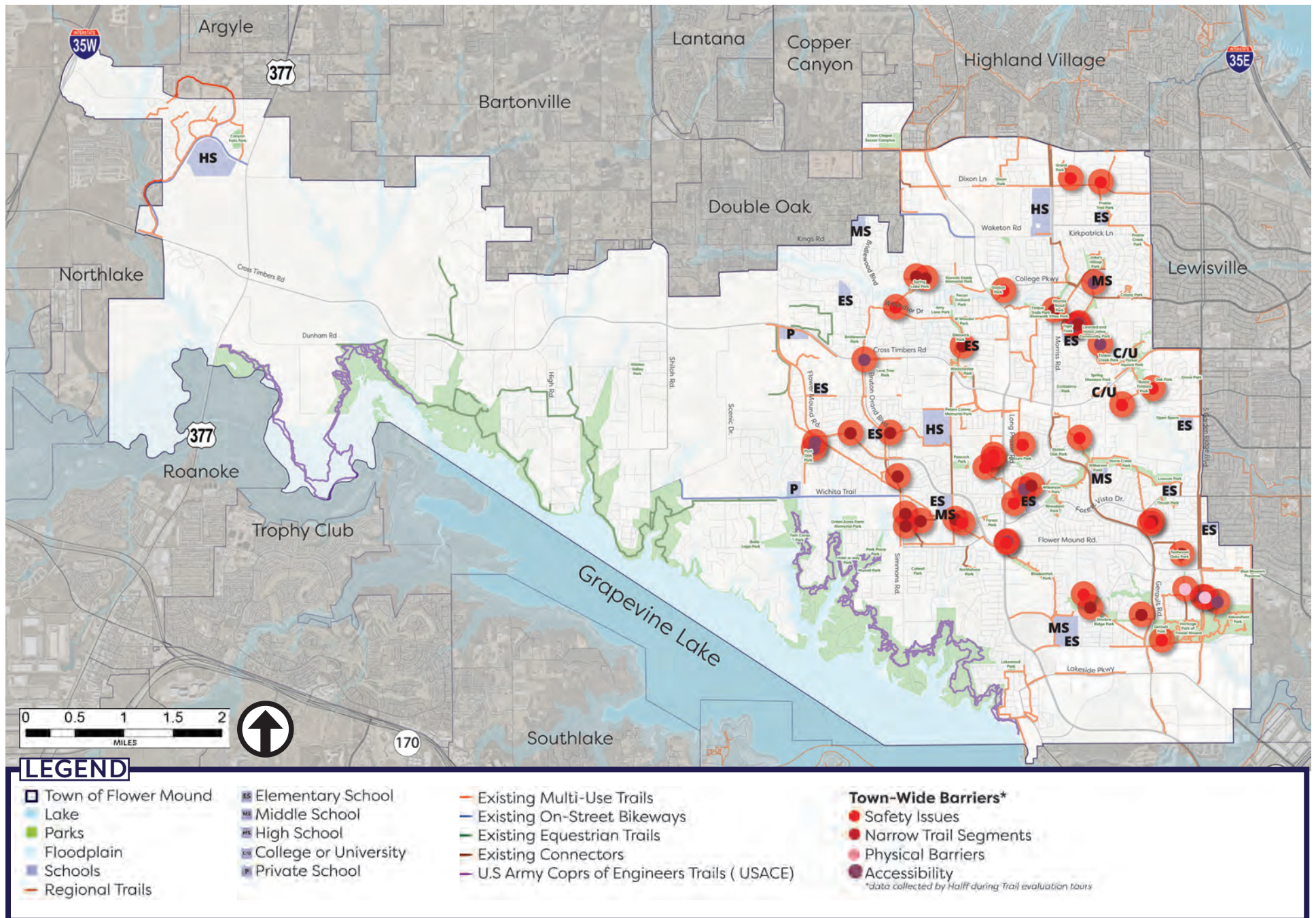
This type of barrier includes trail segments that are too narrow, including trails that are less than 8' in width. These segments may not be able to be widened due to right-of-way constraints, physical barriers, or may include bridges and infrastructure that cannot be widened. Narrow segments existing throughout the system, but are especially frequent within neighborhoods and internal to parks. As shown in **Figure 3.14**, just 64 percent of the trail system is 8 foot or wider. Narrow segments should be evaluated to see if they can be widened to meet national standards for trail widths.



NARROW TRAIL SEGMENTS

This type of barrier includes potential ADA compliance, lack of wayfinding/directional signage, and locations where trails dead end without warning. The entire trail system would benefit from increased wayfinding signage, but this would be especially useful where named trails intersect, or to provide direction to key destinations in Flower Mound.

FIGURE 3.12: MAJOR BARRIERS FOR TRAILS & BIKEWAYS IN FLOWER MOUND



OPPORTUNITIES

Based on the needs assessment, evaluation of the existing trail system, and stakeholder input, opportunities for the trails and bikeways system were identified. These opportunities serve as a framework for the recommendations presented later in the document. **Figure 3.15** on page 72 shows opportunities in map form and the following categories are described below and on page 71.



CONNECTIONS TO MAJOR DESTINATIONS

Connections throughout the town were identified as important by system users. Key destinations include schools, parks, libraries, and activity centers such as Lakeside, Riverwalk, Parker Square, Grapevine Lake, Town Hall, and Stone Creek. Providing better connectivity to these places can reduce dependence on automobiles and encourage active transportation and healthier lifestyles.



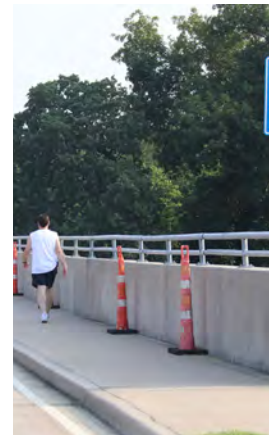
INTERJURISDICTIONAL CONNECTIONS

Interjurisdictional connections present opportunities to connect Flower Mound to adjacent communities like Grapevine, Coppell, Lewisville, Highland Village, Double Oak, North Lake, Roanoke, and Trophy Club. Improving bicycle and pedestrian connections to these communities, either through the expansion of the Regional Veloweb trailway system or through new connections, will enhance regional connectivity and provide access to key activity centers for residents of the region.



ACCESSIBILITY

The overall trails and bikeways system can be enhanced through filling in gaps in the existing system and providing for better connections to existing neighborhoods. Gaps in the system exist along all named and unnamed trails in Flower Mound. Potential new trails and connections would improve the accessibility of the system.



CORRIDORS TO WIDEN

Segments of trails that are less than 8 feet in width should be widened where possible to meet current standards and best practices. Opportunities to widen existing trails exist along Long Prairie Road, Gerault Road, S. Garden Ridge Blvd, Lakeside Parkway, and many other roads in eastern Flower Mound, as shown in **Figure 3.13**.

OPPORTUNITIES CONTD.



ADDITIONAL CONNECTIVITY OPPORTUNITIES

Opportunities to expand the system exist throughout the town. This plan considers five feasibility corridors discussed later in this plan and utility corridors as places where new trails can be constructed to expand the system. It also looks at new paddling launch points for a paddling trail system, additional locations for trails along greenways or creeks, and improved intersection crossings to improve overall connectivity of the system.



PLACEMAKING

Placemaking can help strengthen and improve a community or system by improving the public realm. Placemaking strategies that can improve the trails and bikeways system in Flower Mound include branding of the trail system through trail naming, wayfinding, and trailheads. Interpretive signage can be included along trails to help educate the community about environmental resources, arts, culture, and history. Intersections of trails can be designed to match the brand of the trail systems.



AMENITIES

Amenities can improve the overall experience for trail users. They provide shade, shelter, places to rest, and places to dispose of waste. Trailheads can be used to identify the start and end of trails. Wayfinding signage can help people identify where they are and where they want to go, while providing for branding along the trail. Other amenities that can improve user experience along trails and bikeways include: bike racks, bike repair stations, waste receptacles, benches, pet waste stations, lighting, and parking.

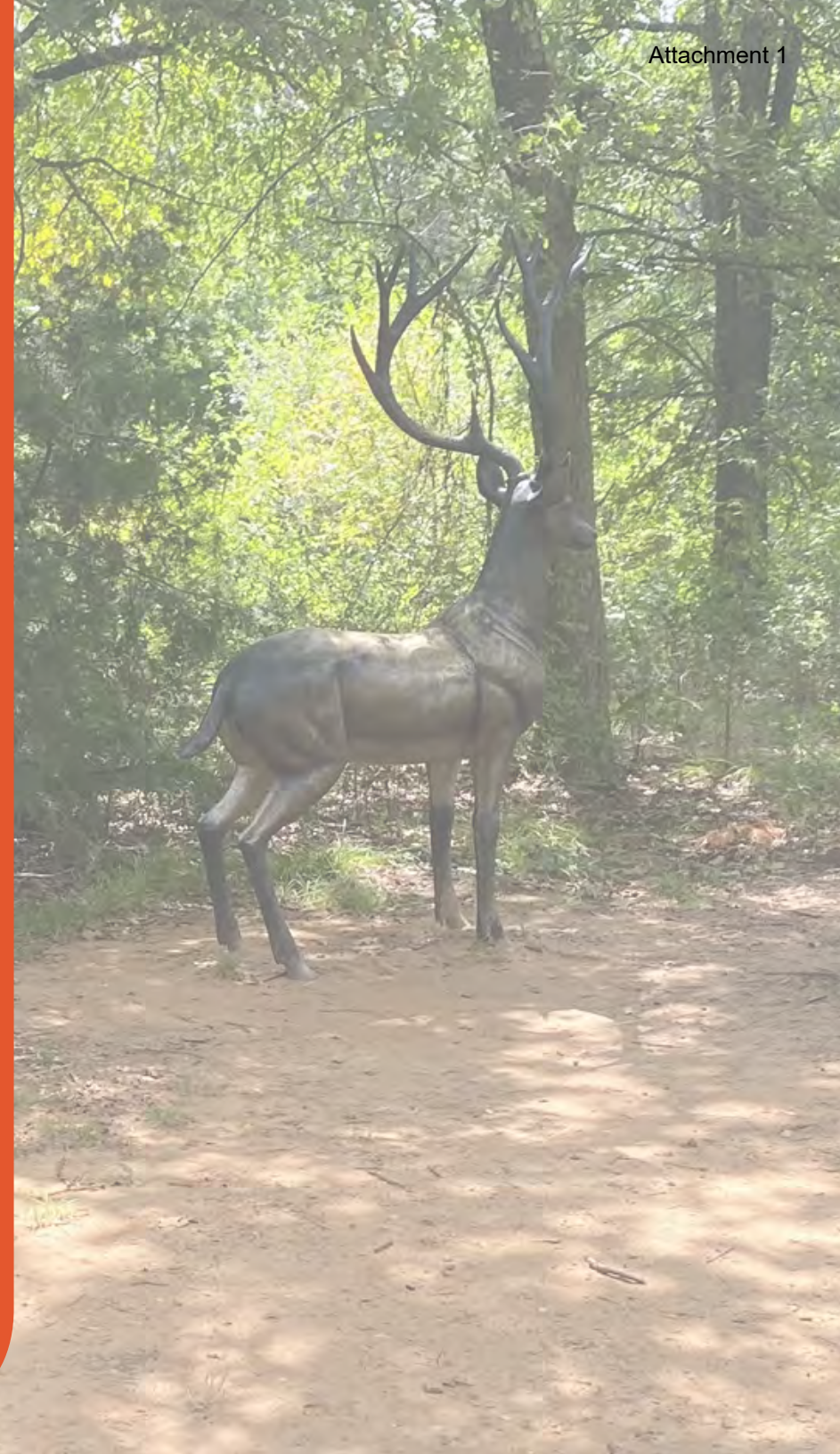
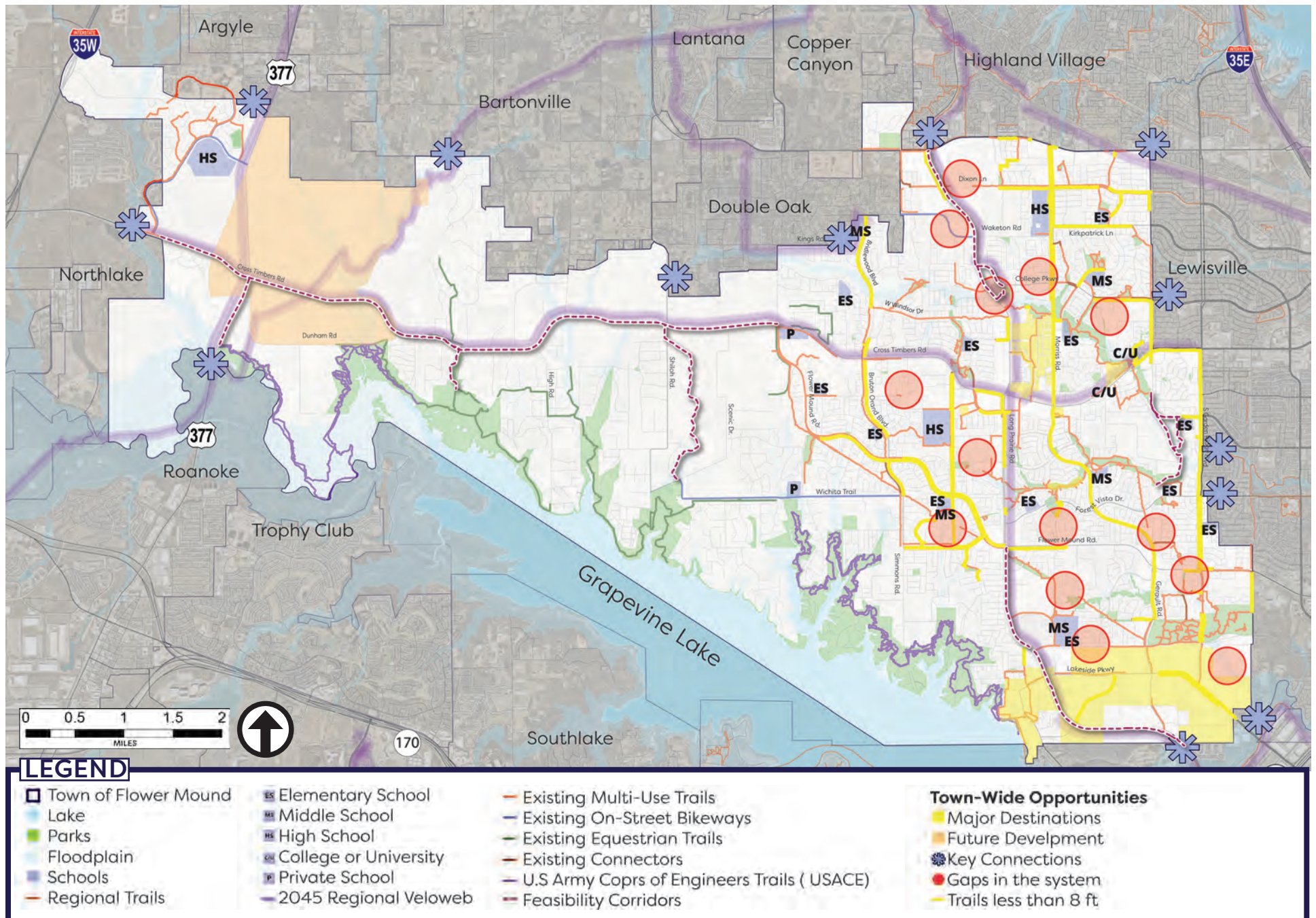
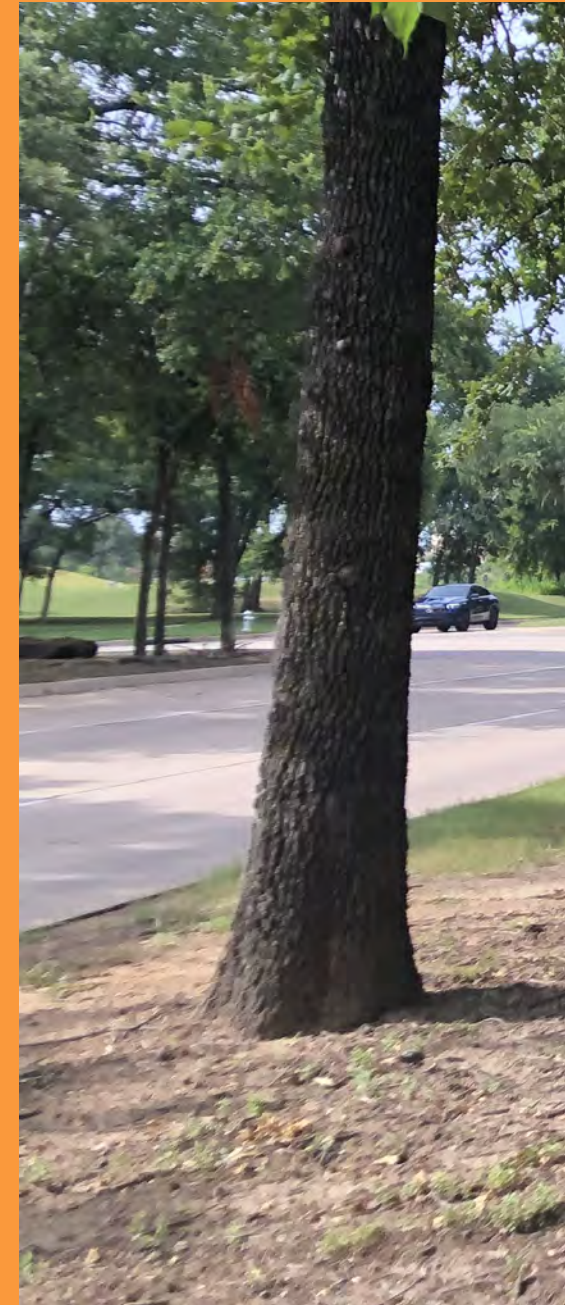


FIGURE 5.1: MAJOR OPPORTUNITIES FOR TRAILS & BIKEWAYS IN FLOWER MOUND

Corridor Identification Facility Hierarchy Recommended Network



O4 TRAILS & BIKEWAYS SYSTEM NETWORK



INDIAN BLANKET TRAIL

75 Flower Mound Trails and Bikeways Master Plan

This plan proposes a well-connected network of on- and off-street trails and bikeways throughout the town. The proposed network was developed through a combination of research, field observation, and community input, much of which has been summarized in preceding chapters. The network depicted intends to encourage recreation, active transportation, and healthy living for generations to come.

CORRIDOR IDENTIFICATION

Five primary evaluation criteria were considered to determine the suitability of the trails and bikeways network in Flower Mound. These criteria, listed below, are used to help determine the level of impact and feasibility of each segment. Not all trails align with each criterion.

Connects the system – The segment would provide connections to the existing or planned system by filling a gap within the existing network.

Connects to destinations – The segment would provide connections to community destinations such as parks, schools, entertainment, and employment opportunities.

Addresses safety issues – The segment would address safety concerns to improve access to the system.

Increases access – The segment is located close to residential areas and would provide additional connectivity to neighborhoods.

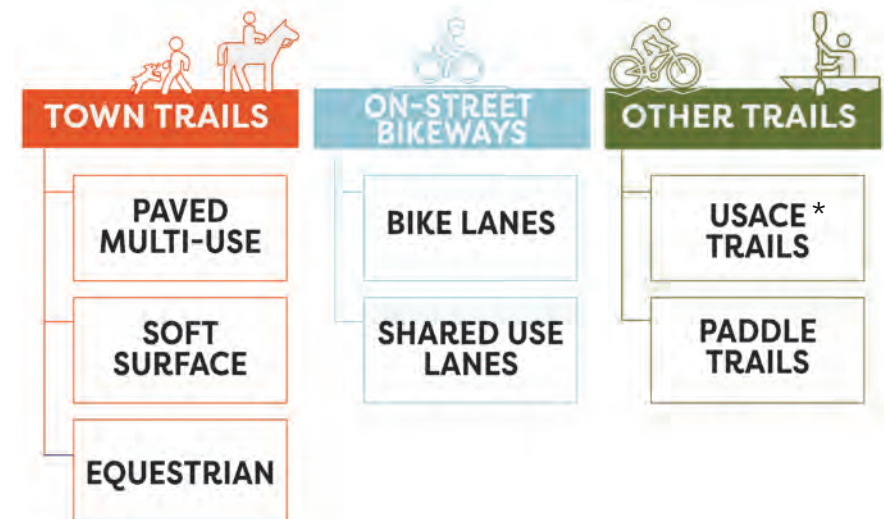
Feasibility of corridor – The segment should be generally feasible to construct. Elements considered during a planning level review include available right-of-way or easements, lane widths, property ownership, topography, and floodplain.

FACILITY HIERARCHY

The Town of Flower Mound's network includes town trails, connectors, on-street bikeway facilities, and other trails, as shown in **Figure 4.1**. Each facility is designed to accommodate specific users. This section discusses key characteristics of each facility hierarchy. More details on design characteristics of each facility type is included in Chapter 5.



FIGURE 4.1: FACILITY HIERARCHY



* US Army Corps of Engineers

TOWN TRAILS

Town Trails provide a high level of comfort for users based on widths and locations of the trails. These trails include paved multi-use trails, soft surface trails, and equestrian trails that are maintained by the Town.



PAVED MULTI-USE TRAILS

Paved multi-use trails can be located adjacent to roadways, within utility easements, or within parks and greenways. These wide, paved facilities are comfortable for bicycle and pedestrian users of various ages and abilities. The minimum width for trails is recommended to be 12', however, 10' may be applicable in areas where there are existing ROW constraints. This is consistent with AASHTO and regional standards. For trails designated as part of the Regional Veloweb, the trail should be 12' to meet NCTCOG standards and provide for a high level of comfort. These paths can be used for recreational uses or for commuting when they connect to employment centers and schools.



PAVED MULTI-USE TRAIL



SOFT SURFACE TRAILS

Soft surface trails maintained by the Town should be designed with decomposed granite or another soft surface material, and can be used in environmentally sensitive areas and should be a minimum of 8' in width. Soft surface trails provide recreational opportunities, connect people to nature, and can be less expensive to construct. There is heavier maintenance required on these trails to maintain ADA accessibility. Anticipated users include walkers, joggers, and people wanting to experience the outdoors.



SOFT SURFACE TRAIL



EQUESTRIAN TRAILS

Equestrian trails are trails for primary use by people on horseback. These natural surface trails can be located through wooded and vegetated areas to provide people with alternative riding experiences and allows them to explore nature. The surface material is typically compacted earth with a width of approximately 15'. Where possible, considerations for hitching posts and trailer parking should be incorporated into equestrian trailheads.



BRIDLEWOOD EQUESTRIAN TRAIL

ON-STREET BIKEWAYS

BIKE LANES



Bike lanes are designated spaces on roadways with relatively higher volumes and travel speeds. Based on AASHTO and Town standards, the minimum width of a bike lane is 5' to provide a more comfortable space for bicyclists. When the facilities are buffered with either striping or a physical barrier, bike lanes can be attractive for a wider range of comfort levels.

SHARED-USE LANES



Shared-use lanes are designated roadways with low traffic volumes and speeds, and include pavement markings on the road to indicate the street is to be shared between vehicles and bicyclists. Pavement markings include arrows and a bicycle, and the roads typically include shared lane signage. In lower traffic areas such as residential streets, these roadways can be designated with just signage and not pavement markings.



SHARED-USE LANE

OTHER TRAILS

OTHER SOFT SURFACE TRAILS



The US Army Corps of Engineers (USACE) owns soft-surface trails along Grapevine Lake that are maintained by the Dallas Off-Road Bicycling Association (DORBA) and the Cross Timbers Equestrian Trails Association (CTETA). These trails provide recreational opportunities for mountain bikers, hikers, people on horseback, and nature seekers. Any proposed changes to the trail system should be coordinated with the USACE. These trails vary in width and are typically compacted dirt.



USACE TRAIL AT GRAPEVINE LAKE

PADDLING TRAILS



Paddling trails located on Grapevine Lake are designated water way trails that provide the opportunity to explore the lake, engage with nature, bird watch, fish, and experience similar water-based activities. Paddling trails are associated with a series of launch points where paddling users can put in and take out their watercraft. Considerations for interactions with operators of motorized boats is important.



TWIN COVES PARK KAYAK LAUNCH

OTHER FACILITIES



CONNECTORS

Connectors are enhanced sidewalks up to 8' in width that connect neighborhoods to key destinations, such as employment centers, entertainment opportunities, schools, and parks. All new connectors or reconstruction of existing connectors should be widened 6'-8' where feasible. This facility type is typically found along major roadways that have constraints restricting the construction of a wider multi-use path. These facilities differ from other sidewalks within the Town system since they fill in key gaps in the overall trail and bikeway system.



HIERARCHY SUMMARY

Table 4.1 provides a summary of the key characteristics of each proposed facility type. For additional descriptions of the design of each facility type, please refer to Chapter 5.

TABLE 4.1: HIERARCHY SUMMARY

Facility Type	Preferred Surface Material	Width (Feet)	Primary Users	Locations
Town Trails				
Paved Multi-Use Trails	Concrete	12', 10' if existing ROW constraints	Pedestrian and Cyclist	Adjacent to roadways, greenbelt corridors, utility easements, within parks
Soft Surface Trails	Decomposed Granite	8'	Pedestrians	Areas of environmental interest
Equestrian Trails	Compacted Earth	15'	Equestrian Users	Located away from roadways
On-Street Bikeways				
Bike Lanes	Pavement	5' minimum	Cyclist	Roadways with speeds less than 45 mph
Shared-Use Lanes	Pavement	14' lane width	Cyclist	Roadways with speeds less than 35 mph
Other Trails				
USACE Trails	Compacted Earth	Varies	Hikers, Mountain Bikers, Equestrian	Within USACE land
Paddling Trails	n/a	n/a	Kayaks, Canoes	Along Grapevine Lake
Other Facilities				
Connectors	Concrete	6'-8' depending on existing ROW constraints	Pedestrians	Adjacent to roadways

RECOMMENDED NETWORK

The recommended network of trails, bikeways, and connectors were informed by public input, needs assessments, corridor evaluations, and guidance from the overall plan goals. This section discusses the proposed network and subsequent impacts to future levels of service (see Chapter 3 for level of service definition).

COMBINED RECOMMENDATIONS

The combined recommendations create a robust trails and bikeways system throughout Flower Mound to connect residents to key destinations and to the larger DFW region. Some of the key components of the network recommendations are described below.

Major Destinations in Flower Mound include parks, schools, major employers, and entertainment centers. As development occurs in these areas, there are opportunities to enhance the system by widening existing facilities, filling in gaps, and constructing new facilities. As development occurs in western Flower Mound, connections should be provided to future destinations.

Regional Connections are important to connect residents to opportunities in surrounding communities. Interjurisdictional connections include trails and bikeways that can connect Flower Mound's citizens to all the DFW Metroplex has to offer, and improves overall regional connectivity, mobility, and recreation.

Filling in Gaps in the existing trail and bikeway system was identified as a priority through the master plan public input process. Many of the existing trail gaps are located in the eastern part of Town that is primarily built-out. This plan sought to fill in strategic gaps to provide more continuous trail segments. Many of these gaps are found along the branded trails such as the Pink Evening Primrose Trail and the Bluebonnet Trail.

TABLE 4.2: RECOMMENDED SYSTEM WIDE FACILITY MILEAGE

Facility Type	Existing Mileage	Recommended Mileage	Total Mileage
Town Trails	59.6	82.1	141.6
On-Street Bikeways	4.7	34.8	39.5
Other Trails	34.5	2.3	36.8
Total	113.5	129.8	243.3

HOW TO USE THE MAP

The Trails and Bikeways Master Plan recommendations map should serve as a blueprint for town staff, leaders, and developers when considering new trails and bikeways within Flower Mound. Whenever a new development or redevelopment is proposed, the associated recommended trail facility is required to be constructed by the developer. Moreover, whenever a roadway is built, expanded, or reconstructed, the proposed bikeway accommodations should be included. Furthermore, future updates to the Thoroughfare Plan may necessitate modifications to the alignments of trails adjacent to roadways and on-street bikeway accommodations. Finally, the Trails and Bikeways Master Plan map may be amended by the Town Council; it is recommended that these modifications occur annually to reflect facilities that are built and other needed changes.

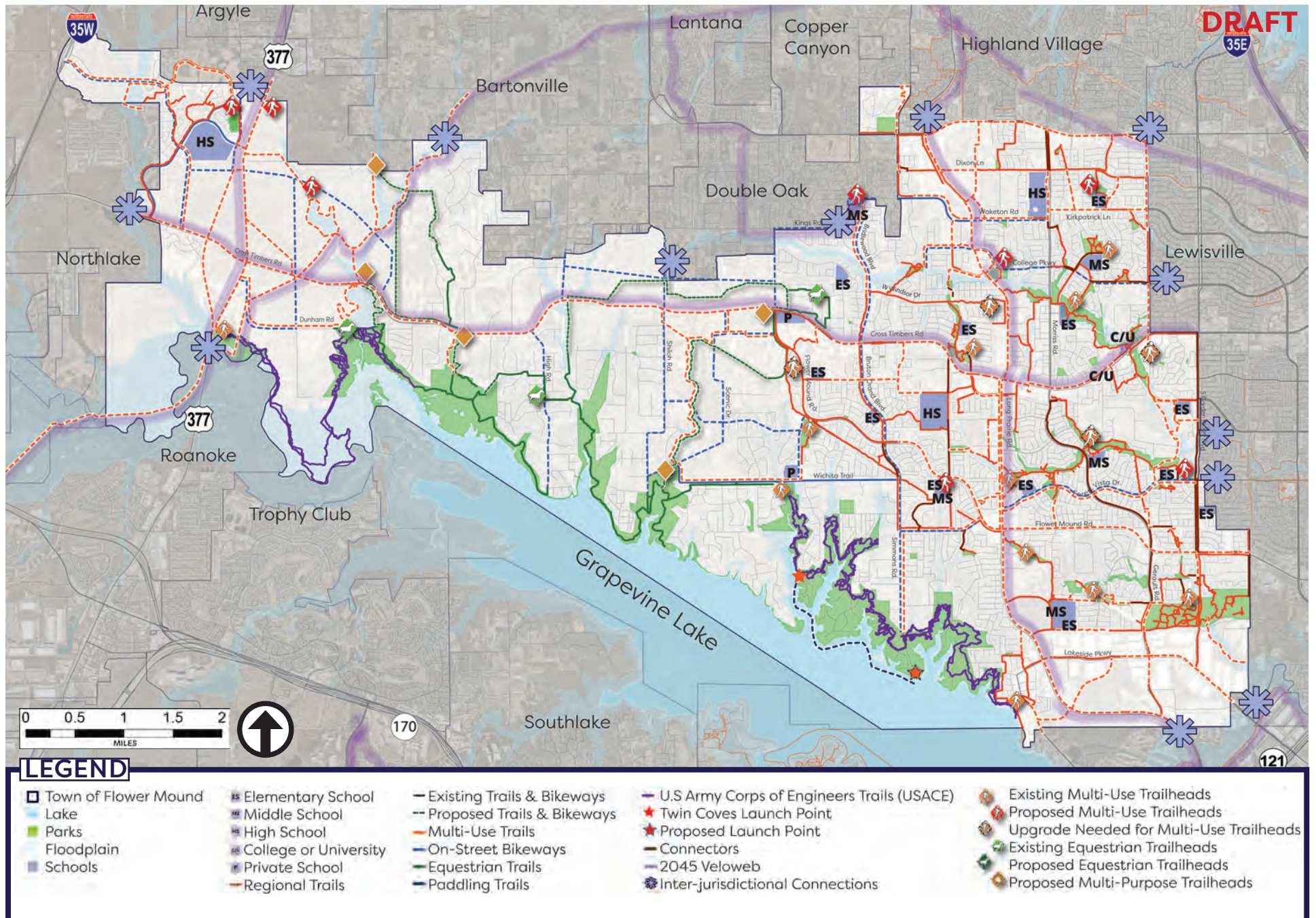
Figure 4.2 on the facing page represents the collective network recommendations for the Town of Flower Mound. **Table 4.2** provides details on the existing and proposed mileage of all facility types. **Table 4.3** shows how implementing these recommendations would change the Town's level of service.

TABLE 4.3: BUILD-OUT LEVEL OF SERVICE (LOS)*

2020 Population	78,080
2038 Population	109,544
Current Trail LOS (2020)	1 mile per 1,310 residents
Future Trail LOS (2038)	1 mile per 1,318 residents
All Recommend Trails LOS (2038)	1 mile per 898 residents

**Trails included in LOS calculations just includes paved multi-use trails.*

FIGURE 4.2: COMBINED RECOMMENDATIONS MAP



TOWN TRAIL RECOMMENDATIONS

Figure 4.3 illustrates the network of town trails intended to accommodate both pedestrians and bicyclists. The designated facilities aim to provide town-wide connectivity to destinations and the larger DFW Region.

PAVED MULTI-USE TRAILS

The proposed paved multi-use trails create town-wide connections and fill in gaps in the existing trail network along major roadways, along greenways, and through utility easements. These trails connect to the regional system, improve connectivity throughout the Town, and provide Flower Mound's residents better access to destinations such as parks, schools, entertainment, and employment centers. Flower Mound has the ability to use undeveloped land and floodways throughout the Town to improve access to the overall trail system. The recommended segments include widening existing trails to meet new standards, and constructing new trails to improve the overall network.

SOFT SURFACE TRAILS

Soft surface trails will primarily exist on the USACE property along Grapevine Lake. Beyond the existing soft-surface trails that are managed by the Town today, there are no additional soft-surface trails recommended since they are not accessible to all users.

EQUESTRIAN TRAILS

The Town of Flower Mound has an active and avid equestrian community. This plan seeks to connect existing trails, create trail loops, and enhance the overall equestrian trails network to connect riders with nature. There are opportunities to finish trail loops where development is proposed on the more natural, west side of Town. The addition of trails to connect north of Cross Timbers Road to the USACE trails along Grapevine Lake are provided at locations where trails either already exist, or where there will be enhanced trail crossing infrastructure, such as an underpass.

TABLE 4.4: TOWN TRAILS RECOMMENDATION SUMMARY

Facility Type	Existing Mileage	Recommended Mileage	Total Mileage
Paved Multi-use Trails	59.6	82.1	141.6
Soft Surface Trails	0.1	0	0.12
Equestrian Trails	14.6	10.9	25.5
Total	74.2	93.0	167.22

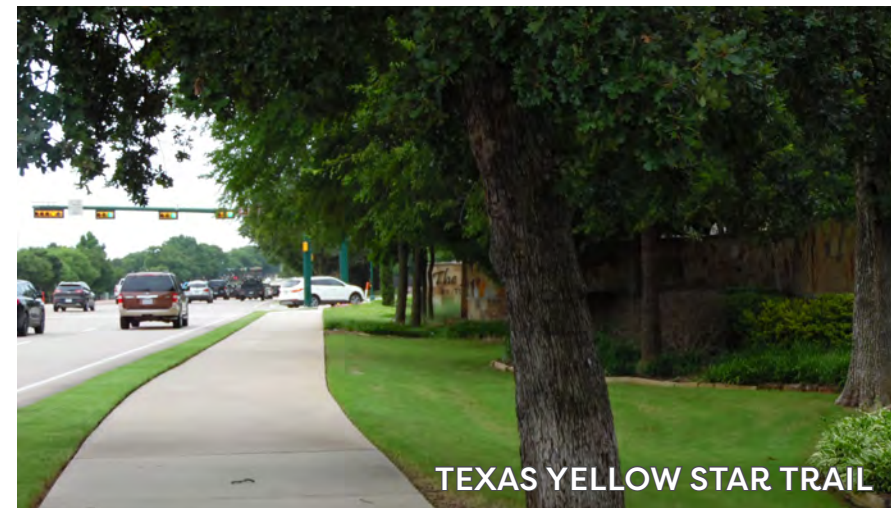
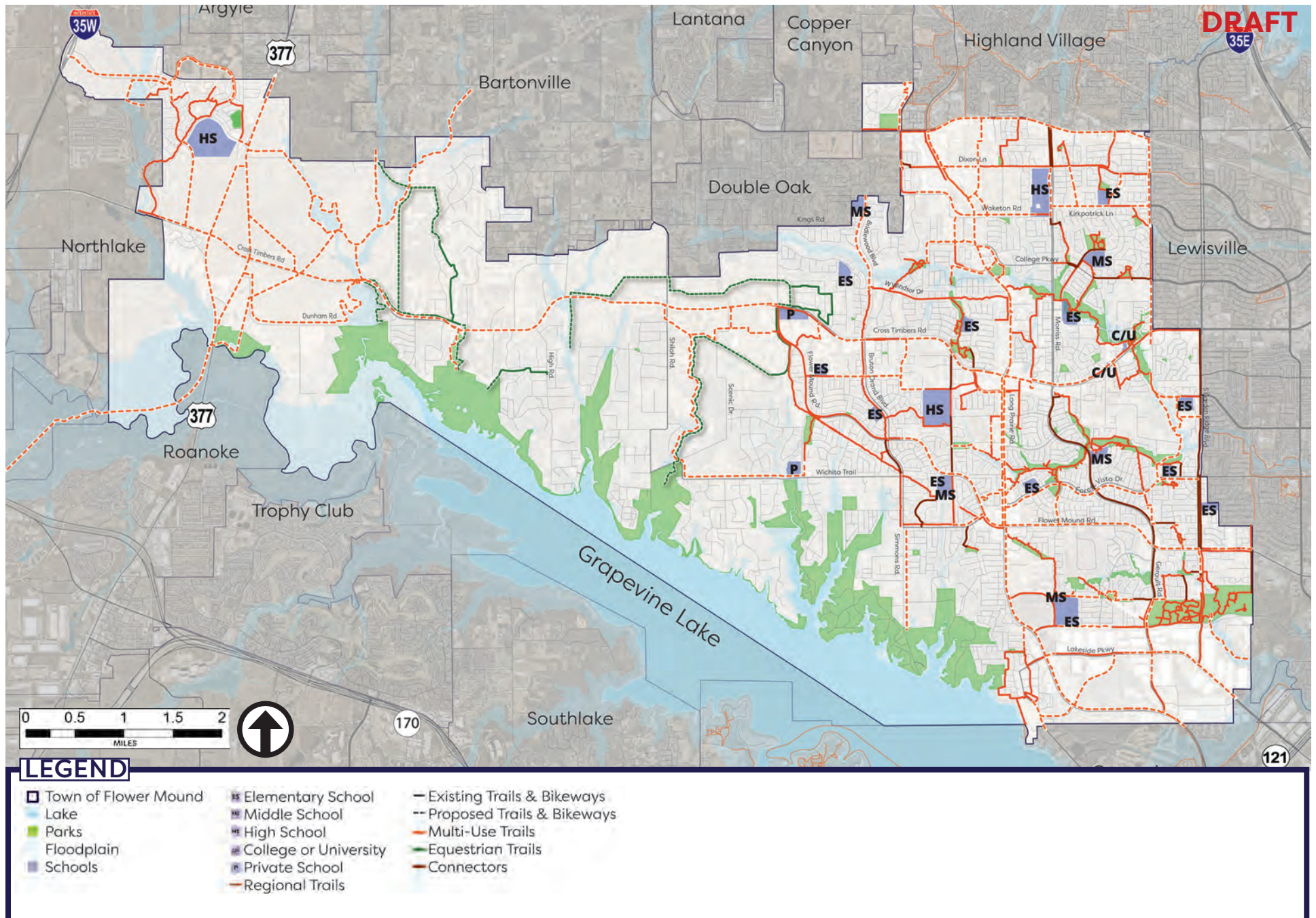


FIGURE 4.3: TOWN TRAILS RECOMMENDATIONS MAP



ON-STREET BIKEWAYS RECOMMENDATIONS

BIKE LANES

Bike lanes have been recommended for the roadways that have relatively higher speeds and volumes and have the available right-of-way, or pavement width, to accommodate the modifications necessary to install bike lanes. Proposed bike lanes were designated along roadways where continuous and comfortable routes for residents are feasible. They provide key connections to the mountain biking trails along Grapevine Lake and to the proposed or existing Town Trails. Generally, riders feel an increased level of comfort on separated facilities, such as bike lanes, and as such they should be implemented opportunistically. The Town should consider designs to add bike lanes where feasible and there is available right-of-ways when thoroughfares are updated, whether they are shown on this map or not. Future updates to the thoroughfare plan can also indicate where additional bike lanes are feasible.

SHARED-USE LANES

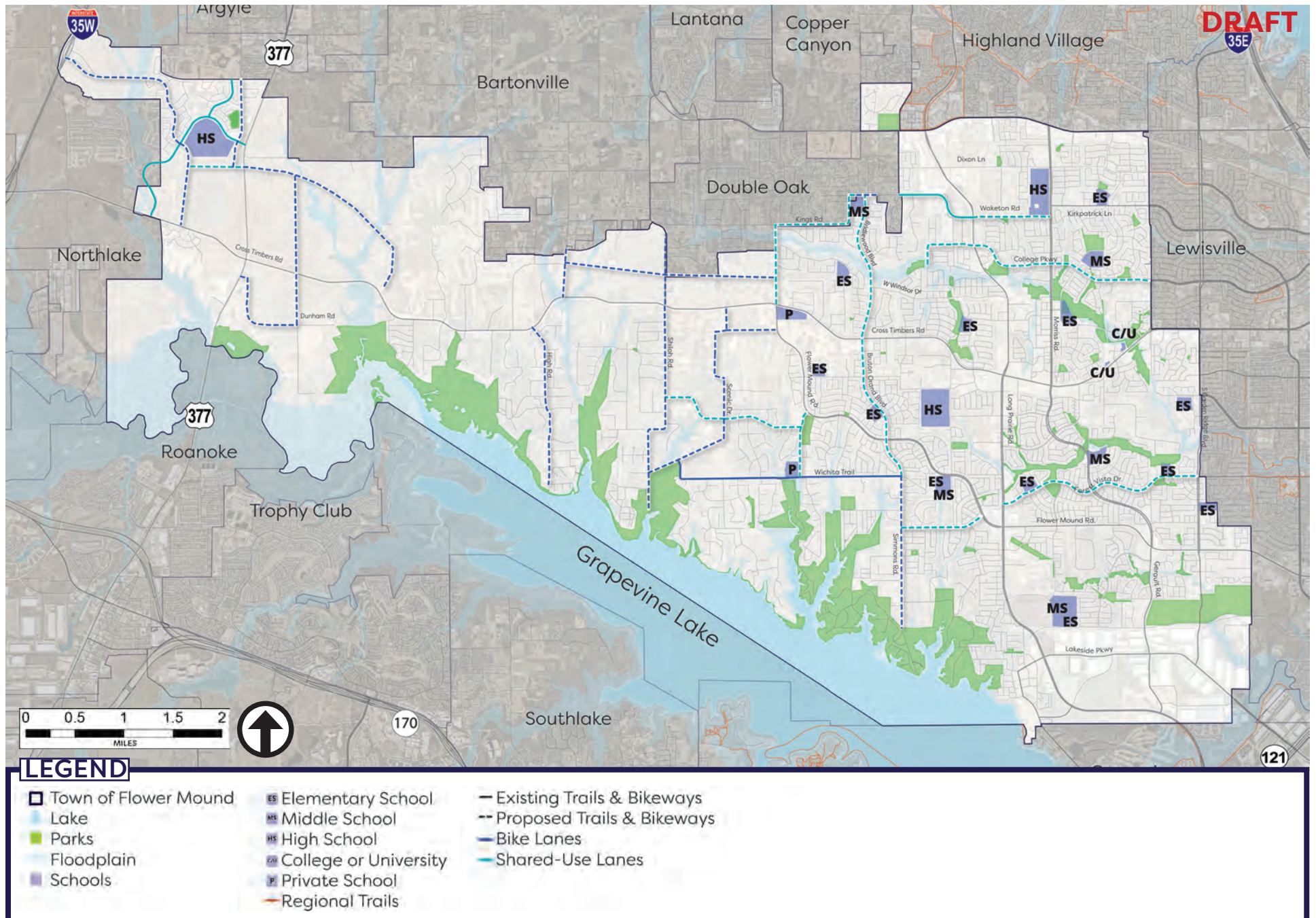
Shared-use lanes can be easily implemented and require little change to the existing roadway. A majority of the bikeway facilities on the east side of Town are shared-use lanes due to existing constraints. These routes are on local roads or collectors with low volumes and speeds, which are more ideal for creating a comfortable riding experience for users of all ages and abilities. These routes connect residents to the trail system, bike lanes, and destinations throughout the Town.



TABLE 4.5: ON-STREET BIKEWAYS RECOMMENDATION SUMMARY

Facility Type	Existing Mileage	Recommended Mileage	Total Mileage
Bike Lanes	2.4	16.5	18.9
Shared-Use Lanes	2.3	18.3	20.6
Total	4.7	34.8	39.5



FIGURE 4.4: ON-STREET BIKEWAYS RECOMMENDATIONS MAP

OTHER TRAILS RECOMMENDATIONS

Other trails include the USACE soft-surface trails along Grapevine Lake and paddling trails in Grapevine Lake. These are diverse trails intended to serve a variety of users.

USACE TRAILS

USACE Trails are soft-surface trails located along Grapevine Lake and are maintained by DORBA and CTETA. This plan does not propose any additional trails on USACE property; additional trails would need to be planned by the USACE based on their requirements. These trails primarily serve mountain bikers, hikers, and equestrian users and attract people from around the DFW region.

