AGENDA

FLOWER MOUND PARKS BOARD AND TRANSPORTATION COMMISSION

JOINT WORK SESSION & PARKS BOARD REGULAR MEETING

APRIL 7, 2022

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

6:30 P.M.

****

AN AGENDA INFORMATION PACKET IS AVAILABLE FOR PUBLIC INSPECTION ONLINE AT WWW.FLOWER-MOUND.COM/AGENDA/AGENDA.PHP

****

Comments regarding any item on this agenda can be sent to the Parks Board by Emailing: Parks@flower-mound.com or Calling: 972.874.6000

All pagers and cell phones must be turned off in the Council Chambers.

A. CALL REGULAR MEETING 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 COMMENTS

To speak to the Parks Board during public comments, please fill out a comment form.

- **Turn in form to the Administrative Assistant prior to the time the meeting is scheduled to begin and up to when the public comment portion of the meeting has concluded**
- **Speakers are limited to 3 minutes; a tone will sound at 30 seconds left and when time has expired**
- **Please state your name and address when speaking**

The purpose of this item is to allow the public an opportunity to address the Parks Board on issues that are not indicated as a "Public Hearing" on this agenda. Issues regarding daily operational or administrative matters should first be dealt with by calling Parks & Recreation at 972-874-6300 during business hours.

E. DIRECTOR'S REPORT

- Update and status report related to Parks and Recreation issues.

F. CONSENT AGENDA

This agenda consists of non-controversial, or "housekeeping" items required by law. Items may be removed from the Consent Agenda by any Board member by making such request prior to a motion and vote on the Consent Agenda.

1. Consider approval of the minutes from the Parks Board held on March 3, 2022.

G. RECESS REGULAR MEETING

H. CALL JOINT PARKS BOARD AND TRANSPORATION COMMISSION WORK SESSION TO ORDER

I. JOINT PARKS BOARD AND TRANSPORATION COMMISSION WORK SESSION ITEMS

2. Review and discuss a 90% review of the draft Trails and Bikeways Master Plan.

J. ADJOURN JOINT PARKS BOARD AND TRANSPORATION COMMISSION WORK SESSION

K. CALL WORK SESSION TO ORDER

L. WORK SESSION ITEMS

3. Presentation and discussion on the Town's Cross Timbers Conservation Development District Cluster Development Survey.

4. Review and discuss a recommendation of park projects for FY 2023-2027 to be incorporated into the Town's Five-Year Capital Improvement Projects list.

M. ADJOURN WORK SESSION

N. RECONVENE REGULAR MEETING

O. REGULAR ITEMS

P. COORDINATION OF CALENDARS AND FUTURE AGENDAS/MEETINGS

- The next regular meeting of the Parks Board is scheduled for May 5, 2022.

Q. ADJOURN REGULAR MEETING

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 posted on the following date and time: April 4, 2022 at 5:00 P.M. at least 72 hours prior to the scheduled time of said meeting.

Jade Olson

Jade Olson, Administrative Assistant

The Flower Mound Town Hall and Council Chambers are wheelchair accessible. Requests for accommodations or interpretative services must be made at least 48 hours prior to this meeting by contacting Jade Olson, Administrative Assistant at (972) 874-6425.

PARK BOARD AGENDA ITEM NO. 1

CONSENT ITEM

DATE: April 7, 2022

FROM: Jade Olson, Administrative Assistant

ITEM: **Consider approval of the minutes from a regular meeting of the Parks Board held on March, 3 2022.**

BACKGROUND INFORMATION: The Parks Board held a regular meeting March 3, 2022.

BOARD REVIEW/CITIZEN FEEDBACK: N/A

ALTERNATIVES/OPTIONS: N/A

FISCAL IMPACT: N/A

LEGAL REVIEW: N/A

ATTACHMENTS:

1. Draft minutes from the March 3, 2022 Regular Meeting of the Park Board.

DRAFT MOTION: Move to approve as presented in the agenda caption.

THE TOWN OF FLOWER MOUND PARKS BOARD REGULAR MEETING HELD ON THE 3rd DAY OF MARCH 2022, IN THE FLOWER MOUND TOWN HALL, LOCATED AT 2121 CROSS TIMBERS ROAD IN THE TOWN OF FLOWER MOUND, COUNTY OF DENTON, TEXAS AT 6:30 P.M.