PADDLING TRAILS

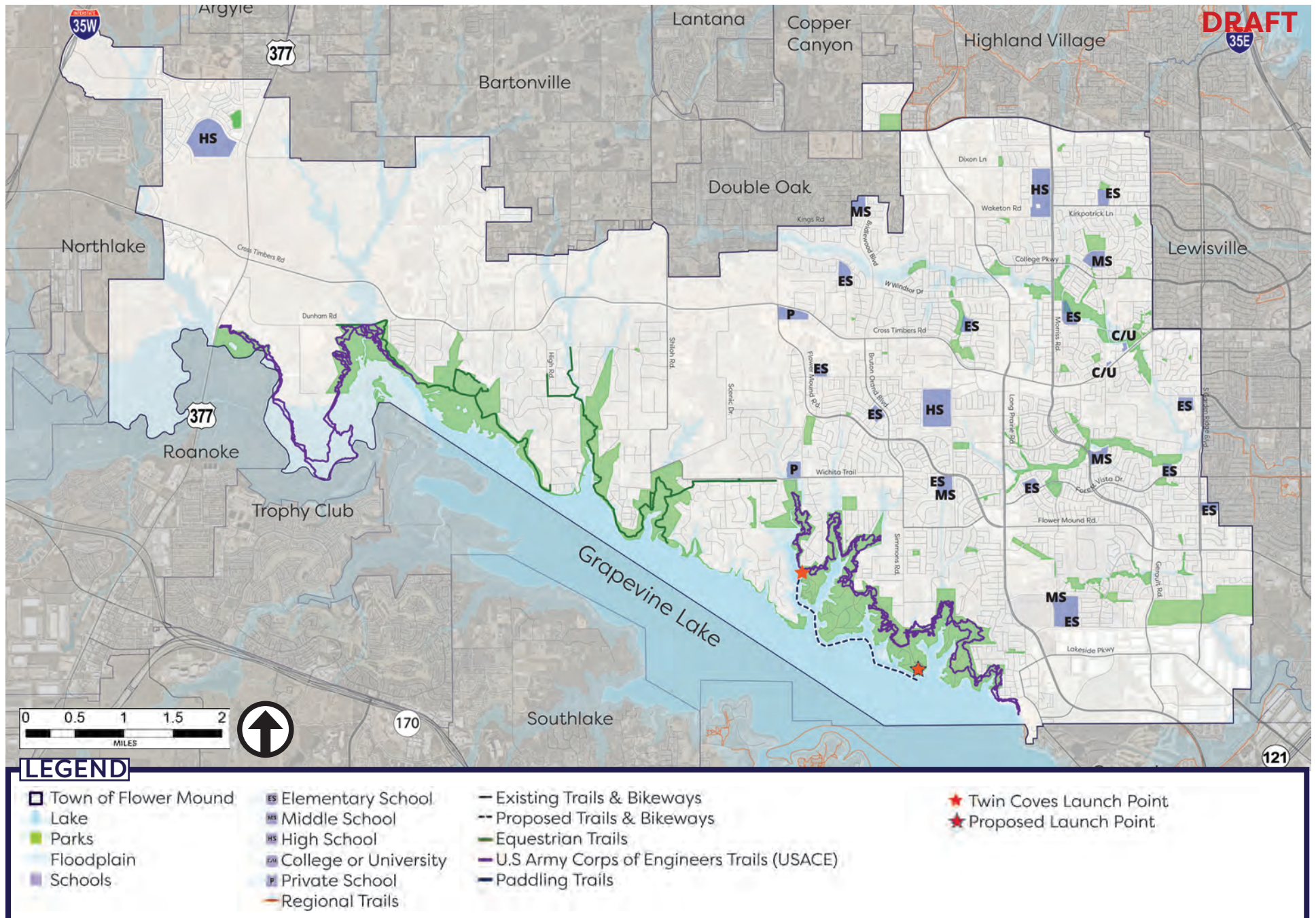
Paddling Trails are shown with proposed and existing launch points. These trails are intended to serve water users, including kayakers, canoers, and paddle boarders, exclusively.



TABLE 4.6: OTHER TRAILS RECOMMENDATION SUMMARY

Facility Type	Existing Mileage	Recommended Mileage	Total Mileage
USACE Trails	34.5	0	34.5
Paddling Trails	0	2.3	2.3
Total	34.5	2.3	36.8



FIGURE 4.5: OTHER TRAILS RECOMMENDATIONS MAP

OTHER CONSIDERATIONS



TOWN CONNECTORS

These are sidewalks that connect trails to major destinations and are usually on major roadways such as collectors and arterials, where existing constraints prohibit widening to a trail. The desired width for connectors is 8', however where existing constraints exist and sidewalks cannot be widened, they should be a minimum of 6'.



TRAILHEADS

Key entrances to the trail system should be designated by trailheads. They should be distributed throughout the town at major destinations, such as at community parks and entertainment centers. Features typically found at a trailhead include parking, restrooms, wayfinding and regulation signage, drinking fountains, benches, bike repair stations, and trash receptacles.



TRAIL ACCESS POINTS

For a trail system to be comprehensive and connected, there should be multiple access points to the trails from existing and planned developments adjacent to the trail system. Trail access points do not have amenities like a trailhead, but they can include signage and branding associated with both the trail system and the place they are tying in from to establish sense of place.



PADDLING LAUNCH POINTS

Flower Mound has the unique opportunity to create water-based recreation around Grapevine Lake. By providing a network of launch points, residents can explore different parts of the lake, have multiple entrance and exit points, and engage in different experiences based on the surroundings of each launch point. Launch points should be in areas with flat banks or beaches that have shallow water close to the shoreline or along creek segments with established launch pads.



MAJOR PEDESTRIAN CROSSINGS

There are two types of roadway crossings. This section includes basic descriptions, more detailed design considerations for roadway crossings are provided in Chapter 5.



ROADWAY INTERSECTIONS

Intersections are an important design consideration when creating a trails and bikeway system. Major roadways crossings are a barrier to connectivity in Flower Mound. Intersections design to enhance pedestrian crossings include signage, high emphasis pavement markings, and signalization, compliant with the MUTCD. Major intersections include Long Prairie and Cross Timbers, Long Prairie and Flower Mound Road, and cross Timbers and US 377.



MID-BLOCK CROSSINGS

Mid-block crossings are where facilities cross a road at a location between intersections. They should be designed to alert drivers to trail users crossing the road through signage, rectangular rapid flashing beacons, and pavement markings relative to the roadway the trails are crossing. Existing mid-block crossings in Flower Mound are along Forest Vista Drive, College Parkway, and within residential subdivisions. Where a trail crosses a local road or neighborhood street, advanced signage and pavement markings should be included to alert drivers that people may be crossing the road.



INTERJURISDICTIONAL CONNECTIONS

The recommended network should take advantage of opportunities to connect residents to surroundings trails and bikeways in communities like Double Oak, Argyle, Highland Village, Grapevine, and Lewisville. Interjurisdictional connections allow Flower Mound residents to access amenities and entertainment throughout the DFW Metroplex.

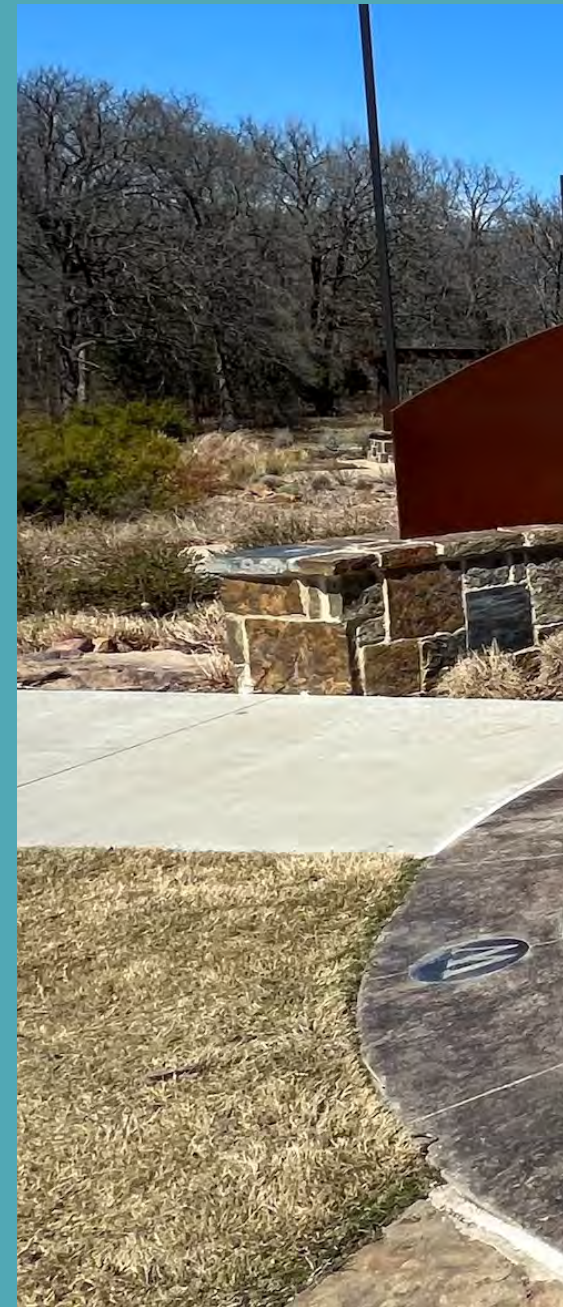


REGIONAL VELOWEB

The Regional Veloweb is an expansive network of off-street shared-use paths that can accommodate multiple user groups including bicyclists, pedestrians, and other non-motorized modes of transportation throughout the DFW Region. The Veloweb is compiled and continuously updated by the NCTCOG through planning efforts with local jurisdictions. The latest version of the regional network is included in the NCTCOG Mobility 2045 plan and contains 1,883 miles of off-street trails.

The NCTCOG Mobility 2045 Plan has established a hierarchy of existing, funded, and planned Veloweb trail segments. The Veloweb segments in Flower Mound include Long Prairie Road from Grapevine to Highland Village, Cross Timbers Road, 377, and an east/west connection from 377 to Bartonville. These corridors may be prime candidates for funding sources that place importance on creating regional connections. Veloweb routes in Flower Mound are shown in **Figure 4.2.**

Design Guidelines Toolbox Using the Toolbox



05 TRAILS & BIKEWAYS DESIGN STANDARDS



DESIGN GUIDELINES TOOLBOX

This plan proposed a diverse network of trail and bikeways to accommodate different types of users. These facilities have design standards intended to provide safety and convenience for various users. It is important to note that all trails and bikeways should at a minimum meet the American Association of State Highway and Transportation Officials (AASHTO), TxDOT, and Town of Flower Mound standards and should exceed those standards if and where possible. This section outlines design considerations related to various aspects of trail and bikeway facilities. Listed below are sources for the most commonly used standards for pedestrian and bicycle facility design; the recommended standards in this plan complies with these sources:

- **AASHTO**: American Association of State Highway and Transportation Officials
- **ADAAG**: American with Disabilities Act Accessibility Guidelines
- **ITE**: Institute of Transportation Engineers
- **NACTO**: National Association of City Transportation Officials
- **PROWAG**: Public Rights-of-Way Accessibility Guidelines
- **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

The intent is after this master plan is adopted, the Town will incorporate the design considerations described in this chapter into the applicable development regulations (subdivision ordinance, technical standards manual, etc.).

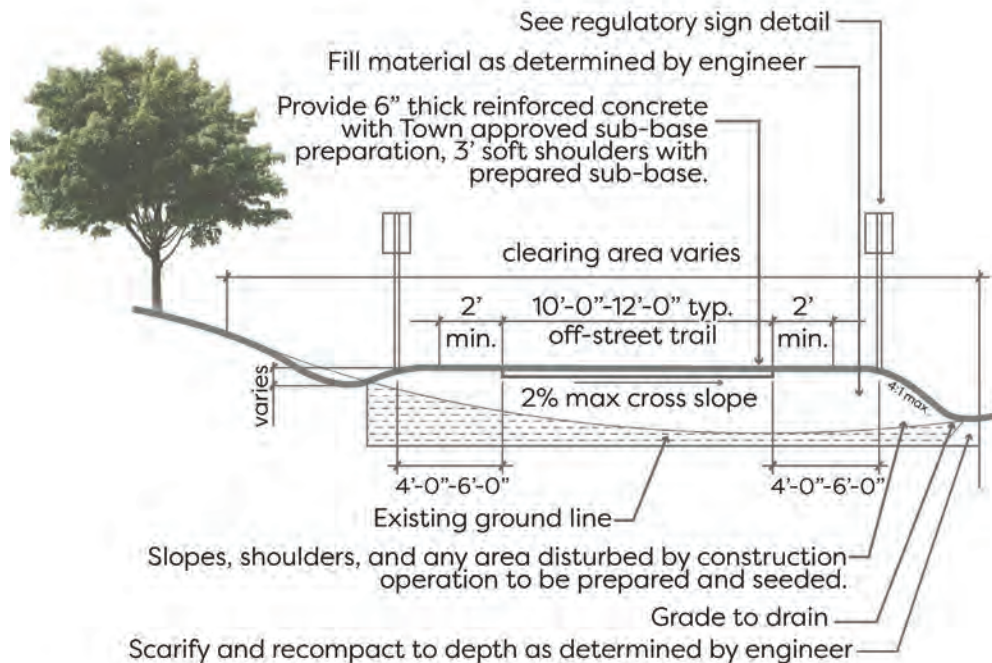


PAVED MULTI-USE TRAILS

Paved multi-use trails include trails located off-street and adjacent to the roadway. This first section outlines design features for paved multi-use trails to:

- Utilize guidelines to protect existing natural features along the trails. Canopy trees should be protected where feasible, and natural drainage patterns should be supported to reduce any impacts to the existing water systems. They should follow the natural topography.
- Alignment of trails should provide visual and experiential diversity. Extreme curves or long straight segments should be avoided where possible, except where tree preservation or other obstructions necessitate such an alignment.
- Intersections with trails and roadways should be located where sight lines are not obstructed, trail users are clearly visible, and should occur in locations that are strategic and necessary for the circulation of the trail system.
- Trails should align with all crosswalks and incorporate accessible ramps that meet the ADAAG, PROWAG, and TAS standards.

FIGURE 5.1: TYPICAL TRAIL CROSS-SECTION

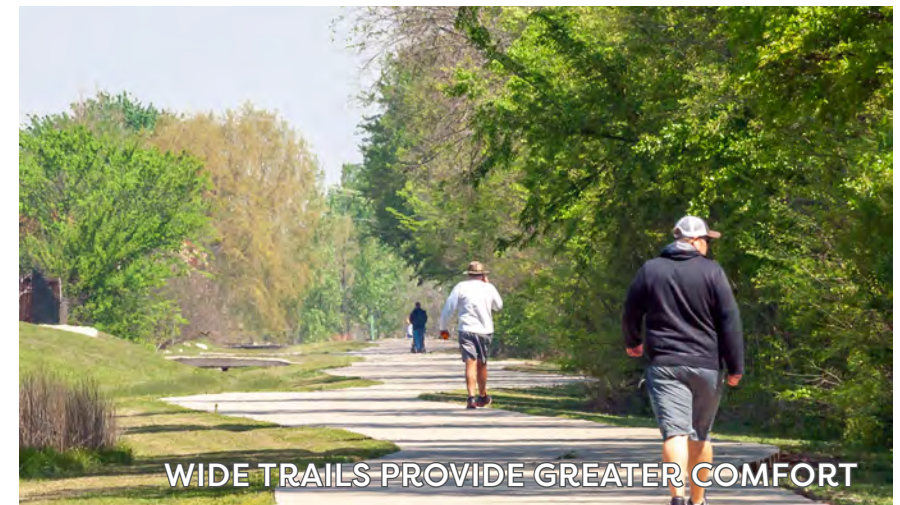


TRAIL WIDTH

Paved multi-use trails include existing and future Town trails as well as Veloweb trails. While the existing trails mainly are 8', where feasible they should be widened to 10' – 12'. All newly constructed multi-use trails should be a minimum of 12' in width, unless there are existing ROW constraints, then 10' may be considered. **Figure 5.1** illustrates a typical off-street trail cross-section.

As discussed in previous chapters, there are several gaps that exist in the existing trail system. Where a gap in the trail system is being filled, the Town should reserve the right to determine the required width to fill the gap in the system based on the following criteria. All trail segments do not have to meet all the criteria, the Town has the ability to determine feasibility on a case-by-case basis.

- Distance of the gap to be filled, for example it may not make sense to have a 100' stretch of 12' trail when the adjacent segments are 8'.
- Available right-of-way or easement constraints.
- Location of existing utilities and the inability to relocate them.
- Presence of environmentally sensitive resources.
- Other property constraints, such as existing infrastructure.
- Signage constraints.



PAVEMENT STRUCTURE

Paved multi-use trail pavement should be six inches thick reinforced concrete with a heavy broom finish. Expansion joints should be placed in the trail at an interval of 40' for 10' wide trails and 50' to 60' for 12' wide trails. Expansion joints should be topped and sealed with a self-leveling elastomeric joint compound and should be flush with the top surface of pavement on both sides of the joint. Control joints should be placed at intervals equal to the trail width and the depth should be one-fourth of the pavement thickness. The joints should be saw-cut and 1/4" wide. In order to provide the most user comfort, the finished surface of trails should not vary more than 1/4" from the lower edge of an 8' long straight edge when laid on the surface in any direction.

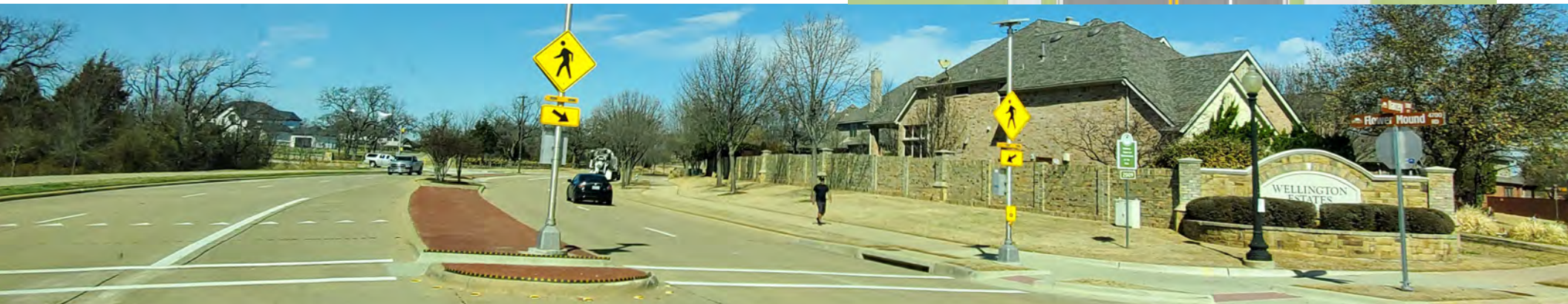
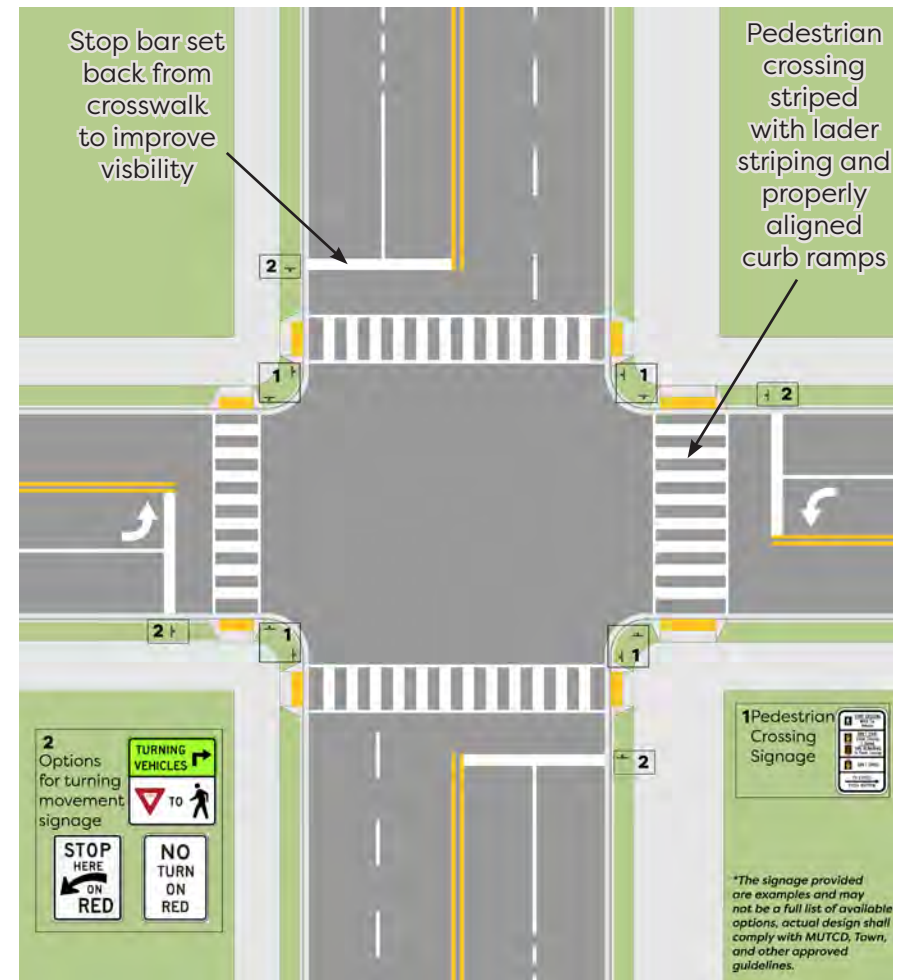
INTERSECTION TREATMENTS

Proper intersection treatments are important to reduce potential conflicts between trail users and motorists. In order to reduce crossing distances, improve visibility, and properly align curb ramps, the turning radii should be designed as tightly as possible.

Trail crossings should include the appropriate signage, crosswalk markings, and pedestrian signals as generally depicted in [Figure 5.2](#). An alternative, more expensive option for crossing roadways is to construct a pedestrian bridge or tunnel to provide a fully separated roadway crossing experience without conflicts from automobiles. There are several examples of trail underpasses in Flower Mound today that avoid an at-grade crossing for trail users.

Additional intersection crossing considerations are provided later in this section.

FIGURE 5.2: TYPICAL INTERSECTION TREATMENT



RECTANGULAR RAPID FLASHING BEACONS AND MEDIAN REFUGE ISLANDS ENHANCE SAFETY AT UNSIGNALIZED INTERSECTIONS

EASEMENTS

When a trail is located away from a roadway, such as in a utility easement or adjacent to natural features, a 50' minimum easement is required. This is to ensure there is enough room to align trails away from creeks where erosion could impact the usability of the trail. For trails adjacent to a railroad, an easement of 20' outside of the railway foul zone is needed to ensure there is enough room for track maintenance.

TRAIL CLEARANCE

Vertical Clearance

Vertical clearance refers to the area above a trail that is to remain clear from obstructions. The recommended vertical clearance over a trail is 10' or higher; this height accommodates maintenance, patrol, and emergency vehicle access. All underpasses and tunnels should be a minimum of 8' in height and where there are vertical clearances less than 10', warning signage should be posted. In order to meet clearance standards for safety and visibility along trails, tree removal or pruning may be necessary in some areas. The trail evaluation section in Chapter 3 identified areas along existing trails that need to have vegetation scaled back; some of these areas are along trails that are not maintained by the Town so coordination with the HOA or other entity is needed.

Horizontal Clearance

The recommended horizontal clearance is the area on each side of the trail to remain free of obstructions. This area enhances the aesthetics, function, and safety for trail users. The desired horizontal clearance is two feet to five feet on each side of trail for heavily used trails. When a trail is adjacent to a roadway, the greatest separation in the form of a landscaped buffer, should be provided between trail users and vehicular travel lanes, where space exists. According to AASHTO, a five foot buffer from the trail facility and the roadway is recommended for optimum user comfort and safety.

Visual Clearance

Trails should be designed to prevent blindspots. Blindspots create conflicts between users, creating safety concerns. Where blindspots and blind curves exist, the trail should be widened, striped, and signed to provide the greatest awareness of oncoming trail traffic. Advanced warning can improve awareness and reduce potential conflicts.

OTHER CONSIDERATIONS

Design Speed

Design speed refers to the preferred speed of the fastest common user, so on multi-use trail, that would be an experienced cyclist. For paved multi-use trails, a minimum design speed of 20 mph should generally be used if the trail grade is less than 5 percent slope. In areas where strong prevailing winds exist or the trail grade exceeds 5 percent, a trail design speed of 30 mph is recommended.

Trail Drainage

Trail drainage should be designed to have adequate drainage away from the trail to mitigate flooding and debris after rain events. This requires the cross-slope of areas adjacent to trail shoulders to have at least a 2 percent minimum slope away from the trail and for the trail surfaces themselves to have a cross slope of 1 percent. Greater cross slope along the trail can make it difficult for some users to safely navigate the trail.

FIGURE 5.3: TYPICAL BLIND CURVE DESIGN



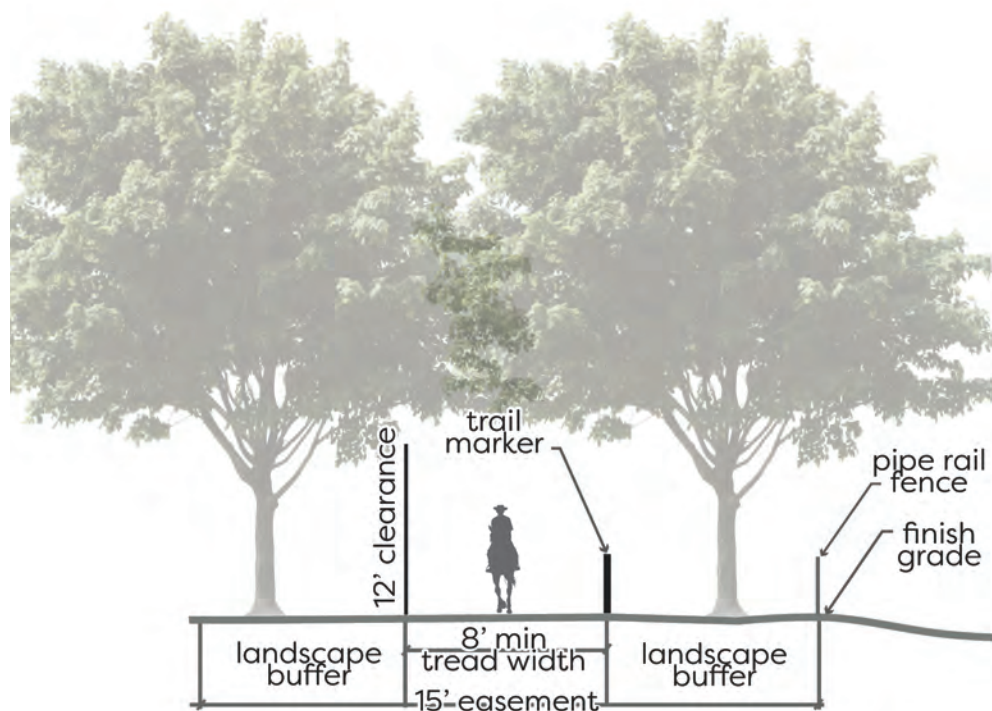
SOFT SURFACE TRAILS

EQUESTRIAN TRAILS

Equestrian trails are designed to provide outdoor experiences to people on horseback in rural or urban settings. Trails should be designed to be comfortable for users and provide space and buffers for multiple users, regardless of location. They should create safe loops with variety of amenities to ensure they are usable and safe.

In Flower Mound, the Town maintains several miles of equestrian trail and there is additional mileage located on the USACE land by Grapevine Lake. The recommended design considerations in this section only refers to the equestrian trails maintained by the Town.

FIGURE 5.4: TYPICAL EQUESTRIAN TRAIL CROSS-SECTION



Equestrian Trail Widths

Equestrian trails should be a minimum of 8' within a 15' easement. The trail surface within the easement should be a minimum of 8' in width, this provides space for passing. The vertical clearance for equestrian trails should be 12' to allow for space for a person on horseback. Trees may need to be pruned or removed in some cases to meet vertical clearance requirements.

Surface Materials

Trails should generally be native materials, such as compacted dirt. In rural and preserve settings, they may include rivers or creek crossings, hills, woods, and other natural features. In urban areas, where multiple users are intended, the trails may be more compact, and comprised of crushed granite, dirt, or other accessible surfaces.

Amenities

Amenities along the trail may differ based on the intended purpose and user of the trail. If the trail is designed to be challenging and provide jumps, they may be offset from the trail to allow for more novice users to not encounter obstacles. Trails should also be marked by trailheads, provide adequate parking for vehicles and trailers, and informational signage with information about trail length, amenities, and etiquette. Posts should be provided to allow for the temporary tie up of horses.



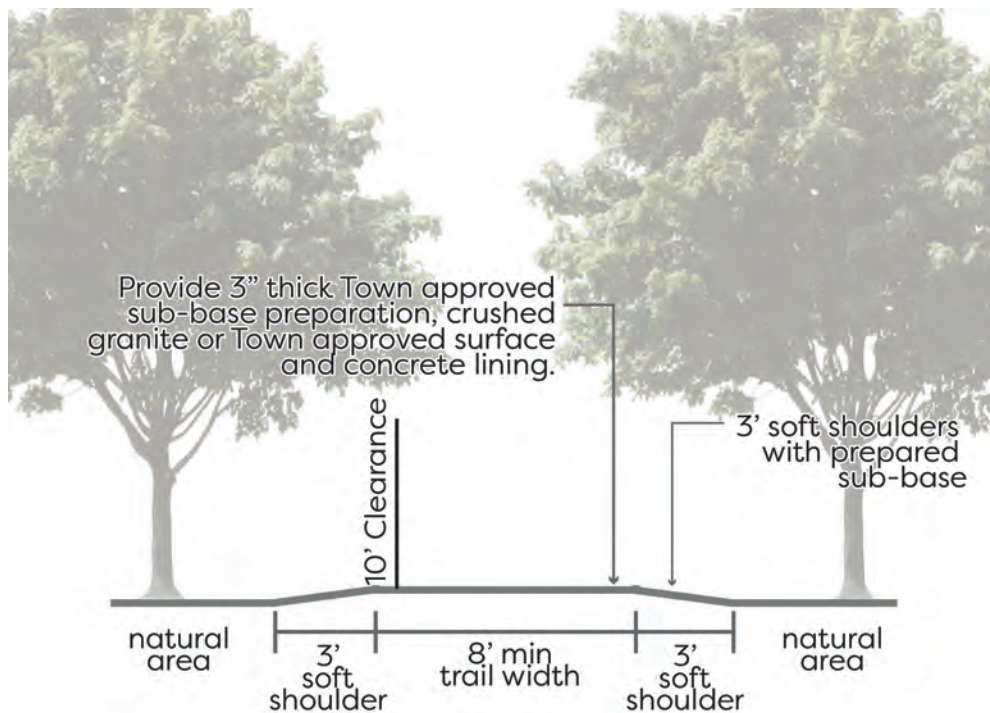
OTHER SOFT-SURFACE TRAILS

Other soft-surface trails may include natural trails through nature preserves, such as the USACE trails along Grapevine Lake, and town maintained soft-surface trails through parks and adjacent to roadways. Soft-surface trails are typically designed for hikers, mountain bikers, and equestrian users. Soft surface trails maintained by DORBA do not have provided standards.

Town Maintained Soft-Surface Trails

Town maintained soft-surface trails should be a minimum of 8' in width. They should include a clear zone of at least 3' on each side and a vertical clearance of at least 10' in height. Trees may need to be cut down or pruned to ensure proper vertical clearance. The trails should be a firm, stable surface such as decomposed granite. In order to maintain form, the trail should be lined by concrete, metal, or a similar hard lining.

FIGURE 5.5: TYPICAL SOFT SURFACE TRAIL CROSS-SECTION



ON-STREET BIKEWAYS

Two types of on-street bikeways are identified on the recommended network: bike lanes and shared-use lanes. This section outlines key considerations for each type of facility in order to:

- Determine appropriate facility types based on roadway travel speeds, traffic volumes, available pavement widths, and roadway functional classification.
- Identify continuous bicycle routes through high demand corridors to provide connections throughout the Town and to adjacent communities.
- Provide guidance on pavement markings, signage, or a combination along identified and future routes to communicate safety procedures and provide wayfinding.



BIKE LANES

Bike lanes are a portion of the travel lane marked for the exclusive use by people on bicycles. This space is separated from travel lanes by striping and signage. Benefits of bike lanes include: enabling people to ride at a constant speed; making bicycles and their space physically visible; and, encouraging people on bicycles to use the street rather than sidewalks where the conflicts with pedestrians are greater. Bike lanes are typically implemented on roadways with relatively higher speeds and traffic volumes.

Width

Width is important to consider when designing your system. The minimum width for a standard one-direction bike lane is 5' from the face of curb or on an open shoulder to allow people on bicycles to be far enough from the curb to avoid debris and drainage grates.

Bike lanes can either be standard bike lanes or separated bike lanes as shown in [Figures 5.6 and 5.7](#). Standard bike lanes have a painted stripe that separates the bicycle traffic from vehicles while the buffered bike lanes have a minimum 3' painted or physical buffer between the bike lane and the travel lane. A physical buffer can include bollards, planters, zebra cycle protectors, or similar barriers, and should be spaced at regular intervals to prohibit automobiles from entering the protected bike lane.

Markings

Markings should follow the TMUTCD, including a one-way directional arrow, bike lane marking, and a solid white stripe. They should be placed at regular intervals in accordance with guidance from the TMUTCD, AASHTO, and NACTO. Where a buffer exists, additional striping is needed, reference [Figure 5.7](#). When the bike lane is between on-street parking and vehicular travel lanes, the lane should be lined on each side with a white stripe so vehicles that are parking are aware of the boundaries.

Signage

Signage required for bike lanes include those that state the bike lane is for cyclist use only. 'Bike Lane' signs should generally be provided adjacent to lane markings but not at all markings to avoid overuse, unless otherwise noted by national or Town standards. Signage, along with the pavement markings, can improve visibility and awareness of people on bicycles for motorists.

FIGURE 5.6: TYPICAL STANDARD BIKE LANE

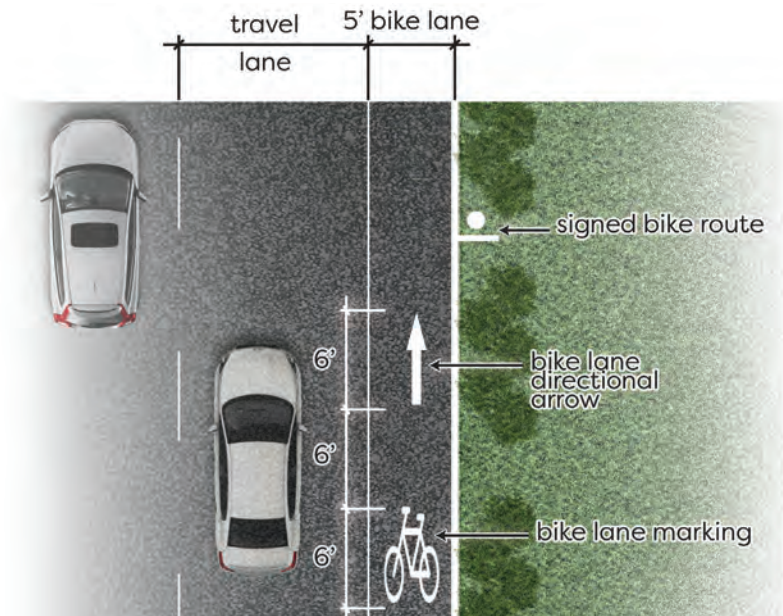


FIGURE 5.7: TYPICAL BUFFERED BIKE LANE

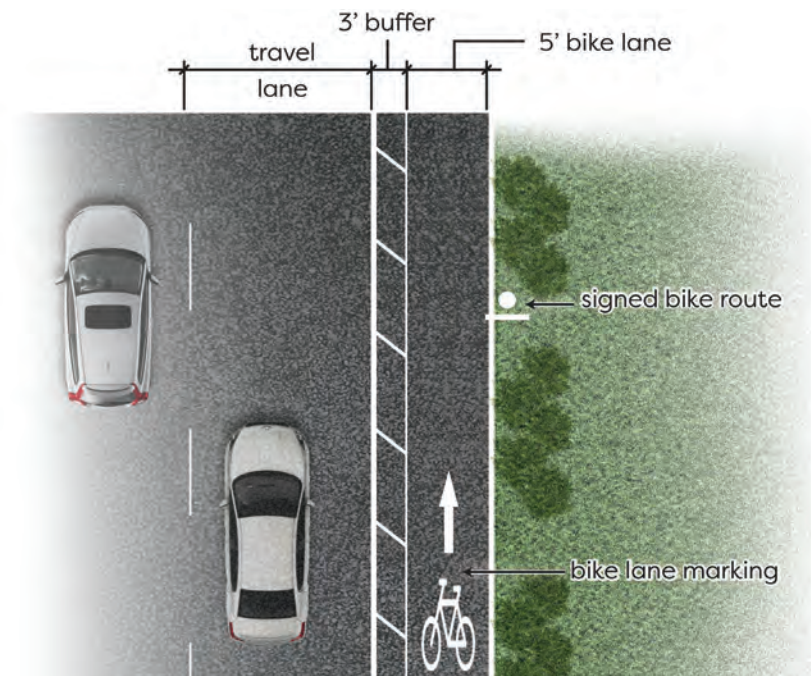
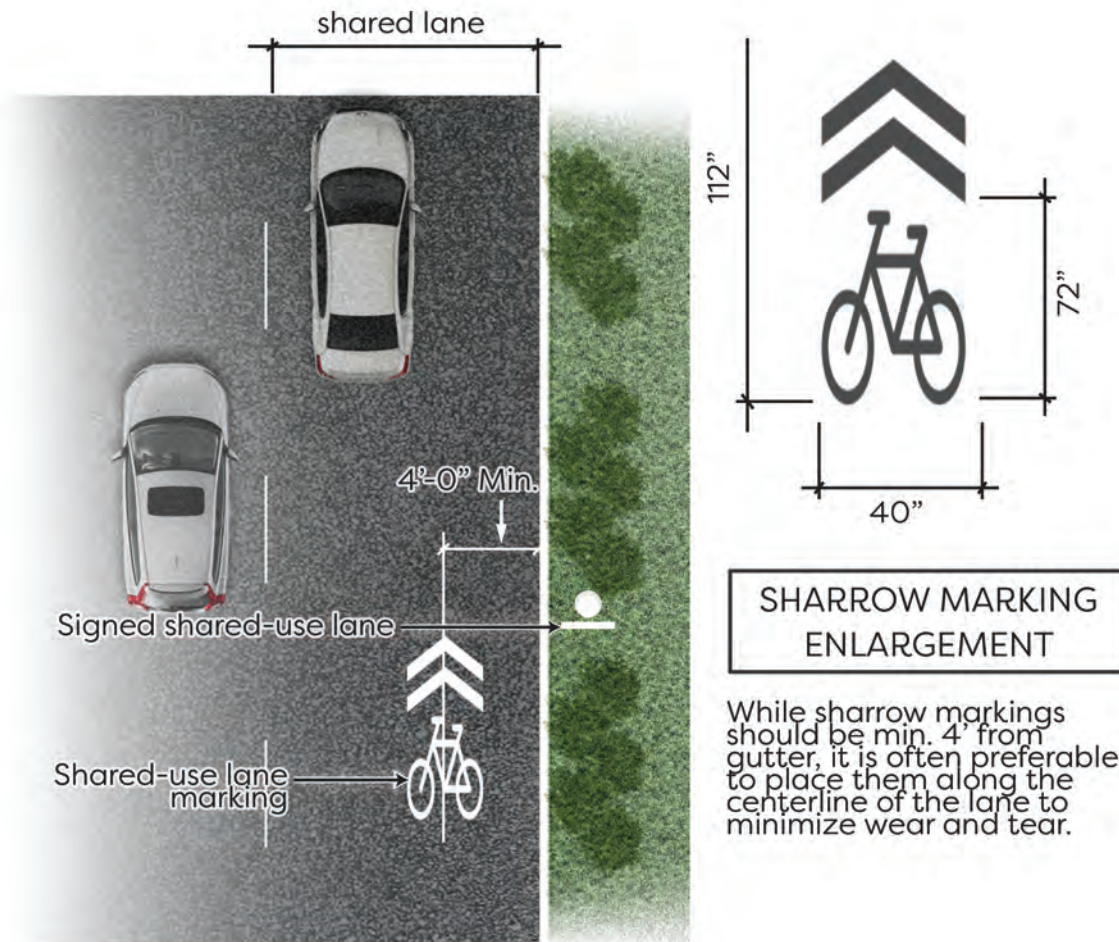


FIGURE 5.8: TYPICAL SHARED-USE LANE**SHARED-USE LANES**

Shared-use lanes are when a lane on a street is designed for both drivers and people on bicycles. The designation is usually shown by pavement markings and/or signage. This accommodation is typically used on a street with a relatively low travel speeds (less than 35 mph) and relatively low volumes since there is no physical separation between the cyclists and motor vehicles.

Roadway Lane Width

Bike lane width that supports shared-use should meet or exceed 14', not including the curb and gutter where they exist. If the lane is less than 14', then cyclists may ride in the middle of the lane. If the lane is 14' or greater, state law dictates that the cyclist must ride near the curb.

Shared-Use Markings

Shared-use lane markings should be located a minimum of 4' from the curb on roadways without on-street parking and a minimum of 5' from the outside of the parking lane on roads with on-street parking. Markings should occur immediately after intersections and at intervals of not greater than 250' unless otherwise required by the Town.

Signage

Signage should be provided along shared-use lanes. Required signage includes 'Share the Road' and 'Bicycle May Use Full Lane' signs, which alert motorists that they may encounter people on bicycles and encourage respectful shared use of the roadway.

Signed Route Considerations

Signed route considerations for residential streets with low speeds and low volumes should have signage without accompanying pavement markings. This would include 'Share The Road' and 'Bicycle May Use Full Lane' signage.

BIKEWAY INTERSECTION TREATMENTS

Intersections are the point where multiples modes of transportation meet, facilities overlap, and should be designed in a safe and efficient matter. At a minimum, intersections should clearly imply how to navigate the intersection for all users through signalization, pavement markings, aligning turning movements, and providing logical routes. Intersection treatment best practices are discussed below.

Bike Boxes

Bike boxes can be used at intersections where there is not enough width to continue a separate bike facility and a designated right-turn lane. An example of bike box configuration and pavement markings are shown in [Figure 5.9](#). Bike boxes are defined spaces at the head of signalized intersections which provide safe, comfortable, and visible spaces for people on bicycles at intersections. To effectively communicate the purpose of the bike box, appropriate signage and pavement markings are required.

An ingress lane within the bike lane, defined by colored pavement, should be provided as cyclists approach the bike box at intersections. Change in pavement color alerts riders of approaching intersections and community cyclists' priority to motorists. Signage such as 'Stop Here on Red', 'Yield to Bikes' and 'No Turn on Red' are examples of informative signage directing users how to share the roadway at these types of intersections.

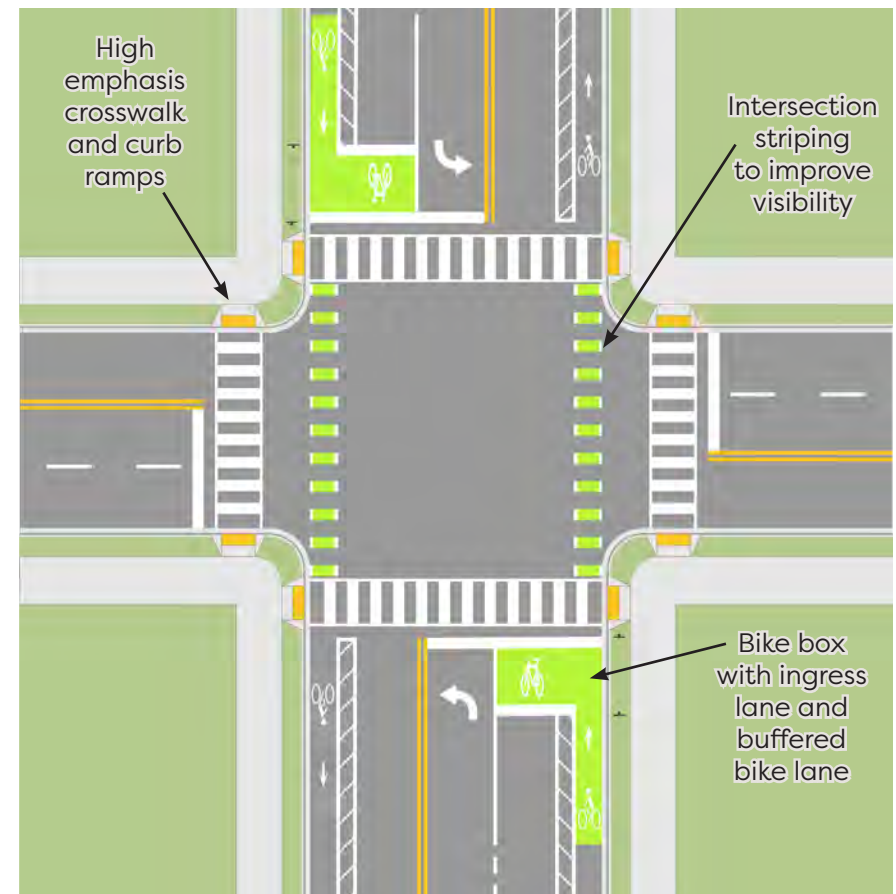
Driveway Crossings

Driveway crossings may include additional elements such as color, signs, signalization, and pavement markings. Continuing marked bicycle facilities at driveway intersections ensures that separation, positioning, and awareness is maintained through the intersection conflict areas.

OTHER CONSIDERATIONS

On-street bikeways should be safe and usable; they should have a smooth surface, uniform width, and should be free of encroachments and bumps such as utility lids, wide cracks, and longitudinal joints. Grates should be bicycle-safe without longitudinal openings to avoid tires being stuck. The use of uneven surfaces such as brick, pavers, or stamped concrete is not recommended along on-street bikeways.

FIGURE 5.9: TYPICAL BIKE BOX TREATMENT



PADDLING TRAILS

A well-designed paddling trail network should include consistent signage and branding, various launch points, and amenities for users of various skill levels, interests, and comforts.

LAUNCH POINTS

Launch points should take into consideration cost, topography, and accommodate expected volume of users. Launch points can be unimproved locations on shallow beaches or easily accessible creeks. Using this type of launch point can increase access quickly, however, may lack formal amenities that draw users to the site, such as parking and restrooms. More formal launch points can also be installed where there are existing motorized boat launches, however, special consideration should be given to the location of these launches to best reduce conflicts between paddle users and motorized boats. An informational kiosk should be provided at all launch points. Each kiosk should include information regarding waterway conservation, ethics, route guidance (including length and difficulty), and rules for paddling. Signage directing people to the launch points should be provided to increase awareness of the facility.

SIGNAGE/MARKERS

Signage and markers are important for a waterway system. Signage should guide paddle trail users, provide information for all waterway users to inform them of potential conflicts, and guide people on the water to other launch points and destinations. Signage at launch points can provide safety information, encourage the use of personal flotation devices, and provide emergency information. The TPWD has paddling trail markers that can be installed along the route. Trail markers can be installed on posts along the shore, or in the water attached to buoys.



TPWD PADDLING TRAIL TYPICAL SIGNAGE

Image Source: Texas Parks and Wildlife

CONNECTORS

As presented in Chapter 4, connectors are sidewalks that fill a gap in the trail network where limitations for a wider facility exist. This section describes the design objectives for pedestrian facilities, such as connectors, including:

- Location of the sidewalk to be within, or parallel to the right-of-way within a pedestrian easement, with a buffer from vehicular traffic, preferably at least 2' wide.
- Crossings at intersections should be given priority considerations to improve safety and reduce potential conflicts.
- ADA compliant ramps shall be placed at intersections, driveways, and roadway crossings.

WIDTH

Connector width is important when designing Town Connectors. Because connectors are used to improve system connectivity and higher pedestrian volumes are anticipated, the desired width is 8'. The minimum acceptable width for a connector is 6' where there are existing constraints such as right-of-way or utilities. All new connectors and improvements to existing connectors should be widened to the greatest extent possible.

INTERSECTION TREATMENTS

Intersection treatments are needed to ensure safety at conflict points. It is recommended that pedestrian crossings at roadway intersections and driveways be designed in a manner that reinforces the right-of-way of pedestrians and prioritizes their safety. To reduce conflicts at intersections, the corner radius for a 90-degree intersection should be designed to be as tight as possible. Curb extensions can better align crossings at intersections, force vehicles to make slower turns by reducing turning radii, and improve visibility for pedestrians crossing the street.

STANDARD PEDESTRIAN CROSSINGS

Standard pedestrian crossings use a combination of pavement markings, signals, and accessible ramps to cross intersecting streets with two-way traffic. Highly visible 'zebra' pavement striping is recommended as they better alert motor vehicles to yield to pedestrians. Routine maintenance of the crosswalk striping is recommended to ensure they are visible.

ENHANCED CROSSWALKS

Enhanced crosswalks may use a combination of pavement markings, pavement materials, mid-block crossing islands, and pedestrian signals such as rapid flashing beacons or pedestrian hybrid beacons to increase driver awareness of pedestrian activity and increase comfort of walkers.

DRIVEWAY CROSSINGS

Driveway crossings along major and minor thoroughfares should be designed to provide safety for pedestrians. Sidewalks and sidepaths should be set back from the back of curb at a sufficient distance to avoid crossing driveway aprons to maintain existing cross slopes and meet ADA accessibility standards. The Town should evaluate its driveway spacing and access management standards in order to improve the pedestrian realm and reduce conflicts between pedestrians, bicyclists, and motor vehicles.



INTERSECTION CONSIDERATIONS

A well-designed intersection facilitates the movements in a safe and efficient manner. Conflicts between uses should be reduced by heightened visibility, denoting clear roadway use through signage and pavement markings, and by ensuring users are aware of each other.

MEDIAN REFUGE ISLANDS

Median refuge islands are protected spaces positioned in the center of the roadway used to facilitate bicycle and pedestrian crossings by having an additional protected stop when crossing at an intersection. This treatment is most appropriate for roadways with higher volumes, faster speeds, and wider pavement widths. Refuge medians reduce crossing lengths, increase visibility of crossing movements, calm traffic through physical design, and prioritize crossing movements. Medians should be a minimum of 6' in width, be well lit, and if any vegetation is included it should be low to improve visibility. Median refuge islands are preferred at signalized intersections, however they can also be a treatment for mid-block crossings.



MEDIAN REFUGE ISLANDS

CURB RAMPS

Curb ramps should be designed for the use of mobility devices (including scooters, walkers, and crutches), provide direction and guidance for roadway crossings, and meet all ADA and PROWAG standards. One curb ramp should be provided for each crosswalk, which usually translates to two per corner, and one on each side of the crosswalk. This provides direction and reduces crossing distances as opposed to when there is one crosswalk per corner. Curb ramps should be sloped to provide a smooth transition from sidewalk to crosswalk. In some cases, curb extensions can be installed to better align crosswalks, reduce crossing distances, and slow turning movements for vehicles.

TRAFFIC CONTROL SIGNAGE

Traffic control signage should indicate crossing features for all roadway users based on guidance from the MUTCD. Signage should be highly visible and capture the attention of all users approaching the crossing area. Intersections can be further enhanced by flashing beacons, pavement markings, or change in pavement material. It is important to note that placing too many traffic control devices at one crossing can be overwhelming and may result in the loss of impact.



CURB RAMPS

CROSSWALKS

Crosswalks should be clearly marked and highly visible. Where a crosswalk is signalized, leading pedestrian signals and longer walk signal times can improve accessibility for pedestrians. To minimize conflicts, other pedestrian crossing tools can include exclusive only left-turn phases, prohibiting right turns on red where sight lines may be reduced or where a leading pedestrian interval is used, and signage to remind drivers to yield to pedestrians. Intersections can include raised crosswalks to slow vehicles and improve visibility of pedestrians. Additional considerations should be included for pedestrians that are visually or hearing impaired. Implementing elements such as Accessible Pedestrian Signals (APS) with integrated audio devices, detectable warning surfaces or tactile pavement, and flashing lights can aid in creating a safe and comfortable pedestrian crossing environment.

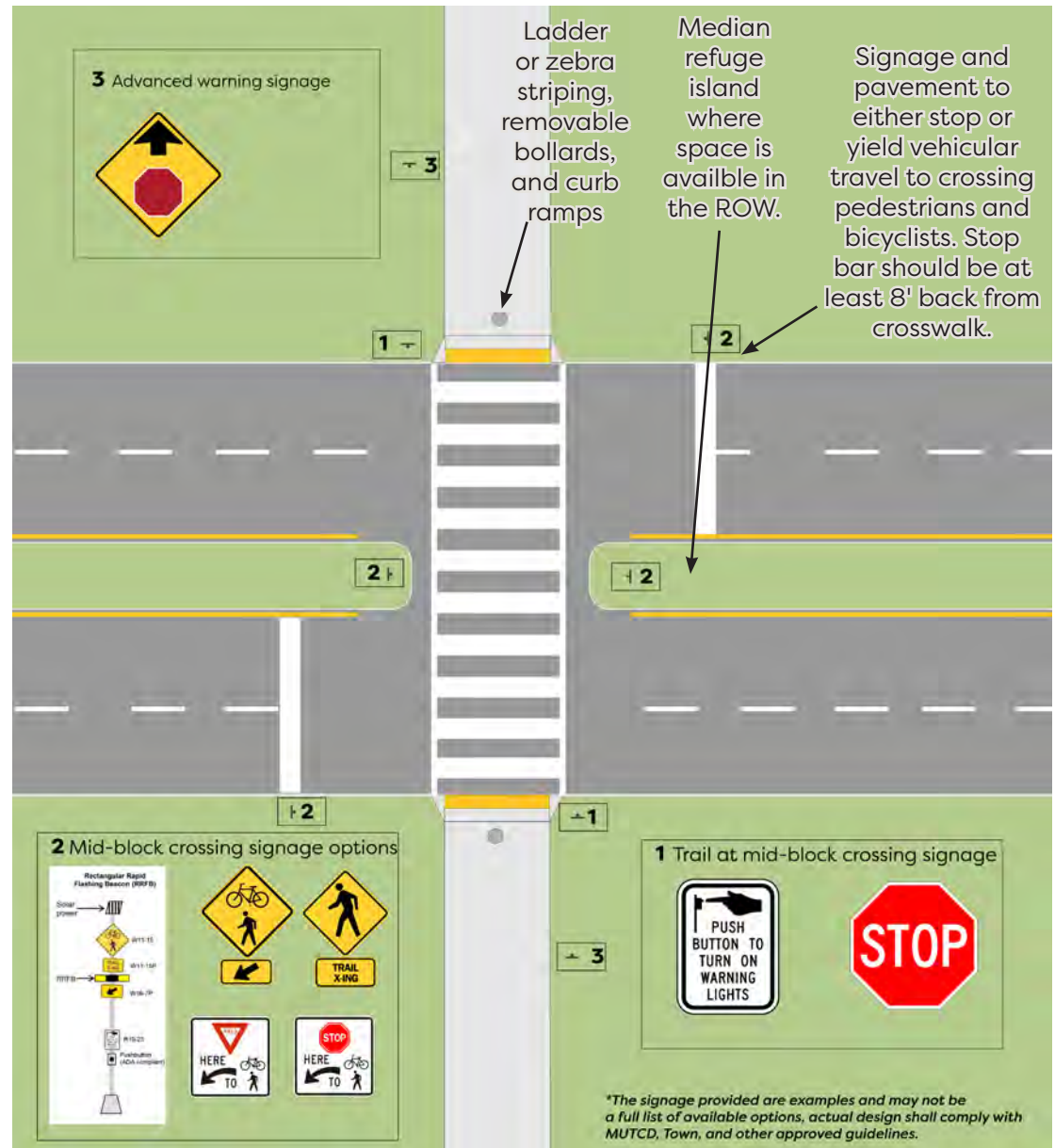
MID-BLOCK CROSSINGS

Where a trail crosses a roadway not at an intersection, special consideration should be given to inform drivers that someone may cross the road. **Figure 5.10** shows typical treatments for mid-block crossings, including rectangular rapid flashing beacons (RRFB), pavement markings, and signage. Local roads may not require a RRFB due to lower roadway speed and volumes. In some cases, the mid-block crossing area can be raised in order to provide a flat crossing surface and slow automobiles at the crossing area.

RECTANGULAR RAPID FLASHING BEACONS

Rectangular Rapid Flashing Beacons (RRFB) are highly visible traffic control devices that help alert motor vehicles of mid-block crossings. RRFB's include rectangular lights that flash at an irregular pattern when pressed by pedestrians crossing the street. These lights are positioned below a crossing sign and above a crosswalk arrow. The sign is pedestrian activated, typically by using a push button. The crossings can be accompanied by advanced signage and stop lines on each side of the intersection to alert drivers to the upcoming mid-block crossing.

FIGURE 5.10: MID-BLOCK CROSSING



TRAIL FEATURES

Trail features can enhance the overall user experience of a trail. This includes improved access, signage, and amenities to support users along the trails. This section details trail amenity features to be considered when designing trails throughout the town. The Parks and Recreation Department will need to determine the placement of each amenity type throughout the network based on the intended goals of each trail.

TRAILHEADS

Trailheads are located at key entrances to the trail system allowing users to access a trail, including within community parks and major destinations. Features typically found at a trailhead include:

- Parking: A minimum of 10 spaces for major trailheads and five spaces at minor trailheads. Shared parking should be encouraged where appropriate.
- Restrooms are appropriate at major trailheads
- Informational Signage should include a larger kiosk with a map, rules and regulations, contact information
- Lighting promotes safety and accessibility.
- Amenities could be provided at all trailheads benches, trash receptacles, bike rack, drinking fountains, and bike repair stations

The typical trailhead amenities described here are appropriate for enhancing existing trailheads as well as to guide required amenities for future trailheads. **Figures 11** and **12** show how major and minor trailheads can be designed.

TRAIL ACCESS POINTS

Trail access points are locations along an off-street trail where users can access a trail. Access points can be found at parks, trail intersections, or minor destinations. Typically, they consist of a brief, paved spur that connects to an existing sidewalk. Trail markers and directional signage should aid users in wayfinding. Additional trail amenities at trail access points are not required.

TRAIL SIGNAGE

The trail network should be identified by consistent signage. Branding is covered in more detail later in this section.

FIGURE 5.11: EXAMPLE MAJOR TRAILHEAD



FIGURE 5.12: EXAMPLE MINOR TRAILHEAD



TRAIL AMENITIES

BIKE RACKS

Bike racks allow trail users to safely secure their bicycles while stopping at destinations along the trail, such as parks and entertainment centers. Bike racks should be located at trailheads and where the trail intersects with key destinations.

BIKE REPAIR STATIONS

Bike repair stations are self-service stations that include tools to perform basic repairs and maintenance to bicycles, including filling deflated tires or changing a flat tire. Such stations should be placed near bicycle parking found at key destinations like parks, schools, and commercial areas.

PARKING

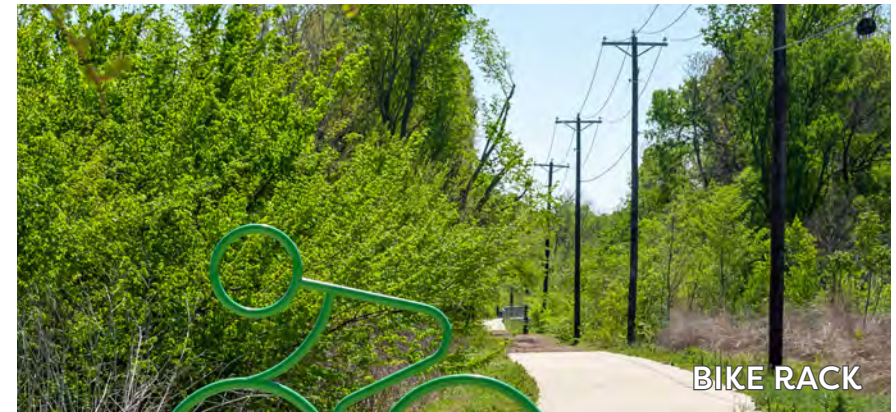
Parking should be provided at all trailheads, with a minimum of 10 spaces. Providing parking allows residents who cannot walk or bike to the trail network the ability to utilize the trail system. Alternative ADA accessible parking surfaces, such as permeable pavement or pavers can be considered where appropriate for parking areas.

TRASH RECEPTACLES

Trash receptacles improve the overall cleanliness of the trail system. They allow users of the trail to dispose of trash in areas where there is a demonstrated need. Typically, these are found only at trailheads. Pet waste stations should be provided along the trail at regular intervals for the easy disposal and collection of pet waste.

SEATING

Seating such as benches, provide respite points along the trails. They should be placed at regular intervals along trails along with other amenities such as hydration stations and trash receptacles.



SHADE

Shade should be provided where possible along the trail to provide comfort and cooling along the trail during the summer months. Shade trees should be placed along trails at regular intervals, but it is important that they remained trimmed to maintain at least ten feet vertical clearance from the trail. Where shade trees cannot be placed due to constraints, shade structures can be included near benches, trail markers, scenic viewing points, and other resting places along the trail.

HYDRATION STATIONS

Drinking fountains or water bottle fill stations provide trail users and their pets hydration opportunities while using the trail. Hydration stations should be located at trailheads where there is existing water infrastructure to connect to, such as at parks. Otherwise, there is a risk that the water can become stagnant with little use.

FITNESS STATIONS

Fitness stations placed along trails are particularly useful for joggers and cyclists seeking to stretch, warm up, and cool down before or after a run or bike ride. Similar to those located within a park, a fitness station offers trail users an opportunity to engage with static exercise equipment and further their health goals.

INFORMATIONAL KIOSKS

Information kiosks should provide information on amenity locations, trail rules, trail distances, and regulations. They should be placed at all trailheads to convey trail information and provide a sense of place and safety for trail users.



INFORMATIONAL KIOSK



HYDRATION STATIONS



FITNESS STATIONS

TRAIL BRANDING

SIGNAGE

Signage is typically provided at trailheads and at key decision-making points along a trail. Signage can mark access points to the trail, provide directional and distance guidance for trail users, direct users to locations of key amenities along the trails, and provide brand recognition of the trail system. Signage can help identify and brand a trail for users.

FIGURE 5.13: BRANDING CONSIDERATIONS



WAYFINDING

Wayfinding helps trail users identify their location on a trail or bikeway, distance to key destinations, and provides directional and distance guidance for preferred routes. Wayfinding can be provided along trails or bikeways by using MUTCD approved signage. Wayfinding includes maps, directional signage, mile markers, and trailhead markers.

MAP

Maps should be included at all major and minor trailheads to help identify the trail network and branded segments.

DIRECTIONAL

Directional signage guides users of the trail system. It provides them with mileage, location information, and directions. These should be placed at trailheads and major trail access points to help guide trail goers along the trail.

TRAILHEAD MARKERS

Trailhead markers are located at trail access points. They can also be located where a trail meets a street right-of-way, where an access point into the trail system is located. They should include the trail and intended users of the trail.

MILE MARKERS

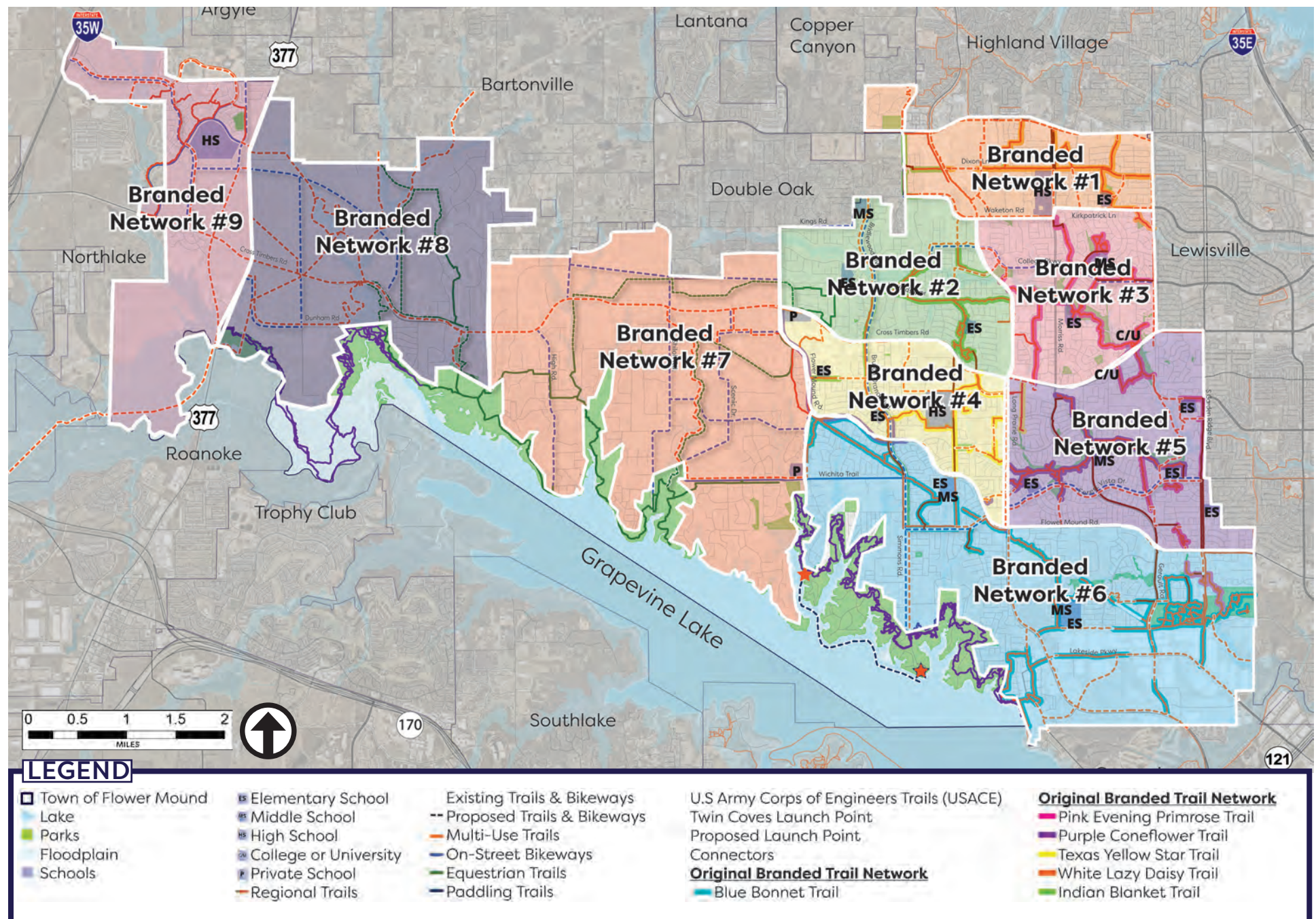
Trail markers should be placed at regular intervals along the trail to identify mileage, provide direction, and provide location information for emergency situations. They can help users be informed as to how far they've traveled. At a minimum, trail markers should be installed at every trailhead, trail access point, and trail intersection, however, trail markers should ideally be placed along the trail at $\frac{1}{4}$ to $\frac{1}{2}$ mile intervals.

DIGITAL SIGNAGE CONSIDERATIONS

A QR code can be included on all signage, which can take a trail user to a website to track where they are located on the trail network. A QR code is a matrix that is readable by a phone camera, and is linked to a specific website.



FIGURE 5.14: RECOMMENDED TRAIL REGIONS OF FLOWER MOUND



FUTURE BRANDING NAMES

The current branding system for the Flower Mound trails system is based on North Texas wildflowers. To help facilitate clear wayfinding while on the trails, **Figure 5.14** represents new proposed networks for branded trails in Flower Mound. As Flower Mound grows and more trails are constructed, this will help create clear guidelines on which branded system new trails would fall into. These networks are based off of major roadways and geographies. Using this system to identify new branded trail corridors and rename existing ones helps with overall branding and placemaking along each trail segment and maintenance needs.

Additional trail names need to be considered as more trails are constructed in rural and undeveloped areas of the Town.

New branded networks can build on the Texas wildflower theme. A list of potential trails include:

- Goldenrod
- Winecup
- Sunflower
- Basketflower
- Rain Lily
- Prickly Pear Cactus

Another option for new networks can enhance the nature theme by using plants found in the natural environment. Examples include:

- Texas Sage (shrub)
- Trumpet Vine (vines)
- Post Oak (tree)



RAIN LILY



BASKET FLOWER



SUNFLOWER

SAFETY AND SECURITY

LIGHTING

Lighting is important to consider when designing trails. Properly installing and maintaining lighting along a trail improves safety for trail users at dawn and dusk and in dark spaces such as densely wooded areas and underneath roadway overpasses. Lighting can improve visibility, increase access and convenience, and give trail users a sense of safety when using trails outside of daylight hours. Because nighttime etiquette is not always followed, proper lighting can help to increase visibility of trail users and reduce the likelihood of crashes. AASHTO recommends lighting to be installed in tunnels or overpasses, at trailheads, at bridge entrances and exits, at public gathering places, along streets, at crosswalks, at path intersections, and to illuminate key signage.

BRIDGES & LOW WATER CROSSINGS

Bridges and low water crossings should be designed by a Texas Professional Engineer and meet all Town or State established engineering standards. Low water crossings should not exceed four feet from the path to the waterway flowline unless otherwise approved by the Town Engineer. Any crossing exceeding this separation will require a bridge to ensure the trail meets all accessibility requirements. For creek crossings that require a short span, box culverts can be used with handrails.

TRAIL SAFETY RAILINGS

Safety railings should be provided where there is significant topography changes within five feet of the trail shoulder. The top of the railing should be a minimum of four feet higher than the trail surface. Railing should be horizontal to avoid catching bicycle handlebars and should be constructed in accordance with the latest International Building Code regulations.

WEB BASED TRAIL SAFETY

Web based trail safety is when there is a downloadable smart phone application (app) that can help a resident track their location on the trail system. The app can be used in tandem with trail signage to allow a trail user to identify their location in case of emergency. In addition to the app, QR codes to connect users to websites and maps to identify where they are on the trail system. There may be strategic locations to provide wireless internet services for trail users, such as in parks or at major trailheads.



MAINTENANCE

Trails and bikeways should be regularly maintained to ensure they meet vertical and horizontal clearance requirements, they are free of debris, and maintain their integrity.

MOWING AND LANDSCAPING

In order to ensure there is no debris or obstructions encroaching on trail surfaces, routine mowing and weed wacking is recommended. Removal or "cutting back" of vegetation in the clearance zones is required to maintain a safe environment along the trails.

SOFT SURFACE TRAILS

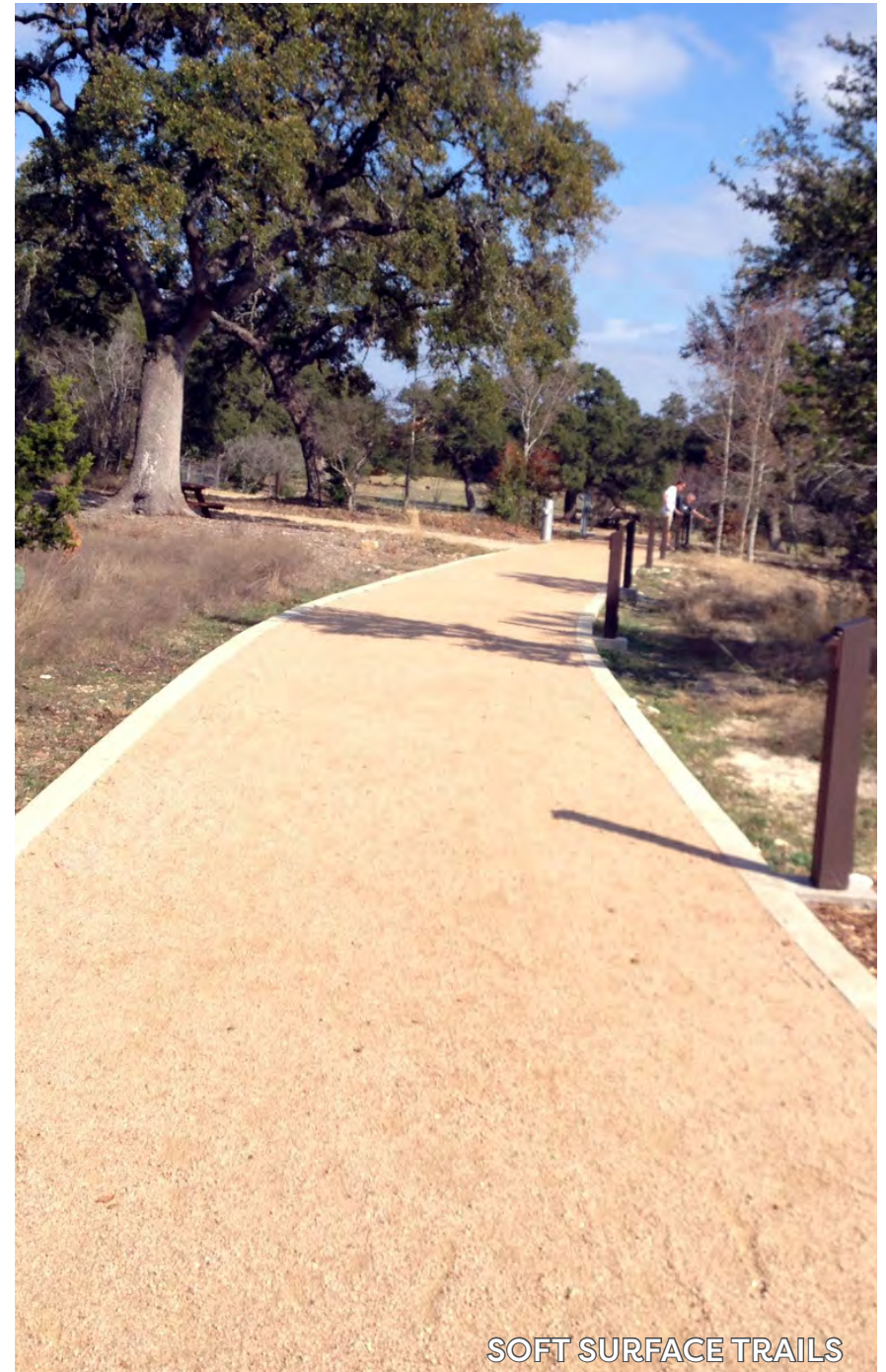
Soft surface trails should be maintained regularly to ensure they meet ADA requirements, have a compact surface, and are free from debris and animals such as snakes. This may need to be done more frequently than for paved trails.

VOLUNTEER GROUPS

Volunteer groups can be utilized to support the Town's maintenance program. The Town can support "Adopt a Trail" or "Friends of the Trail" groups that help with litter clean-up, tree planting, and raising funds for trail amenities. Trail volunteer groups can help with security patrolling along trails and identify maintenance concerns to Town staff.



VOLUNTEERING GROUP PROGRAMS



SOFT SURFACE TRAILS

USING THE TOOLBOX

UPDATING STANDARDS

The design considerations included in this chapter represent guidance for future updates to the Town's development ordinances. Upon adoption of the overall Trails and Bikeways Master Plan, these recommendations should be codified into the Town of Flower Mound Code of Ordinances and the Design Criteria and Construction Manual where applicable.

DEVELOPMENT REGULATIONS

The character and minimum dedication standards related to trails should be updated to reflect this plan's design considerations. The design considerations included in this chapter represent guidance for future updates to the Town's development ordinances. Examples where updates should be considered include Land Development Regulations Article V, Division 5: Sidewalks and Subdivision Regulations Article 6 Division 8: Parks and Recreational Areas. Both sections should be updated to reflect the standards in this document, including width of sidewalks and trails, and trail classifications. An audit of the existing regulations can identify other necessary amendments to implement this plan.

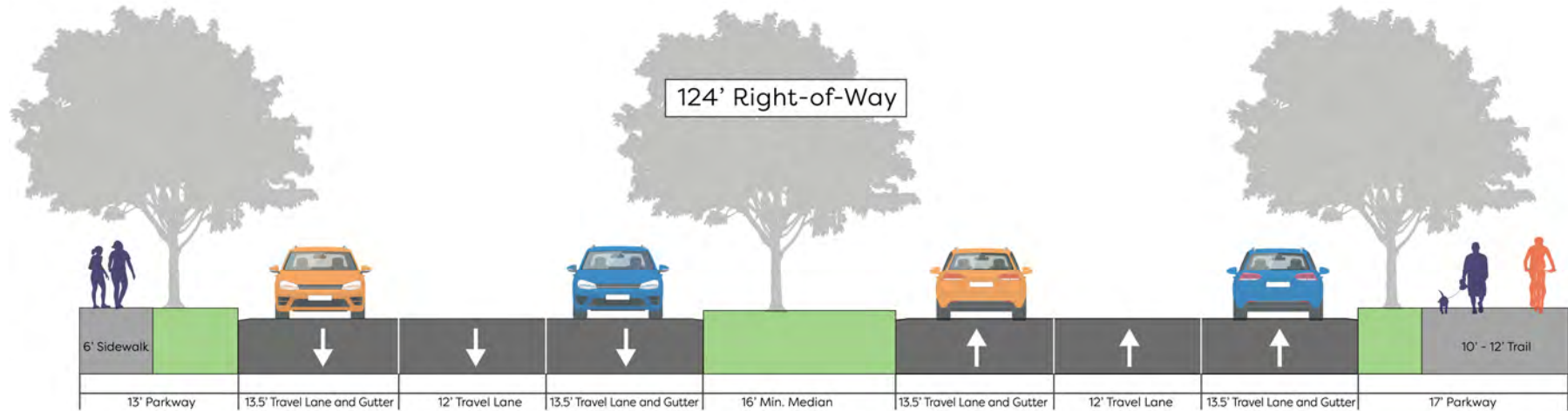
INTEGRATION WITH THOROUGHFARE PLAN

The Town Thoroughfare Plan was last updated in 2009, however several minor amendments have occurred since then. The plan specifies a variety of thoroughfare types, each with its own function and typical cross-section. Some of the cross-sections include specifications on the type and width of trail, pedestrian, or bikeway facility, but not all of the cross-sections address these multi-modal facilities. In order to better accommodate trail and bikeway facilities into future updates of the thoroughfare plan, modifications to the roadway cross-sections should be considered. **Figures 5.15 - 5.26** on the following pages depict possible updates to the cross-sections as they exist today to more fully integrate trail and bikeway accommodations as recommended in this master plan. The following cross-sections are proposed modifications to the cross-sections from the Town Thoroughfare Plan. These recommendations may need to be modified as necessary to account for existing conditions and constraints. Nothing in this plan should prohibit or limit the use easements or landscape buffers outside of the right-of-ways to enhance or improve the location of trails along roadway corridors.

ENGINEERING DESIGN STANDARDS

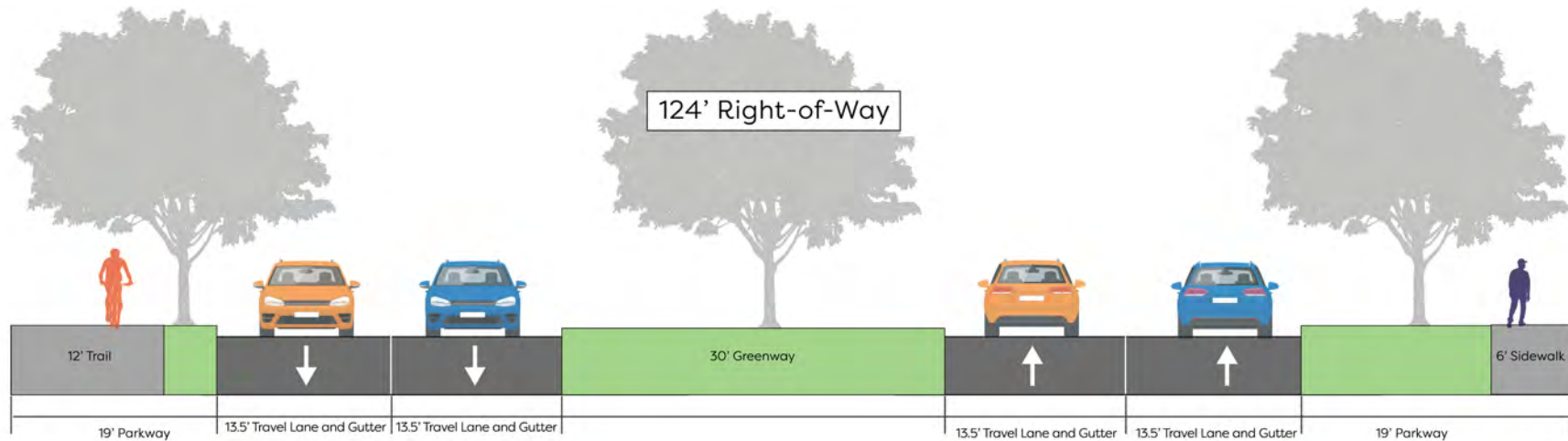
The thoroughfare plan is codified through the master plan process and the Engineering Design Standards (EDS). The EDS should be updated to reflect recommendations outlined in this plan, including any lane widths, right-of-ways widths, design speeds considerations, driveway spacing to improve the pedestrian realm, and similar topics.

FIGURE 5.15: MAJOR ARTERIAL PROPOSED CROSS-SECTION



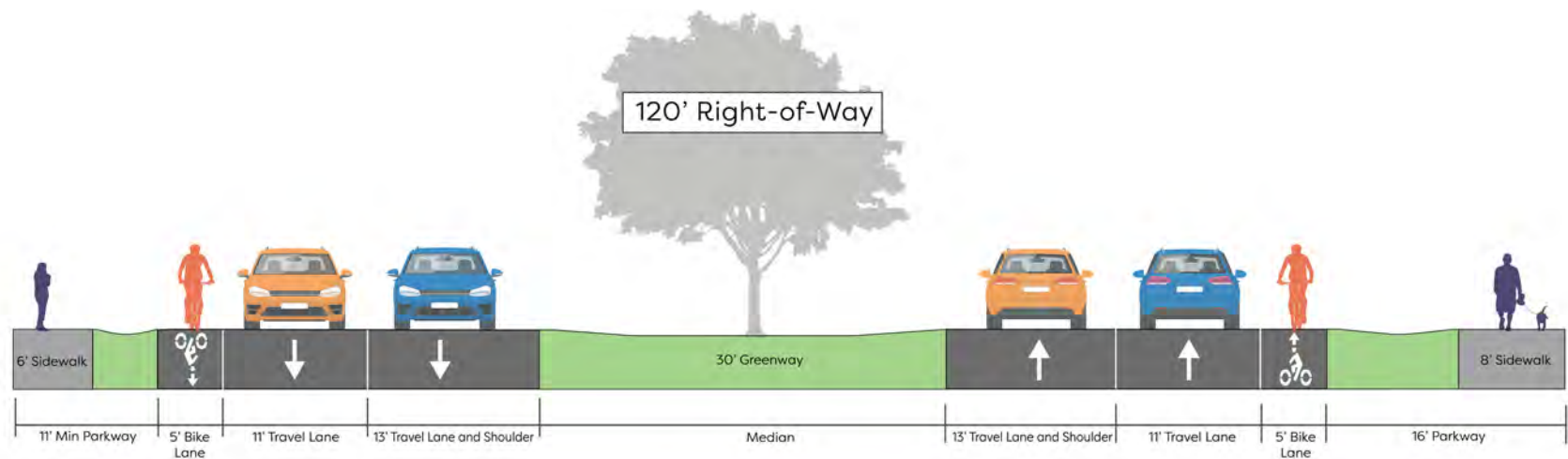
Major arterials include roads such as FM 1171, US HWY 377 and FM 2499. While these roads are mostly built-out, any new construction or reconstruction should consider minimizing the median in order to increase the buffer between pedestrian zones and motor vehicles. The road should also include a 6' wide sidewalk and 12' wide shared-use path where able.

FIGURE 5.16: GREENWAY URBAN ARTERIAL PROPOSED CROSS-SECTION



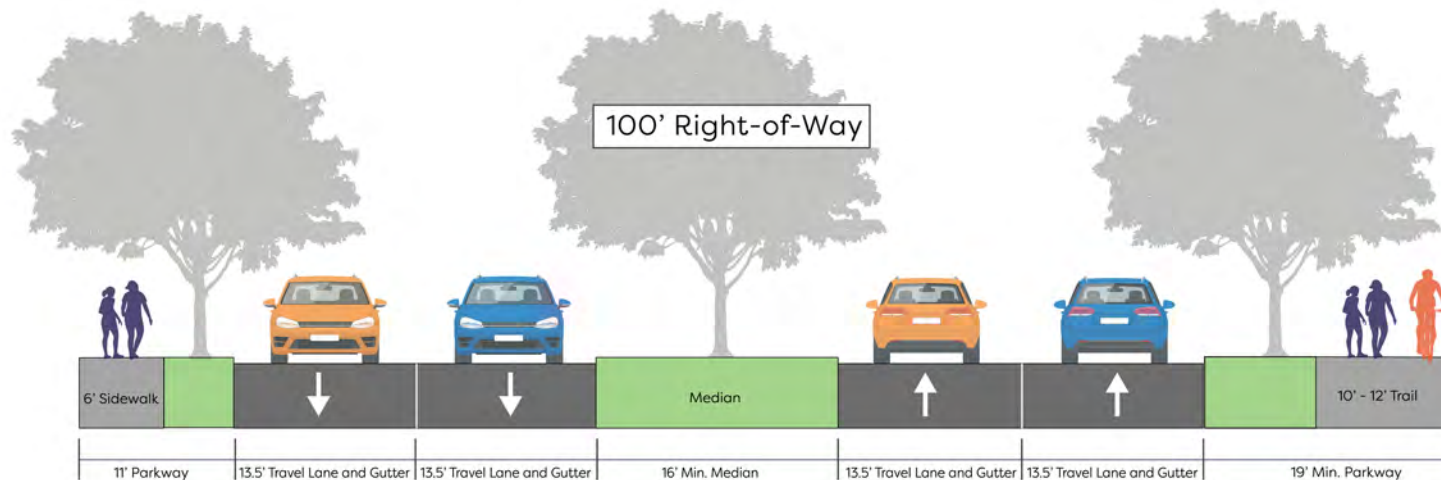
Greenway urban arterials include roads such as Garden Ridge Trail. This corridor should include a 12' wide shared use path where possible in order to create a comfortable shared realm. If the corridor is redeveloped, the median should be reduced in order to increase the width of the landscape buffer.

FIGURE 5.17: GREENWAY RURAL ARTERIAL PROPOSED CROSS-SECTION



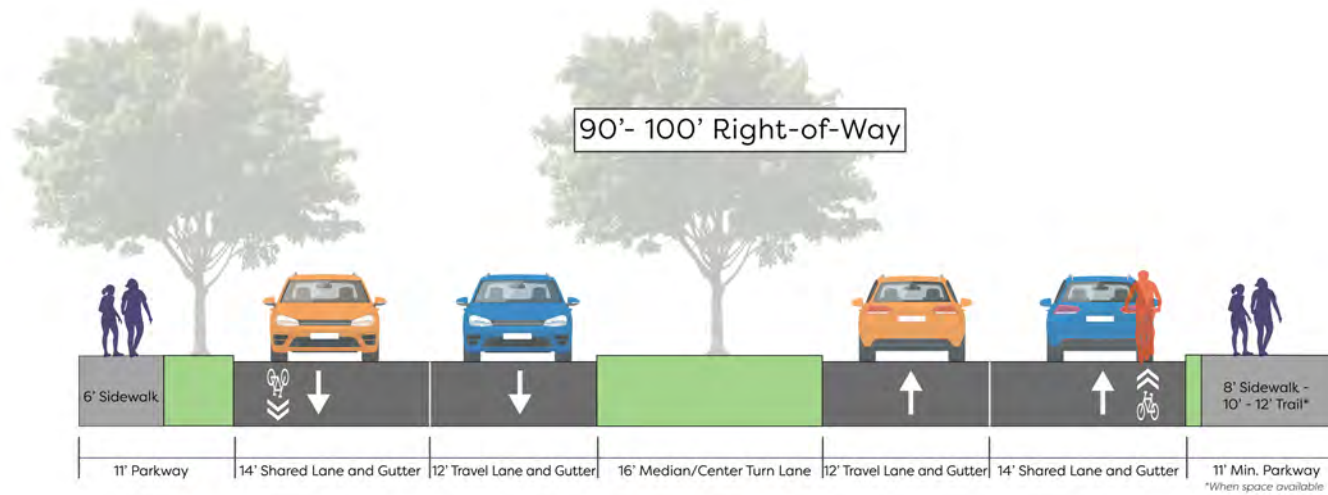
Greenway rural arterials are a future roadway classification in west Flower Mound. This roadway should include a landscaped median/center turn lane, bike lanes on each side of the road, and sidewalks with a minimum width of 6' on each side. If possible, the center turn lane should be reduced to the minimum necessary width in order to widen the parkways for landscape buffers between the sidewalk and motor vehicle lanes.

FIGURE 5.18: URBAN MINOR ARTERIAL PROPOSED CROSS-SECTION



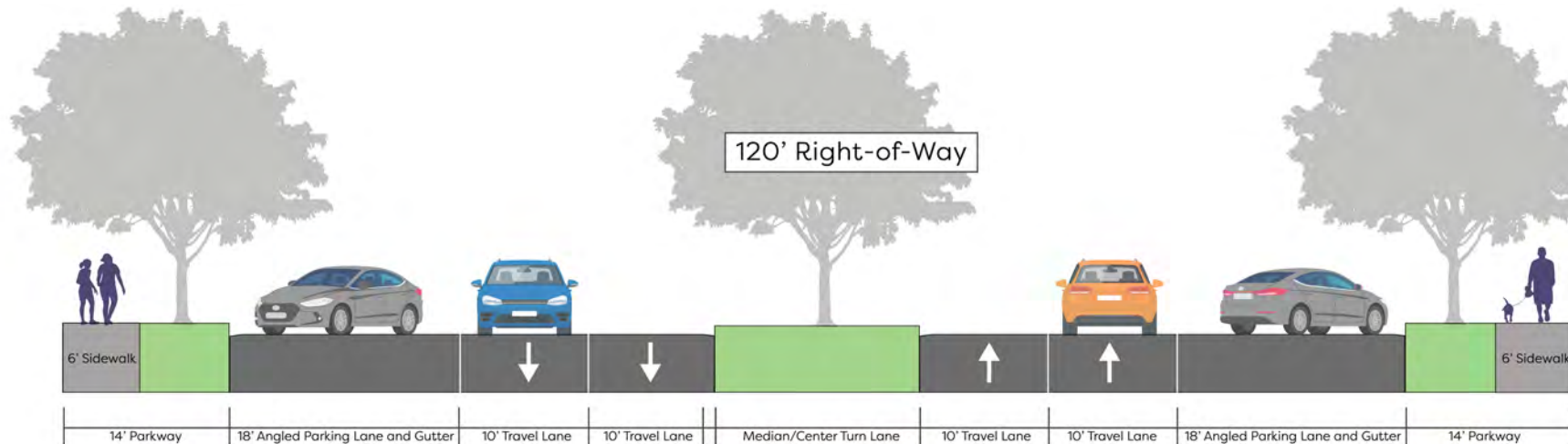
Urban minor arterials include a majority of the built roads in eastern Flower Mound, such as Flower Mound Road and Morris Road which move people and vehicles to destinations throughout the Town. Where able, this roadway cross-section should include a 10'-12' shared use path, a six foot sidewalk, and landscaped medians. It is recommended that when redevelopment of minor arterials occurs, the median be reduced in order to increase buffers and landscaped areas between the pedestrian ways and travel lanes. All new minor arterials should include 100' right-of-ways to ensure there adequate space to accommodate all facilities.

FIGURE 5.19: URBAN MINOR ARTERIAL WITH SHARED LANE PROPOSED CROSS-SECTION



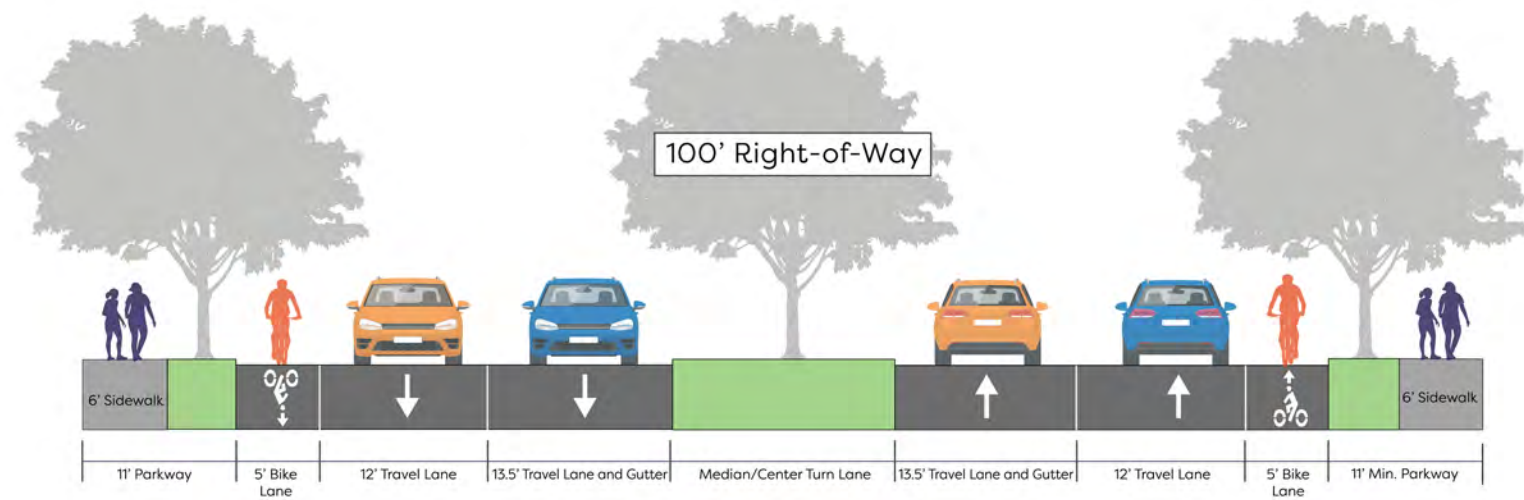
Urban minor arterials with shared-use lane is a new subclassifications of the urban minor arterial. In order to facilitate bicycle movement throughout the town, this roadway can include a shared-use lane by reducing the internal lane width. This cross-section should include a 6' sidewalk and a 10'-12' shared use path where space is available. All new urban minor arterials should have a 100' right-of-way.