The Parks Board met in a regular session with the following members present:

Scott Langley	Place 1
Teresa Thomason	Place 3 – Chair
Rick Kenyon	Place 4 – Vice-Chair
Holly Royer	Place 5
Mark Mayer	Place 6
Jennifer Romaszewski	Place 7
Preston Peterson	Place 8 – Alternate
Robert Sheets	Place 10 – Alternate

The following Board members were not in attendance:

Allen Pichon	Place 2
Brittany Bowden	Place 9 – Alternate

The following members of Town Staff were in attendance:

Chuck Jennings	Director of Parks and Recreation
Mark Long	Assistant Director of Parks and Recreation
John Habern	Parks, Trails, and Landscape Manager
Clayton Litton	Parks Superintendent
Matt Chutchian	Athletic Supervisor
Jade Olson	Administrative Assistant

A. CALL REGULAR MEETING TO ORDER – 6:30 P.M.

B. INVOCATION – Robert Sheets

C. PLEDGE OF ALLEGIANCE TO THE AMERICAN FLAG AND THE TEXAS FLAG

D. PUBLIC COMMENTS

KC Walsh – 2120 Helmsford Dr. spoke in opposition of the Cummings Ranch development.

E. PRESENTATIONS

Joe Whiteley, Environmental Review Analyst, provided the Board with information in regards to certifying parks in Flower Mound offered though the National Wildlife Federation.

Matt Chutchian, Athletic Supervisor, introduced David Gray and Chris Brown to represent Bad Dawg Tennis. The Board was updated with Bad Dawg Tennis's operations in regards to youth and adult tennis.

F. DIRECTOR'S REPORT

Chuck Jennings, Director of Parks and Recreation had the following announcements and provided a power point presentation on park development updates:

- All infields as Bakersfield Park and Gerault Park have been renovated.
- The athletic crews are busy as the spring season sports leagues have started.
- The Town is currently out to bid on the Landscape Maintenance Contract.
- Tomorrow staff will host 5 LISD high school students for career out day.
- The Citizens Academy will be on Saturday starting at the Senior Center.
- Still no update on Peters Colony Memorial Park. We are still waiting on funding.
- On April 18th there will be an update with at the Council meeting for the Parks Board and CDC.
- Rheudasil Park construction is still underway.
- Canyon Falls Park construction is still underway. The park is anticipated to be complete by May of 2022.
- Heritage Park has received the life floor, shade structures, and the synthetic turf. The adult fitness area project is in process.
- The playground and pavilion have been ordered for Grand Park and the construction award will be on the March 7 council agenda
- The dog park restroom and parking lot project has been completed.
- Culwell Park, Shadow Ridge, Colony Park, Prairie Trail Park, and Lone Tree Park playgrounds received new safety surfacing.
- Glenwick Park baseball field and tennis court are getting new LED lights. Leonard and Helen Johns tennis courts are also getting new LED lights.
- The Trails and Bikeways Master Plan is anticipated to be completed and presented to Board and Commissions in May or June.

Mark Long, Assistant Director of Parks and Recreation had the following announcements:

- On Friday, February 25 the Town announced Randy Rogers Band as the headline act for Independence Fest 2022
- Terri Lee, Recreation Services Recreation Specialist, was named the 2021 CAC Employee of the Year. Chosen by full-time staff. The award is given to one part-time staff member who shows continued dedication to their job and regularly goes above and beyond throughout the year.
- Early Summer Camp registration begins for CAC Members at 9 a.m. on Monday, March 14
- Due to a lifeguard shortage, the Community Activity Center's indoor pool will run on an adjusted scheduled beginning this Friday, March 4, until further notice. The pool will operate with a delayed open of 8 a.m. on M/W/F.
- Please join the Denton County Indian Cultural Association and the Town of Flower Mound to celebrate Holi: Festival of Color on Saturday, March 19 from 10 – 3 p.m. at Heritage Park. The festival will include music, dance performances, drum performances, food trucks, community mural, children's activities, and, of course, a color throw!
- TCP Manager, Brian Vonderlin returned last week from South Carolina where he completed the Outdoor Hospitality Professional certification program through the

National School of RV and Campground Management. Deep dive into operations, law, HR, and marketing. He's already asking to do a lot of what he learned.
- Art Selection Committee met on Tuesday, March 2nd to discuss and select three designs for the 2022 Traffic Signal Box Art Project.
- Arts Festival. Vendor applications are being accepted

G. CONSENT AGENDA

1. Consider approval of the minutes from a special meeting of the Parks Board held on February 16, 2022.

Board Deliberation
Board Member Mayer moved to approve as presented in the agenda caption. Board Member Romaszewski seconded the motion.