FIGURE 5.20: URBAN MINOR ARTERIAL WITH ON-STREET PARKING PROPOSED CROSS-SECTION



Urban minor arterials with on-street parking are found within the Lakeside Development. These roads are intended to provide parking for the shops and restaurants and provide wide sidewalks to encourage walking throughout the community. No changes have been proposed to this cross-section. Any new roadway segments should consider providing enhanced sidewalks where pedestrian volumes are expected to be higher.

FIGURE 5.21: URBAN MINOR ARTERIAL WITH BIKE LANES PROPOSED CROSS-SECTION



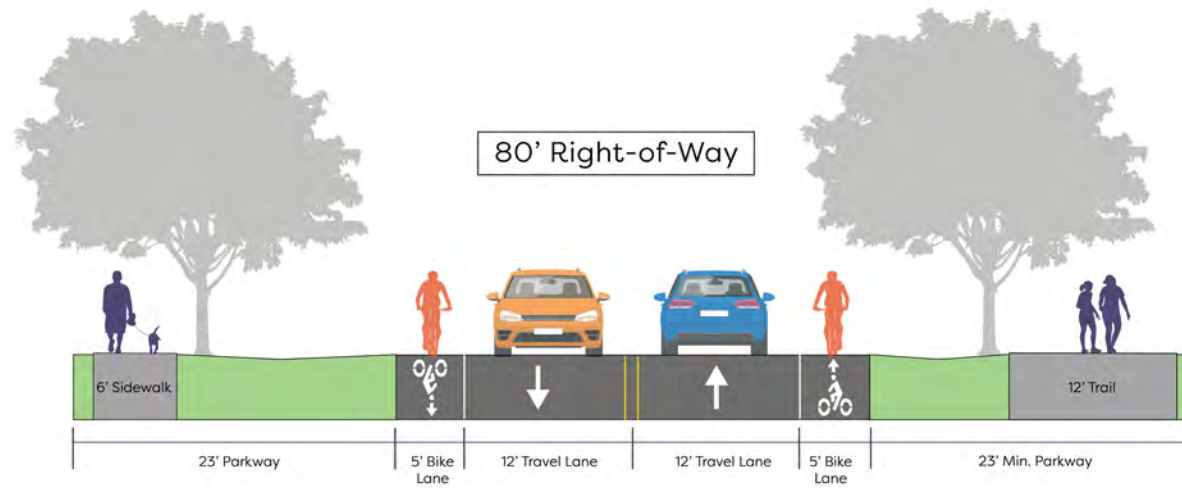
Urban minor arterials with bike lanes include roadways in west Flower Mound, including Canyon Falls Drive and other future corridors in the Canyon Falls Development. This cross-section provides 5' wide dedicated bike lanes, and 6' wide sidewalks on each side of the road.

FIGURE 5.22: URBAN COLLECTOR PROPOSED CROSS-SECTION



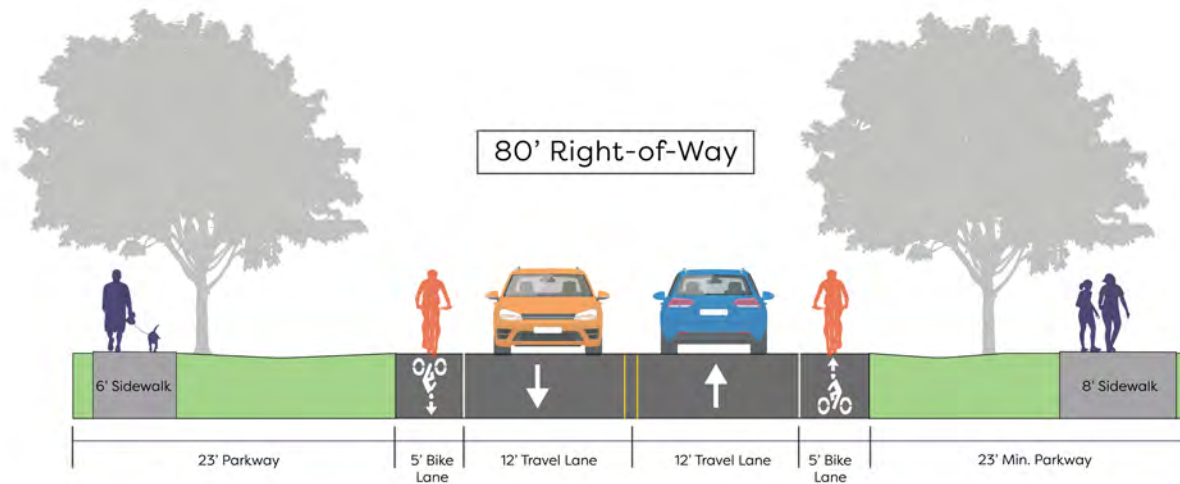
Urban collectors are roads in Flower Mound connect residents to arterial roadways. These include roads like Quail Run, Kirkpatrick Lane, and Lake Forest Boulevard. This cross-section should include shared-use lanes, and 6' wide sidewalks buffered by landscaping. It would be appropriate to consider 5' bike lanes on urban collectors in place of the shared-use lane markings.

FIGURE 5.23: RURAL COLLECTOR PROPOSED CROSS-SECTION - A



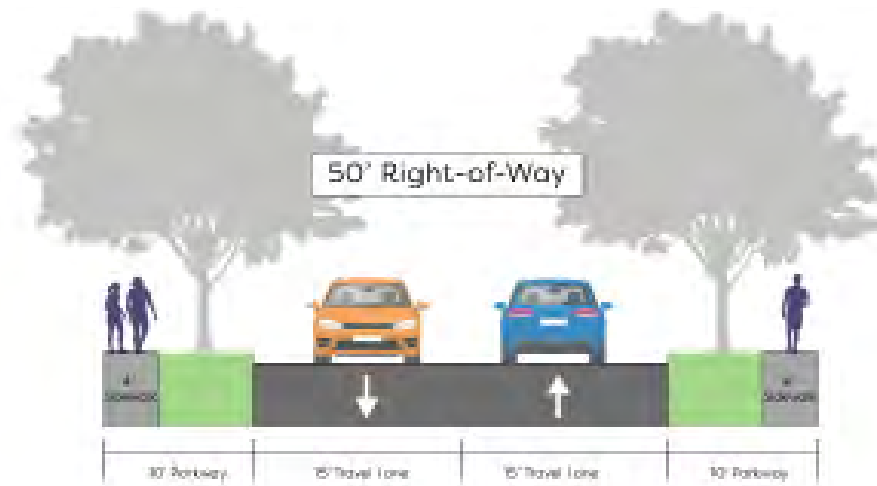
Rural collectors are roads in Flower Mound mainly found on the rural and undeveloped areas of the Town. These corridors should include bike lanes and 6' wide sidewalks. Where identified on the trails master plan, they should also include a 12' wide shared-use path.

FIGURE 5.24: RURAL COLLECTOR PROPOSED CROSS-SECTION - B



Rural collectors are roads in Flower Mound mainly found on the rural and undeveloped areas of the Town. These corridors should include bike lanes and 6' - 8' wide sidewalks.

FIGURE 5.25: LOCAL RESIDENTIAL URBAN PROPOSED CROSS-SECTION



Local residential urban roads are primarily residential roadways. There are no recommended changes to this cross-section. These roads can be considered for shared-use path signage due to the lower speeds and volumes. There should be connectivity from residential streets to the town-wide trails and bikeways system.

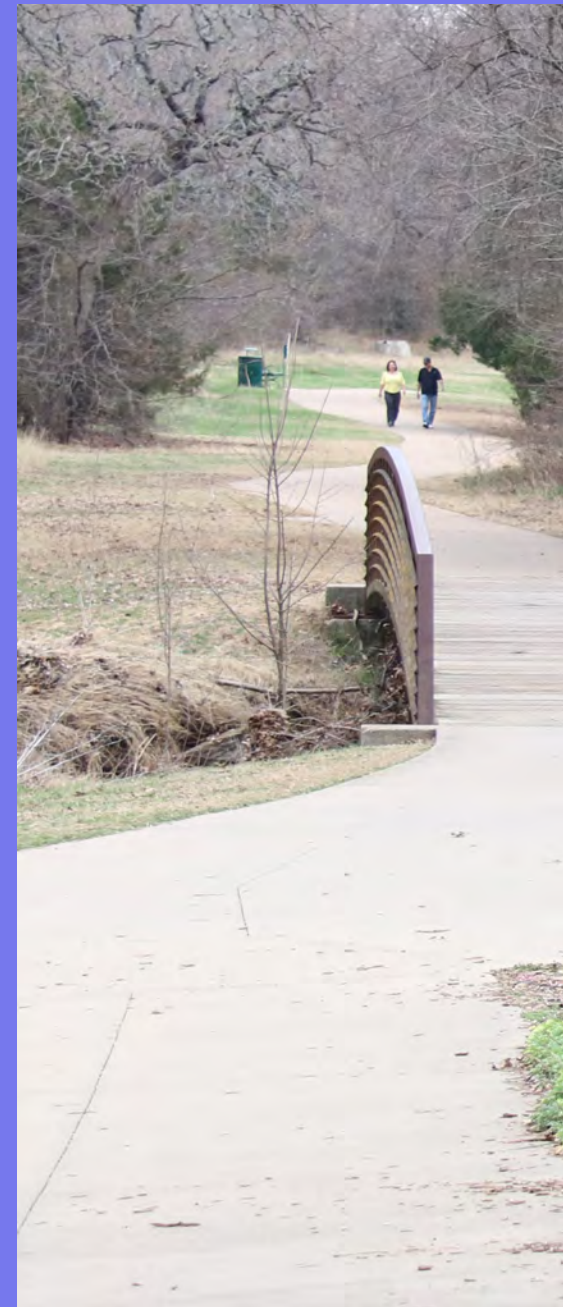
FIGURE 5.26: LOCAL RESIDENTIAL ESTATE PROPOSED CROSS-SECTION



Local residential estate roads are mainly local roads within large lot subdivisions. There are no recommended changes to this cross-section.

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Corridor Prioritization Implementation Plan Conclusion



O6 IMPLEMENTATION



123 Flower Mound Trails and Bikeways Master Plan

Implementation of this plan's trails and bikeways recommendations will take time, funding, and coordination amongst various partners. This chapter presents a prioritized list of projects to implement over time by facility type. Also presented are policies, programs, and projects that can help support implementation of the trail and bikeway corridors. Funding opportunities and details on plan administration are also discussed.

CORRIDOR PRIORITIZATION

As described in Chapter 4, this master plan recommends over 90 miles of new trail and bikeway facilities in Flower Mound. All of the recommendations cannot be implemented at once, so the project team conducted a prioritization process to compare and rank the most important projects. A set of prioritization criteria was established and refined with the Steering Committee and Technical Working Group. Once the criteria were set, each proposed trail and bikeway segment was scored based on the established criteria and given an overall score, which was then translated to high, medium, and low priorities.

- **High Priority:** Corridors that should be initiated in the first five years of plan implementation.
- **Medium Priority:** Corridors that should be initiated in years five to ten of plan implementation.
- **Low Priority:** Corridors that should be initiated beyond year ten of plan implementation.



PURPLE CONEFLOWER TRAIL

TOWN MULTI-USE TRAILS

The Town's multi-use trail network will provide critical connections, improve existing corridors and facilities, and enhance safety for trail users. This section includes the action program for the Town to consider investment over the planning horizon.

CRITERIA

The criteria in [Table 6.1](#) were used to score each of the town paved multi-use trail segments in order to determine the proposed timing for implementation. In order to determine the weighted score for each project, the criteria were assigned a weight based on the level of importance determined by the Steering Committee, Technical Working Group, and planning team.

TABLE 6.1: TOWN MULTI-USE TRAIL CRITERIA DESCRIPTIONS

Criteria	Description
Connects to key destinations	The trail segment connects residents to parks, schools, major shopping centers, or employment centers.
Connects to the existing trail/ bikeway network	The trail segment provides a connection to the existing trail/bikeway network to create loops, primary routes, and high connectivity throughout the system.
Creates an interjurisdictional connection	The trail segment connects residents to surrounding communities and improves regional connectivity.
Located on the designated Regional Veloweb	The trail segment is part of the designated Regional Veloweb and connects residents to the greater DFW Metroplex. The Regional Veloweb provides funding opportunities through NCTCOG.
Solves a safety issue or overcomes a barrier	The trail segment addresses an identified safety issue or barrier.
Fills a gap in the existing system	The trail segment fills a gap in the existing system by connecting two segments of existing trail.
Improves an existing trail	The trail segment widens an existing facility to enhance the comfort along the trail.
Ease of implementation	The trail segment is feasible to construct. Factors considered for this criterion include property ownership, topography, floodplain, and barriers.
Amount of environmentally sensitive areas disturbed	The trail segment provides the least disruption of natural areas.
Facilitates bicycling/walking to school	The trail segment provides safe, off-street routes for students of all ages to get to school from their homes.
Population density	The trail segment provides access to higher population densities.
Primary Trail	The trail segment is located on the primary trail or loop trail, as shown in Figure 6.9 on page 138.

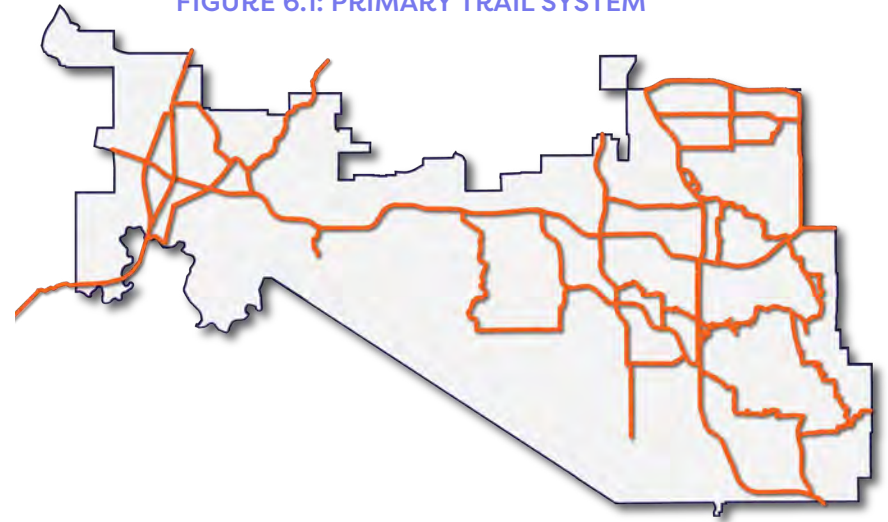
PRIMARY TRAIL CORRIDORS

Primary trails, shown in [Figure 6.1](#), are characterized by their accessibility through the Town. They are major east/west and north/south trails through Flower Mound, primarily located on major roadways like Long Prairie, Cross Timbers, and US-377. Many of these longer corridors are also part of the Regional Veloweb, which provide regional and local connectivity and can support major trailheads at main trail junctions. Primary trails can also be located through greenways and off major corridors to create loops and linkages to parks, schools, and destinations.

Primary trails provide residents with continual corridors for walking, jogging, or general exercise purposes. In contrast, intersecting loop trails bring diversity to the system and create various mileages for trail users. Loops create scenic or relaxing experiences by connecting to off-road trail segments, improving shade along trails, and providing access to nature and exploration.

The concept of primary trail corridors was used as a scoring criteria (see [Table 6.1](#) on page 124). While not all projects that scored as "high priority" are located on the primary trail system, primary trails should be used to identify grant and bond program projects.

FIGURE 6.1: PRIMARY TRAIL SYSTEM



BLUEBONNETT TRAIL

TOWN MULTI-USE TRAIL NETWORK ACTION PLAN

There are a total of 82.1 miles of recommended off-street trails, 21 percent of which are designated as high priority, 24 percent as medium priority, and 55 percent as low priority, as shown in [Figure 6.2](#) (page 127). [Figure 6.3](#) (page 128) and [Table 6.2](#) represent the action plan for the Town's multi-use trail network.

[Table 6.2](#) provides the **Corridor ID** for the trail projects shown from north to south; the **Facility Type** to determine if it's a multi-use trail, part of the Regional Veloweb, or one of the more detailed feasibility corridors; the **Corridor** to describe where the segment is located; the **Length** of each project; and the **Priority** of the project based on the weighted criteria.

In eastern Flower Mound, most trail corridors recommend filling gaps in the existing system and upgrading existing trails and sidewalks to reflect the recommendations of this plan. New trail segments include trails along greenways, easements, and undeveloped land.

In western Flower Mound, new trail segments are recommended through undeveloped land and along major corridors. It is anticipated that many of these trail segments will be constructed by private developers in conjunction with property development.

FIGURE 6.2: TOWN MULTI-USE TRAIL PRIORITY BREAKDOWN

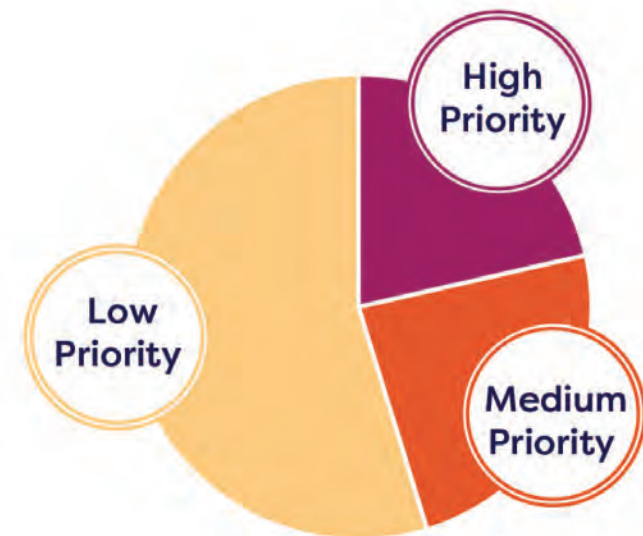


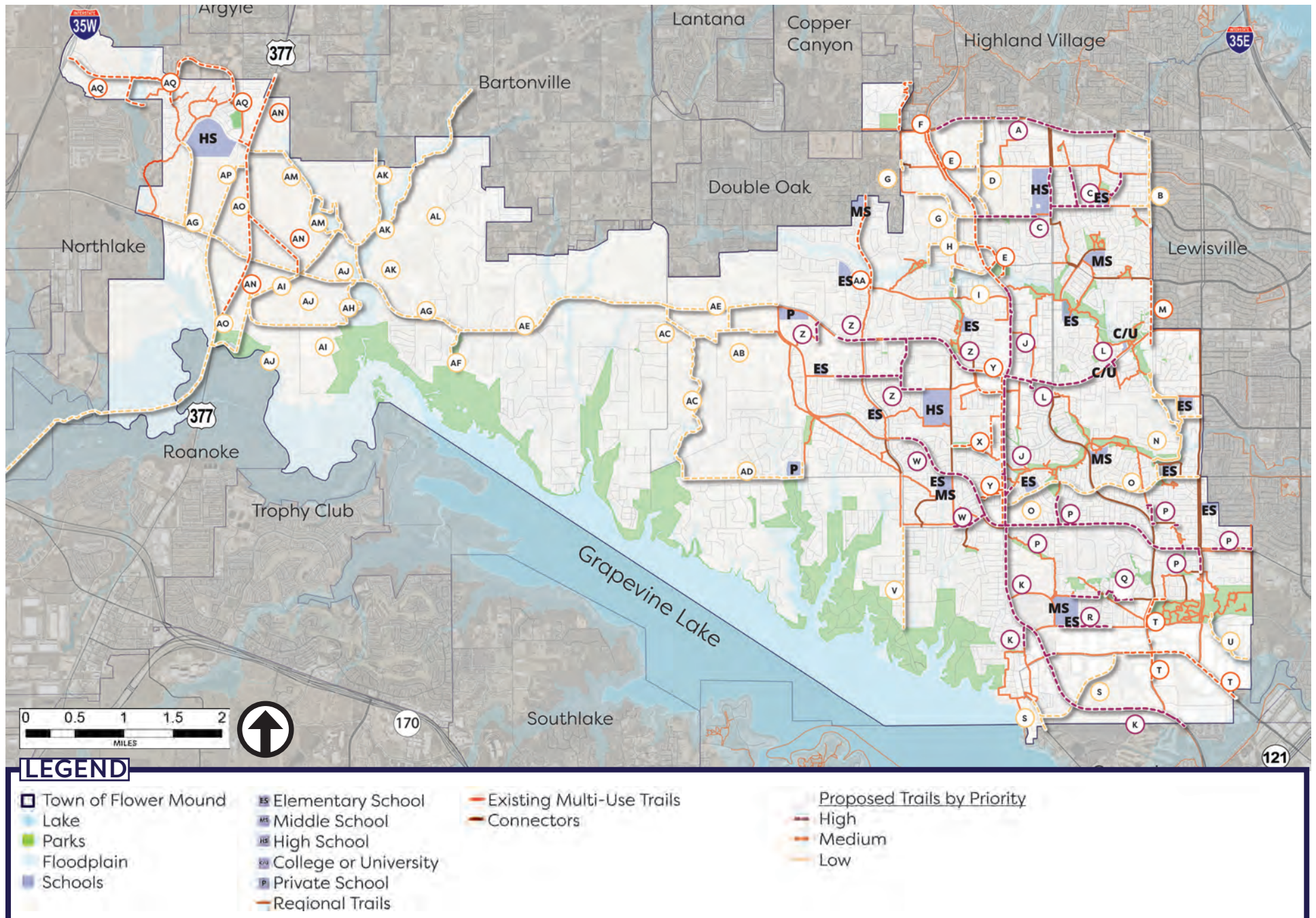
TABLE 6.2: TOWN MULTI-USE TRAILS RECOMMENDATION SUMMARY

Corridor ID	Facility Type	Corridor	Length (miles)	Priority
A	Multi-Use	Justin Rd	1.70	High
B	Multi-Use	Lone Buck Dr	2.23	Low
C	Multi-Use	Waketon/Morris/Kirkpatrick Ln	2.34	High
D	Multi-Use	Easement/Dixon Ln	1.38	Low
E	Proposed Veloweb	Long Prairie Rd/College Pkwy	2.87	Medium
F	Multi-Use	Chin Chapel Rd	0.65	Medium
G	Multi-Use	Chinn Chapel Rd/Waketon Rd	0.80	Low
H	Multi-Use	Rippy Rd/Pecan Meadows	0.94	Low
I	Multi-Use/Connector	Rippy Rd/Birch St	0.61	Low
J	Proposed Veloweb	Long Prairie Rd	2.54	High
K	Proposed Veloweb	Long Prairie Rd	3.50	High
L	Proposed Veloweb	Cross Timbers Rd	1.12	High

TABLE 6.2: TOWN MULTI-USE TRAILS RECOMMENDATION SUMMARY

Corridor ID	Facility Type	Corridor	Length (miles)	Priority
M	Multi-Use	Kirkpatrick Ln	2.26	Medium
N	Feasibility Corridor	Kirkpatrick Ln/Timber Creek Easement	2.76	Low
O	Multi-Use	Forest Vista Dr	2.20	Low
P	Multi-Use	Flower Mound Rd./Garden Ridge Blvd.	3.18	High
Q	Multi-Use	Shadow Ridge Park/Sweet Water Ln	0.77	High
R	Multi-Use	Spinks Rd	0.53	High
S	Multi-Use	Lakeside Pkwy/Lakeside Village Pkwy	1.36	Low
T	Multi-Use	Lakeside Pkwy/Gerault Rd.	2.01	Medium
U	Multi-Use	Easement by Water Treatment Plant	0.69	Low
V	Multi-Use	Simmons Rd	1.01	Low
W	Multi-Use	Flower Mound Rd./McKamy Creek	1.81	High
X	Multi-Use	Peacock Park	0.53	Medium
Y	Multi-Use	Long Prairie Rd	2.28	Medium
Z	Multi-Use	Cross Timbers Rd/Auburn Dr/Quail Rn/Peters Colony	2.98	High
AA	Multi-Use	Bridlewood Blvd	1.00	Medium
AB	Multi-Use	Walsingham/Scenic	1.18	Low
AC	Proposed Veloweb	Shiloh Easement	2.00	Low
AD	Multi-Use	Wichita Trail	1.56	Low
AE	Proposed Veloweb	1171 - Cross Timbers	3.55	Low
AF	Feasibility Corridor	Floodplain	0.55	Low
AG	Feasibility Corridor	1171 - Cross Timbers	3.20	Low
AH	Multi-Use	Floodplain	1.02	Low
AI	Multi-Use	Dunham Rd	1.37	Low
AJ	Proposed Veloweb	Future Corridor	2.00	Low
AK	Multi-Use	Floodplain	1.70	Low
AL	Proposed Veloweb	Floodplain	1.37	Low
AM	Multi-Use	Furst Ranch (Future Development)	2.24	Medium
AN	Proposed Veloweb	377	3.55	Medium
AO	Multi-Use	Railroad Corridor	4.97	Low
AP	Multi-Use	Future Corridor	0.87	Low
AQ	Multi-Use	Prairie Ridge Rd/Denton Creek Blvd	3.16	Medium

FIGURE 6.3: TOWN MULTI-USE TRAILS RECOMMENDED NETWORK



ON-STREET BIKEWAYS

On-street bikeways include bike lanes and shared-use lanes to improve active transportation town-wide. Many of the identified routes are frequently used by bicyclists, and connect residents to destinations and the region. On-street facilities can provide critical connections where other facilities may be constrained.

CRITERIA

The following criteria in [Table 6.3](#) was used to score each of the on-street bikeway segments in order to determine the proposed timing for implementation. In order to determine the weighted score for each project, the criteria were assigned a weight based on the level of importance determined by the Steering Committee, Technical Working Group, and planning team. Many of the criteria are similar to the trails, as they help to create a complete network. Level of comfort and level of coordination are specific to the bikeways in order to evaluate rights-of-way constraints and user preference.



TABLE 6.3: ON-STREET BIKEWAYS CRITERIA

Criteria	Description
Connects to the existing trail/ bikeway network	The bikeway segment provides a connection to the existing trail/bikeway network to create loops, primary routes, and high connectivity throughout the system.
Creates an interjurisdictional connection	The bikeway segment connects residents to surrounding communities and improves regional connectivity.
Solves a safety issue or overcomes a barrier	The bikeway segment addresses an identified safety issue or barrier.
Level of Comfort	The bikeway segment provides a high level of comfort. Comfort is a critical factor for the development of bikeways; the more comfortable a facility is perceived, the greater chance the facility will be utilized by users of all ages and abilities. The level of comfort of a roadway takes into consideration traffic volumes, speeds, and pavement widths.
Fills a gap in the existing system	The bikeway segment fills gap in the existing system by connecting two segments of existing bikeways. The existing system is relatively disjointed, filling in gaps will help improve connectivity, particularly on the east side of the Town.
Improves an existing facility	The bikeway segment improves a facility that cyclists currently use.
Ease of implementation	The bikeway segment is feasible to construct. Factors considered for this criterion include rights-of-way widths, speed of roadway, pavement widths, and roadway constraints.
Level of coordination needed with other entities	The bikeway segment requires little coordination with other entities. Bikeways are easier to implement when less coordination is needed. Entities that may need to be coordinated with include TxDOT, railroads, utility companies, and the USACE.
Population Density	The bikeway segment provides access to higher population densities.

ON-STREET BIKEWAYS NETWORK ACTION PLAN

There are a total of 39.5 miles of recommended on-street bikeways, 41 percent of which are designated as high priority, 18 percent as medium priority, and 41 percent as low priority, as shown in [Figure 6.4](#). [Figure 6.5](#) and [Table 6.4](#) represent the action plan for on-street bikeways in Flower Mound.

[Table 6.5](#) provides the **Corridor ID** for the bikeway projects shown from north to south; the **Facility Type** to determine if it's a shared-use lane or bike lane; the **Corridor** to describe where the segment is located; the **Length** of each project; and the **Priority** of the project based on the weighted criteria.

In eastern Flower Mound, bikeways provide connections to surrounding communities, and connect to parks, schools, and destinations.

In western Flower Mound, bikeways connect residents to the USACE trails, are proposed with future roadways, and connect residents to parks and schools.

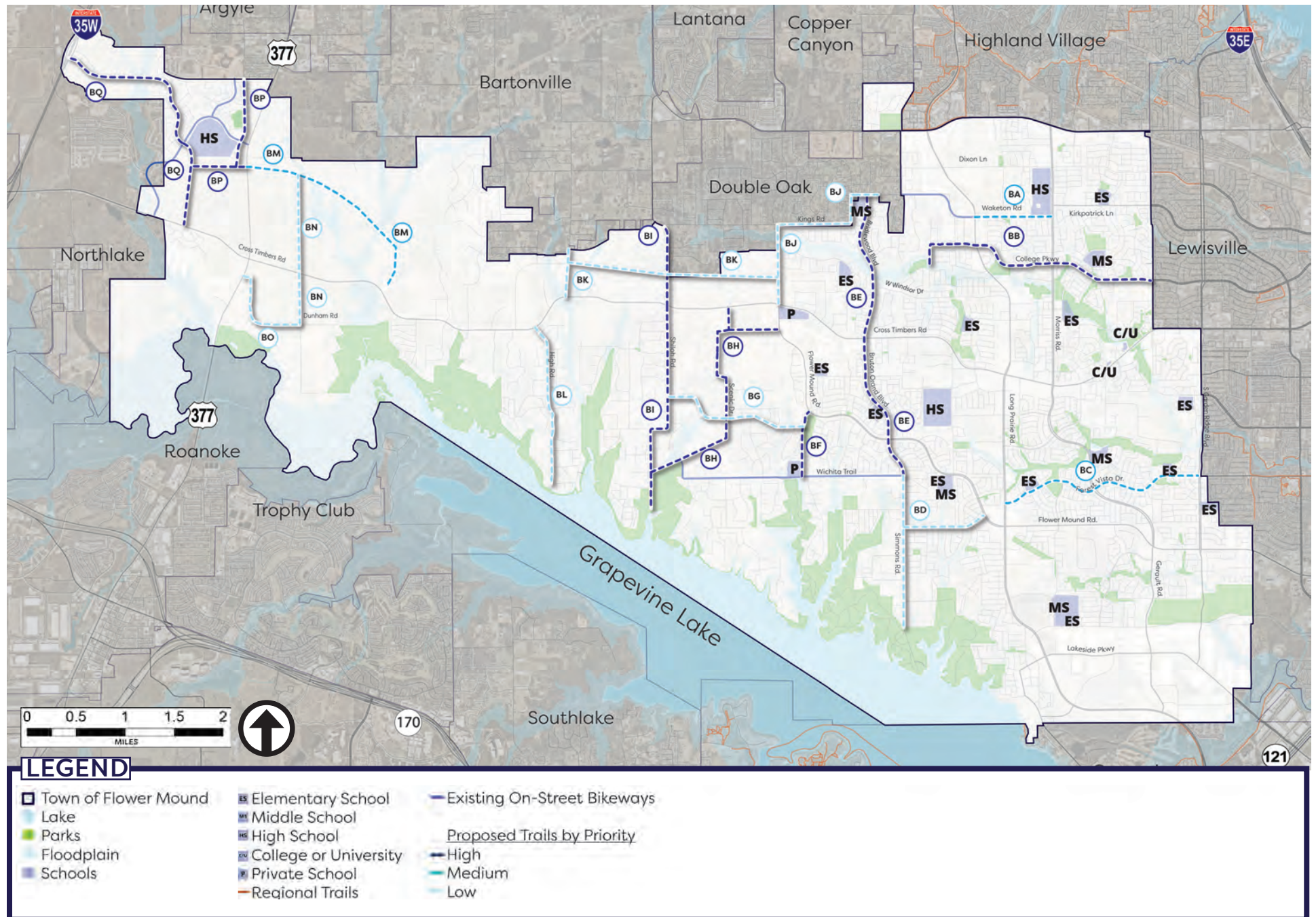
FIGURE 6.4: ON-STREET BIKEWAYS PRIORITY BREAKDOWN



TABLE 6.4: ON-STREET BIKEWAYS RECOMMENDATION SUMMARY

Corridor ID	Facility Type	Corridor	Length (miles)	Priority
BA	Shared-Use Lane	Waketon Rd	1.65	Medium
BB	Shared-Use Lane	College Pkwy	2.57	High
BC	Shared-Use Lane	Forest Vista Dr	2.13	Medium
BD	Shared-Use Lane	Simmons Rd	2.37	Low
BE	Shared-Use Lane	Bridlewood Blvd./Burton Orand Blvd	3.01	High
BF	Shared-Use Lane	Skillern Rd	0.67	High
BG	Shared-Use Lane	River Hill Dr	1.52	Low
BH	Bike Lane/Shared-Use Lane	Scenic Dr	2.80	High
BI	Bike Lane	Shiloh Rd	3.00	High
BJ	Shared-Use Lane/Bike Lane	Lusk Ln/Kings Rd/Waketon Rd	2.10	Low
BK	Bike Lane	Red Rock Ln/Future Corridor	2.61	Low
BL	Bike Lane	High Rd.	1.64	Low
BM	Bike Lane	Future Corridor	2.20	Medium
BN	Bike Lane	Future Corridor	1.50	Low
BO	Bike Lane	Dunham Rd	1.00	Low
BP	Shared-Use Lane/Bike Lane	Future Corridor/Stonecrest Dr	0.90	High
BQ	Bike Lane	Denton Creek Blvd	1.73	High

FIGURE 6.5: ON-STREET BIKEWAYS RECOMMENDED NETWORK



NON-TRADITIONAL TRAIL FACILITIES

For the non-traditional trails, including town equestrian trails and paddling trails, 25 percent are high priority trails, 63 percent are medium priority trails, and 12 percent are low priority trails, as shown in Figure 6.6. Figure 6.7 and Table 6.5 represent the action plan for non-traditional trail facilities, including equestrian trails and paddling trails.

TOWN EQUESTRIAN TRAILS

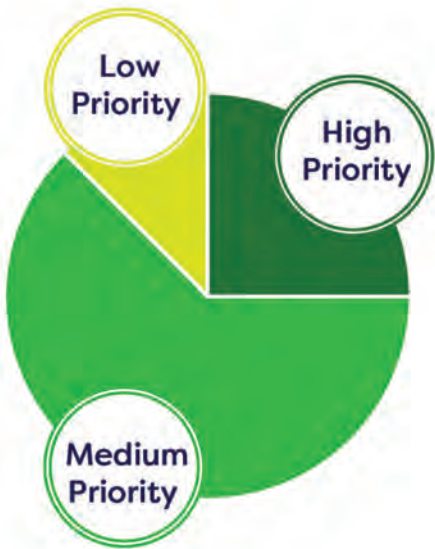
There are a total of 10.9 miles of equestrian trails recommended in this master plan. While there is not a set of established prioritization criteria for equestrian trails specifically, based on feedback from citizens and stakeholders, the most important components were:

- Completing existing equestrian trail loops
- Providing more connections to the existing USACE equestrian trails

OTHER TRAILS - PADDLING TRAILS

There are 2 miles of paddling trails recommended in this master plan. Similar to equestrian trails, there is not a set of established prioritization criteria for paddling trails. Given that there is only one primary recommended segment, this corridor was given a prioritization of medium priority based on the anticipated complexity to complete.

FIGURE 6.6: NON-TRADITIONAL TRAILS PRIORITY BREAKDOWN



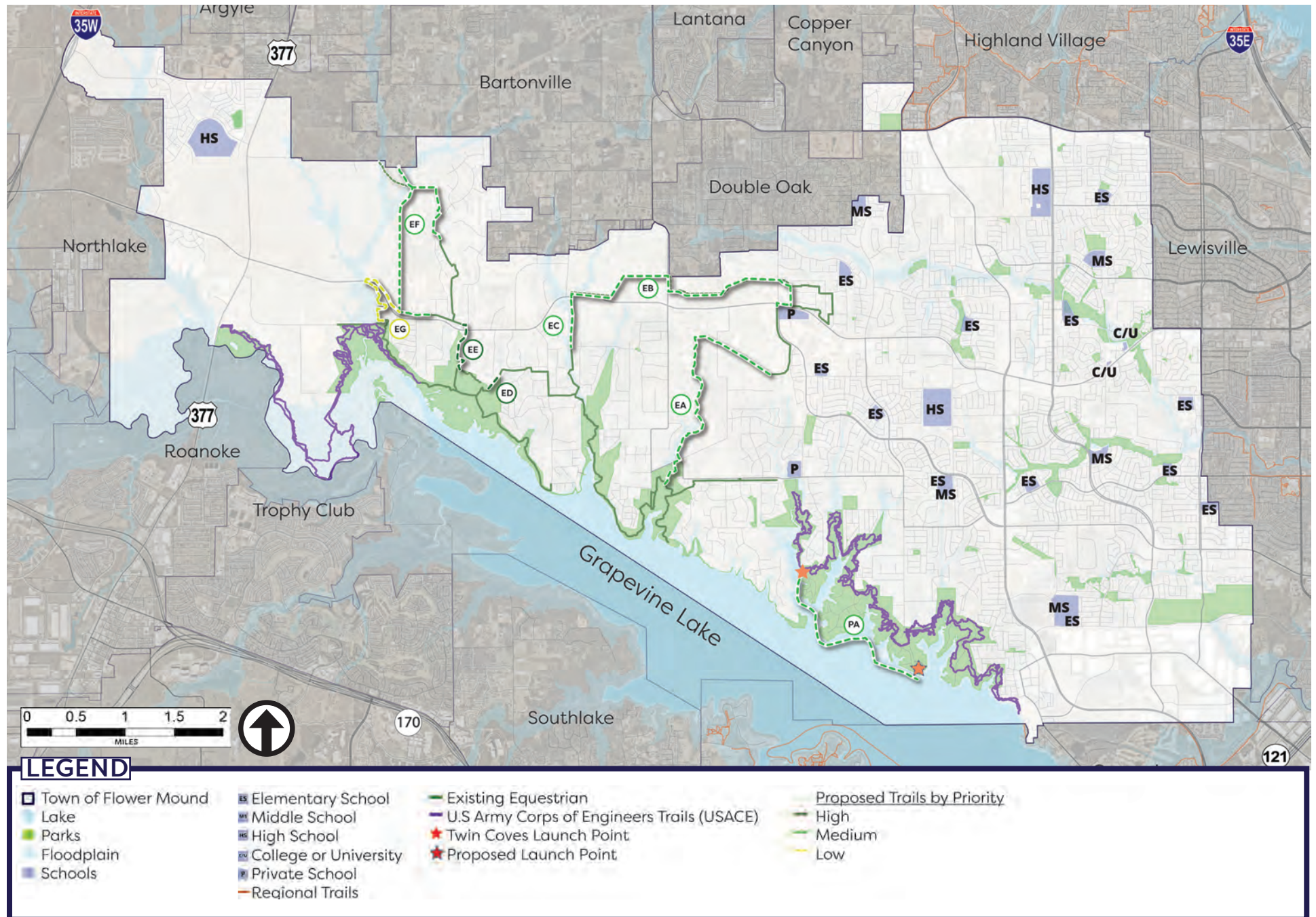
OTHER TRAILS - USACE TRAILS

This plan does not recommend additional USACE soft surface trails. Important considerations include implementing cautionary signage to reduce potential conflict from different users.

TABLE 6.5: NON-TRADITIONAL TRAILS RECOMMENDATION SUMMARY

Corridor ID	Facility Type	From	To	Length (Miles)	Priority
EA	Equestrian	Melville Cir	Rocky Point	2.71	Medium
EB	Equestrian	Brindle Wy	Cross Timbers	3.02	Medium
EC	Equestrian	Cross Timbers	Raintree Pl	0.48	Medium
ED	Equestrian	Hidden Brook Farm		0.16	High
EE	Equestrian	Cross Timbers	Hidden Ridge Dr	2.70	High
EF	Equestrian	Cross Timbers	Montalcino	0.58	Medium
EG	Equestrian	Cross Timbers		1.21	Low
PA	Paddling	Twin Coves	Murrel Park	1.95	Medium

FIGURE 6.7: NON-TRADITIONAL TRAIL PRIORITIZATION



PLAN IMPLEMENTATION

TYPICAL FACILITY COSTS

While implementing each corridor will pose different challenges, it is beneficial to establish typical facility costs to help with planning and budgeting. **Table 6.6** represents the typical planning level cost range for all of the facility types recommended in this master plan.

These cost ranges are based on recent project bids, current market trends, and engineering standards and design methods. Each estimate considers general cost elements, demolition, transportation, and grading costs based on similar projects. *It is important to note that these cost estimate ranges are at a pre-design level and will likely change as additional planning, design, and engineering occurs for each project.*

TABLE 6.6: TYPICAL PROJECT COSTS BY FACILITY

Facility Type	Parameters	Typical Cost Range
Paved Multi-Use Trail	12' paved trail	\$1.35 – \$1.9M per mile
Paved Multi-Use Trail	10' paved trail	\$1.35 – \$1.9M per mile
Connector	8' paved wide sidewalk	\$1.0M – \$1.4M per mile
Soft-Surface Trail	8' decomposed granite trail with grading	\$600,000 – \$900,000 per mile
Equestrian Trail	8' natural surface trail with grading	\$250,000 – 400,000 per mile
Bike Lane	Lane striping, signage, and pavement markings on both sides of the street	\$95,000 per mile (existing street surface)
Shared-Use Lane	Signage, pavement markings	\$75,000 per mile (existing street surface)
Shared-Use Lane	Signage	\$3,000 per mile
Paddling Trail	Signage, informational signage kiosk,	\$2,000 – \$10,000 per mile based on signage
Sidewalk	6' sidewalk	\$900,000 – \$1.6M per mile

Note: Costs for a specific trail or bikeway facility will vary based on site conditions and as additional planning, design, and engineering occurs. An inflation rate of 3% per year should be factored into any project cost. Chapter 5 includes typical crosssections and additional design considerations for these facility types. Source of cost estimates is Half Associates, Inc. based on similar projects.

PRIORITY PROJECTS

Figure 6.8 illustrates the percentage of the high priority projects by facility type. Overall, 50 percent of the high priority projects are for Town multi-use trails, 39 percent are for bikeways, and 11 percent are for equestrian trails. All high priority projects are combined into a single systemwide prioritization map and table, shown in **Figure 6.9** (page 136) and **Table 6.7** (page 135).

FIGURE 6.8: PRIORITY BREAKDOWN

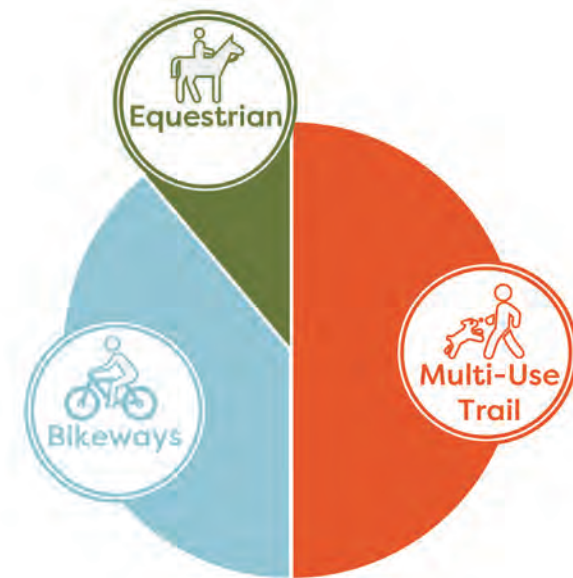


Table 6.7 (page 135) provides the **Corridor ID** for the high priority projects; the **Facility Type** to determine if it's a multi-use trail, bikeway, or equestrian trail; the **Corridor** to describe where the segment is located; the **Length** of each project; and the **Cost Estimate Range** of the project based on the average of the planning level typical project costs; and **Partnerships** to identify potential funding partners for the construction of the system. Due to the length of many of the prioritized trail and bikeway segments, a variety of funding mechanisms may need to be utilized in order to complete the network, including private developer funds, Town funds, state entities such as TxDOT, regional funding opportunities with NCTCOG, and voter approved bond projects.

Most high priority Town multi-use trails are located in eastern Flower Mound. These trails enhance safe routes to school, fill in critical gaps, and connect residents to destinations in Flower Mound and the DFW region. These corridors can be implemented as one project with voter approved bonds or grant programs, or they can be divided into smaller segments to be included in the Town's annual budget.

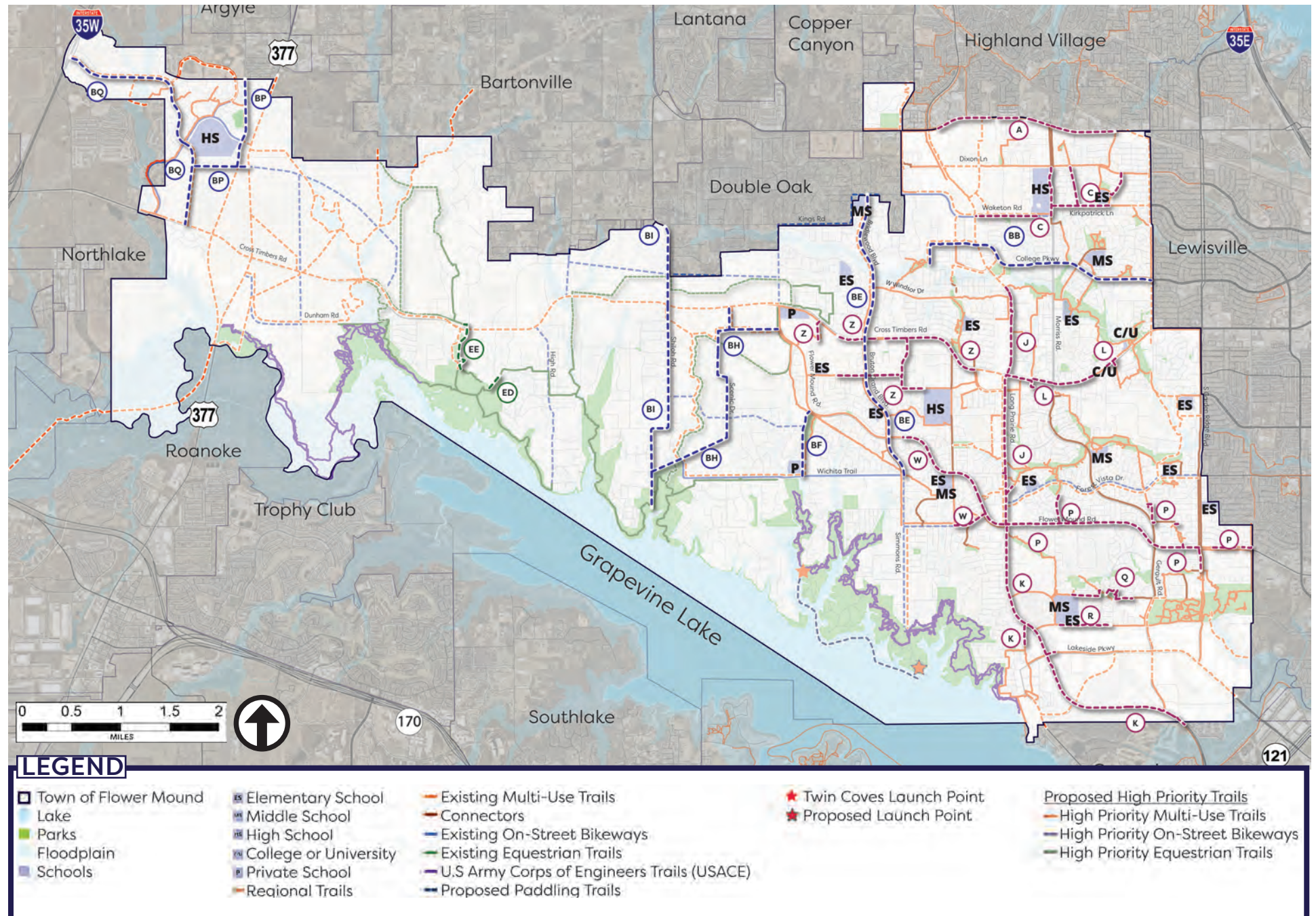
High priority bikeway corridors are located throughout Flower Mound. These were identified as heavily used corridors by bicyclists during the needs assessment, and should be improved to enhance safety and awareness of multiple roadway users. High priority bikeways provide residents with access to parks, schools, existing trails and bikeways, and surrounding jurisdictions.

TABLE 6.7: PRIORITY TRAILS RECOMMENDATION SUMMARY

Corridor ID	Corridor	Facility Type	Length (miles)	Average Cost Estimate	Funding Partnerships
A	Justin Rd	Multi-Use	1.7	\$2,763,600	Developer, CIP, Bond
C	Waketon/Morris/Kirkpatrick Ln	Multi-Use	2.3	\$3,802,653	Developer, CIP, Bond
J	Long Prairie Rd	Proposed Veloweb	2.5	\$4,119,589	Developer, CIP, NCTCOG, Bond
K	Long Prairie Rd	Proposed Veloweb	3.5	\$5,696,871	Developer, CIP, NCTCOG, Bond
L	Cross Timbers Rd	Proposed Veloweb	1.12	\$1,824,699	Developer, CIP, NCTCOG, Bond
P	Flower Mound Rd./Garden Ridge Blvd.	Multi-Use	3.18	\$5,169,875	Developer, CIP, NCTCOG, Bond
Q	Shadow Ridge Park/Sweet Water Ln	Multi-Use	0.77	\$1,255,926	Developer, CIP
R	Spinks Rd	Multi-Use	0.53	\$856,482	Developer, CIP
W	Flower Mound Rd./McKamy Creek	Multi-Use	1.87	\$2,953,822	Developer, CIP, Bond
Z	Cross Timbers Rd/Auburn Dr/Quail Rn/Peters Colony	Multi-Use, Proposed Veloweb	2.98	\$4,837,647	Developer, CIP, NCTCOG, Bond
BB	College Pkwy	Shared-Use Lane	2.57	\$192,649	CIP, NCTCOG, Developer
BE	Bridlewood Blvd./Burton Orand Blvd	Shared-Use Lane	3.01	\$225,985	Transportation Funds, CIP, NCTCOG
BF	Skillern Rd	Shared-Use Lane	0.67	\$50,034	Transportation Funds, CIP, NCTCOG
BH	Scenic Dr	Bike Lane/Shared-Use Lane	2.80	\$226,775	Transportation Funds, CIP, NCTCOG
BI	Shiloh Rd	Bike Lane	3.01	\$285,904	Transportation Funds, CIP, NCTCOG
BP	Future Corridor/Stonecrest Dr	Shared-Use Lane/Bike Lane	0.90	\$85,667	Transportation Funds, CIP, NCTCOG
BQ	Denton Creek Blvd	Bike Lane	1.73	\$163,998	Transportation Funds, CIP, NCTCOG
ED	Hidden Brook Farm	Equestrian	0.58	\$363,736	Developer, CIP
EE	Cross Timbers	Equestrian	0.16	\$100,288	Developer, CIP

*Corridor ID is based on the Action Plan for each facility type (see pages 125-132)

FIGURE 6.9: HIGH PRIORITY TRAIL AND BIKEWAY CORRIDORS



OTHER CONSIDERATIONS

Figure 6.10 (page 138) shows proposed trailhead locations and major conflict points. While these considerations have not been included in the prioritization tables, they should be considered for future funding opportunities in order to improve safety, accessibility, and usability of the overall trails and bikeways network.

TRAILHEADS

Potential trailhead locations are depicted in **Figure 6.10** (page 138). Trailheads identified include equestrian, multi purpose, and multi-use.

Equestrian Trailheads

Equestrian trailheads are located at major entry points to the equestrian trail system. These should include a variety of amenities including informational signage, parking, and tie ups. **This plan does not propose any new equestrian trailhead. The new trailheads for equestrian trails are identified as multi purpose trailheads.** Existing trailheads should be evaluated and enhanced in order to provide the necessary amenities for horseback riding and accessing existing equestrian trails.

Multi Purpose Trailheads

Multi purpose trailheads are located in locations where multi-use trails and equestrian trails converge. Due to their location and anticipated user demand, a wider range of amenities should be provided, including parking areas with trailer parking and automobile parking, lighting, seating, signage, waste receptacles, bike amenities, shade, and similar amenities. The location of horse tie-ups should be away from the bike and pedestrian entry to the trail system to reduce user conflict. Signage should include a map, directional, safety precautions, and rules and regulations for using the trail for the various users. **This plan proposes 5 new multi purpose trailheads.**

Multi-Use Trailheads

Multi-use trail trailheads are located where trails converge, or at trail entry points for pedestrians and bicyclists. These should include parking, benches, signage, waste receptacles, and similar amenities described in Chapter 5.

The anticipated user volume, space limitations, and similar elements may determine the classification of trailhead. Existing trailheads are used to mark entry of trails from neighborhoods, but may not include recommended amenities to enhance access and usability of the trail. These should be enhanced where identified on **Figure 6.9**. **The plan proposes 12 new or enhanced trailheads.**



MAJOR CONFLICT POINTS

Major Intersections

Intersection design recommendations were discussed in Chapter 5. **Figure 6.9** (page 138) shows locations where intersection improvements and enhancements may be necessary to improve safety in the trail system. Major intersections are generally located where a trail crosses an arterial roadway, or where a trail crosses at least four lanes of traffic. Intersections should be analyzed ensure they maximize safety and reduce conflicts.

Improvements to existing intersections where trail crossings are located should be prioritized. Future trail development should include roadway crossings in the design of the project.

Estimated cost range for signage, striping, and other improvements:
\$xxxx

Mid-Block Crossings

There may be additional intersections and mid-block crossings that are not identified on this map which should be evaluated for safety improvements and enhancements, especially where a trail crosses a road mid-block. The level of design may vary based on the roadway conditions.

Improvements to existing mid-block crossings should be proritized to ensure there is proper signage, striping, and other advanced warning. New trails should include mid-block crossings in the design of the project.

Estimated cost range for signage, striping, and other improvements:
\$xxxx

Existing Trail Improvements

The existing system was addressed in Chapter 3. During the assessment, various maintenance and safety concerns were analyzed. Concerns to be evaluated include blindspots, i.e. where there is a 90 degree turn in the trail, bridge replacement needs, and low hanging vegetation. While some concerns can be fixed relatively easily, some need further investigation.

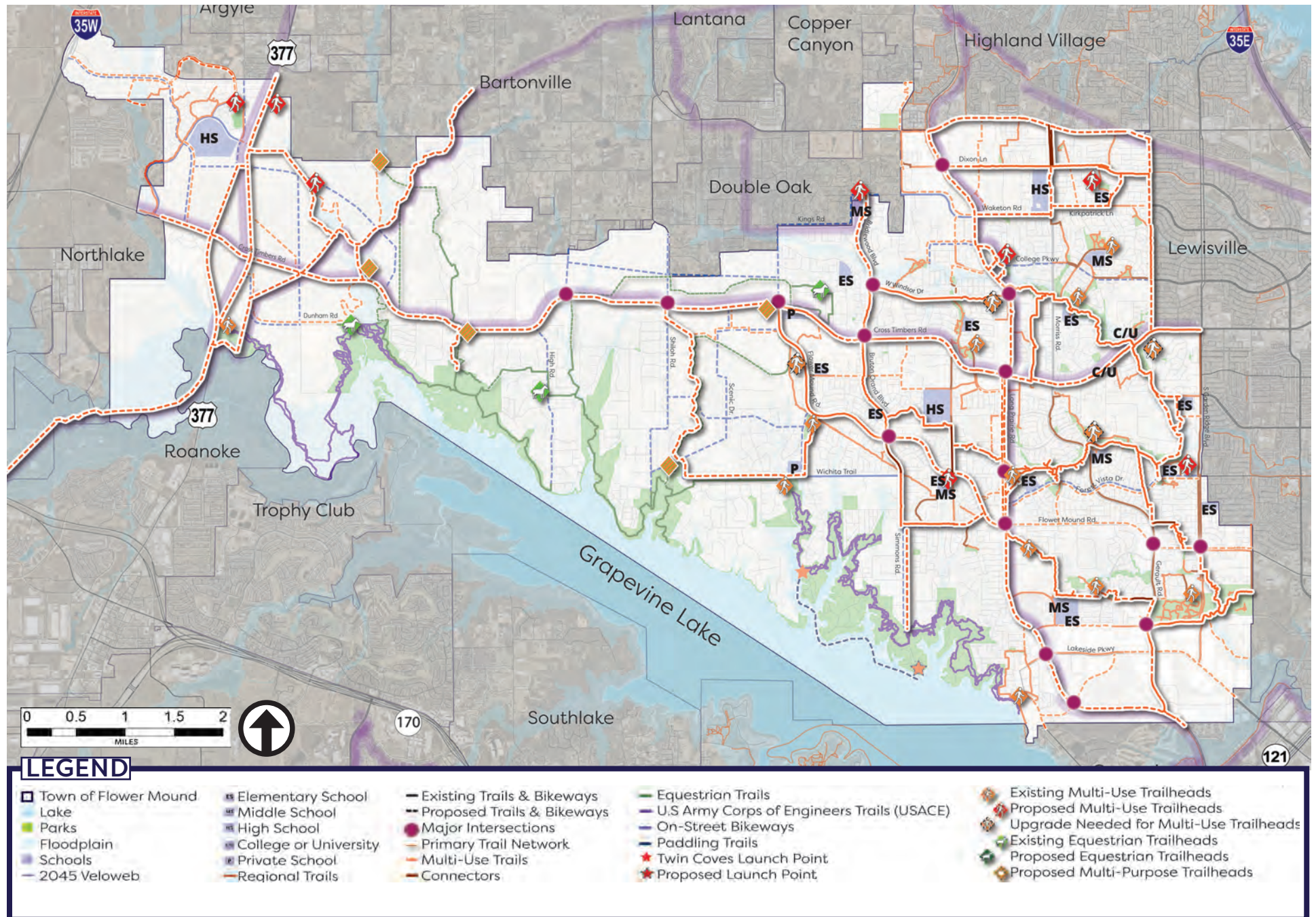
Areas for further investigation include:

- **Pink Evening Primrose Trail** - Blind curves at Rustic Timbers Park/ Parker Square Park and various locations along Timber Creek
- **Bluebonnett Trail** - Various locations along the gasline easement should be studied in further detail, or alernative accesible routes identified.
- **All trails** - low hanging vegetation should be removed on a regular basis
- **All trails** - where extreme curves exist, they should be studied to determine if there are opportunities to ease the curve, or improvements can be made to improve safety.

Estimated cost range for signage, striping, and other improvements for blind curves:
\$xxxx



FIGURE 6.10: PRIMARY TRAILS, TRAILHEADS, AND MAJOR INTERSECTIONS



POLICIES, PROGRAMS, AND PROJECTS

There are various policy changes, programs, and projects that can be completed to support the implementation of Flower Mound's recommended trails and bikeways network. The master plan goals and objective previously presented in Chapter 1 identifies initiatives that should be considered to help with overall plan implementation, and proposes metrics for tracking the plan's implementation.

GOAL 1: CONNECTED COMMUNITY

Create a complete trails and bikeways system that connects the community with active transportation options.

OBJECTIVES:

- **1.1:** Increase trail level of service.
- **1.2:** Provide trail and bikeway connections to key destinations.
- **1.3:** Fill in gaps in the existing trail system.

INITIATIVES:

- **Policy:** Attain a target level of service for trails of 1 mile per 1,000 residents.
- **Project:** Undergo design of the feasibility and high priority corridors.

METRICS:

- Increased levels level of service:
 - Mileage of off-street trails within Flower Mound.
 - Mileage of on-street bikeways in Flower Mound.
 - Mileage of new and improved connectors in Flower Mound.
 - Mileage of equestrian trails in Flower Mound.
- Greater percentage of bicycle and pedestrian mode share counts from the Census
- Number of interjurisdictional connections

GOAL 2: SAFE & ACCESSIBLE SYSTEM

Ensure the trails and bikeway system is safe, comfortable, and accessible for users of all abilities and ages.

OBJECTIVES:

- **2.1:** Provide a variety of facility types appropriate for users of different abilities.
- **2.2:** Improve overall safety and comfort of existing facilities.
- **2.3:** Address areas identified as barriers within the existing trail system.

INITIATIVES:

- **Policy:** Implement additional roadway crossing improvements.
- **Project:** Tie trail makers and system branding to the EMS system
- **Policy:** Incorporate the design standards included in this master plan into the Town's standards.
- **Policy:** Implement blindspot and safety improvements on existing trails.
- **Project:** Evaluate high-frequency crash locations on an annual basis

METRICS:

- Number of crashes involving bicyclists
- Number of crashes involving pedestrian
- Number of roadway crossings improved (at intersections or mid-block)
- Number of blindspots improved

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GOAL 3: USER FRIENDLY

Improve awareness, signage, and usability of the trails and bikeways system.

OBJECTIVES:

- **3.1:** Increase awareness of the existing trail and bikeway system.
- **3.2:** Create a consistent brand across the trails system so it is easily recognizable.
- **3.3:** Install wayfinding signage to direct users to destinations along the trails.

INITIATIVES:

- **Program:** Implement the systemwide wayfinding and branding plan for the trails and bikeways system.
- **Program:** Develop a bicycle etiquette/awareness program that addresses cyclist and motor vehicle etiquette.
- **Project:** Install trail counters along the system to determine areas with most usage.
- **Project:** Create a smart phone application that links to a GPS system to provide guidance and assistance on the trail.

METRICS:

- Number of new trailhead installations
- Facility usage from trail counters and Strava data
- Number of new amenities along the trail including:
 - Amenities (benches, trash receptacles, bike racks, bike repair stations, and similar)
 - Parking areas
 - Wayfinding features

GOAL 4: UNIQUE SYSTEM

Design and construct trails that support the health and wellness of the community and natural environment.

OBJECTIVES:

- **4.1:** Provide trails through natural areas, parks, and open space.
- **4.2:** Provide for interpretative and educational opportunities along trails.
- **4.3:** Utilize an environmentally-friendly and context-sensitive approach to developing and maintaining trails.

INITIATIVES:

- **Project:** Install interpretative signage that educates users on historic, cultural, and natural resources.
- **Project/Program:** Install new shade trees and explore additional shade opportunities along the trails.
- **Policy:** Encourage trails around stormwater ponds and through natural areas.

METRICS:

- Miles of trail constructed in greenways
- Number of new shade trees planted along trails
- Number of interpretive signage installations

GOAL 5: PARTNERSHIPS

Leverage partnerships between the Town and the community, internal and external organizations, and outside agencies to achieve a connected trails and bikeways system.

OBJECTIVES:

- **5.1:** Pursue joint projects with surrounding cities, the County, NCTCOG, TxDOT, TPWD, USACE, and utility providers.
- **5.2:** Maintain relationships with user groups to solicit feedback on the trails and bikeways system.
- **5.3:** Work with other departments to incorporate bicycle and pedestrian accommodations into ongoing or upcoming projects.

INITIATIVES:

- **Policy:** Provide NCTCOG with updated trail files so they can update their regional maps.
- **Project:** Update the Town's thoroughfare plan to include the additional bicycle/pedestrian accommodations recommended in this plan.
- **Program/Policy:** Work with the City of Grapevine to identify future kayak/canoe launch points to apply for TPWD Trail funding.
- **Program/Policy:** Work with adjacent cities to identify interjurisdictional trail opportunities and funding options.

METRICS:

- Miles of trail completed on the Regional Veloweb
- Miles of trail completed on USACE lands
- Number of meetings with outside entities regarding trail and bikeway planning, design, and construction with the construction and reconstruction of roadways
- Number of joint meetings held between the Town's appointed and elected officials

GOAL 6: FUNDING

Pursue a variety of funding sources for trails and bikeway development.

OBJECTIVES:

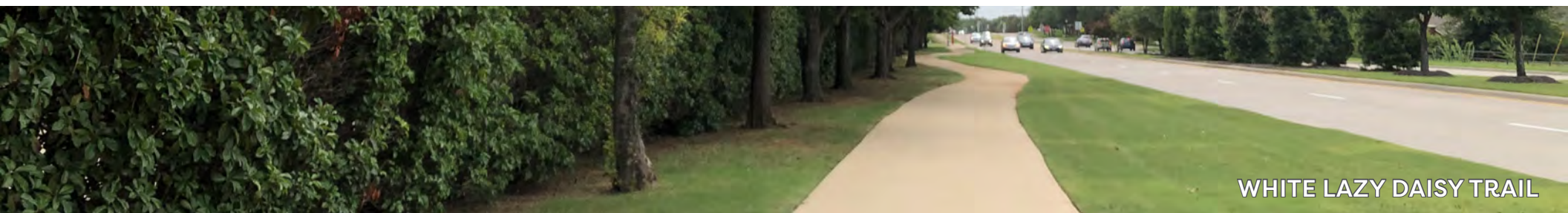
- **6.1:** Apply for grant funding to implement trail and bikeway projects.
- **6.2:** Continue to work with developers to ensure trails and bikeways are included with new development.
- **6.3:** Coordinate with user and volunteer groups to help fund improvements to trails and bikeways.

INITIATIVES:

- **Policy:** Utilize the prioritization criteria developed for this master plan to prioritize future CIP projects for trails and bikeways.
- **Policy:** Utilize 4B Sales Tax funds for trail infrastructure projects.
- **Project:** Submit applications for Transportation Alternative and Safe Routes to School funding where applicable.

METRICS:

- Amount of grant funding received for trail and bikeway implementation
- Percent of Town's budget dedicated to trail and bikeway implementation



PLAN ADMINISTRATION

IMPLEMENTATION ROLES

There are various public and private entities that will have roles in the implementation and maintenance of the Trails and Bikeways Master Plan.



TOWN OF FLOWER MOUND IMPLEMENTATION ROLES

- The **Parks and Recreation Department** will incorporate trails into park facilities, maintain the trail infrastructure, and track the progress of the plan.
- The **Transportation Services Department** will prioritize bicycle facilities in the design and implementation of roadway construction projects and coordinate thoroughfare plan updates consistent with this plan.
- The **Planning Department** will continue to coordinate the construction of trails identified within the plan with new development projects and provide updates to the land development code and subdivision regulations.
- **Elected and Appointed Officials** are responsible for supporting the plan and determining funding eligibility for projects.

OTHER PUBLIC ENTITY IMPLEMENTATION ROLES

- **TxDOT** will coordinate the construction of trails and bikeways in construction or improvement projects, provide facility types which are consistent with the plan, and support bikeway designation efforts.
- **Denton County** will partner with the Town to identify and develop the bicycle and pedestrian network.
- **Utility Companies** will continue to support the development of off-street trails within utility easements given appropriate design measure for the trails are followed.

PRIVATE ENTITY ROLES

- **Developers** will be responsible for the construction of trails and bikeways within development projects consistent with this plan to enhance connectivity and user experience for the overall network.
- **Foundations/Non-Profits** will continue to support the construction, maintenance, and implementation of trails and bikeways.
- **Homeowners Associations** will continue to maintain trails within their neighborhoods and support the implementation of the plan.

FUNDING OPPORTUNITIES

There are a variety of funding opportunities to implement the vision of this plan. This section outlines typical funding opportunities at local, state, and federal levels but does not represent a comprehensive list of funding sources.

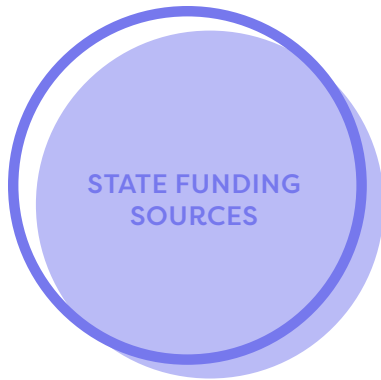


- The **General Fund** is used for smaller repair and replacement efforts and routine maintenance for existing parks and facilities. It also funds the administration and services provided by the Town of Flower Mound. The general fund provides funds for routine pavement and sidewalk maintenance.
- The **Special Revenue Fund** are funds from special revenue sources to support the development of new facilities. In Flower Mound, these include:
 - Park Development Fund
 - Street Maintenance Tax
 - 4B Parks Sales Tax funding
- **Capital Improvement Program (CIP)** Expenditures provide funding for significant public improvements, such as the construction of new parks, replacement of park equipment, new trail construction, and street construction and maintenance projects which can include on and off-street bicycle facilities.

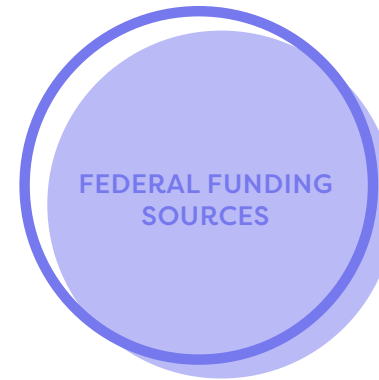


The North Central Texas Council of Governments (NCTCOG) appropriates funds for transportation improvement projects from the Federal Government and TxDOT. NCTCOG then administers the funds to local jurisdictions for the construction of projects which improve mobility and air quality throughout the region. **They administer the following funds:**

- **The Transportation Alternatives Program (TAP)** are funds for the construction of on- and off-road bicycle and pedestrian facilities, shared-use paths, similar bicycle and pedestrian safety measures, and Safe Routes to School (SRTS) projects. These projects focus on interconnectivity within communities, to destinations such as schools and employment centers, and connections to the region.
- **Transportation Improvement Program (TIP)** is a short-term planning document for various transportation related projects in the DFW region. This plan is updated every two years and is created in concert with TxDOT, local governments, and transportation authorities. The program implements projects identified in the Master Transportation Plan (MTP) through 2045.



- **Transportation Alternatives Set-Aside Program** are funds administered by TxDOT for bicycle and pedestrian infrastructure projects in communities with less than 200,000 people. These projects focus on interconnectivity within communities, to destinations such as schools and employment centers, and connections to the region.
- **National Recreational Trails Grants** are administered by the Texas Parks and Wildlife Division (TPWD) for the construction of new recreational trails, to improve existing trails, to develop trailheads and amenities, and to acquire land for trail construction. The reimbursable grants can be up to 80 percent of the project cost for non-motorized trail projects up to \$300,000.
- **Outdoor Recreation Grants** provide 50 percent matching grant funds to cities, counties, Municipal Utility Districts (MUDs), and other special districts with a population less than 500,000 to acquire and develop parkland or to renovate existing public recreation areas. There are two funding cycles per year with a maximum award of \$500,000. Projects must be completed within three years of approval. Application deadlines are October 1st of each year (the master plans submission deadline is 60 days prior to application deadline). Award notifications occur 6 months after deadlines.



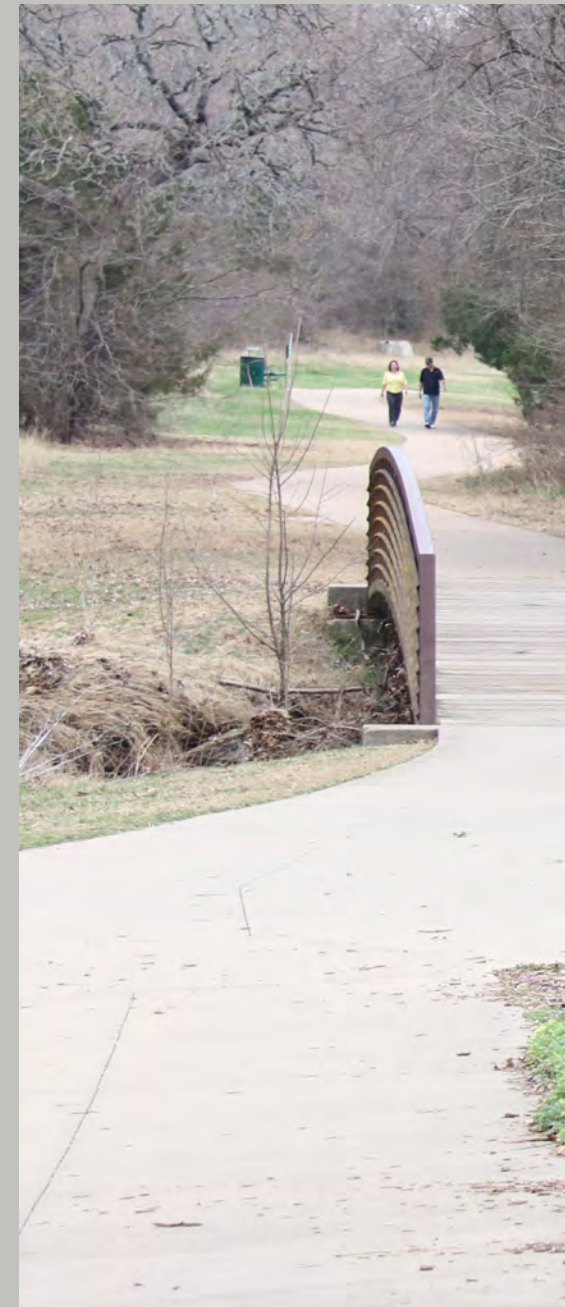
- **Rebuilding American Infrastructure with Sustainability and Equity (RAISE)** Discretionary Grants are available on a competitive basis for projects that will have a significant impact on local and regional travel. The Department of Transportation administers funding. Projects can include roadway, rail, and alternative transportation.
- **Congestion and Air Quality Improvement Program (CMAQ)** funds are for projects that help improve air quality. Bicycle and pedestrian facilities are eligible for these funds because they act as an alternative mode of transportation and reduce emissions from automobiles.
- **Surface Transportation Block Grant Program (STBG)** funds are for projects that address mobility needs for bicycle and pedestrian improvement projects. Federal funds are allocated to TxDOT to distribute. TxDOT works with MPO's to administer the funds for eligible and prioritized projects.

CONCLUSION

The Flower Mound Trails and Bikeways Master Plan is a community-driven vision for creating a comprehensive and diverse network of trails and bikeways. When the recommendations from this plan are implemented, the Town will have a safe, well-connected, and accessible trails and bikeways network for users of all ages and abilities.



Appendix A: Glossary of Terms
Appendix B: Commonly Used Signage
Appendix C: Detailed Community Input
**Appendix D: Trail Corridor Feasibility
Assessments**
Appendix E: Detailed Maps



07 APPENDIX



PINK EVENING PRIMROSE TRAIL

APPENDIX A - GLOSSARY OF TERMS

APPENDIXB - COMMONLY USED SIGNAGE



TOWN COUNCIL AGENDA ITEM NO. 2

WORK SESSION ITEM

DATE: April 21, 2022

FROM: Lexin Murphy, Director of Planning Services

ITEM: **Presentation and discussion on the results of staff's outreach efforts on the Cross Timbers Conservation Development District**

BACKGROUND INFORMATION: During the July 15, 2021, Strategic Planning Session (SPS), Town Council identified development options within the Cross Timbers Conservation Development District (CTCDD) as a topic for future discussion ([Video](#), topic starts at 3:06:54). Following that meeting, staff presented analysis of existing development options in the CTCDD, as well as potential considerations for any changes Council might want to pursue during a work session on November 18, 2021 ([Video](#)). As there was consensus among Council Members to consider adjustments to the current development options in the CTCDD, on January 18, 2022, staff presented the framework for a public outreach plan ([Video](#)), and Council authorized staff to move forward.

Below is a summary of staff's efforts to date. More detailed information, such as the comprehensive survey results and the links to work session videos, are available on the Town's website at www.flower-mound.com/CTDD2022.

Date	Description	Details
January 18, 2022		Direction to begin reviewing the CTCDD
January 19, 2022	CTCDD Webpage was published	Link: www.Flower-Mound.com/CTCDD2022
January 28, 2022	Cross Timbers Gazette (CTG) Inserts Delivered	Nearly 3,000 inserts were given to the CTG office, which were delivered to households along USPS delivery routes that included the CTCDD. Delivery took place February 5 and 6.
January 28, 2022	Utility Bill inserts begin	Information about the CTCDD review was included in the February utility bill and reached all of Flower Mound by February 28, 2022.
February 1, 2022	Town newsletter sent	Information about the CTCDD 2022 Review was included in the Town's February newsletter with the webpage address.
February 4, 2022	Survey went live	The CTCDD 2022 Review survey is published and added to the CTCDD 2022 webpage.
February 7, 2022	Cross Timbers Gazette runs article about 2022 review	Link: https://www.crosstimbersgazette.com/2022/02/07/flower-mound-reviewing-seeking-input-on-ctcdd/
February 11, 2022	Information boards posted	4 information boards were placed at Town facilities (Town Hall, CAC, Senior Center, Library) including details about the CTCDD, survey, and open house dates.
February 11, 2022	Informational signs placed around Town	Five signs were placed along the ROW around Town including two within the CTCDD, Town Hall, near Lakeside DFW, and the CAC.
February 14, 2022	FMTV slide published	A slide with information about the CTCDD 2022 Review was added to FMTV.
February 14, 2022	Survey Facebook post	The Town posted information about the CTCDD 2022 Review, including a link to the webpage and survey.
February 15-17, 2022	Info is sent to property owners in the CTCDD via mail	A one-page bulletin was sent to all property owners within the CTCDD with information about the upcoming open houses, a QR code to complete the survey, and a link to the CTCDD 2022 webpage.
February 18, 2022	Electronic Message Board	An electronic message board was placed at Fire Station 2 within the CTCDD with information about the upcoming open houses.

February 28, 2022	Notify Me	Messages about the upcoming open houses were sent through Notify Me to all subscribers that signed up for notices in relation to Area 2 or the CTCDD.
March 1, 2022	Town newsletter sent	Information about the CTCDD 2022 Review was included in the Town's March newsletter with the webpage address and link to take survey.
March 3, 2022	First CTCDD Open House	The Town hosted the first open house to the public about the CTCDD.
March 8, 2022	Open House Facebook post	The Town posted information about the March 10, 2022, open house.
March 10, 2022	Second CTCDD Open House	The Town hosted the second open house to the public about the CTCDD.
March 11, 2022	Survey was closed	The CTCDD survey was closed for new submissions.
March 21, 2022	Developer survey was sent	A survey to developers regarding the CTCDD was emailed.
March 26, 2022	Developer survey closed	The CTCDD developer survey was closed for new submission.
March 28, 2022	P&Z Work Session	Staff presented the survey results to P&Z for input.
April 5, 2022	ECC Work Session	Staff presented the survey results to ECC for input.
April 7, 2022	Parks Board Work Session	Staff presented the survey results to Parks Board for input.

Staff will present the survey results, as well as a variety of potential modifications to development standards that could be implemented based on these results, to Town Council during the work session.

ALTERNATIVES/OPTIONS: Staff is seeking direction from Council on potential modifications to development options within the CTCDD. Staff will implement the direction of the Council.



TOWN COUNCIL AGENDA ITEM NO. 3

WORK SESSION ITEM

DATE: April 21, 2022

FROM: Chuck Jennings, Director of Park and Recreation

ITEM: Presentation and discussion regarding the final report for Tennis Center Feasibility Study.

BACKGROUND INFORMATION: The Town of Flower Mound has fallen short on the recommended level of service for public tennis courts for many years with only five public courts for its 80,000 residents. The past two Parks and Recreation Master Plans have recommended that a tennis center be constructed to meet recommended service levels. With increasing pressure from the public to expand tennis, the Town approved funding in fiscal year 2021 to secure a firm to produce a tennis center feasibility study. A request for statement of qualifications (SOQ) was advertised and the Town entered into a contract with Pros Consulting, LLC.

The feasibility study is to be utilized as a tool to help the Town determine whether to proceed with planning, funding, and developing of an outdoor tennis center. The study developed goals, program pricing methodology, and a five-year financial pro forma. The study utilized data and information to analyze the market and to determine the size and amenities to be included in a tennis facility. Recommendations included: 16 tennis courts, 12 pickleball courts, a club house, playground, and walking trail. The study also touched on cost estimates, partnership strategies, potential funding sources, operating budgets, revenues, and the economic impact of a future tennis center.

Public engagement was an important aspect of the study to “mine” local knowledge using a creative and comprehensive public participation process. The process incorporated a variety of methods that included interviews, focus group meetings, public forums (virtually and in-person) and an online survey with over 1,232 responses. The data gleaned from this process helped aid the consultant when articulating the unmet needs, addressing operational issues, and providing recommendations for system improvements.

The feasibility study shows support from the community to pursue the development and future use of a tennis center in the Town. The population of the service area (15-mile radius) will increase by 42% in the next 15 years, and both tennis and pickleball participation continue to grow at 21% and 68% over the last five years. The tennis center has the potential to be a valuable economic and social asset to the Town of Flower Mound and its potential service area.

BOARD REVIEW/CITIZEN FEEDBACK:

- Virtual Community Meeting – August 18, 2021 – 172 people in attendance
- Online Survey – August 18 - October 1 – 1,232 responses
- Parks Board Presentation of the Key Findings – October 7, 2021
- Parks Board Presentation of the four concept plans for a tennis center – January 6, 2022
- Public comment on two viable concept plans and locations – January 7 - 30, 2022 – 184 responses
- Parks Board Presentation of the operational analysis and updated concept plan – March 3, 2022

ALTERNATIVES/OPTIONS: N/A

FISCAL IMPACT: N/A

LEGAL REVIEW: N/A

ATTACHMENTS:

1. Tennis Center Feasibility Study

DRAFT MOTION: This item is for discussion proposes only.



Tennis Center Feasibility Study

April 2022





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Chapter One – EXECUTIVE SUMMARY

1.1 OVERVIEW

The Town of Flower Mound was incorporated in February 27, 1961. The government is composed of an elected Mayor and five council members, with an appointed Town Manager. Flower Mound is located primarily in southern Denton County, approximately 28 miles northwest of downtown Dallas, 25 miles northeast of Fort Worth, and three miles north of the Dallas/Fort Worth (DFW) International Airport. The Town is a master-planned community that encompasses approximately 45 square miles with a population of approximately 82,330. The Town is served by two high schools with numerous athletic facilities which include tennis centers consisting of 12 courts at each school. Recreational tennis opportunities are not currently offered to the public in either high school. The Town operates a four-court tennis facility at its Leonard and Helen Johns Community Park and a single tennis court at Glenwick Park. The recommended service level for tennis courts in the Town's 2017 Parks and Trails Master Plan indicates that, based on the current population, the Town has a shortage of tennis courts available for public use.

Due to this shortage, the Town issued a Solicitation of Qualifications for a Tennis Center Feasibility Study. The desired outcome of the Feasibility Study is to determine whether the Town should proceed with planning, funding, and developing an outdoor tennis center.

1.2 OBJECTIVES OF THE STUDY

The objectives of the Tennis Center Feasibility Study are to:

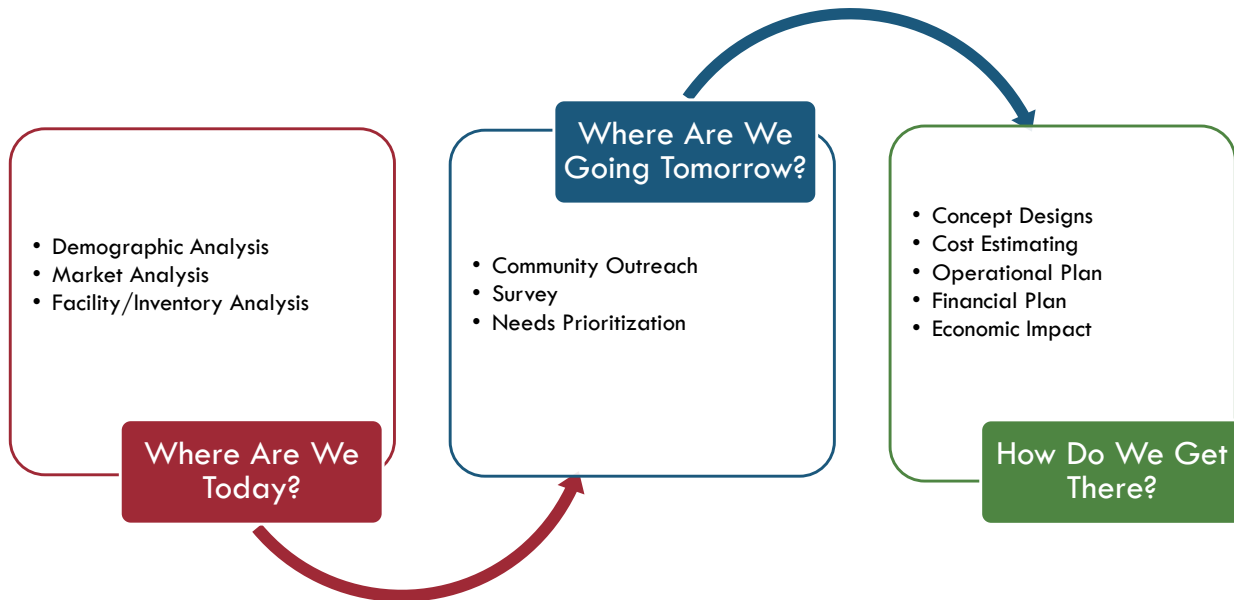
- Engage the community and conduct necessary research and analysis to identify and evaluate community need for an outdoor tennis center. Evaluate current tennis center facilities in and around the DFW metroplex and determine the geographic draw area of the center.
- Assess partnership opportunities, including identification of collaborative partners in the public, private, and not-for-profit sectors, and how such partnerships impact the funding and operation.
- If a tennis center is needed, determine several options regarding facility and program scope, size, features and amenities, and prepare an initial cost estimate, broken down by facility features and amenities.
- Prepare an operating pro forma detailing anticipated tennis center programming issues and costs for several programming options, considering viable partnership opportunities.
- Prepare an operating pro forma detailing anticipated operational and maintenance issues and costs, considering viable partnership opportunities. The pro forma should also include an analysis of attendance estimates, fee structures, revenue generation projections, operation cost projections, and long-term capital replacements/improvements.
- Evaluate potential sites on Town and non-Town owned properties and provide recommendations for site characteristics and options regarding a suitable site for an outdoor tennis center facility.
- Recommend and detail possible funding mechanisms and partnerships to build, operate, and maintain an outdoor tennis center.
- Research the economic impact of a tennis center within the Town.

1.3 PROJECT PROCESS



Flower Mound, Texas

The process of developing the Flower Mound Tennis Center Feasibility Study followed a logical planning path as illustrated below:



The foundation of the work as to “mine” local knowledge through the use of a creative and comprehensive public participation process. It was important to engage community members who enjoy the opportunity to participate in planning as well as to encourage thoughts from other stakeholders that typically do not voice their opinions. The public input process incorporated a variety of methods that included interviews, focus group meetings and public forums. The data generated from these critical community interactions was used to aid the consulting team when accurately articulating the true unmet needs, addressing key operational issues, providing recommendations for system improvements, and strategizing for optimum results.

1.4 FEASIBILITY STUDY ORGANIZATION

This Tennis Center Feasibility Study presents the overall analysis, findings, and recommendations of the consulting team related to the areas outlined in the scope of services. This study begins with an Introduction that provides an overview, and the following sections respond to the desired categories outlined in the study scope to reveal findings, determine needs and to offer operational and capital improvement recommendations.

1.5 COMMUNITY PROFILE

1.5.1 FLOWER MOUND TENNIS CENTER SERVICE AREA – 15 SQUARE MILES/20-30 MINUTE DRIVE TIME

POPULATION

The population in the 15 square mile service area is increasing significantly and is projected to experience a 42% population growth over the next 15 years (2.3M). This is much greater than the national average over the same time period. With a fast-growing population, park and recreation services will need to strategically invest, develop, and maintain tennis courts in relation to current and future residential growth in the service area.

PLEASE NOTE: The Town of Flower Mound comprises 5% of the population in the service area.

AGE SEGMENTATION

The service area currently has a balanced age segmentation with the largest group being 35-54+. Over the next 15 years, the service area is projected to remain balanced but also age slightly as the 55+ segment will be 28.6% in 2036.

HOUSEHOLDS AND INCOME

With median and per capita household income averages at or above Town, state and national averages, it would be important for the Town to prioritize providing offerings to service area residents that are first class with exceptional customer service while seeking opportunities to create revenue generation.

1.6 COMMUNITY INPUT KEY FINDINGS

There has been extensive public input and participation as part of this process. Twelve (12) leadership interviews and community focus groups, and three public workshops were conducted as the foundation of public participation.

The following summarizes the themes of community input:

- Participants felt that the Flower Mound's tennis and pickleball court system has a strong, albeit limited, presence in the community.
- Participants see the system as excellently maintained with great staff/contracted staff and enjoy the programs and amenities offered.
- Updating and expanding the tennis court system was continually expressed throughout all focus groups as demand for tennis and pickleball significantly outweighs the supply. Meeting the local need for tennis and pickleball should be prioritized ahead of opportunities for sports tourism.
- Participants are routinely having to drive out of town to participate in leagues tournaments as court capacity in Flower Mound to host leagues and tournaments is limited.



Flower Mound, Texas

1.7 MARKET ANALYSIS – COURT INVENTORY

1.7.1 TOWN OF FLOWER MOUND

Location	Ownership	Service Offerings	Tennis Courts	Stand Alone Pickleball Courts	Permanent Restroom
Glenwick Park	Town Owned	Open Play	1 - Outdoor	0	No
Leonard & Helen Johns Community Park	Town Owned	Open Play Reservations Lessons	4 - Outdoor	0	No
Bridlewood	HOA	Open Play Reservations Lessons	5 - Outdoor	0	Yes
Wellington	HOA	Open Play	5 - Outdoor	0	Yes
Argyle High School	ISD	Summer Programs	8 - Outdoor	0	No
Flower Mound High School	ISD	Summer Programs	12 - Outdoor	0	No
Lewisville High School (Harmon Campus)	ISD	Summer Programs	12 - Outdoor	0	Yes
Marcus High School	ISD	Summer Programs	12 - Outdoor	0	Yes

- The Town of Flower Mound owns, manages, and maintains two locations where tennis courts are publicly available.
- The Town of Flower Mound is not the primary provider of tennis courts in the Town of Flower Mound.
- High Schools and Home Owner Associations are the primary provider of tennis courts in the Town; however, these courts are generally not available for use by the public.



Tennis Center Feasibility Study | DRAFT Report

1.7.2 FLOWER MOUND TENNIS CENTER SERVICE AREA – 15 SQUARE MILES/20-30 MINUTE DRIVE TIME

Drive Distance	Drive Time	Tennis Center	Address	Service Offerings	Tennis Courts	Stand Alone Pickleball Courts	Permanent Restroom	Office/Pro Shop
4.4 mi	11 min	Wagon Wheel Tennis Center	950 Creekview Drive, Coppell, TX 75019	Open Play Reservations Lessons/Leagues/Tournaments	12 - Outdoor	4	Yes	Yes
7.2 mi	15 min	Unity Park	2200 Briarhill Blvd., Highland Village, TX 75077	Open Play Reservations Lessons	4 - Outdoor	0	Yes	No
7.2 mi	15 min	Highland Village Tennis Center	101 Clearwater Drive South, Highland Village, TX 75077	Open Play Reservations Lessons	4 - Outdoor	0	Yes	No
9 mi	13 min	Tennis Courts at Heritage Park	222 Ball St, Grapevine, TX 76051	Open Play	2 - Outdoor	0	No	No
13.1 mi	21 min	Dove Park	1509 Hood Lane, Grapevine, TX 76051	Open Play Reservations Lessons/Leagues/Tournaments	6 - Outdoor	4	No	No
14.2 mi	20 min	Southlake Tennis Center	450 W. Southlake Blvd. Southlake, TX 76092	Open Play Reservations Lessons/Leagues/Tournaments	17 - Outdoor 2 - Indoor	0	Yes	Yes

- The two primary Tennis Center facilities in the service area that are most utilized by Flower Mound residents are the Wagon Wheel Tennis Center in Coppell and the Southlake Tennis Center in Southlake.
- Other tennis court locations within the service area provide a similar level of service as the Town's tennis courts at Leonard & Helen Johns Community Park.





Flower Mound, Texas

1.8 LEVEL OF SERVICE AND FACILITY ANALYSIS

Level of Service (LOS) standards are guidelines that define service areas based on population that support investment decisions related to tennis and pickleball courts. LOS standards can and will change over time; as the population increases, the need to acquire additional land and develop tennis and pickleball courts also increases as will the costs to do so.

The LOS standards analysis is a review of the inventory of tennis and pickleball courts in relation to the total population of the study area and community needs. Ultimately, these standards are guidelines for Flower Mound leadership to utilize in measuring service levels and making decisions about providing tennis and pickleball courts. The standards should not be the sole determinant of how Flower Mound will invest in its tennis and pickleball courts over the next 15 years.

PLEASE NOTE: The tennis court level of service standard (1 court per 6,000 population) utilized for this study was derived from the 2017 Town of Flower Mound's Parks and Recreation Master Plan. Pickleball court level of service standard (1 court for 12,000) was developed as part of the feasibility study.