VOTE ON THE MOTION

AYES: Langley, Peterson, Kenyon, Royer, Mayer, Romaszewski
NAYS: None

H. RECESS REGULAR MEETING

I. CALL WORK SESSION TO ORDER

J. WORK SESSION ITEMS

2. Review and discuss updated plans and operational analysis of a tennis center as part of the tennis center feasibility study.

Staff Introduction
Chuck Jennings – Director of Parks & Recreation

Pros Consulting
Mike Svetz

Mike Svetz discussed operational plans, economic impacts, and the few adjustments to one of the locations on the concept plan.

Susan Johannes – 125 Forest Oak Ct, Double Oak, TX 75077 – chose not to speak but was in support of a Tennis Center.

K. ADJOURN WORK SESSION

L. RECONVENE REGULAR MEETING

M. REGULAR ITEMS

3. Consider recommending to Planning and Zoning Commission and Town Council Park Land Dedication and Park Development Fee requirements for the Cummings Ranch residential development generally located north of Cross Timbers Rd. and west of Shiloh Rd.

Staff Presentation
John Habern – Parks, Trails, and Landscape Manager

Ridinger Association
Jason Kilpatrick

Board Deliberation
Vice Chair Kenyon made a motion to recommend approval to Planning and Zoning and Town Council Park Land Dedication of the area as defined in the drawing at the meeting and with the following additional items: a 50ft scenic landscape buffer along 1171 will be part of the HOA as a maintenance easement and the standard landscape buffer along Red Rock Ln and the Collector Rd also as an HOA maintenance easement, and along the back of the homes in the area detailed will also be HOA maintenance easement, and all land that will become HOA maintained will remain publicly accessible, and Park Development Fees in the amount of $302,584.00 for the Cummings Ranch residential development generally located north of Cross Timbers Rd. and west of Shiloh Rd. Board Member Mayer seconded the motion.

VOTE ON THE MOTION

AYES: Romaszewski, Mayer, Royer, Kenyon, Peterson
NAYS: Langley

N. COORDINATION OF CALENDARS AND FUTURE AGENDAS/MEETINGS

- The next regular meeting is scheduled for April 7, 2022.

O. ADJOURNMENT

Board Member Royer made a motion to adjourn the meeting. Board Member Peterson seconded the motion.

Chair Thomason adjourned the Special Meeting at 8:58pm.

TOWN OF FLOWER MOUND, TEXAS

Teresa Thomason, Chair

ATTEST:

Jade Olson, Administrative Assistant

PARKS BOARD
TRANSPORTATION COMMISSION
JOINT WORK SESSION ITEM NO. 2

DATE: April 7, 2022
FROM: Chuck Jennings, Director of Parks and Recreation
WORK SESSION ITEM: **Review and discuss a 90% review of the draft Trails and Bikeways 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, 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 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). The website will remain active three months after the completion of the project. Civic Brand worked with Halff and Town staff to create 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 their 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 the upcoming meeting dates:

- April 7 Parks Board / Transportation Commission – Joint Work Session
- April 11 Planning & Zoning Commission – Work Session
- April 21 Town Council – Work Session
- May 5 Parks Board – Public Hearing
- May 10 Transportation Commission - Public Hearing
- May 23 Planning & Zoning Commission - Public Hearing
- 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.

Fiscal Impact: N/A

Legal Review: N/A

Attachments:

1. Draft Trails and Bikeways Master Plan (90% complete)
2. Draft Prioritization Maps

Draft Motion: This item is for discussion purposes only.