INVENTORY		SERVICE LEVELS		2036 FACILITY STANDARDS			2036 NEEDS TOWN CONTRIBUTION LEVEL	2036 NEEDS TOWN CONTRIBUTION LEVEL
Court Type	Total Inventory	Recommended Service Levels; Revised for 15 square mile Service Area		Meet Standard/ Need Exists	Additional Facilities/ Amenities Needed		% of Inventory Recommended to be Provided by the Town to Meet Needs	Additional Courts Needed in 2036 Based on Town Contribution Level
Tennis Courts	84.00	1.00	court per	6,000	Need Exists	295 Court(s)	5%	16
Pickleball Courts (stand-alone)	8.00	1.00	court per	12,000	Need Exists	182 Court(s)	5%	10

As noted in the table above, inventory of tennis and pickleball courts is deficient in serving the needs of Flower Mound residents and with the rapid increase in population, the deficiency will continue to increase over the next 15 years. Coupled with the Tennis system assessments, community input and analysis conducted, it is recommended at a minimum, that the Town utilize the tennis and pickleball court LOS Standards to as starting point to add tennis and pickleball courts to the Town's parks and recreation system.

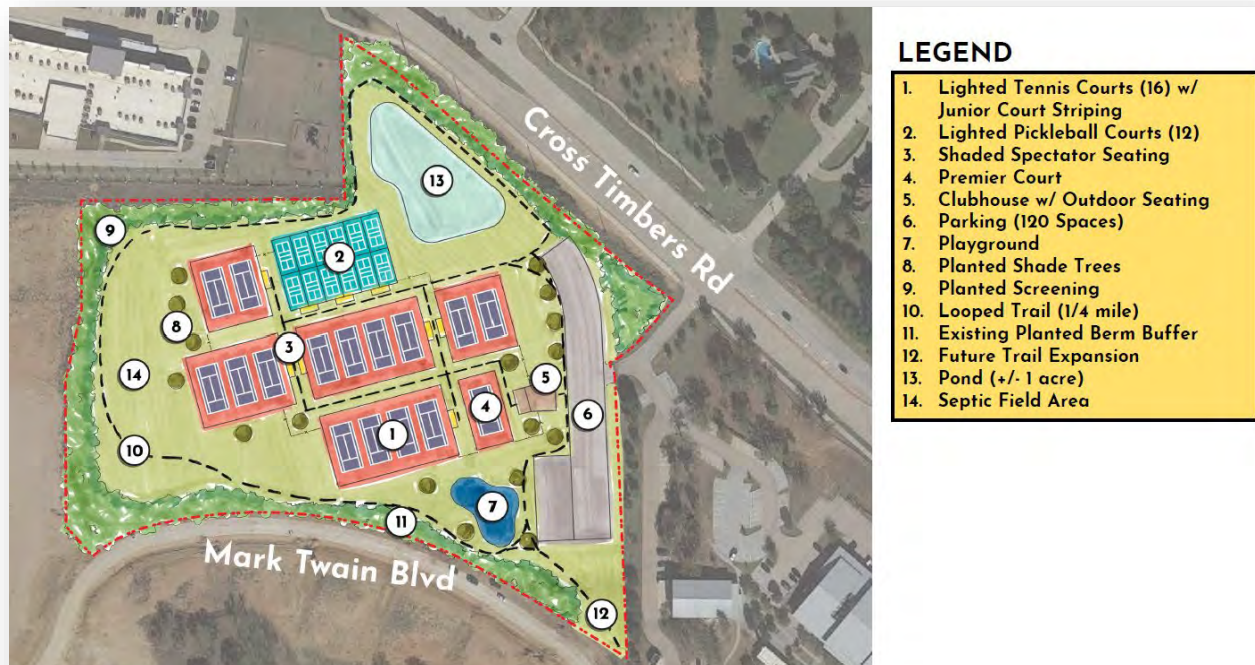
1.9 INVENTORY AND LEVEL OF SERVICE SUMMARY

- **Service Area Population** – Expected to grow by 42% in next 15 years (2.3M by 2036).
- **Participation Trends** – Tennis & Pickleball participation have grown by 21% and 68% over the last 5 years.
- **Community Needs** – Strong support for additional tennis and pickleball courts.
- **Community Needs** – Multiple uses of courts cited by public and anticipated high frequency of use, year round.
- **Current Inventory** – 86% of current inventory is in outlying communities and the ISD.
- **ISD Tennis Courts** – not (and are not expected to be) fully accessible to the public.
- **Level of Service** – 16 tennis courts and 10 stand-alone pickleball courts are recommended for the Town of Flower Mound as part of a Tennis Center.

1.10 TENNIS CENTER PREFERRED CONCEPT PLAN

The Consulting Team developed four conceptual master plans for review by the community in January 2022. The outcome of the community feedback was to identify a “preferred” conceptual master plan for the development of a tennis center in Flower Mound.

The following graphic details the preferred concept plan: A tennis center at Trotter Park.



1.11 TENNIS CENTER CONSTRUCTION COST ESTIMATE

The following table quantifies the estimated costs (based on 2022 dollars) for the construction of a tennis center at Trotter Park based on the concept plan above.

Trotter Tennis Center Construction Estimate	
Total Construction =	\$ 10,100,000.00
Contingency and CMT (15%) =	\$ 1,515,000.00
Survey and Design (10%) =	\$ 1,161,500.00
OVERALL TOTAL =	\$ 12,776,500.00



1.12 FUNDING THE FEASIBILITY STUDY

To achieve the outcomes identified in the key findings and recommendations as presented in the Feasibility Study, a reliable and sustainable funding plan is needed. The consulting team identified and analyzed primary funding sources that may be used to fund portions of a tennis center in Flower Mound as well as the operations, maintenance, and economic impact of tennis centers as part of the Feasibility Study process.



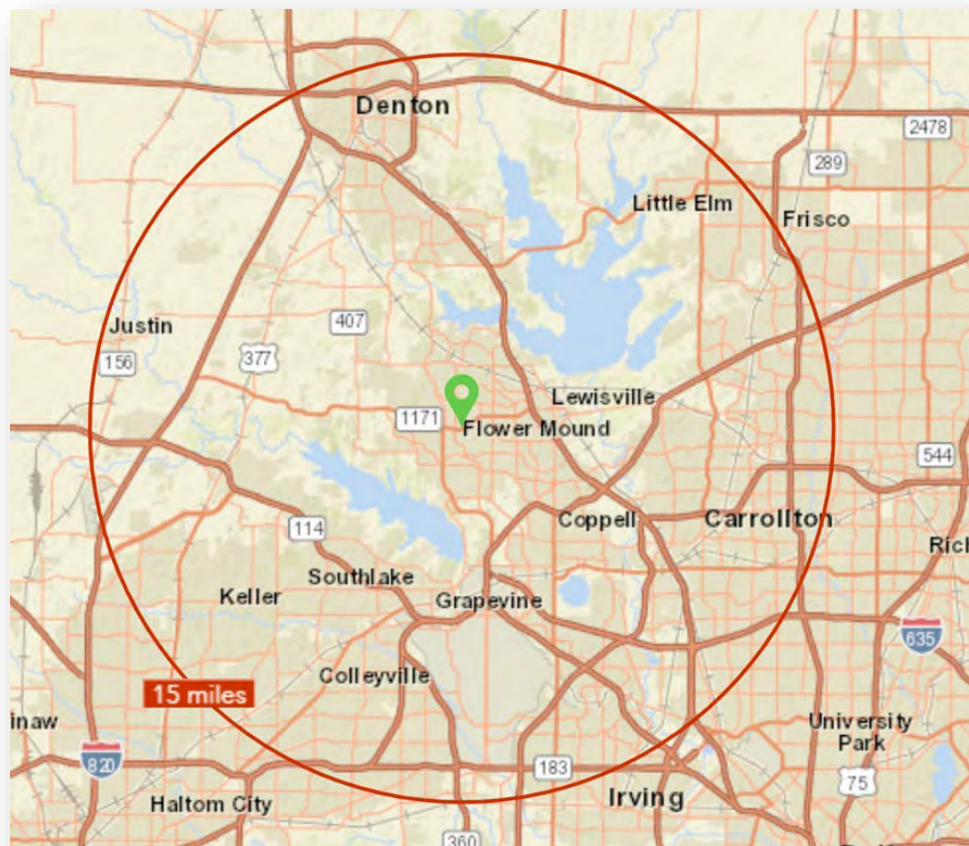
Chapter Two – COMMUNITY PROFILE

The Demographic and Trend Analysis provides an understanding of the service area population that might utilize for a potential tennis center in Flower Mound. This analysis demonstrates the overall size of total population by specific age segment, and the overall economic status and spending power of the residents through household income statistics. It is important to note that while the demographics analysis evaluates the population characteristics based on the geographic area, the Parks and Recreation Department does tend to serve an audience outside that as well.

All future demographic projections are based on historical trends. All projections should be utilized with the understanding that unforeseen circumstances during or after the time of the projections could have a significant bearing on the validity of the final projections.

2.1 DEMOGRAPHIC ANALYSIS METHODOLOGY

Demographic data used for the analysis was obtained from U.S. Census Bureau and from the Environmental Systems Research Institute (ESRI), the largest research and development organization dedicated to Geographical Information Systems (GIS) and specializing in population projections and market trends. All data was acquired in September 2021 and reflects actual numbers as reported in the latest Census, and estimates for 2021 and 2026 as obtained by ESRI. Straight line linear regression was utilized for projected 2031 and 2036 demographics. The 15 square mile study area is shown in the map below.





2.1.1 RACE AND ETHNICITY DEFINITIONS

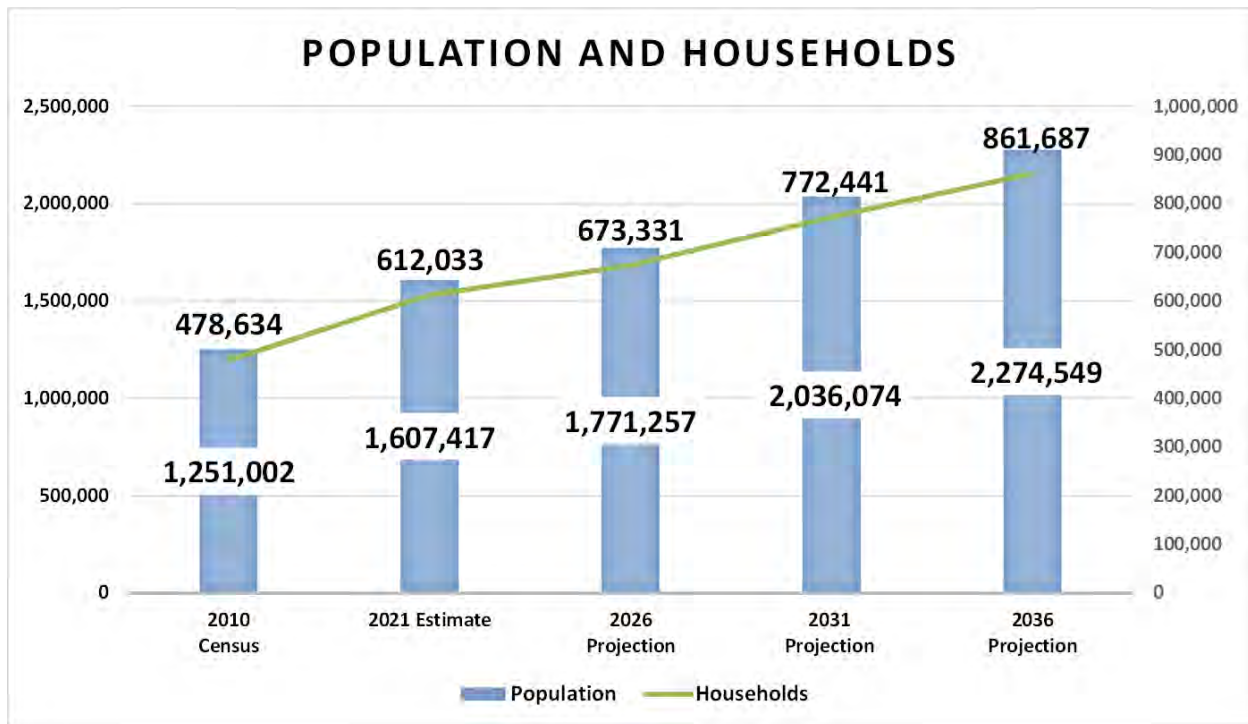
The minimum categories for data on race and ethnicity for Federal statistics, program administrative reporting, and civil rights compliance reporting are defined as below. The Census 2020 data on race are not directly comparable with data from the 2010 Census and earlier censuses; caution must be used when interpreting changes in the racial composition of the US population over time. The latest (Census 2020) definitions and nomenclature are used within this analysis.

- American Indian – This includes a person having origins in any of the original peoples of North and South America (including Central America), and who maintains tribal affiliation or community attachment.
- Asian – This includes a person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent including, for example, Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Thailand, and Vietnam.
- Black – This includes a person having origins in any of the black racial groups of Africa.
- Native Hawaiian or Other Pacific Islander – This includes a person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands.
- White – This includes a person having origins in any of the original peoples of Europe, the Middle East, or North Africa.
- Some Other Race - Includes all other responses not included in the "White", "Black or African American", "American Indian and Alaska Native", "Asian" and "Native Hawaiian and Other Pacific Islander" race categories described above.
- Two or more races - People may have chosen to provide two or more races either by checking two or more race responses.
- Hispanic or Latino – This is an ethnic distinction, a subset of a race as defined by the Federal Government; this includes a person of Mexican, Puerto Rican, Cuban, South or Central American, or other Spanish culture or origin, regardless of race.

2.2 DEMOGRAPHIC ANALYSIS

2.2.1 POPULATION

The population of the service area has experienced a growing trend in recent years and is currently estimated at 1.6 Million individuals. Projecting ahead, the total population is expected to continue to grow at rate five times greater than the U.S. annual growth rate (0.8%) over the next 15 years. Projections indicate that the service area is expected to grow by 42% over the next 15 years and will have nearly 2.3 million people living within 861,687 households by 2036.



Flower Mound comprises 5% of total population of the service area.

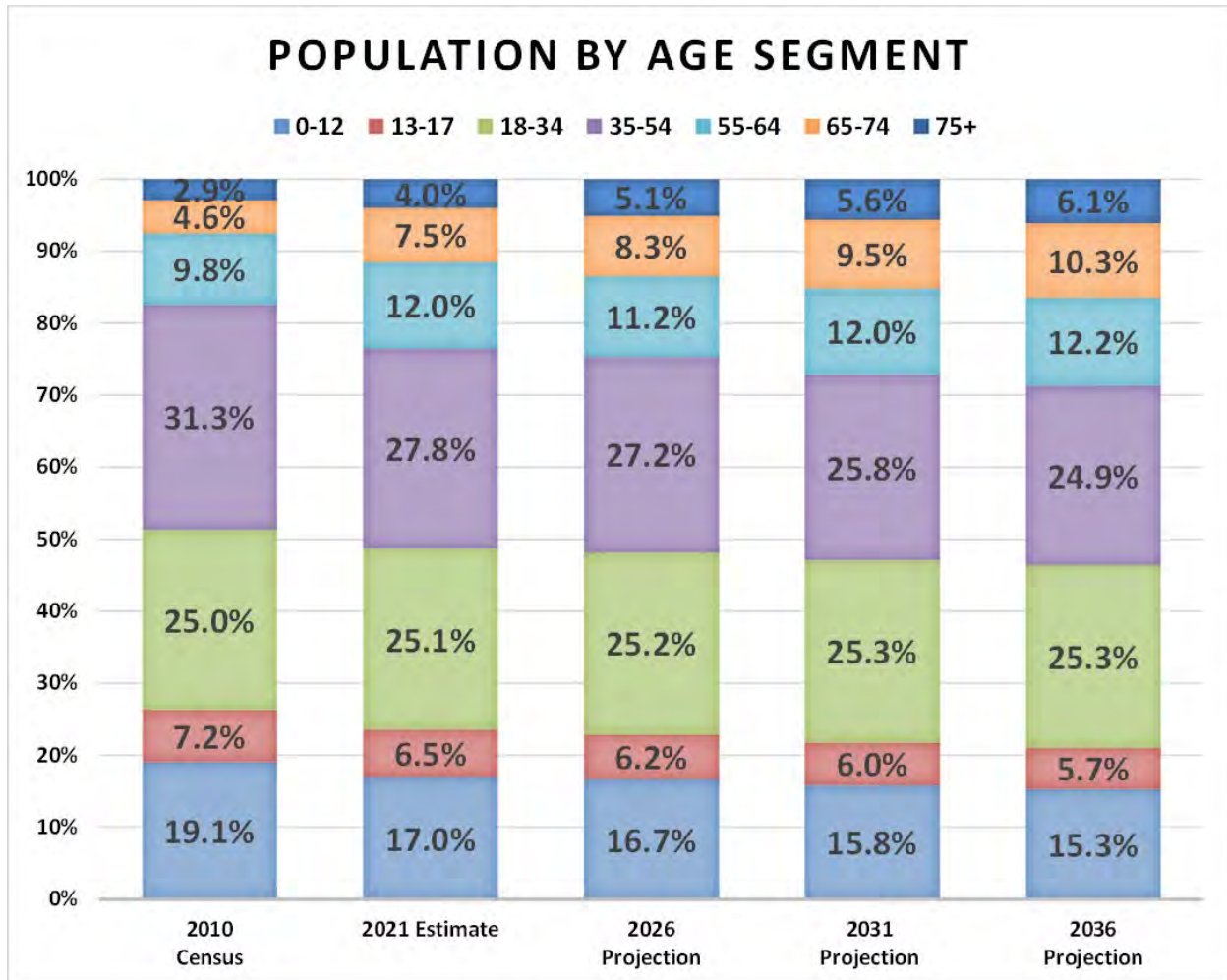


Flower Mound, Texas

2.2.2 AGE SEGMENT

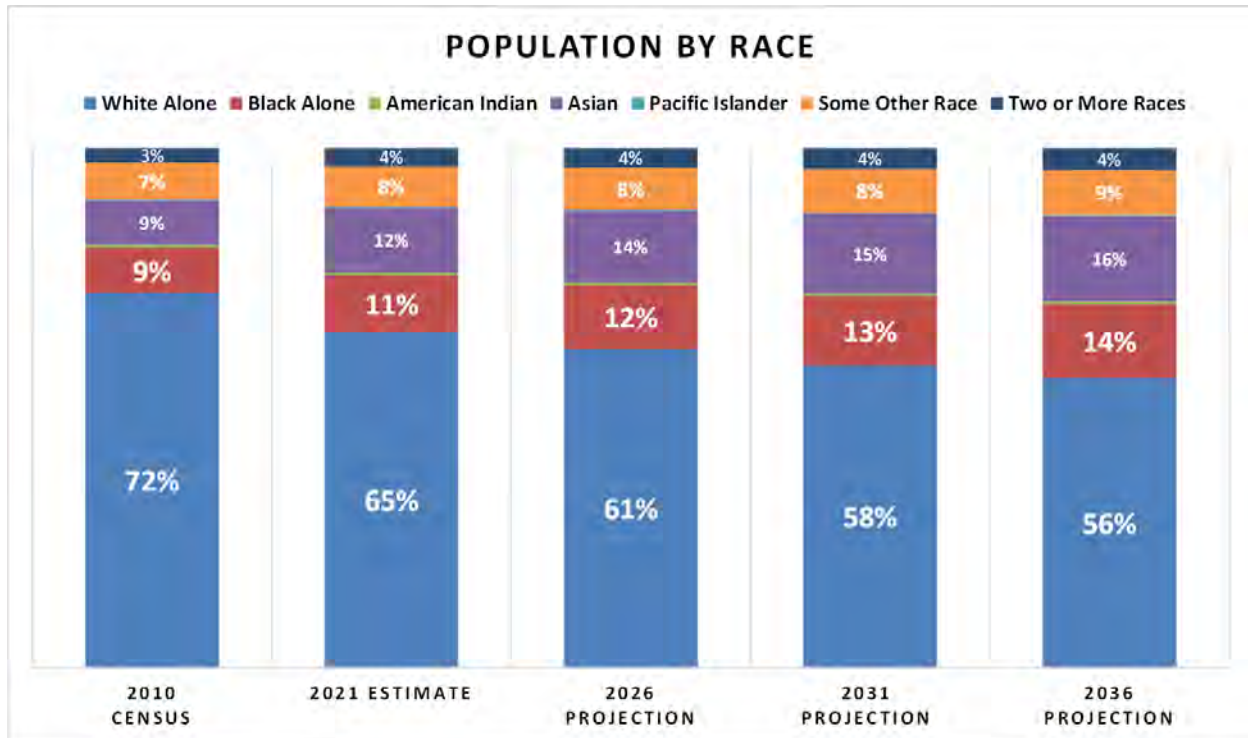
Evaluating the population by age segments, the service area exhibits a balanced distribution among the major age segments. Currently, the largest major age segment is the 35-54 segment, making up 27.8% of the population.

The overall age composition of the population within the service area is projected to remain balanced and age slightly over the next 15 years as the 55+ age segment will make up 28.6% of the population.

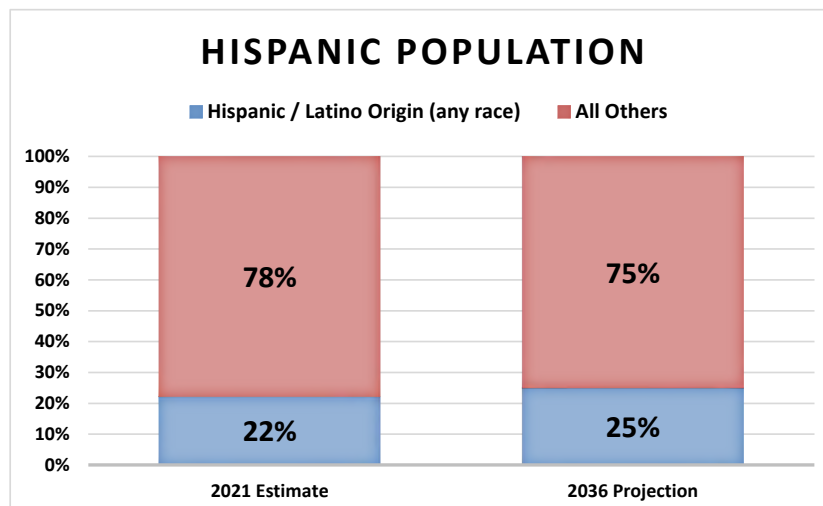


2.2.3 RACE AND ETHNICITY

In analyzing race, the service area's current populations are predominately White Alone. The 2021 estimates show that 65% of the service area's population falls into the White Alone category, while the Asian category (12%) represents the largest minority. The predictions for 2036 expect that the service area's population by race will diversify with a decrease in the White Alone population by approximately 9% and slight increases in most every other category.



Based on the 2021 estimate, those of Hispanic/Latino origin represented 22% of the service area's total population. The Hispanic/Latino population is expected to experience a slight increase to 25% by 2036.

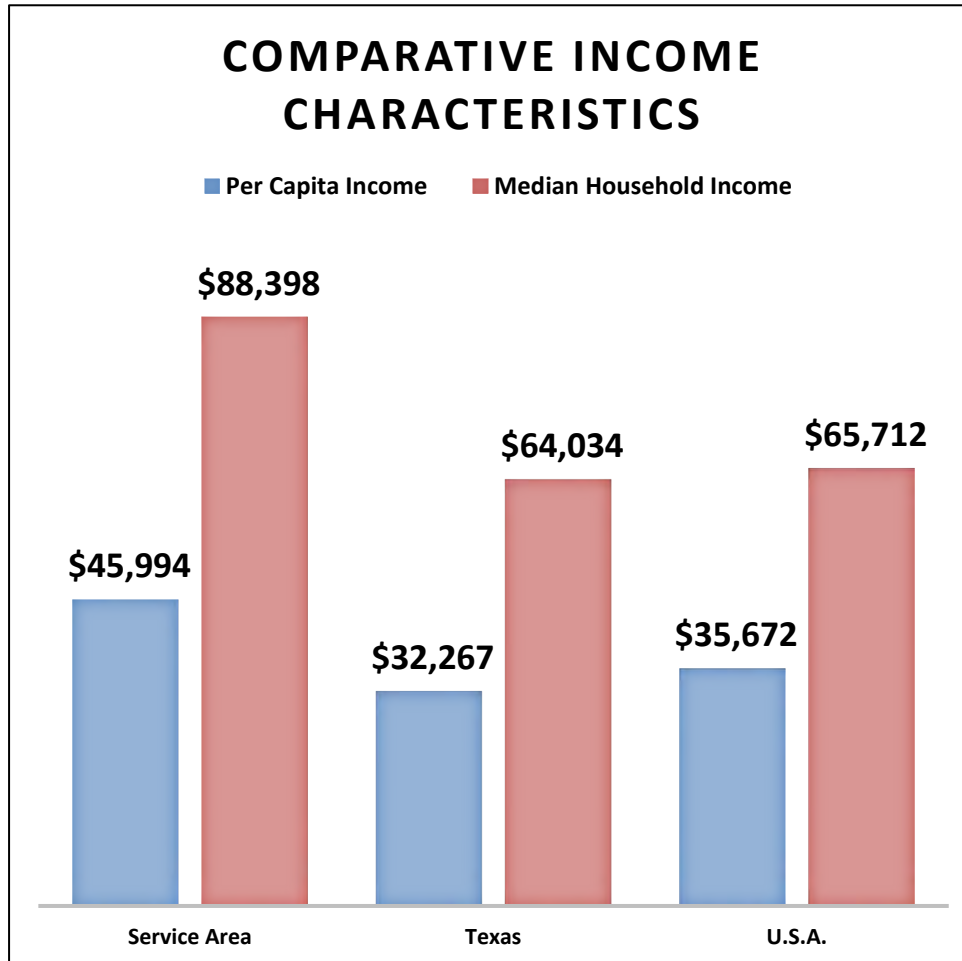




Flower Mound, Texas

2.2.4 INCOME

As seen in the chart below, the service area's per capita and median household income levels are significantly above both state and national averages.



TOWN OF FLOWER MOUND SERVICE AREA DEMOGRAPHIC IMPLICATIONS

The following implications are derived from the analyses provided above. Each implication is organized by the outlined demographic information sections.

POPULATION

The population is increasing significantly and is projected to experience a 42% population growth over the next 15 years (2.3M). This is much greater than the national average over the same time period. With a fast-growing population, park and recreation services will need to strategically invest, develop, and maintain tennis courts in relation to current and future residential growth in the service area.

PLEASE NOTE: The Town of Flower Mound comprises 5% of the population in the service area.

AGE SEGMENTATION

The service area currently has a balanced age segmentation with the largest group being 35-54+. Over the next 15 years, the service area is projected to remain balanced but also age slightly as the 55+ segment will be 28.6% in 2036.

RACE AND ETHNICITY

A diversifying population will likely focus the Town on providing traditional and non-traditional programming and service offerings while always seeking to identify emerging activities and sports, such as pickleball, that in some cases may be defined by cultural influences.

HOUSEHOLDS AND INCOME

With median and per capita household income averages at or above Town, state and national averages, it would be important for the Town to prioritize providing offerings to service area residents that are first class with exceptional customer service while seeking opportunities to create revenue generation.

2.3 NATIONAL RECREATION TRENDS ANALYSIS

The Recreational Trends Analysis provides an understanding of national and local recreational trends. Trends data used for this analysis was obtained from Sports & Fitness Industry Association's (SFIA), National Recreation and Park Association (NRPA), and Environmental Systems Research Institute, Inc. (ESRI). All trend data is based on current and/or historical participation rates, statistically-valid survey results, or NRPA Park Metrics.

2.3.1 NATIONAL TRENDS IN RECREATION

METHODOLOGY

The Sports & Fitness Industry Association's (SFIA) *Sports, Fitness & Leisure Activities Topline Participation Report 2021* was utilized in evaluating the following trends:

- National Recreation Participatory Trends
- Core vs. Casual Participation Trends



The study is based on findings from surveys carried out in 2020 by the Physical Activity Council (PAC), resulting in a total of 18,000 online interviews. Surveys were administered to all genders, ages, income levels, regions, and ethnicities to allow for statistical accuracy of the national population. A sample size of 18,000 completed interviews is considered by SFIA to result in a high degree of statistical accuracy. A sport with a participation rate of five percent has a confidence interval of plus or minus 0.32 percentage points at a 95 percent confidence level. Using a weighting technique, survey results are applied to the total U.S. population figure of 303,971,652 people (ages six and older).

The purpose of the report is to establish levels of activity and identify key participatory trends in recreation across the U.S. This study looked at 118 different sports/activities and subdivided them into various categories including: sports, fitness, outdoor activities, aquatics, etc.

CORE VS. CASUAL PARTICIPATION

In addition to overall participation rates, SFIA further categorizes active participants as either core or casual participants based on frequency of participation. Core participants have higher participatory frequency than casual participants. The thresholds that define casual versus core participation may vary



based on the nature of each individual activity. For instance, core participants engage in most fitness activities more than 50-times per year, while for sports, the threshold for core participation is typically 13-times per year.

In each activity, core participants are more committed and tend to be less likely to switch to other activities or become inactive (engage in no physical activity) than casual participants. This may also explain why activities with more core participants tend to experience less pattern shifts in participation rates than those with larger groups of casual participants.

2.3.2 IMPACT OF COVID-19

Approximately 229.7 million people ages 6 and over reported being active in 2020, which is a 3.6% increase from 2019 and the greatest number of active Americans since 2007. With a shift towards working remotely and children moved to virtual learning, free time increased. This, coupled with stay-at-home orders and general decisions to keep out of public places, put an emphasis on the public finding ways to occupy their time.

Participation in sports and activities that allowed people to be socially distant saw significant increases. These activities included pickleball, tennis, golf, trail running, skateboarding, surfing, day hiking, and recreational kayaking. In general, outdoor sports and racquet sports had the largest increase in participation compared to their 2019 participation numbers.

As could be expected, team sports, showed consistent drops in participation with all but 5 of the 23 tracked team sports showing decreases in overall participation. The team sports like Basketball and Tennis, that did show an increase of participation in 2020 can be attributed to recreational or backyard play, which contradicts the trend of the past decade.

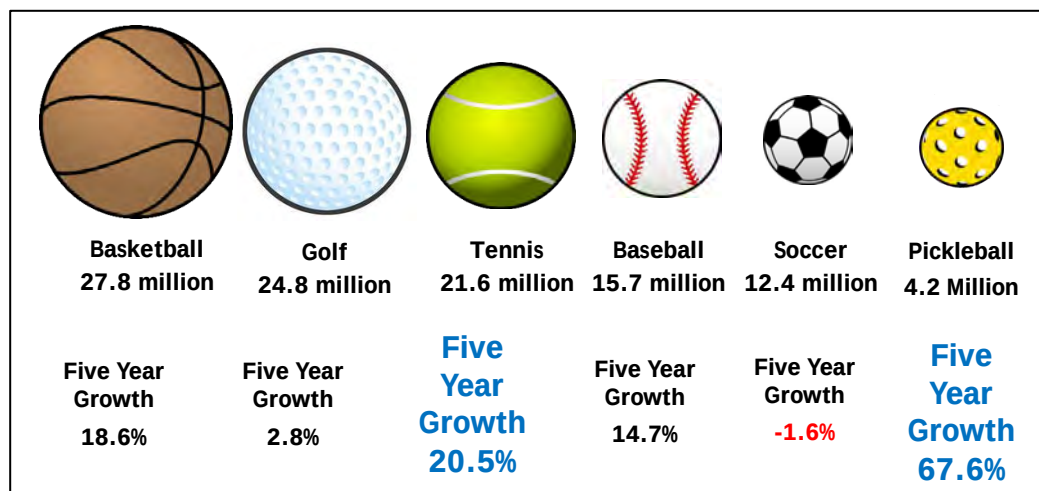
With gyms and health clubs being forced to close in most of the country, fitness participation levels overall decreased in 2020. However, home fitness activities that can be practiced at home, like Yoga, Pilates, and Dumbbells/Hand Weights, showed significant participation increases, while activities done generally in health clubs, studios, or pools like Aquatic Exercise, Group Stationary Cycling, Stair-Climbing Machine, and Cardio Kickboxing, experienced substantial declines. It should be noted, that the long-term effects of COVID-19 on recreation programs and services are developing as the Pandemic evolves. It is expected that some changes in how individuals recreate will continue post pandemic, such as more virtual and online program offerings however, most other anomalies are expected to trend back to “normal” but this may take several years.

2.3.3 NATIONAL TRENDS IN GENERAL SPORTS

PARTICIPATION LEVELS

The top sports most heavily participated in the United States were Basketball (27.8 million), Golf (24.8 million), and Tennis (21.6 million) which have participation figures well in excess of the other activities within the general sports category. Baseball (15.7 million), and Soccer (12.4 million) round out the top five.

The popularity of Basketball, Golf, and Tennis can be attributed to the ability to compete with relatively small number of participants, this coupled with an ability to be played outdoors and/or properly distanced helps explain their popularity during the COVID-19 pandemic. Basketball's overall success can also be attributed to the limited amount of equipment needed to participate and the limited space requirements necessary, which makes basketball the only traditional sport that can be played at the majority of American dwellings as a drive-way pickup game. Golf continues to benefit from its wide age segment appeal and is considered a life-long sport. In addition, target type game venues or Golf Entertainment Venues have increased drastically (72.3%) as a 5-year trend, using Golf Entertainment (e.g., Top Golf) as a new alternative to breathe life back into the game of golf.



FIVE-YEAR TREND

Since 2015, Golf Entertainment Venues (72.3%), Pickleball (67.6%), and Tennis (20.5%) have shown the largest increase in participation. Similarly, Flag Football (20.1%) and Basketball (18.6%) have also experienced significant growth. Based on the five-year trend from 2015-2020, the sports that are most rapidly declining in participation include Ultimate Frisbee (-47.3%), Squash (-32.0%), Fast Pitch Softball (-26.4%), Touch Football (-25.3%), and Roller Hockey (-21.3%).

ONE-YEAR TREND

In general, the most recent year shares a similar pattern with the five-year trends; with Tennis (22.4%), Golf- Entertainment Venues (21.7%), and Pickleball (21.4%) experiencing the greatest increases in participation this past year. Baseball (-0.5%) is the only sport that shows a five-year trend increase, but also a one-year decrease. This is likely a direct result of the COVID-19 pandemic. Similarly, other team sports such as Fast Pitch Softball (-19.2%), Gymnastics (-18.1%), and Volleyball (-16.6%) also had significant decreases in participation over the last year.

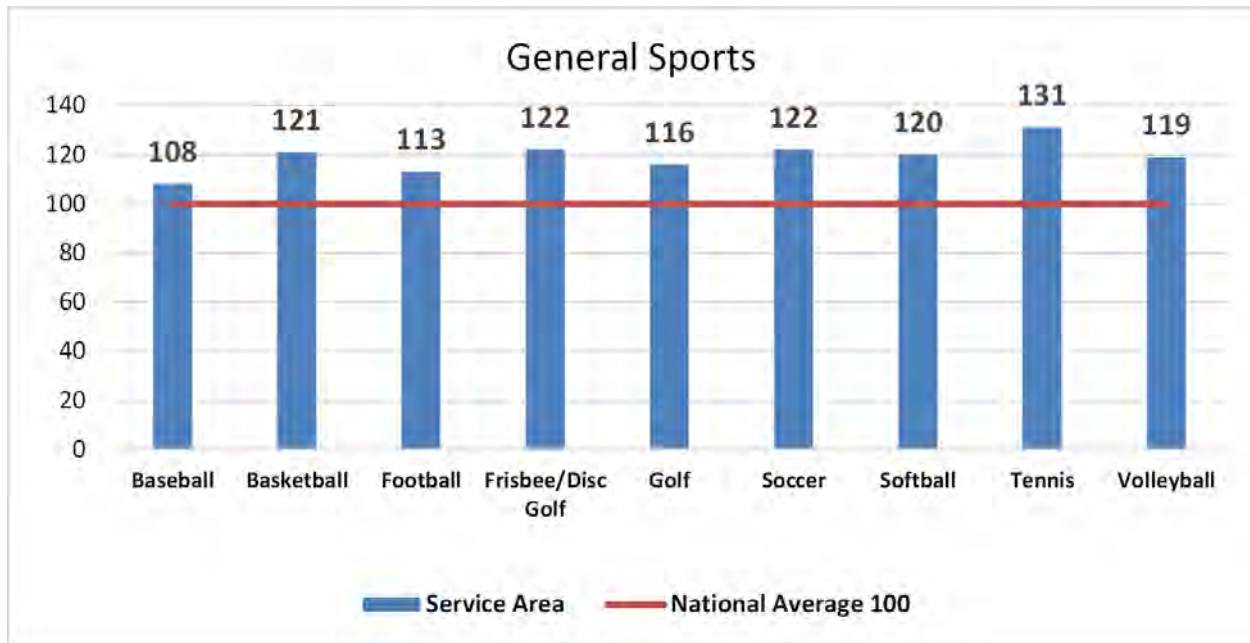


Flower Mound, Texas

National Participatory Trends - General Sports					
Activity	Participation Levels			% Change	
	2015	2019	2020	5-Year Trend	1-Year Trend
Basketball	23,410	24,917	27,753	18.6%	11.4%
Golf (9 or 18-Hole Course)	24,120	24,271	24,804	2.8%	2.2%
Tennis	17,963	17,684	21,642	20.5%	22.4%
Baseball	13,711	15,804	15,731	14.7%	-0.5%
Soccer (Outdoor)	12,646	11,913	12,444	-1.6%	4.5%
Golf (Entertainment Venue)	6,998	9,905	12,057	72.3%	21.7%
Football (Flag)	5,829	6,783	7,001	20.1%	3.2%
Softball (Slow Pitch)	7,114	7,071	6,349	-10.8%	-10.2%
Badminton	7,198	6,095	5,862	-18.6%	-3.8%
Soccer (Indoor)	4,813	5,336	5,440	13.0%	1.9%
Volleyball (Court)	6,423	6,487	5,410	-15.8%	-16.6%
Football (Tackle)	6,222	5,107	5,054	-18.8%	-1.0%
Football (Touch)	6,487	5,171	4,846	-25.3%	-6.3%
Volleyball (Sand/Beach)	4,785	4,400	4,320	-9.7%	-1.8%
Pickleball	2,506	3,460	4,199	67.6%	21.4%
Gymnastics	4,679	4,699	3,848	-17.8%	-18.1%
Track and Field	4,222	4,139	3,636	-13.9%	-12.2%
Racquetball	3,883	3,453	3,426	-11.8%	-0.8%
Cheerleading	3,608	3,752	3,308	-8.3%	-11.8%
Ultimate Frisbee	4,409	2,290	2,325	-47.3%	1.5%
Ice Hockey	2,546	2,357	2,270	-10.8%	-3.7%
Wrestling	1,978	1,944	1,931	-2.4%	-0.7%
Lacrosse	2,094	2,115	1,884	-10.0%	-10.9%
Softball (Fast Pitch)	2,460	2,242	1,811	-26.4%	-19.2%
Roller Hockey	1,907	1,616	1,500	-21.3%	-7.2%
Rugby	1,349	1,392	1,242	-7.9%	-10.8%
Squash	1,710	1,222	1,163	-32.0%	-4.8%
NOTE: Participation figures are in 000's for the US population ages 6 and over					
Legend:	Large Increase (greater than 25%)	Moderate Increase (0% to 25%)	Moderate Decrease (0% to -25%)	Large Decrease (less than -25%)	

LOCAL TRENDS - MARKET POTENTIAL

A Market Potential Data (MPI) measures the probable demand for a service in the target area. The MPI communicates the likelihood that a resident of the service area will exhibit certain consumer behavior when compared to the US National average. The National average is 100, therefore above 100 would represent a higher than average participation rate. The following illustrates the index of the greatest recreation market potential the service area.



2.3.4 SERVICE AREA – GENERAL SPORTS MPI

It is critically important for the Town of Flower Mound to understand the national participation trends in recreation activities. In doing so, the department can gain general insight into the lifecycle stage of recreation sports programs and activities and thereby anticipate potential changes in need and demand for the programs and activities that it provides to the residents of Flower Mound.

Nationally and locally, participation in tennis is exceptionally strong and indicate an opportunity to grow this services.



Chapter Three - COMMUNITY INPUT

There has been extensive public input and participation as part of this process. A combined twelve (12) leadership interviews, community focus groups, and public workshops were conducted as the foundation of public participation.

3.1 INPUT OPPORTUNITIES

The qualitative data collected included multiple leadership interviews, focus groups and community meetings. A summary of the public input opportunities is provided below.

Note: The findings listed below are solely the opinion of the attendees at these meetings and do not reflect the overall community, staff or the consultant's opinion.

- Eight (8) leadership group interviews and focus groups were conducted to be representative, but not exhaustive of interests affecting tennis and pickleball in the Town of Flower Mound. These sessions included:
 - o Administration and leadership
 - o Stakeholders
 - o Users and non-users of the tennis system
 - o Tennis program and service contractors
 - o Business and community leaders
- Four (4) community meetings were conducted in order to capture representative interests, needs, and priorities of residents through a virtual community meeting and Park Board workshops.

3.2 KEY LEADERSHIP, FOCUS GROUP AND PUBLIC INPUT SUMMARY

3.2.1 OVERVIEW

There has been extensive public input and participation in the planning process. Key leadership interviews and focus groups were conducted to help gain an understanding of the community values, as well as determining the priorities for Tennis needs of the Town of Flower Mound.

3.2.2 SUMMARY

- Participants felt that the Flower Mound's tennis and pickleball court system has a strong, albeit limited, presence in the community.
- Participants see the system as excellently maintained with great staff/contracted staff and enjoy the programs and amenities offered.
- Updating and expanding the tennis court system was continually expressed throughout all focus groups as demand for tennis and pickleball significantly outweighs the supply. Meeting the local need for tennis and pickleball should be prioritized ahead of opportunities for sports tourism.
- Participants are routinely having to drive out of town to participate in leagues tournaments as court capacity in Flower Mound to host leagues and tournaments is limited.

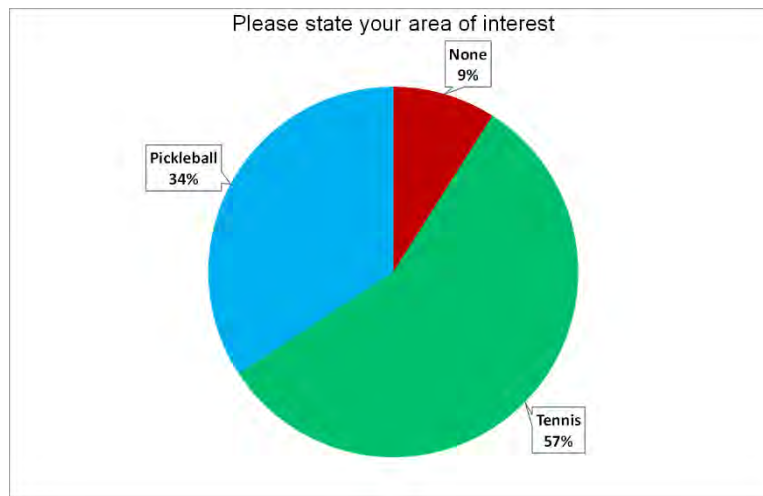
3.3 ON-LINE SURVEY RESULTS

An online survey was conducted during August and September of 2021 to help establish priorities for the potential future development and direction of management of Flower Mound Tennis Center. 1,232 surveys, representing 2,726 individuals, were completed as part of the process.

PLEASE NOTE: 93% of the surveys were completed by Flower Mound residents.

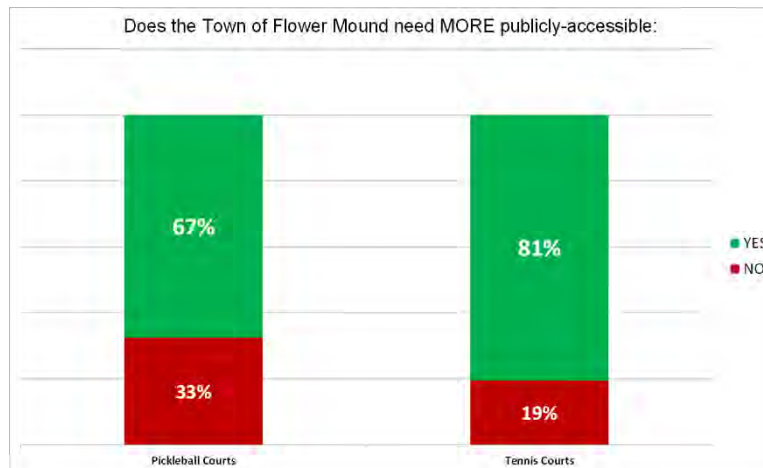
3.3.1 AREA OF INTEREST

57% of survey respondents indicated that they were interested in utilizing a tennis center to play tennis while 34% indicated they would play pickleball.



3.3.2 PERCEPTION OF NEED

81% of survey respondents indicated that the Town of Flower Mound needs more publicly-accessible tennis courts, while 67% indicated a need for more pickleball courts.



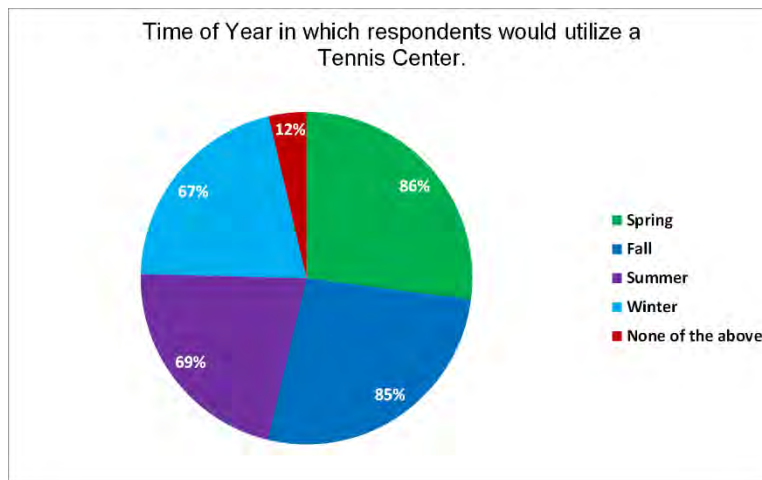


Flower Mound, Texas

3.3.3 UTILIZATION – TIME OF YEAR

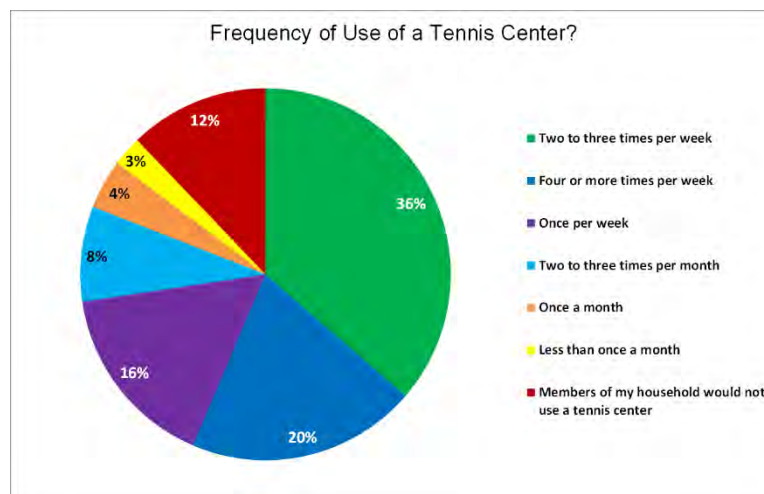
88% of survey respondents indicated that they would utilize a tennis center for tennis and/or pickleball. Of the survey respondents that indicated that they would utilize a tennis center in Flower Mound:

- 86% indicated they would use a tennis center during the spring.
- 85% indicated they would use a tennis center during the fall.
- 69% indicated they would use a tennis center during the summer.
- 67% indicated they would use a tennis center during the winter.



3.3.4 UTILIZATION - FREQUENCY

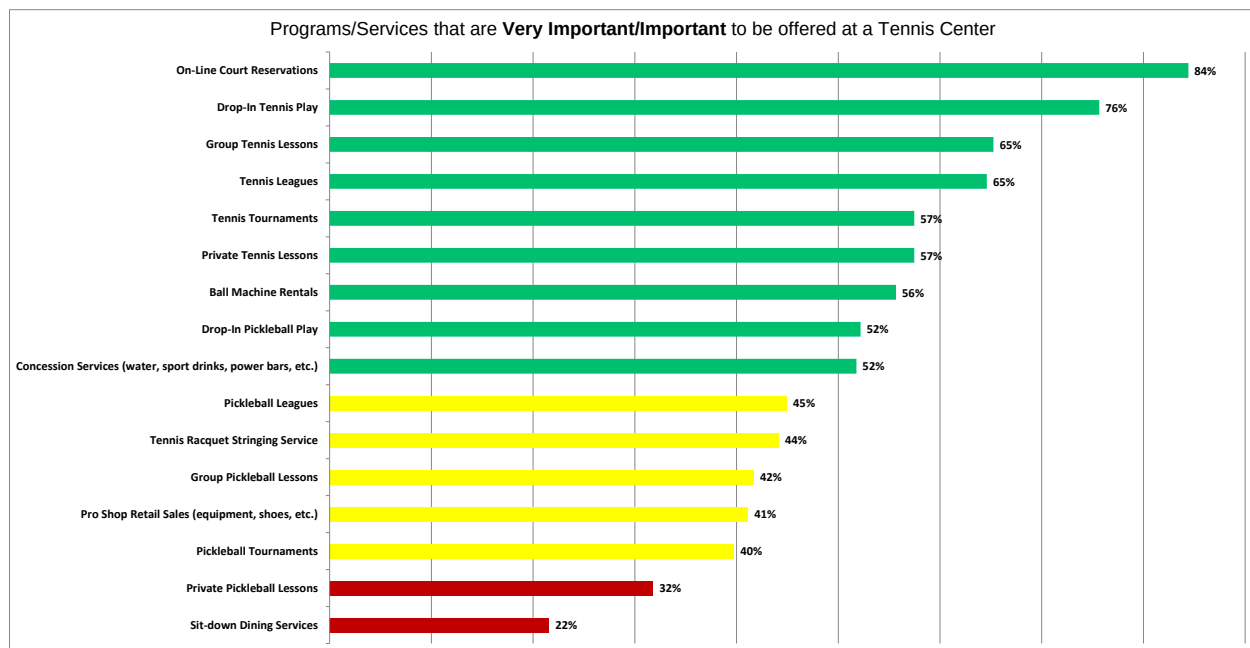
Of the survey respondents who indicated they would utilize a tennis center in Flower Mound, 56% indicated they would utilize the facility at least two times per week, with another 16% indicating they would visit at least once per week.



3.3.5 PRIORITIZATION OF NEED – PROGRAMS AND SERVICES?

Of the 88% of the survey respondents that indicated that they would utilize a tennis center in Flower Mound, 84% indicated that on-line court reservations are Very Important/Important to be offered. Other programs/services that have the highest level of importance are:

- Drop-In Tennis Play – 76%
- Group Tennis Lessons – 65%
- Tennis Leagues – 65%
- Tennis Tournaments – 57%
- Private Tennis Lessons – 57%
- Ball Machine Rentals – 56%
- Drop-In Pickleball Play – 52%
- Concession Services – 52%



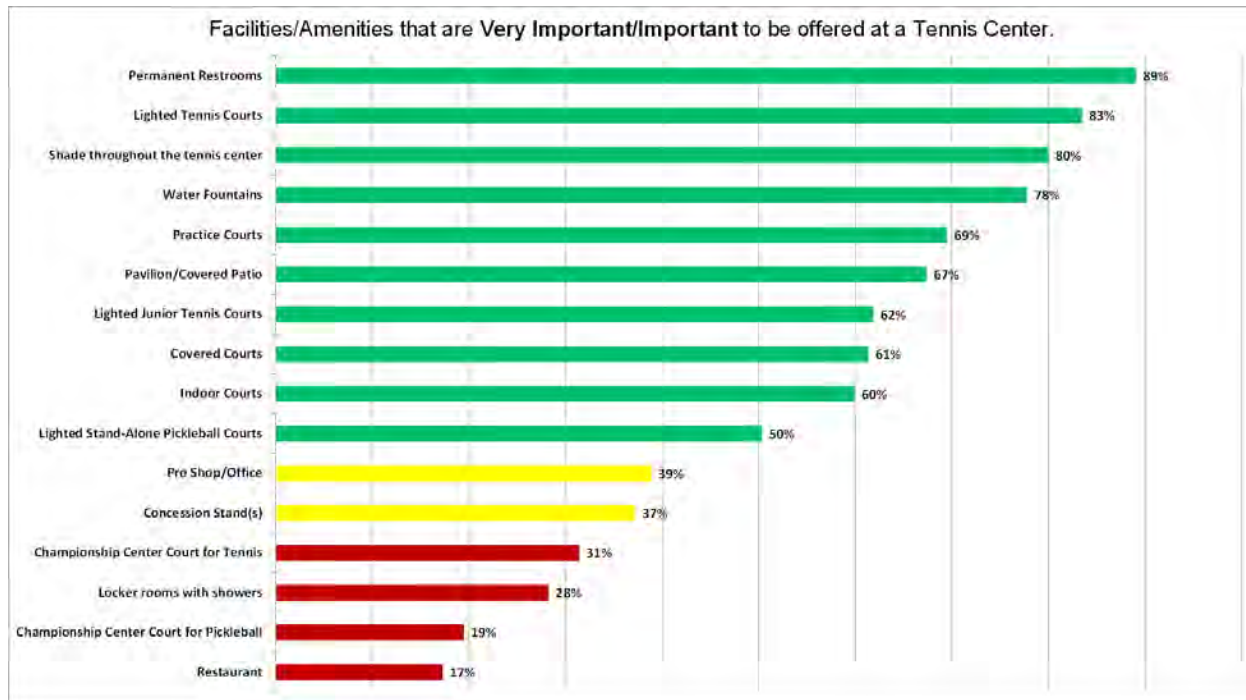


Flower Mound, Texas

3.3.6 PRIORITIZATION OF NEED – FACILITIES AND AMENITIES

Of the 88% of the survey respondents that indicated that they would utilize a tennis center in Flower Mound, 89% indicated that permanent restrooms are Very Important/Important. Other facilities/amenities that have the highest level of importance are:

- Lighted Tennis Courts – 83%
- Shade throughout the Tennis Center – 80%
- Water Fountains – 78%
- Practice Courts – 69%
- Pavilion/Covered Patio – 67%
- Lighted Junior Tennis Courts – 62%
- Covered Courts – 61%
- Indoor Courts – 60%
- Lighted Stand-Alone Pickleball Courts – 50%



Chapter Four – TENNIS/PICKLEBALL COURT INVENTORY AND ASSESSMENT

Assessments of the existing tennis/pickleball courts in Flower Mound were conducted by MHS as part of the Tennis Center Feasibility Study. The purpose of the assessments is to evaluate the existing conditions and functionality of the tennis/pickleball courts in the Town of Flower Mound. This review includes the tennis/pickleball court inventory owned by the Town of Flower Mound, homeowner associations and Independent School Districts. The inventory and assessments provide insight and suggestions as to possible repair, replacement or modification of each element to meet the recreational use requirements in the Town. The results of the assessments are summarized in the following sections of this chapter.

4.1 GLENWICK PARK – TOWN OF FLOWER MOUND

GLENWICK PARK ONE COURT



STRENGTHS:

- Court surfacing in good condition
- Court lighting (older fixtures)
- Pickleball striping
- Good nets, fences and windscreens
- Trees nearby
- Parking nearby

WEAKNESSES:

- Court lighting is non LED
- Hard for spectators because of windscreens all around
- One court with no room for expansion
- Portable restrooms only
- No water fountain





Flower Mound, Texas

4.2 LEONARD AND HELEN JOHNS COMMUNITY PARK – TOWN OF FLOWER MOUND

LEONARD AND HELEN JOHNS COMMUNITY PARK FOUR COURTS



STRENGTHS:

- Court surfacing in good condition
- Court lighting (old fixtures)
- Jr. tennis striping on courts
- Most nets in good condition
- Opportunity for expansion*
- Parking nearby

WEAKNESSES:

- Court lighting is non LED
- No player shade
- No spectator seating
- Fence and windscreen in poor conditions
- Portable restroom only
- No water fountain
- Trees close to courts cause excessive pine straw debris (maintenance issues)



*Opportunity for expansion is contingent upon the prioritization of other competing interests for the redevelopment of the site.

4.3 BRIDLEWOOD HOMEOWNER'S ASSOCIATION

BRIDLEWOOD HOA

FIVE COURTS



*Four courts located at Amenity Center



*One court located at Golf Course

**STRENGTHS:**

- Court surfacing in good condition
- Court lighting (older fixtures)
- Pickleball striping on one court
- Jr. tennis striping on one court
- Shaded spectator areas
- Trees on site
- Clubhouse with water, restrooms, etc.
- Nearby parking

WEAKNESSES:

- Court lighting is non LED
- No player shade
- Private facility
- Five courts with no room for expansion



4.4 WELLINGTON HOMEOWNER'S ASSOCIATION

WELLINGTON HOA FIVE COURTS



STRENGTHS:

- Court surfacing in good condition
- Court lighting (LED)
- Pickleball striping on one court
- Jr. tennis striping
- Nets in good condition
- Shade trees around
- Clubhouse with water, restrooms, etc.
- Nearby parking

WEAKNESSES:

- No shade for players
- Private facility
- Lack of spectator viewing
- Five courts with no room for expansion



4.5 ARGYLE HIGH SCHOOL

ARGYLE HIGH SCHOOL EIGHT COURTS



*Most current aerial photography



STRENGTHS:

- Court surfacing, fences, and windscreens in great condition
- Court lighting (LED)
- Eight courts with room for expansion

WEAKNESSES:

- No player shade
- No shade or seating for spectators (under construction)
- Private facility
- No restrooms or water fountains nearby
- No nearby parking





4.6 FLOWER MOUND HIGH SCHOOL

FLOWER MOUND HIGH SCHOOL 12 COURTS



STRENGTHS:

- Court surfacing, nets, and fence are in good condition
- Court lighting (non LED)
- Player shade
- Spectator shade/seating
- Nearby parking

WEAKNESSES:

- Court lighting is non LED
- Private facility
- No restrooms or water fountains nearby
- Trees close to courts cause excessive pine straw debris (maintenance issues)
- 12 courts with no room for expansion



4.7 LEWISVILLE HIGH SCHOOL

LEWISVILLE HIGH SCHOOL (HARMON CAMPUS)

12 COURTS

**STRENGTHS:**

- Court surfacing, fencing, and windcreens in good condition
- Court lighting (LED)
- Great spectator areas with shade
- Great LED lighting
- Restroom/Concession/water fountain nearby
- Parking nearby

WEAKNESSES:

- No player shade
- Private facility
- 12 courts with little room for expansion
- Located outside Flower Mound Town Limits





4.8 MARCUS HIGH SCHOOL

MARCUS HIGH SCHOOL

12 COURTS

**STRENGTHS:**

- Court surfacing, fencing, and windcreens in good condition
- Court lighting
- Great spectator areas with shade
- Great lighting
- Clubhouse nearby
- Parking nearby

WEAKNESSES:

- No player shade
- No LED lighting
- Private facility
- 12 courts with little room for expansion



4.9 SUMMARY OF COURT INVENTORY

4.9.1 TOWN OF FLOWER MOUND

Location	Ownership	Service Offerings	Tennis Courts	Stand Alone Pickleball Courts	Permanent Restroom
Glenwick Park	Town Owned	Open Play	1 - Outdoor	0	No
Leonard & Helen Johns Community Park	Town Owned	Open Play Reservations Lessons	4 - Outdoor	0	No
Bridlewood	HOA	Open Play Reservations Lessons	5 - Outdoor	0	Yes
Wellington	HOA	Open Play	5 - Outdoor	0	Yes
Argyle High School	ISD	Summer Programs	8 - Outdoor	0	No
Flower Mound High School	ISD	Summer Programs	12 - Outdoor	0	No
Lewisville High School (Harmon Campus)	ISD	Summer Programs	12 - Outdoor	0	Yes
Marcus High School	ISD	Summer Programs	12 - Outdoor	0	Yes

- The Town of Flower Mound owns, manages, and maintains two locations where tennis courts are publicly available.
- The Town of Flower Mound is not the primary provider of tennis courts in the Town of Flower Mound.
- High Schools and Home Owner Associations are the primary provider of tennis courts in the Town; however, these courts are generally not available for use by the public.



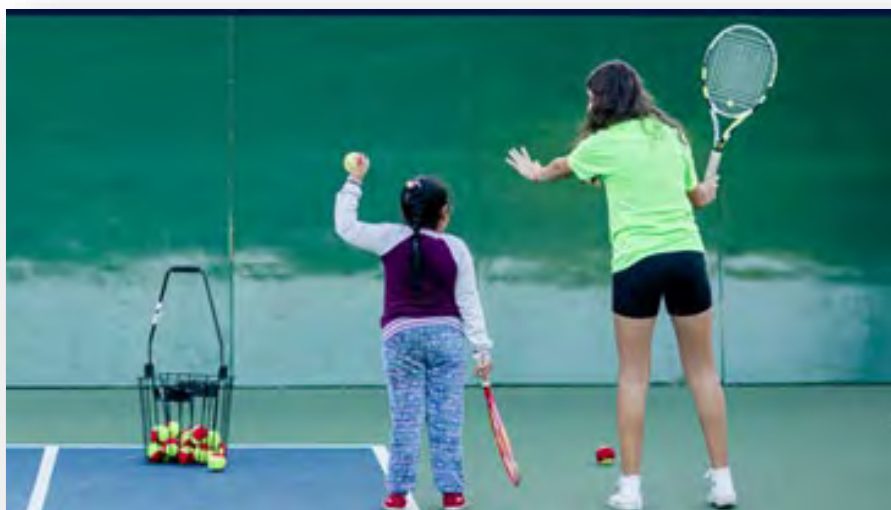
Chapter Five - MARKET ANALYSIS

PROS Consulting, in conjunction with the Town of Flower Mound and MHS, identified publicly accessible tennis and pickleball court providers in the service area as defined in Chapter Two. The goal of the market analysis task is to evaluate how the Town of Flower Mound's Tennis Court system is positioned in the market and to provide insight on how best to meet the needs of the community in the future.

5.1 FLOWER MOUND TENNIS CENTER SERVICE AREA – 15 SQUARE MILES/20-30 MINUTE DRIVE TIME

Drive Distance	Drive Time	Tennis Center	Address	Service Offerings	Tennis Courts	Stand Alone Pickleball Courts	Permanent Restroom	Office/Pro Shop
4.4 mi	11 min	Wagon Wheel Tennis Center	950 Creekview Drive, Coppell, TX 75019	Open Play Reservations Lessons/Leagues/Tournaments	12 - Outdoor	4	Yes	Yes
7.2 mi	15 min	Unity Park	2200 Briarhill Blvd., Highland Village, TX 75077	Open Play Reservations Lessons	4 - Outdoor	0	Yes	No
7.2 mi	15 min	Highland Village Tennis Center	101 Clearwater Drive South, Highland Village, TX 75077	Open Play Reservations Lessons	4 - Outdoor	0	Yes	No
9 mi	13 min	Tennis Courts at Heritage Park	222 Ball St, Grapevine, TX 76051	Open Play	2 - Outdoor	0	No	No
13.1 mi	21 min	Dove Park	1509 Hood Lane, Grapevine, TX 76051	Open Play Reservations Lessons/Leagues/Tournaments	6 - Outdoor	4	No	No
14.2 mi	20 min	Southlake Tennis Center	450 W. Southlake Blvd. Southlake, TX 76092	Open Play Reservations Lessons/Leagues/Tournaments	17 - Outdoor 2 - Indoor	0	Yes	Yes

- The two primary Tennis Center facilities in the service area that are most utilized by Flower Mound residents are the Wagon Wheel Tennis Center in Coppell and the Southlake Tennis Center in Southlake.
- Other tennis court locations within the service area provide a similar level of service as the Town's tennis courts at Leonard & Helen Johns Community Park.



Chapter Six - LEVEL OF SERVICE STANDARDS

Level of Service (LOS) standards are guidelines that define service areas based on population that support investment decisions related to parks, facilities, and amenities. LOS standards can and will change over time; as the population increases, the need to acquire additional land and develop parks also increases as will the costs to do so.

6.1 LEVEL OF SERVICE STANDARD ASSUMPTIONS

The consultant team evaluated and developed LOS standards using a combination of local, regional, and national resources, including:

- Demographic projections (including population, age and diversity segmentation).
- 2017 Town of Flower Mound Overall Master Plan.
- 2017 Town of Flower Mound Parks and Recreation Master Plan.
- National Recreation and Park Association (NRPA) guidelines.
- United States Tennis Association (USTA) guidelines.
- Recreation activity participation rates reported by the Sports & Fitness Industry Association's (SFIA) 2021 Study of Sports.
- Ownership and/or acquisition of park land for tennis/pickleball court development.
- Community and stakeholder input including the online survey and general observations.
- The ability for the Town to financially sustain a high-quality tennis center.
- Other publicly accessible service providers.
- Assumption that Homeowner Associations (HOA) in Flower Mound complement the publicly accessible tennis and pickleball courts in the Town.

The service level standards analysis is a review of the inventory of tennis and pickleball court inventory in relation to the total population of the study area and community needs. Ultimately, these standards are guidelines for Flower Mound leadership to utilize in measuring service levels and making decisions about providing tennis and pickleball courts. The standards should not be the sole determinant of how Flower Mound will invest in its tennis and pickleball courts over the next 15 years.



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6.2 CURRENT INVENTORY

The chart below provides a snapshot of the current publicly accessible tennis and pickleball court inventory in the service area.

INVENTORY					
Court Type	Town of Flower Mound	Flower Mound Homeowner Association Courts	Other Providers	* High School Courts	Total Inventory
Tennis Courts	5.00	10.00	47.00	44.00	84.00
Pickleball Courts (stand-alone)	-	-	8.00	-	8.00

*** High School Inventory – 50% of actual inventory counts toward level of service**

6.3 CURRENT SERVICE LEVELS

The chart below provides a snapshot of the current level of service standards for the service area.

INVENTORY						SERVICE LEVELS		
Court Type	Town of Flower Mound	Flower Mound Homeowner Association Courts	Other Providers	* High School Courts	Total Inventory	Current Service Level based upon population		
Tennis Courts	5.00	10.00	47.00	44.00	84.00	1.00	court per	19,136
Pickleball Courts (stand-alone)	-	-	8.00	-	8.00	1.00	court per	200,927

*** High School Inventory – 50% of actual inventory counts toward level of service**

6.4 LEVEL OF SERVICE STANDARDS RECOMMENDATION

The evaluation of existing service levels along with the system assessments, community input and analysis conducted, it is recommended that the Town update its level of service standards to better provide for the recreational priorities of its residents while seeking to achieve geographical equity. The following chart summarizes the recommended service level standards.

INVENTORY		SERVICE LEVELS					
Court Type	Total Inventory	Current Service Level based upon population			Recommended Service Levels; Revised for 15 square mile Service Area		
Tennis Courts	84.00	1.00	court per	19,136	1.00	court per	6,000
Pickleball Courts (stand-alone)	8.00	1.00	court per	200,927	1.00	court per	12,000

6.5 MEETING RECOMMENDED SERVICE LEVELS IN 2021

The following table shows the level of service currently being achieved by the Town against the recommended service level standards. Based on the numeric analysis alone, opportunities to meet the recommended service level standards exist for tennis and pickleball courts in the Town.

2021 Inventory		Service Levels		2021 Facility Standards			Town Contribution Level	2021 Needs Town Contribution Level
Court Type	Total Inventory	Recommended Service Levels; Revised for 15 square mile Service Area		Meet Standard/ Need Exists	Additional Facilities/ Amenities Needed		% of Inventory Recommended to be Provided by the Town to Meet Needs	Additional Courts Needed in 2021 Based on Town Contribution Level
Tennis Courts	84.00	1.00	court per	6,000	Need Exists	184 Court(s)	5%	9
Pickleball Courts (stand-alone)	8.00	1.00	court per	12,000	Need Exists	126 Court(s)	5%	6



Flower Mound, Texas

6.6 MEETING RECOMMENDED SERVICE LEVELS IN 2036

The population of Town and service area will increase by approximately 42% by 2036 and with it, there will be a correlating increase in need for tennis and pickleball courts. The following table shows the magnitude of additional tennis and pickleball courts that will be needed in 2036 based on the projected population growth and the recommended service level standard.

INVENTORY		SERVICE LEVELS		2036 FACILITY STANDARDS			2036 NEEDS TOWN CONTRIBUTION LEVEL	2036 NEEDS TOWN CONTRIBUTION LEVEL
Court Type	Total Inventory	Recommended Service Levels; Revised for 15 square mile Service Area		Meet Standard/ Need Exists	Additional Facilities/ Amenities Needed		% of Inventory Recommended to be Provided by the Town to Meet Needs	Additional Courts Needed in 2036 Based on Town Contribution Level
Tennis Courts	84.00	1.00	court per	6,000	Need Exists	295 Court(s)	5%	16
Pickleball Courts (stand-alone)	8.00	1.00	court per	12,000	Need Exists	182 Court(s)	5%	10

6.7 INVENTORY AND LEVEL OF SERVICE SUMMARY

- **Service Area Population** – Expected to grow by 42% in next 15 years (2.3M by 2036).
- **Participation Trends** – Tennis & Pickleball participation have grown by 21% and 68% over the last 5 years.
- **Community Needs** – Strong support for additional tennis and pickleball courts.
- **Community Needs** – Multiple uses of courts cited by public and anticipated high frequency of use, year round.
- **Current Inventory** – 86% of current inventory is in outlying communities and the ISD.
- **ISD Tennis Courts** – not (and are not expected to be) fully accessible to the public.
- **Level of Service** – 16 tennis courts and 10 stand-alone pickleball courts are recommended for the Town of Flower Mound as part of a Tennis Center.

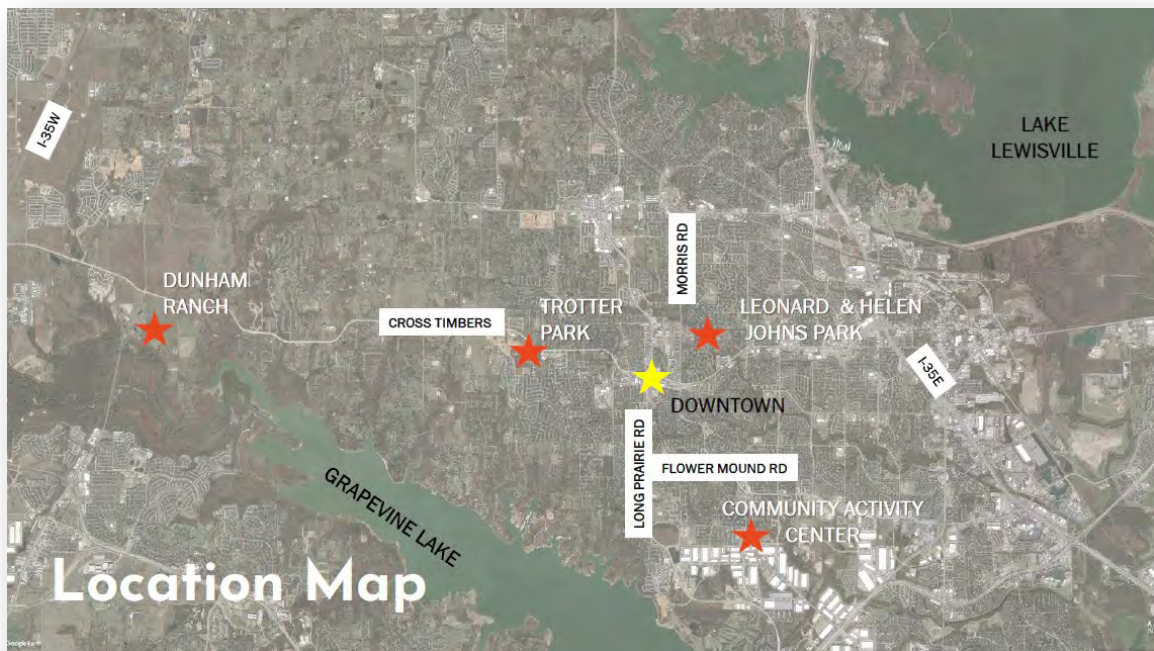


Chapter Seven - CONCEPT PLAN DEVELOPMENT

Based on the outcomes of the inventory and assessments as well as the community needs and level of service analyses, the consulting team, working in coordination with the residents of the Town of Flower Mound, the Park Board and Town staff evaluated and developed conceptual site plans for four locations.

1. Community Activity Center
2. Leonard and Helen Johns Park
3. Trotter Park
4. Dunham Ranch

The map below identifies the location of each of the locations.



7.1 SITE SPECIFIC PARK MASTER PLAN DEVELOPMENT PROCESS

Site specific concept plans are not intended to fully reflect what will happen as parks and facilities are developed or re-developed. Rather, concept plans create a visual of what is realistically possible within any given location. The design process for fully designing and developing a new park or recreation facility is as follows:

- **Concept Plan Phase - Pre-Design Phase - High Level (test fit).**
- **Schematic Design Phase** - A range of alternative design concepts are explored.
- **Design Development Phase** - All detailed design decisions are completed during this phase.
- **Construction Document Phase** - Consists of preparation of drawings and specifications establishing the requirements for the construction of the project.



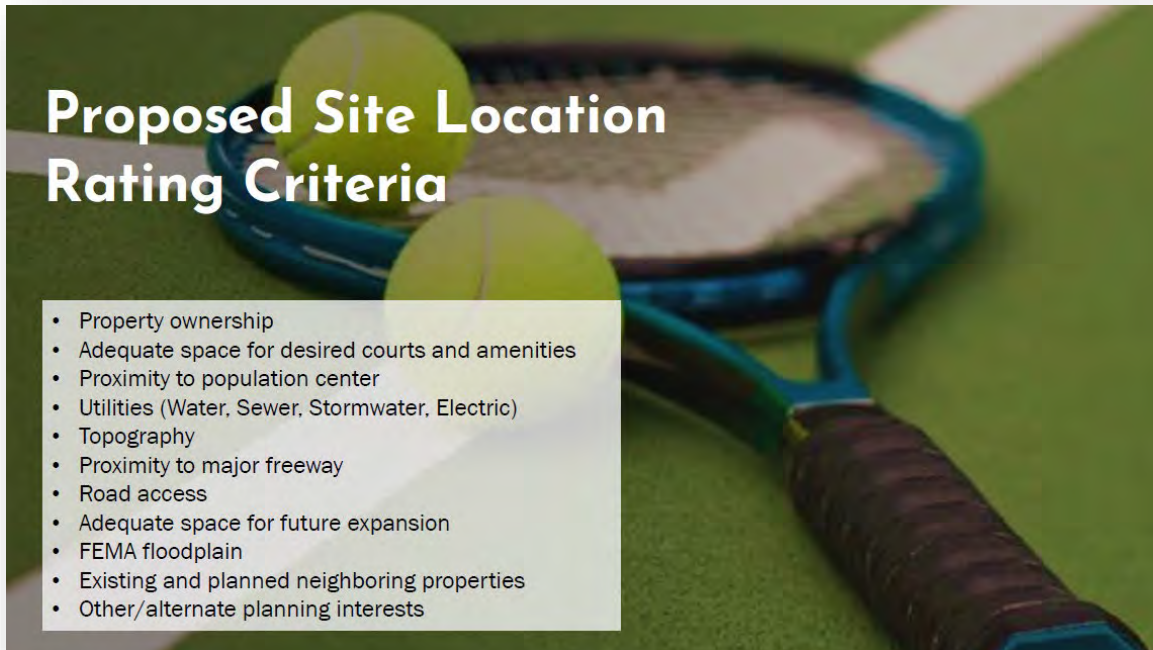
7.2 CONCEPT PLAN DEVELOPMENT MILESTONES

The development of each of the concept plans was an iterative process that combined the technical expertise of staff and the consulting team with community consensus. The following reflects the milestones of the concept plan development process:

- December 2021 – Draft concept plans were developed by the consulting team.
- January 6, 2022 – Draft concept plans were presented to the Park Board and public at the Park Board Meeting.
- January 9 – January 31, 2022 – Draft concept plans were posted on the Town’s website for public review and comment.
 - o 177 comments were provided by Town of Flower Mound households.
- February 1 – March 1, 2022 – Town staff and the consulting team reviewed each comment and grouped the comments into “categories”. These categories of comments were then evaluated utilizing several criteria to determine if changes could be incorporated into the plans, including, but not limited to:
 - o Community need
 - o Quality of experience
 - o Safety
 - o Existing site opportunities and constraints
 - o Consistency with previous planning efforts
 - o Functionality
 - o Compatibility with adjacent experiences within a park or other parks in the system
 - o Impact on adjacent current and future residential development
 - o Topography
 - o General operational impact
 - o Pedestrian/bicycle/vehicular circulation.
 - o Ingress/Egress
 - o Lighting
 - o Natural, historic and cultural resources
 - o Noise and light pollution
- March 3, 2022 – Final concept plans were presented to the Park Board and the public at the Park Board Meeting.

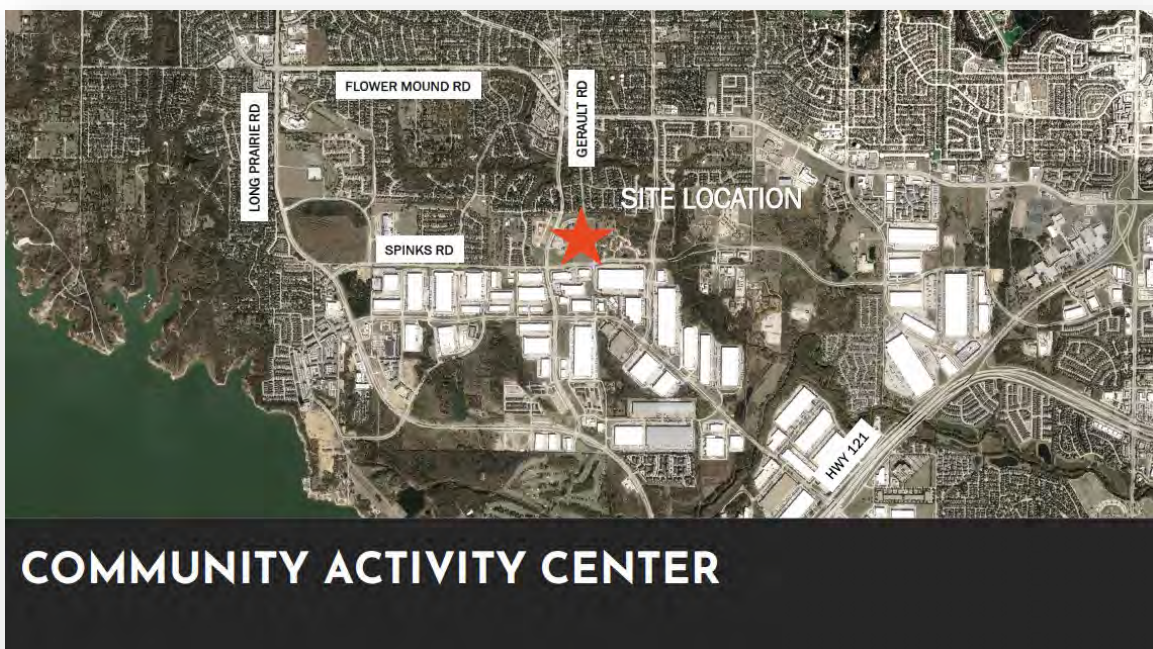
7.3 SITE EVALUATION CRITERIA

The development of the concept plans for each of the four sites were done so utilizing criteria that adheres to best practice design standards. The criteria are as follows:



7.4 COMMUNITY ACTIVITY CENTER LOCATION-TENNIS CENTER CONCEPT PLAN

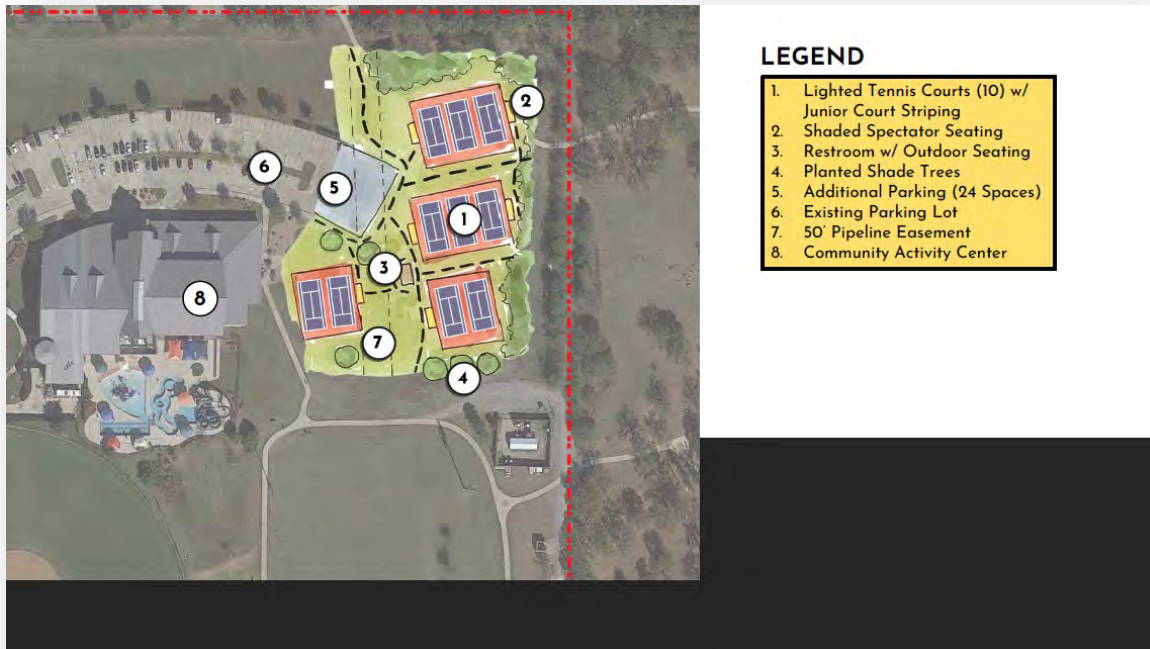
7.4.1 COMMUNITY ACTIVITY CENTER LOCATION SITE MAP





Flower Mound, Texas

7.4.2 COMMUNITY ACTIVITY CENTER LOCATION – TENNIS CENTER CONCEPT PLAN

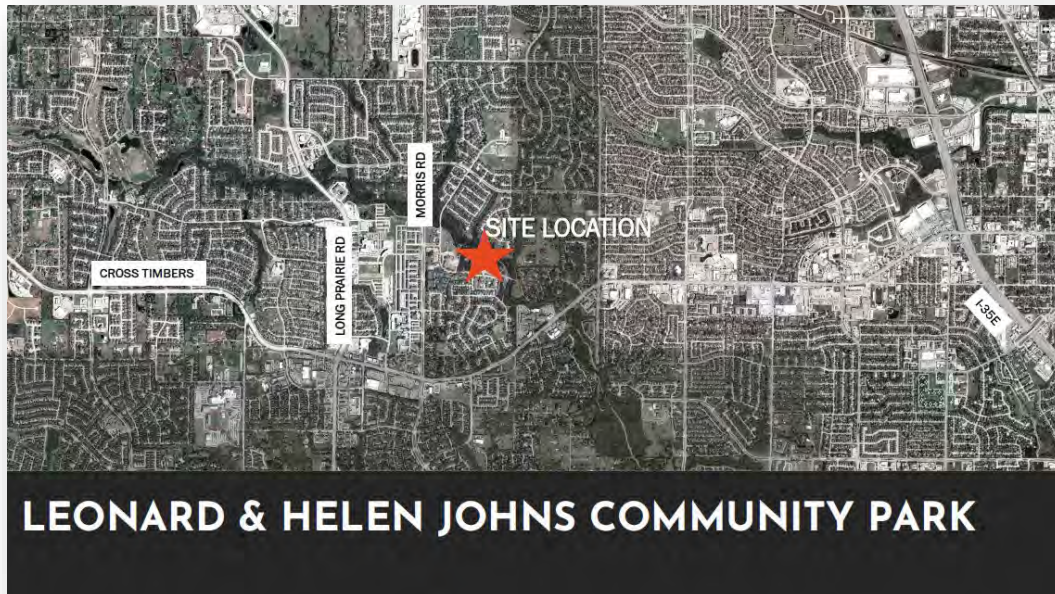


7.4.3 COMMUNITY ACTIVITY CENTER LOCATION – SITE RATING

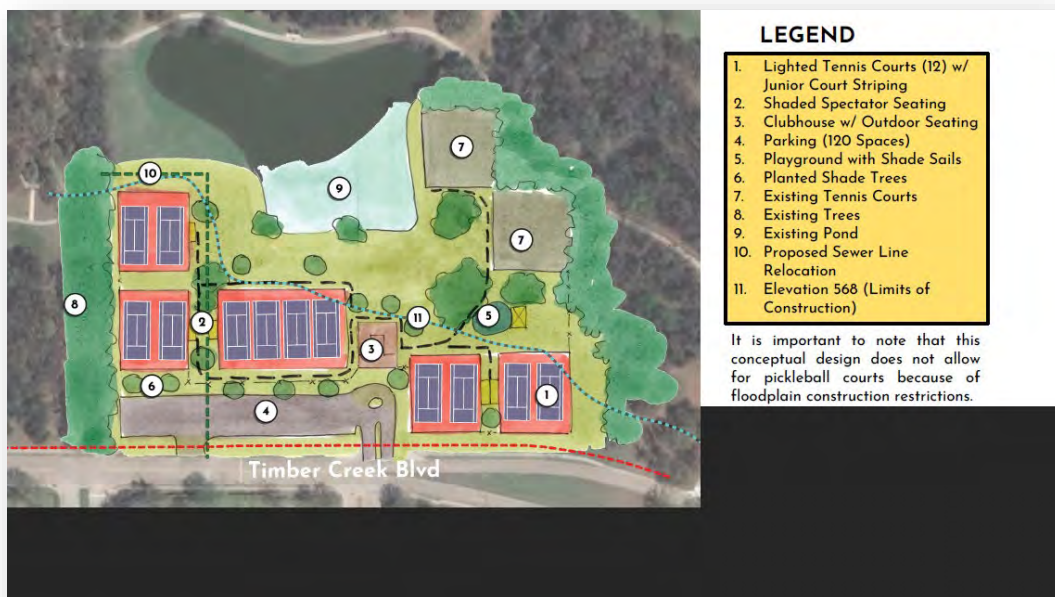


7.5 LEONARD AND HELEN JOHNS COMMUNITY PARK LOCATION-TENNIS CENTER CONCEPT PLAN

7.5.1 LEONARD AND HELEN JOHNS COMMUNITY PARK LOCATION SITE MAP



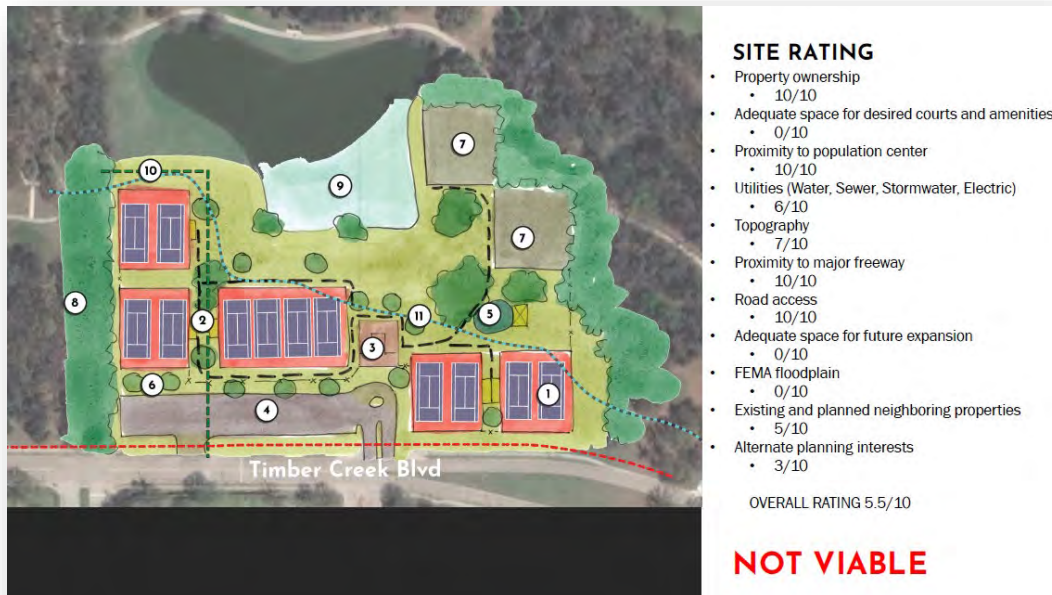
7.5.2 LEONARD AND HELEN JOHNS COMMUNITY PARK LOCATION - TENNIS CENTER CONCEPT PLAN





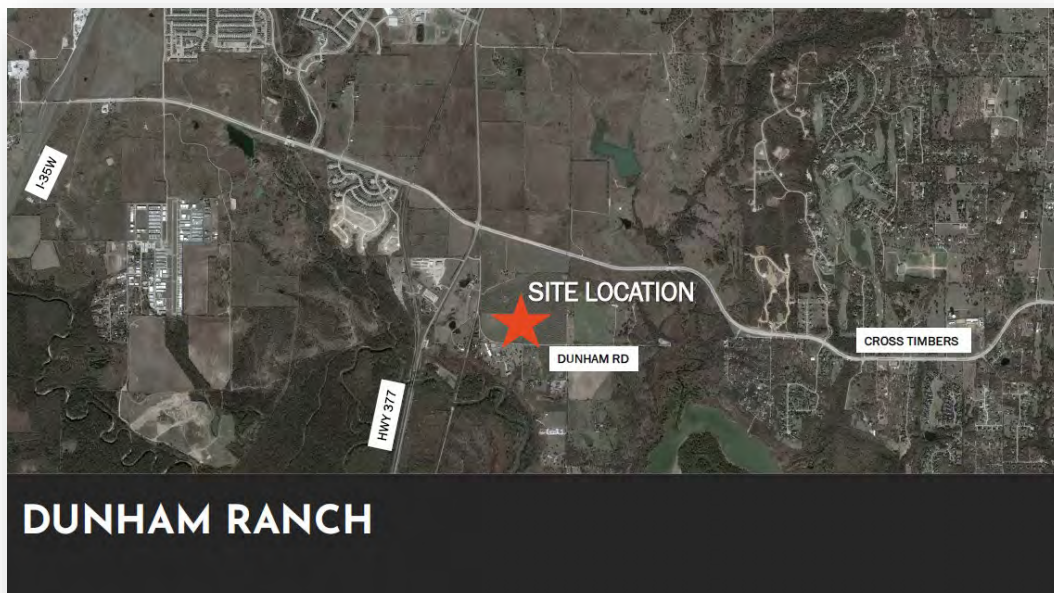
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7.5.3 LEONARD AND HELEN JOHNS COMMUNITY PARK LOCATION – SITE RATING



7.6 DUNHAM RANCH LOCATION-TENNIS CENTER CONCEPT PLAN

7.6.1 DUNHAM RANCH LOCATION SITE MAP



Tennis Center Feasibility Study | DRAFT Report

7.6.2 DUNHAM RANCH LOCATION – TENNIS CENTER CONCEPT PLAN



7.6.3 DUNHAM RANCH LOCATION – SITE RATING





7.7 TROTTER PARK LOCATION-TENNIS CENTER CONCEPT PLAN

7.7.1 TROTTER PARK LOCATION SITE MAP



7.7.2 TROTTER PARK LOCATION - TENNIS CENTER CONCEPT PLAN



7.7.3 TROTTER PARK LOCATION – SITE RATING



7.8 SITE EVALUATION SUMMARY

The following provides a snapshot summary of the four locations for a possible Tennis Center in Flower Mound.

1. Trotter Park Location - Viable with an overall rating score of 8.6 out of 10

- Developable land in central location with road access
- Estimated Construction Cost: +/- \$13M
- Flower Mound residents favor this site as the location for a potential Tennis Center by a 2 to 1 margin over Dunham Ranch

2. Dunham Ranch Location - Viable with an overall rating score of 7.1 out of 10

- Developable land west of Town with no existing utilities or road access
- Estimated Construction Cost: +/- \$15M

3. Community Activity Center Location - Not Viable

4. Leonard & Helen John's Community Park Location - Not Viable

Among the four locations studied, the consulting team recommends Trotter Park as the most viable location for a potential Tennis Center in Flower Mound.



7.9 CONSTRUCTION COST ESTIMATE

The table below provides a cost estimate of the construction costs of a Tennis Center at Trotter Park. The cost estimate is based on April 2022 dollars and drawn from current cost estimates for a similar project that is currently in the final phases of design in Garland, Texas.

Trotter Tennis Center Construction Estimate	
Total Construction =	\$ 10,100,000.00
Contingency and CMT (15%) =	\$ 1,515,000.00
Survey and Design (10%) =	\$ 1,161,500.00
OVERALL TOTAL =	\$ 12,776,500.00

Cost estimating assumptions and a detailed construction cost estimate for a Tennis Center at Trotter Park can be found in Appendix A of this document.



7.10 TROTTER PARK TENNIS CENTER CONCEPT PLAN RENDERINGS





Flower Mound, Texas



Tennis Center Feasibility Study | DRAFT Report



Chapter Eight - OPERATIONAL AND FINANCIAL PLAN

8.1 OPERATIONAL STANDARDS

The Operational Standards for a Tennis Center start with a clear philosophy that the Town would consider the development of a Tennis Center to achieve three key goals.

1. Meet the local community drop-in play, leagues and tournaments needs for tennis and pickleball for youth, teens, adults and seniors.
2. A Tennis Center can be an economic driver for local economy by providing local retail operations revenue from the sale of food, lodging and retail purchasing from users who play in the local tournaments and showcases at the facility.
3. Demonstrate to potential residents and businesses that Flower Mound has a high quality of life and has invested in quality of life amenities that will attract people to want to live in the area.

To accomplish these three goals the Town must be willing to invest in the capital costs and operational costs and to determine the right management strategy to oversee and maintain a Tennis Center.

If this is accomplished, a Tennis Center will achieve the expectations outlined in this feasibility study. The Town should consider self-operating the facility versus being a facility provider. The Parks and Recreation Department has the skill set to manage this resource within these standards.

The Parks and Recreation staff must operate a Tennis Center like a revenue center, similar to the operations at the Community Activity Center and Twin Coves Park, in that they choose to operate the facility through the lens of a business. This will require that the programs, leagues, tournaments and clinics are priced to market rates and managed to the quality that users will expect when they visit the facility. This would be a “higher” standard by which the facility is operated and much higher level than currently exists at Leonard and Helen Johns Community Park.

The Town must strike a balance between local use (drop-in play, leagues, smaller tournaments) and the attraction of regional tournaments and aggressively marketing a Tennis Center as a high end destination facility.

8.2 MANAGEMENT OPTIONS OF A TENNIS CENTER

The Town of Flower Mound should consider two options for the management of a Tennis Center.

8.2.1 PREFERRED OPTION - SELF-OPERATE

This would be the preferred option from the Consulting Team’s perspective. Under this arrangement the Town is the operator of the facility and would receive some level of taxpayer funding to manage and maintain the Tennis Center, similar to the operations of the Community Activity Center and Twin Coves Park.

If the Town self-operates, they would take over ownership of developing the leagues and tournaments for the new site and build public support the value of offering youth and adult sports on the site. They also are able to control all the revenues for the site including revenues from the leagues and tournaments held at the Tennis Center. The Town has an excellent maintenance staff that can manage the site and have best practice operational standards that will allow them to successfully manage, drop-in play, programs, leagues, tournaments and clinics.

One caveat of this operational model is that the Town would contract with a private operator for the development and administration of all teaching components that take place at a Tennis Center, including but not limited to group and private tennis and pickleball lessons, camps and clinics.

8.2.2 ALTERNATIVE OPTION - CONTRACT THE MANAGEMENT OF A TENNIS CENTER

This option provides the opportunity for the Town to contract with a private operator to manage a Tennis Center for a percentage of the gross. This arrangement would be similar to that of the Southlake Tennis Center in Southlake, Texas. As guided by an operating agreement, the Town's percentage of annual revenue received from this arrangement is 15-25%, which would cover the Town's maintenance and utility costs for a Tennis Center. The key to this option is finding an operator who has the expertise to manage a Tennis Center to its highest use and is willing to invest in marketing of the site and programming the site year-round. The operator would schedule all games, develop the leagues, clinics and tournaments for the Town and manage the concession operations. Risks of this option include the residents of Flower Mound being charged user fees that might be charged higher than those charged by the Town if it self-operated the facility.

8.3 OPERATING ASSUMPTIONS OF SELF-OPERATED TENNIS CENTER

8.3.1 STAFFING MODEL

The following staffing model is provided to give the Town an understanding of the staffing investment needed to self-operate the Tennis Center. The goal of the Tennis Center is to be as self-sufficient as possible and to become an economic tool for the Town for weekend tournaments while still serving the local community.

The structure recommended for the Tennis Center is similar to the staffing model for the Town-operated Community Activity Center and Twin Coves Park:

- Full-time Tennis Center Manager - 1
- Tennis Center Program Supervisor - 1
- 3,300 hours of part-time seasonal employees
- Contract out to Tennis Professional the operations of the "teaching program" – lessons, camps, clinics, etc.
 - Contractor would receive approximately 80% of revenue generated from group lessons/camps/clinics and 90% of revenue from private lessons.
- Grounds Maintenance would be provided by Town of Flower Mound's Parks Division and expenditures associated with this function should be included in the operating budget of a Tennis Center
- PLEASE NOTE: Further evaluation will need to be undertaken in the next Parks and Recreation Master Plan to determine if expansion of department executive management staff is necessary in light of the growing parks and recreation system.



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8.3.2 OPERATING HOURS

It is anticipated that a Tennis Center would operate 12 months per year and approximately 82 hours. Anticipated operating hours of a Tennis Center are as follows:

- Monday - Friday 8 am to 9 pm
- Saturday 8 am to 6 pm
- Sunday 11am to 6 pm (Summer hours 8am-3pm)
- Holiday Hours will vary depending upon the holiday from being closed to reduced hours.

8.3.3 MEMBERSHIP TO THE TENNIS CENTER

Similarly to other city/town owned tennis centers in the DFW metroplex, there will be no charge to have a membership account to a tennis center in Flower Mound. However, a membership account will be required of all patrons in order to:

- Reserve tennis and pickleball courts.
- Participate in programs, clinics, lessons, and camps offered at the Tennis Center.
- Participate in in-house leagues.

8.3.4 TENNIS AND PICKLEBALL COURT MAINTENANCE STANDARDS

The following best practice maintenance standards are desired for a Tennis Center with Hard Tennis Court (Asphalt/Concrete) with cushion systems or standard acrylic paint:

DAILY MAINTENANCE

There is no daily maintenance required for hard tennis courts (asphalt or concrete), other than occasionally blowing or brushing leaves and debris off the court.

AS NEEDED MAINTENANCE – SWEEPING AND WATER REMOVAL

A hard tennis court should be swept clean of any dirt or debris on a weekly basis. Leaves, twigs and plant material left on the court may stain the court and can also result in a tripping or slipping hazard. If play is desired shortly after a rain, a water removal unit will be necessary. The following products are recommended for sweeping and removing water on hard tennis/pickleball courts:

- Push Broom Aluminum Handle 36" Complete
- Rol-Dri Master Complete Water Remover

ANNUAL MAINTENANCE – PRESSURE WASHING

A hard tennis court should be pressure washed at least annually to remove built up mildew, dirt etc.

LONG-TERM MAINTENANCE AND UPKEEP

Hard tennis courts (asphalt/concrete) should be resurfaced every 5-7 years. Resurfacing consists of the following steps:

- Crack repair, which can entail filling in cracks or installing a fiberglass membrane over the cracks.
- Patching of low areas and depressions that hold water.
- Application of acrylic “resurfacer” to cover minor imperfections in the surface.
- Application of cushion materials, if required.
- Application of acrylic court paint.
- Application of acrylic line paint and line sealer.

Additional maintenance standards, for the grounds of, and other amenities constructed as part of a tennis center, can be found in the 2017 Flower Mound Parks and Recreation Master Plan.

8.4 FINANCIAL PLAN – TROTTER PARK TENNIS CENTER

PROS Consulting reviewed the concept plans for the Trotter Park Tennis Center to determine revenue sources to develop, operate and maintain a Tennis Center. A Tennis Center of this magnitude should incorporate this business plan/feasibility study for daily operations and revenue management of the site to achieve the desired outcomes of all parties involved. This will include partnership agreements between all entities using the site. The pro forma identifies appropriate levels of staffing, supply and maintenance costs, asset management costs and revenue management requirements desired by the Town.

8.4.1 CAPITAL FUNDING SOURCE OPPORTUNITIES

The following funding sources can provide revenue opportunities for the Town, but it will take a dedicated staff person to investigate and pursue the source and manage for the future. The following are funding sources that can be developed for the Tennis Center:

- **Redevelopment Funding:** Redevelopment money from the County or the State to promote sports tourism and for economic development in the area. Redevelopment agencies are typically located as part of cities and counties in most states and this could be a good source to draw on for the capital costs needed for developing the site.
- **Dedicated Sales Tax:** A dedicated sales tax of \$0.1 cent on food and beverages sold in the Town could to be dedicated to a Tennis Center.
- **Bed Tax (transient occupancy tax):** A Bed Tax (transient occupancy tax) money from the development of future hotels and motels in the Town who would directly benefit from the sports tournaments held at the site. Towns/Cities/Counties usually manage this funding source, which would require Denton and Tarrant Counties to support the funding source. This could be one or two percent added to the existing bed tax to support the development of the facility.
- **Facility Improvement District:** Cities and Towns across the United States can develop a Facility Improvement District or Business Improvement District to support a recreation sports facility due to the number of people who will use it in one location.
- **Town Bond Issue:** This would require local residents to vote on a bond issue to develop the site from property tax or sales tax commitments by residents.



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- **Lease Back Option:** The Town would enter into a lease back option with a private finance company to provide the financing for the project. The Town, along with their partners, would agree to pay the development costs back over a 30-year period from the revenues earned from the site or from general fund dollars dedicated to the project.
- **Naming Rights:** Private fundraising could be developed to fund a portion or all of it through naming rights for the site and through individual amenity naming rights. Naming rights are calculated by the number of impression points by visitors to the site. Center could raise 20%-30% of the development costs from naming rights.
- **Grants:** Grants have always been a good source for funding of parks throughout the United States. Grants can be provided by the Federal Government such as the land and conservation fund, Texas Park and Wildlife state grant funds, local grants from community foundations and United States Tennis Association (USTA) grants.
- **Establish a Facility Authority:** A Facility Authority is, at times, utilized by park and recreation agencies to improve a specific park or develop a specific improvement such as a stadium, large recreation centers, large aquatic centers and tennis centers for competitive events. The sale of these bonds usually comes from sales taxes. As an example, the City of Indianapolis has created several community venues for recreation and national competition events for local and economic purposes. The Facility Authority is responsible for managing the sites and operating them in a self-supporting manner.
- **Dedicated Millage:** This source provides the opportunity for the park and recreation system to demonstrate how well it is meeting the community's needs through a voter-approved millage. Communities demonstrate the value of parks when given the opportunity to vote on an increase.

8.4.2 OPERATIONAL FUNDING COSTS OPPORTUNITIES

Tennis centers have numerous revenue sources to draw from to support operational and management costs that include long-term capital replacement costs. The following are funding options to consider in operations of the site.

- **User/Rental fees:** User fees to use the Tennis Center. Fees can range from \$4 for reserving court time up to \$2500 for the reservation of the facility for a weekend tournament.
- **Concessions:** Resale of prepacked food and beverage items sold by the Town of Flower Mound at the Tennis Center.
- **Admission Fee:** An admission fee to an event at the Tennis Center can be utilized, similar to those charged by high schools for admittance to their sporting events.
- **Tournament Fees:** Tournament fees for pickleball and tennis can be assessed for each team who enters a tournament and can vary based on the number of matches guaranteed.
- **Official Product Sponsors:** Official product sponsors for balls, racquets, paddles, clothing, etc. can be used for the site. The value of the sponsorship can vary by how much exposure is received and the number of sales created.

- **Advertising Revenue:** Advertising revenue can come from the sale of ads on banners at the facility. The advertising could include tennis court fencing and netting, sun umbrellas over picnic tables, and in restrooms.
- **Program Fees:** Program Fees to support existing programs at each attraction can be employed in the form of lessons, clinics, camps, etc. These types of programs would help support the operations of the Tennis Center.
- **Capital Improvement Fee:** A Capital Improvement Fee on all programs and events can be added. The Tennis Center will require an on-going maintenance endowment to keep the park and amenities updated and positioned for the future. A capital asset fee of \$2-\$3 on each person who participates in a league, camp, clinic or program can be incorporated into the cost of the program or event.
- **Ball Machine Rentals:** User fee paid to rent a ball machine for practice.
- **Volunteerism:** The revenue source is an indirect revenue source in that persons donate time to assist a Tennis Center in providing a product or service on an hourly basis. This reduces the Town's cost in providing the service plus it builds advocacy.
- **Special Fundraiser:** Many agencies hold special fundraisers on an annual basis to help cover specific programs and capital projects to be dedicated to the Tennis Center.
- **Private Management of Teaching Program:** The Town should outsource the teaching program to be operated at the Tennis Center. Town would receive a percentage of revenue achieved by this funding strategy.

8.4.3 THE PARTNERING PROCESS

Flower Mound Parks and Recreation has developed partnerships over many years that have helped to support the management of parks and recreation facilities and programs services, while also providing educational and recreational opportunities for the citizens of Flower Mound. Partnership opportunities should be explored for a Tennis Center.

Potential, but not limited to, partners for the construction, operation and utilization of a Tennis Center in Flower Mound include:

- Lewisville Independent School District
- Bad Dawg Tennis - (<http://baddawgtennis.com/flower-mound-tennis/>) (current provider of tennis programs/services for Flower Mound Parks and Recreation)
- United States Tennis Association - www.usta.com

The steps for the creation of successful partnerships with the Town of Flower Mound for the creation and/or operation of a Tennis Center are as follows:

- Flower Mound Parks and Recreation will create a public notification process that will help inform any and all interested partners of the availability of partnerships with Flower Mound Parks and Recreation. This will be done through notification in area newspapers, listing in the brochure, or through any other notification method that is feasible.



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- The proposing partner takes the first step to propose partnering with Flower Mound Parks and Recreation.
 - o To help in reviewing both the partnerships proposed, and the project to be developed in partnership, Flower Mound Parks and Recreation asks for a Preliminary Proposal according to a specific format.
 - o If initial review of a Preliminary Proposal yields interest and appears to be mutually beneficial based on Flower Mound Parks and Recreation Mission and Goals, and the Selection Criteria, a Flower Mound Parks and Recreation staff person or appointed representative will be assigned to work with potential partners.
- The Flower Mound Parks and Recreation representative is available to answer questions related to the creation of an initial proposal, and after initial interest has been indicated, will work with the proposing partner to create a checklist of what actions need to take place next. The Flower Mound Parks and Recreation representative will facilitate the process of determining how the partnership will address these issues. This representative can also facilitate approvals and input from any involved Flower Mound Parks and Recreation staff member, providing guidance for the partners as to necessary steps.
- An additional focus at this point will be determining whether this project is appropriate for additional collaborative partnering, and whether this project should prompt Flower Mound Parks and Recreation to seek a Request for Proposal (RFP) from competing/collaborating organizations.
 - o Request for Proposal (RFP) Trigger: In order to reduce concerns of unfair private competition, if a proposed project involves partnering with a private "for profit" entity and a dollar amount greater than \$5,000, and Flower Mound Parks and Recreation has not already undergone a public process for solicitation of that particular type of partnership, then Flower Mound Parks and Recreation will request Partnership Proposals from other interested private entities for identical and/or complementary facilities, programs or services. A selection of appropriate partners will be part of the process.
- For most projects, a Formal Proposal from the partners for their desired development project will need to be presented for the Flower Mound Parks and Recreation's official development review processes and approvals. The project may require approval by the Legal Counsel of the Town.
- Depending on project complexity and anticipated benefits, responsibilities for all action points are negotiable, within the framework established by law, to assure the most efficient and mutually beneficial outcome. Some projects may require that all technical and professional expertise and staff resources come from outside the Flower Mound Parks and Recreation staff, while some projects may proceed most efficiently if Flower Mound Parks and Recreation contributes staff resources to the partnership.
- The partnership must cover the costs the partnership incurs, regardless of how the partnered project is staffed, and reflect those costs in its project proposal and budget. The proposal for the partnered project should also discuss how staffing and expertise will be provided, and what documents will be produced. If Flower Mound Parks and Recreation staff resources are to be used by the partnership, those costs should be allocated to the partnered project and charged to it.

- Specific Partnership Agreements appropriate to the project will be drafted jointly. There is no specifically prescribed format for Partnership Agreements, which may take any of several forms depending on what will accomplish the desired relationships among partners. The agreements may be in the form of:
 - o Lease Agreements
 - o Management and/or Operating Agreements
 - o Maintenance Agreements
 - o Intergovernmental Agreements (IGAs)
 - o Or a combination of these and/or other appropriate agreements

Proposed partnership agreements might include oversight of the development of the partnership, concept plans and project master plans, environmental assessments, architectural designs, development and design review, project management, and construction documents, inspections, contracting, monitoring, etc. Provision to fund the costs and for reimbursing Flower Mound Parks and Recreation for its costs incurred in creating the partnership, facilitating the project's passage through the Development Review Processes, and completing the required documents should be considered.

- If all is approved, the Partnership begins. Flower Mound Parks and Recreation is committed to upholding its responsibilities to Partners from the initiation through the continuation of a partnership. Evaluation will be an integral component of all Partnerships. The agreements should outline who is responsible for evaluation; the types of measures used, and detail what will occur should the evaluations reveal Partners are not meeting their Partnership obligations.

8.4.4 SIX YEAR PRO FORMA – SELF OPERATING

The following is a summary report of the revenues and expenditures for a Tennis Center over a six-year period. The breakdown of the six-year pro forma is listed in the tables that follow this summary report. The tables breakdown the revenues by category and the expenses by category. Overall the Tennis Center will be able to achieve an 85% cost recovery rate if managed to the operational and financial plans outlined in this feasibility study.

Pro Forma Revenues & Expenditures						
Flower Mound Tennis Center						
REVENUES AND EXPENDITURES						
	1st Year	2nd Year	3rd Year	4th Year	5th Year	6th Year
Revenues*						
Tennis Center Revenue	\$609,250.00	\$627,527.50	\$646,353.33	\$665,743.92	\$685,716.24	\$706,287.73
Total Revenues	\$609,250.00	\$627,527.50	\$646,353.33	\$665,743.92	\$685,716.24	\$706,287.73
Expenditures	\$719,423.75	\$741,006.46	\$763,236.66	\$786,133.76	\$809,717.77	\$834,009.30
Net Revenues Over (Under) Expenditures	(\$110,173.75)	(\$113,478.96)	(\$116,883.33)	(\$120,389.83)	(\$124,001.53)	(\$127,721.57)
Total Cost Recovery	85%	85%	85%	85%	85%	85%



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8.4.5 REVENUE MODEL

AREA OF FACILITY	PROGRAM/SERVICE	PRICE		UNITS	REVENUES	EXPLANATION
Tennis Courts	Court Rentals Residents	\$4.00	1	4,000	\$16,000.00	\$4 per person - 2 hour court rental
Tennis Courts	Court Rentals Non-Residents	\$5.00	1	2,000	\$10,000.00	\$5 per person - 2 hour court rental
Tennis Courts	Punch Cards Residents	\$50.00	1	150	\$7,500.00	30 punch card (1 punch = 1 person and not a full court rental)
Tennis Courts	Punch Cards Non-Residents	\$70.00	1	75	\$5,250.00	30 punch card (1 punch = 1 person and not a full court rental)
Tennis Courts	Youth Development Lessons	\$60.00	1	4,000	\$240,000.00	Average cost of lesson for Youth Development
Tennis Courts	Tennis Lessons/Clinics Adult	\$75.00	1	500	\$37,500.00	Average cost of lesson for Adult Lessons
Tennis Courts	Camps - Youth	\$150.00	8	20	\$24,000.00	Spring Break (1), Summer Camps (7)
Tennis Courts	Private Tennis Lessons	\$50.00	1	500	\$25,000.00	Average cost of lesson for Private/Semi-Private
Tennis Courts	Adult Leagues (In-House)	\$35.00	4	100	\$14,000.00	4 leagues per year; 100 registrants per league
Tennis Courts	Tournaments Rentals	\$2,500.00	1	10	\$25,000.00	10 tournaments per year; \$2500; 3 days per tournament
Tennis Courts	Ball Machine Rental	\$15.00	1	2,500	\$37,500.00	\$15 per hour average cost for ball machine rental - 2,500 rentals per year
Pickleball Courts	Court Rentals Residents	\$4.00	1	4,000	\$16,000.00	\$4 per 2 hour court rental
Pickleball Courts	Court Rentals Non-Residents	\$5.00	1	2,000	\$10,000.00	\$5 per 2 hour court rental
Pickleball Courts	Punch Cards Residents	\$50.00	1	100	\$5,000.00	30 punch card (1 punch = 1 person and not a full court rental)
Pickleball Courts	Punch Cards Non-Residents	\$70.00	1	50	\$3,500.00	30 punch card (1 punch = 1 person and not a full court rental)
Pickleball Courts	Group Pickleball Lessons	\$50.00	1	100	\$5,000.00	Average cost of beginner pickleball lessons; 100 participants per year
Pickleball Courts	Adult Leagues (In-House)	\$35.00	4	200	\$28,000.00	4 leagues per year; 200 registrants per league
Pickleball Courts	Tournaments Rentals	\$1,500.00	1	5	\$7,500.00	5 tournaments per year; \$1500; 3 days per tournament;
Tennis Center	Retail Sales				\$10,000.00	
Tennis Center	Racquet Stringing	\$30.00	1	250	\$7,500.00	
Tennis Center	Concessions	\$75,000.00	1	1	\$75,000.00	75,000 visitors - \$1 average spend per visitor
					TENNIS COURT REVENUE	\$441,750
					PICKLEBALL COURT REVENUE	\$75,000
					GENERAL TENNIS CENTER REVENUE	\$92,500
					TOTAL TENNIS CENTER REVENUES	\$609,250.00

REVENUE HIGHLIGHTS – TENNIS COURTS

- 6,000 Court Rentals for drop-in and league play (12,000 hours of court time rented which equates approximately to 18% of available court time).
- 5,200 Program/Camp/Lesson/In-House League Participants.
- 2,500 Ball Machine Rentals.
- 10 – Three Day “Large” Tournaments.

REVENUE HIGHLIGHTS – PICKLEBALL COURTS

- 6,000 Court Rentals for drop-in and league play (12,000 hours of court time rented – which equates approximately to 24% of available court time).
- 1,000 Program/Camp/Lesson/In-House League Participants.
- 5 – Three Day “Large” Tournaments.

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8.4.6 EXPENDITURE MODEL

Pro Forma Expenditures		
Operations and Maintenance Expenditures		
PERSONNEL SERVICES		
Tennis Center Manager	\$75,000.00	1 FT
Program Supervisor	\$58,000.00	1 FT
Part-time staff	\$82,500.00	5,5000 @ \$15 per hour
Overtime	\$2,000.00	
Employer's Share of FICA	\$13,833.00	6.36% of Salaries and Wages
Employer's Share of Medicare	\$3,240.75	1.49% of Salaries and Wages
Additional Full-Time Benefits	\$46,550.00	35% of Full Time Regular
Total	Personnel Services	\$281,123.75
OTHER SERVICES & CHARGES		
Staff Training and Travel	\$5,000.00	
Professional Association Dues	\$1,500.00	
Professional Services Contract	\$245,200.00	80% of Group Teaching Programs
Professional Services Contract	\$22,500.00	90% of Private Lesson Program
Equipment Rentals	\$2,500.00	
Equipment Repairs & Maint.	\$2,500.00	
Site Repair and Maintenance	\$10,000.00	
Office Supplies and Printing	\$1,500.00	
Uniforms	\$1,000.00	
Program Supplies and Materials	\$50,000.00	
Pro Shop Merchandise	\$7,500.00	
Furniture & Fixtures	\$5,000.00	
General Area Maintenance	\$10,000.00	
Utilities	\$20,000.00	
Concession Supplies	\$37,500.00	
Trash Collection	\$3,000.00	
Subscriptions	\$2,100.00	
Small Tools & Minor Equip.	\$5,000.00	
Janitorial Services and Supplies	\$5,000.00	
Safety Supplies	\$1,500.00	
Total	Other Services	\$438,300.00
TOTAL EXPENSES	TOTAL EXPENSES	\$719,423.75



Chapter Nine – CONCLUSION AND IMPLEMENTATION

The Town of Flower Mound Park and Recreation Department is a best practice agency that has demonstrated to the community the value of having a park and recreation system to access and take great pride in for living in Flower Mound. The Tennis Center Feasibility Study is a guide for the development of a Tennis Center for Department for the next fifteen years.

The recommendations outlined in the Tennis Center Feasibility Study are aligned with the vision, mission and core values of the community and the Department. These recommendations follow what the community has voiced as a priority. It is possible under the current conditions that all the recommended capital projects in this Feasibility Study can be completed within 3-5 years.



APPENDIX A- CONSTRUCTION COST ESTIMATE

COST ESTIMATE ASSUMPTIONS

- Assumes that the excavation for park will balance but will need an average of 2 feet of excavation over the impacted area. A topographic survey and detailed grading analysis will be required to obtain accurate grading and retaining wall quantities.
- The prices for all utilities are allowances, a detailed design analysis will be required to obtain accurate pricing.
- Assumes that a detention pond will be required. A detailed drainage analysis will be needed to determine the size of the pond.
- Assumes that an on-site commercial septic system will be needed.
- A preliminary geotechnical report will be needed to give an accurate pavement and subgrade recommendation.
- Assumes that the site will be developed as shown in the attached layout.
- Assumes the existing electrical system has capacity for a tennis facility.
- The prices in this estimate are based on recent bids on a similar project in the DFW area.
- PLEASE NOTE: This estimate was prepared prior to detailed design and engineering.



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DETAILED COST ESTIMATE

	Description	Total Cost
Start-Up and Erosion Control		
	Mobilization	\$ 450,000.00
	General Conditions	\$ 900,000.00
	Silt Fence	\$ 4,000.00
	Construction Fence	\$ 15,000.00
	Inlet Protection	\$ 1,000.00
	Rock Check Dams	\$ 2,000.00
	Total Start-Up and Erosion Control	\$ 1,372,000.00
Excavation and Demo		
	Construction Entrance	\$ 3,000.00
	Unclassified Excavation (Avg. 2' grading throughout site)	\$ 450,000.00
	Strip, Stock Pile, and Replace Ex. Topsoil (Avg. 1/2' throughout site)	\$ 150,000.00
	Misc. Clearing, and Grubbing	\$ -
	Detention Pond	\$ 80,000.00
	Total Excavation and Demo	\$ 683,000.00
Paving		
	6" Reinf. Concrete Pavement, Curb & Gutter	\$ 250,000.00
	8" Stabilized Subgrade	\$ 35,000.00
	Trail (6' wide)	\$ 100,000.00
	Trail (10' wide)	\$ 200,000.00
	6" Compacted Subgrade	\$ 30,000.00
	Barrier Free Ramps	\$ 5,000.00
	Connect to Ex. Pavement	\$ 1,000.00
	Misc. Lane Markings for Roads and Parking	\$ 1,000.00
	Total Paving	\$ 622,000.00

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	Description	Total Cost
Water		
	6" PVC Water (C900 DR14)	\$ 3,000.00
	6" Gate Valves	\$ 2,000.00
	Fire Hydrants & Assembly	\$ 6,000.00
	Trench Safety	\$ 1,000.00
	Water Line Testing	\$ 1,000.00
	Total Water	\$ 13,000.00
Sanitary Sewer		
	Commercial Septic System	\$ 35,000.00
	Total Sanitary Sewer	\$ 35,000.00
Storm Sewer		
	Storm Sewer Allowance	\$ 150,000.00
	Total Storm Sewer	\$ 150,000.00
Electric and Signs		
	Primary Electric	\$ 50,000.00
	Main Switchgear and Lighting Control	\$ 100,000.00
	Sports Lighting - Controller	\$ 10,000.00
	Trail Lights (20')	\$ 150,000.00
	Parking Lot Lights (25')	\$ 50,000.00
	Misc. Signage	\$ 20,000.00
	Misc. Electric Throughout Site	\$ 30,000.00
	Total Electric and Signs	\$ 410,000.00



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	Description	Total Cost
Landscape		
	Fine Grading, Hydromulch, and Grow-In	\$ -
	Fine Grading, Sod	\$ 100,000.00
	Irrigation- Bed	\$ 2,000.00
	Irrigation -Grass	\$ 50,000.00
	Misc. Tree Planting	\$ 20,000.00
	Misc. Landscaping	\$ 15,000.00
	Misc. Landscaping Screening	\$ 350,000.00
	Total Landscape	\$ 537,000.00
Tennis Pod - 1 Court		
	Fencing With Screening	\$ 15,000.00
	Benches with Shade Structure	\$ 25,000.00
	5' of Select Fill	\$ 40,000.00
	Post Tensioned Concrete	\$ 100,000.00
	Plexipave Surface	\$ 15,000.00
	Striping and Nets with Poles	\$ 5,000.00
	Trench Drain	\$ 5,000.00
	Pole - 1 Light	\$ 65,000.00
	Total Tennis Pod - 1 Court	\$ 270,000.00
	Total Number of Pods	\$ 270,000.00
Tennis Pod - 2 Courts		
	Fencing With Screening	\$ 25,000.00
	Benches with Shade Structure	\$ 50,000.00
	5' of Select Fill	\$ 80,000.00
	Post Tensioned Concrete	\$ 200,000.00
	Plexipave Surface	\$ 30,000.00
	Striping and Nets with Poles	\$ 10,000.00
	Trench Drain	\$ 10,000.00
	Pole - 1 Light	\$ 65,000.00
	Pole - 2 Lights	\$ 35,000.00
	Total Tennis Pod - 2 Courts	\$ 505,000.00
	Total Number of Pods	\$ 1,010,000.00

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Tennis Pod - 3 Courts	Description	Total Cost
	Fencing With Screening	\$ 30,000.00
	Benches with Shade Structure	\$ 75,000.00
	5' of Select Fill	\$ 120,000.00
	Post Tensioned Concrete	\$ 300,000.00
	Plexipave Surface	\$ 40,000.00
	Striping and Nets with Poles	\$ 15,000.00
	Trench Drain	\$ 15,000.00
	Pole - 1 Light	\$ 65,000.00
	Pole - 2 Lights	\$ 75,000.00
	Total Tennis Pod - 3 Courts	\$ 735,000.00
	Total Number of Pods	\$ 735,000.00
Tennis Pod - 4 Courts		
	Fencing With Screening	\$ 35,000.00
	Benches with Shade Structure	\$ 100,000.00
	5' of Select Fill	\$ 15,000.00
	Post Tensioned Concrete	\$ 400,000.00
	Plexipave Surface	\$ 55,000.00
	Striping and Nets with Poles	\$ 10,000.00
	Trench Drain	\$ 20,000.00
	Pole - 1 Light	\$ 65,000.00
	Pole - 2 Lights	\$ 110,000.00
	Total Tennis Pod - 4 Courts	\$ 810,000.00
	Total Number of Pods	\$ 1,620,000.00



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Pickleball	Description	Total Cost
	Fencing With Screening	\$ 35,000.00
	Benches with Shade Structure	\$ 100,000.00
	5' of Select Fill	\$ 120,000.00
	Post Tensioned Concrete	\$ 300,000.00
	Plexipave Surface	\$ 40,000.00
	Striping and Nets with Poles	\$ 30,000.00
	Trench Drain	\$ 20,000.00
	Pole - 1 Light	\$ 65,000.00
	Pole - 2 Lights	\$ 110,000.00
	Total Pod - 12 Courts	\$ 820,000.00
	Total Number of Pods	\$ 820,000.00
Amenities		
	30' x 50 ' Covered Patio w/ Site Furniture	\$ 150,000.00
	Administration Building w/ Restroom	\$ 1,200,000.00
	Shade Structure with Benches	\$ 300,000.00
	Playground	\$ 350,000.00
	Site Furniture, Amenities	\$ 100,000.00
	Center Court Terraced Espectator Area	\$ 150,000.00
	Entry Sign	\$ 50,000.00
	Wrought Iron Fence	\$ 60,000.00
	Total Amenities	\$ 2,360,000.00
Total Construction = \$ 10,100,000.00 Contingency and CMT (15%) = \$ 1,515,000.00 Survey and Design (10%) = \$ 1,161,500.00 OVERALL TOTAL = \$ 12,776,500.00		

APPENDIX B - ECONOMIC IMPACT ANALYSIS

INTRODUCTION

PROS Consulting performed an economic impact analysis to measure the economic benefit of construction and estimated tourism related to the development of the Trotter Park Tennis Center if the community chose to utilize new Tennis Center to increase sports tourism in the Town. Economic multipliers used in the analysis are from the Regional Input-Output Modeling System produced by the U.S. Department of Commerce - Bureau of Economic Analysis. A model developed in Microsoft Excel uses survey data and the regional multipliers to present the approximate economic impact on the local economy. The economic impact is expressed in terms of dollars generated in the economy and in terms of the change in the number of jobs. The multipliers in this analysis are for illustrative purposes and not specific the Flower Mound area.

SUMMARY PROJECTIONS:

The table below shows the summary of the construction and tourism economic analysis for the Tennis Center. Tourism spending is estimated at \$737,750 annually. The economic impact is \$1,018,360 of final demand value added with a local job impact of 19 full-time jobs. Final economic impact of \$12.8 Million in spending for the construction of the Tennis Center is estimated to be \$17,572,339 with a local job increase of 248 full-time jobs. The combined economic impact from tourism and construction is \$18,590,700 with a total job increase of 267.

	Economic Impact	Equivalent Jobs
Tourism Total	\$ 1,018,360	19
Construction	\$ 17,572,339	248
Total	\$ 18,590,700	267

TENNIS TOURNAMENT ASSUMPTIONS

The projected revenues from the estimated economic impact modeling are based on assumptions of events, attendance, and spending patterns. These assumptions were prepared by PROS Consulting in conjunction with the Town of Flower Mound staff and based on operational experience nationwide.

TENNIS TOURNAMENT EVENT AND ATTENDANCE ASSUMPTIONS

Tennis Tournaments are projected to have 7,500 annual participants. The analysis assumed that 10 tournaments will be held each year and an average of 750 participants per tournament.

Tournaments-Participants	
10	Tournaments
750	Participants
7,500	Estimated Participants



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PROJECTED REVENUES RELATED TO PROPOSED TENNIS TOURNAMENTS

The estimated annual revenues from Tennis Tournaments are shown below. The revenues are projected based on the estimated attendees/visitors shown previously.

Tournaments-Revenues	
<u>\$25,000</u>	Tournament Revenues
Concessions	
7,500	Estimated Participants
<u>\$25</u>	Average Revenue Per Participant
<u>\$187,500</u>	Tournament Revenues
Total Tournament Revenues	
<u>\$ 212,500</u>	Tournament Revenues



PROJECTED OUT-OF-TOWN VISITOR SPENDING RELATED TO PROPOSED TENNIS TOURNAMENTS

The estimated out-of-town visitor revenues from Tennis Tournaments are shown in the table below. Out-of-town visitors are estimated to be 20% of the total attendees/visitors. The out-of-town visitors are estimated to stay one night with average room rate of \$150 per double occupancy. The meals and retail spending are estimated to be \$75 and \$25 respectively.

The estimated economic impact revenues estimated to be \$492,500 from Tennis Tournaments are shown below.

Local spending was not considered in this analysis as money spent at the Tennis Center is likely a transfer of resources from one sector (e.g. going to the movies) within the local economy to another sector (e.g. going to the Tennis Center). The transfer of local spending from one sector to another sector within the local economy is typically accounted for as an economic growth neutral.

Total Tournament Revenues		
\$	212,500	Tournament Revenues
	20%	Estimated Percent Out-of-Town Attendees/Visitors
\$	42,500	Estimated Out-of-Town Tournament Revenues

Estimated Out-of-Town Attendee/Visitor Revenues		
	7,500	Estimated Attendees/Visitors
	20%	Estimated Percent Out-of-Town Attendees/Visitors
	1,500	Estimated Out-of-Town Attendees/Visitors
\$	150.00	Average Cost Per Room Night
	3	Occupants Per Room
\$	50.00	Per Person Room Costs
\$	75.00	Daily Spending: Meals
\$	25.00	Daily Spending: Retail, Other
\$	150.00	Daily Attendee/Visitor Spending
	2	Average Attendee/Visitor Days
\$	300.00	Average Attendee/Visitor Spending Per Event
\$	450,000	Estimated Annual Average Attendee/Visitor Spending

Estimated Total Out-of-Town Tournament Revenues		
\$	42,500	Estimated Out-of-Town Tournament Revenues
\$	450,000	Estimated Annual Average Attendee/Visitor Spending
\$	492,500	Estimated Total Out-of-Town Revenues



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The Tennis Tournament revenues are shown in the table below, grouped by the economic impact categories used by the U.S. Department of Commerce.

Out-of-Town Tournament Revenues by Category		
\$	5,000	Tournament Fees
\$	150,000	Lodging
\$	112,500	Retail
\$	225,000	Meals
\$	492,500	Estimated Total Out-of-Town Revenues

PICKLEBALL TOURNAMENT ASSUMPTIONS

The projected revenues from the estimated economic impact modeling are based on assumptions of events, attendance, and spending patterns. These assumptions were prepared by PROS Consulting in conjunction with the Town of Flower Mound staff and based on operational experience nationwide.

PICKLEBALL TOURNAMENT EVENT AND ATTENDANCE ASSUMPTIONS

Pickleball Tournaments are projected to have 3,750 annual participants. The analysis assumed that 5 tournaments will be held each year, and an average of 750 persons per tournament.

Tournaments-Participants		
	5	Tournaments
	750	Participants
	3,750	Estimated Participants

PROJECTED REVENUES RELATED TO PROPOSED PICKLEBALL TOURNAMENTS

The estimated annual revenues from Pickleball Tournaments are shown below. The revenues are projected based on the estimated attendees/visitors shown previously.

Tournaments-Revenues		
	\$7,500	Tournament Revenues
Concessions		
	3,750	Estimated Participants
	\$25	Average Revenue Per Participant
	\$93,750	Tournament Revenues
Total Tournament Revenues		
\$	101,250	Tournament Revenues

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PROJECTED OUT-OF-TOWN VISITOR SPENDING RELATED TO PROPOSED PICKLEBALL TOURNAMENTS

The estimated out-of-town visitor revenues from Pickleball Tournaments are shown previously. Out-of-town visitors are estimated to be 20% of the total attendees/visitors. The out-of-town visitors are estimated to stay one night with average room rate of \$150 per double occupancy. The meals and retail spending are estimated to be \$75 and \$25 respectively.

The estimated economic impact revenues estimated to be \$245,250 from Pickleball tournaments are shown in the table on the following page.

Local spending was not considered in this analysis as money spent at the Tennis Center is likely a transfer of resources from one sector (e.g. going to the movies) within the local economy to another sector (e.g. going to the Tennis Center). The transfer of local spending from one sector to another sector within the local economy is typically accounted for as an economic growth neutral.

Total Tournament Revenues		
\$	101,250	Tournament Revenues
	20%	Estimated Percent Out-of-Town Attendees/Visitors
<u>\$</u>	<u>20,250</u>	Estimated Out-of-Town Tournament Revenues

Estimated Out-of-Town Attendee/Visitor Revenues		
	3,750	Estimated Attendees/Visitors
	20%	Estimated Percent Out-of-Town Attendees/Visitors
	<u>750</u>	Estimated Out-of-Town Attendees/Visitors
\$	150.00	Average Cost Per Room Night
	3	Occupants Per Room
<u>\$</u>	<u>50.00</u>	Per Person Room Costs
\$	75.00	Daily Spending: Meals
<u>\$</u>	<u>25.00</u>	Daily Spending: Retail, Other
\$	150.00	Daily Attendee/Visitor Spending
	2	Average Attendee/Visitor Days
<u>\$</u>	<u>300.00</u>	Average Attendee/Visitor Spending Per Event
<u>\$</u>	<u>225,000</u>	Estimated Annual Average Attendee/Visitor Spending

Estimated Total Out-of-Town Pickleball Tournament Revenues		
\$	20,250	Estimated Out-of-Town Tournament Revenues
<u>\$</u>	<u>225,000</u>	Estimated Annual Average Attendee/Visitor Spending
<u>\$</u>	<u>245,250</u>	Estimated Total Out-of-Town Revenues



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The Pickleball Tournament revenues are shown below, grouped by the economic impact categories used by the U.S. Department of Commerce.

Out-of-Town Pickleball Tournament Revenues by Category		
\$	1,500	Tournament Fees
\$	75,000	Lodging
\$	56,250	Retail
\$	112,500	Meals
\$	245,250	Estimated Total Out-of-Town Revenues

OUT-OF-TOWN REVENUE ASSUMPTIONS

Thus, the projected out-of-town revenue assumptions for the Tennis Center are a total of \$737,750 as shown below.

Spending Category	Tennis Court		Pickleball Courts	
	Tournaments		Tournaments	Total
Tournament Fees	\$ 5,000		\$ 1,500	\$ 6,500
Lodging	\$ 150,000		\$ 75,000	\$ 225,000
Retail	\$ 112,500		\$ 56,250	\$ 168,750
Meals	\$ 225,000		\$ 112,500	\$ 337,500
Total	\$ 492,500		\$ 245,250	\$ 737,750

As noted previously, the assumptions have been intentionally conservative and local spending has not been considered in this analysis in order to accurately depict new revenue and economic impact being driven by these facilities and not simply a transfer from one sector in the Town of Flower Mound to another.

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ECONOMIC IMPACT ANALYSIS OF PROPOSED TOWN OF FLOWER MOUND TENNIS FROM TOURISM

The economic impact multipliers used in this analysis are from U.S. Department of Commerce - Bureau of Economic Analysis, Regional Economic Analysis Division, Analysis and Special Studies Branch, Regional Input-Output Modeling System (RIMS II). The multipliers in this analysis are for illustrative purposes and not specific to the Flower Mound area. The table below shows the factors used in the analysis.

Industry Segment	(Impact of Estimated Tourism)				Direct Effect	
	Final-demand Output /1/ (dollars)	Final-demand Earnings /2/ (dollars)	Final-demand Employment /3/ (number of jobs)	Final-demand Value-added /4/ (dollars)	Direct-effect Earnings /5/ (dollars)	Direct-effect Employment /6/ (number of jobs)
Performing arts, spectator sports, museums, and related activities	1.5516	0.4508	24.8090	0.9346	1.5513	1.4887
Accommodation	1.5612	0.3952	15.6434	0.8815	0.1566	1.4207
Retail Trade	1.5236	0.4087	16.1219	0.9804	1.4547	1.3434
Food services and drinking places	1.5401	0.4179	23.6217	0.8604	1.4420	1.2095

ECONOMIC IMPACT FROM OUT-OF-TOWN VISITOR SPENDING RELATED TO PROPOSED FLOWER MOUND TENNIS CENTER

The total direct economic impact of the development of the Trotter Park Tennis Center tourism is shown in the table below. Column 1 shows the output in terms of dollars and represents the total dollar change in output that occurs in all industries for each additional dollar of output delivered to final demand by the industry corresponding to the entry. Columns 2 and 3 are estimates of the final effect earnings and employment (jobs), on the Flower Mound area. Column 2 represents the total dollar change in earnings of households employed by all industries for each additional dollar of output delivered to final demand by the industry corresponding to the entry. Column 3 represents the total change in number of jobs that occurs in all industries for each additional million dollars of output. Columns 5 and 6 show the Direct-effect Earnings and Total Jobs, respectively. Column 6 represents the total change in number of jobs in all industries for each additional job in the industry corresponding to the entry. The Final-demand Value-added factors include direct, indirect, and induced economic impacts. The economic impact of the development of the Trotter Park Tennis Center is total output of \$1,138,247 and \$1,018,360 of final demand effect value-added with a local job impact of 19 full-time jobs.

Industry Segment	Total Rev/Sales Captured by Local Region	(Impact of Estimated Tourism)				Direct Effect	
		Final-demand Output /1/ (dollars)	Final-demand Earnings /2/ (dollars)	Final-demand Employment /3/ (number of jobs)	Final-demand Value-added /4/ (dollars)	Direct-effect Earnings /5/ (dollars)	Direct-effect Employment /6/ (number of jobs)
Tennis Center Revenue (from Out of Town Guests)	6,500	10,085	2,930	0	9,426	4,546	0
Accommodation	225,000	351,270	88,920	4	309,645	13,928	5
Other Retail	168,750	257,108	68,968	3	252,068	100,328	4
Food services and drinking places	337,500	519,784	141,041	8	447,222	203,381	10
Total Annual Spending	\$ 737,750	\$ 1,138,247	\$ 301,860	14	\$ 1,018,360	\$ 322,183	19



Flower Mound, Texas

ECONOMIC IMPACT ANALYSIS OF THE TROTTER PARK TENNIS CENTER CONSTRUCTION

The construction of permanent structures has a strong positive impact of the local economy. The Town's construction of the Tennis Center is the basis for the analysis. The impact of the project was analyzed using construction impact economic multipliers from the U.S. Department of Commerce, Bureau of Economic Analysis, and Regional Input-Output Modeling System (RIMS). Each RIMS industry category has a value multiplier and a jobs multiplier. The economic impact multipliers used in this analysis are shown below. The multipliers in this analysis are for illustrative purposes and not specific the Flower Mound area.

Industry Segment	Final-demand Output /1/ (dollars)	Final-demand Earnings /2/ (dollars)	Final-demand Employment /3/ (number of jobs)	Final-demand Value-added /4/ (dollars)	Direct-effect Earnings /5/ (dollars)	Direct-effect Employment /6/ (number of jobs)
Construction	1.5737	0.4486	12.354	0.8605	1.4648	1.5723
Professional, scientific, and technical services	1.5270	0.4963	10.7786	1.0395	1.3666	1.7257

The following table illustrates the total final economic impact of the Tennis Center construction. Column 1 shows the output in terms of dollars. Columns 2 and 3 are estimates of the final effect earnings and employment (jobs), in the Town. The Final-demand Value-added in dollars is shown in Column 4. The Final-demand Value-added factors include direct, indirect, and induced economic impacts.

Industry Segment	Total Rev/Sales Captured by Local Region	Final Demand				Direct Effect	
		Final-demand Output /1/ (dollars)	Final-demand Earnings /2/ (dollars)	Final-demand Employment /3/ (number of jobs)	Final-demand Value-added /4/ (dollars)	Direct-effect Earnings /5/ (dollars)	Direct-effect Employment /6/ (number of jobs)
Construction	11,615,000	18,278,526	5,210,489	143	15,728,671	7,632,324	226
Professional, scientific, and technical services	1,161,500	1,773,611	576,452	13	1,843,668	787,780	22
Total Annual Spending	\$ 12,776,500	20,052,136	5,786,941	156	17,572,339	8,420,104	248

CONCLUSION OF OVERALL ECONOMIC IMPACT (CONSTRUCTION AND OPERATION)

Final economic impact of constructing and operating a Tennis Center in Flower Mound is estimated to be \$18,590,700 with a total job increase of 267.