Attachment 1



THE TOWN OF FLOWER MOUND Parks & Recreation

DRAFT APRIL 2022

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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Mayor Derek France
Adam Schiestel
Sandeep Sharma
Ben Bumgarner
Jim Engel
Ann Martin

PARKS BOARD

Teresa Thomason (Chair)
Rick Kenyon (Vice Chair)
Scott Langley
Allen Pichon
Holly Royer
Mark Mayer
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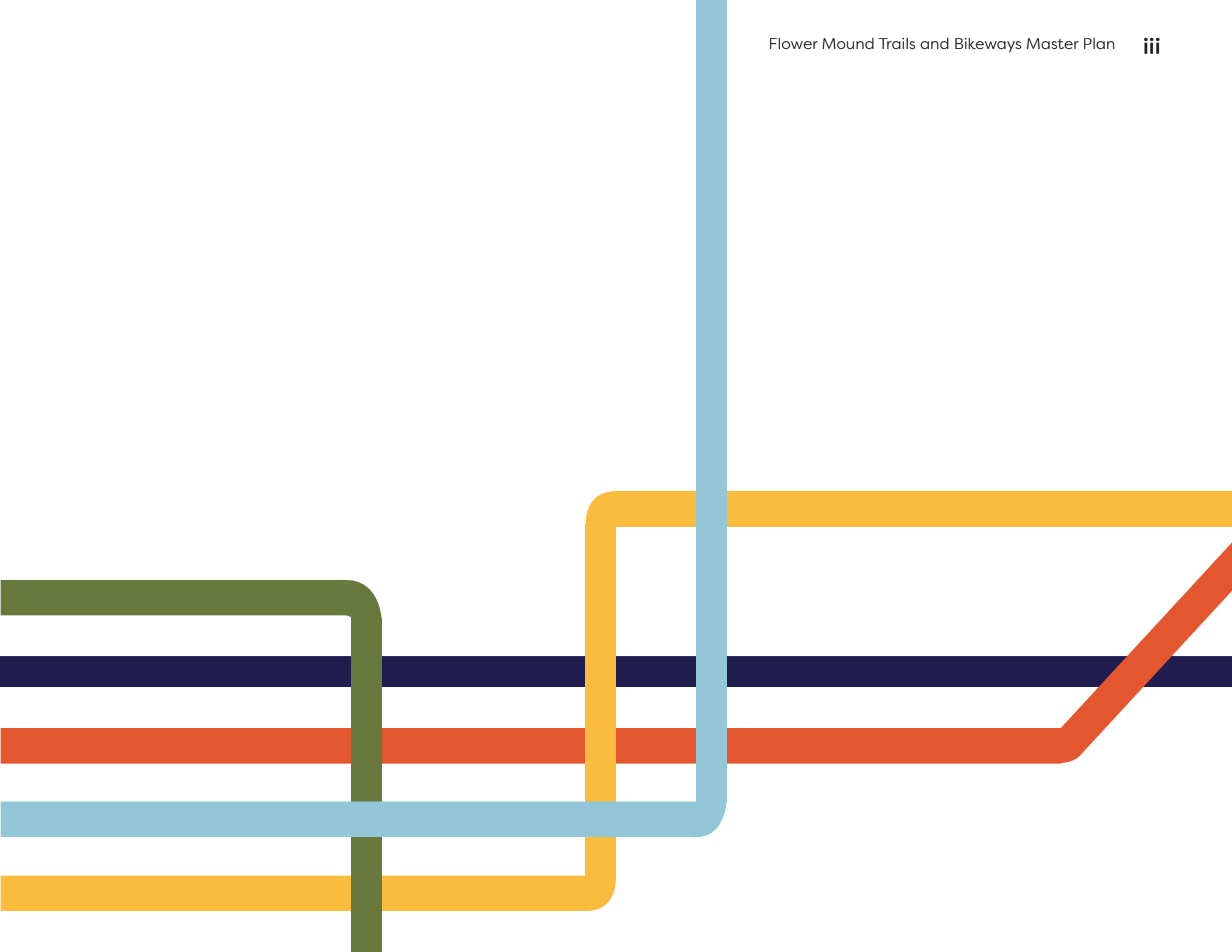


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LIST OF ACRONYMS

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



VISIONING PUBLIC OPEN HOUSE


HERITAGE PARK

INTRODUCTION

The Town of Flower Mound Trails and Bikeways Master Plan serves as a blueprint for the future implementation of on-street bikeways and off-street trail facilities 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 2045[1]. 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.



BLUEBONNET TRAIL

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



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

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.

ECONOMIC BENEFITS

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

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.

SOCIAL BENEFITS

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

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.

SAFETY BENEFITS

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

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.

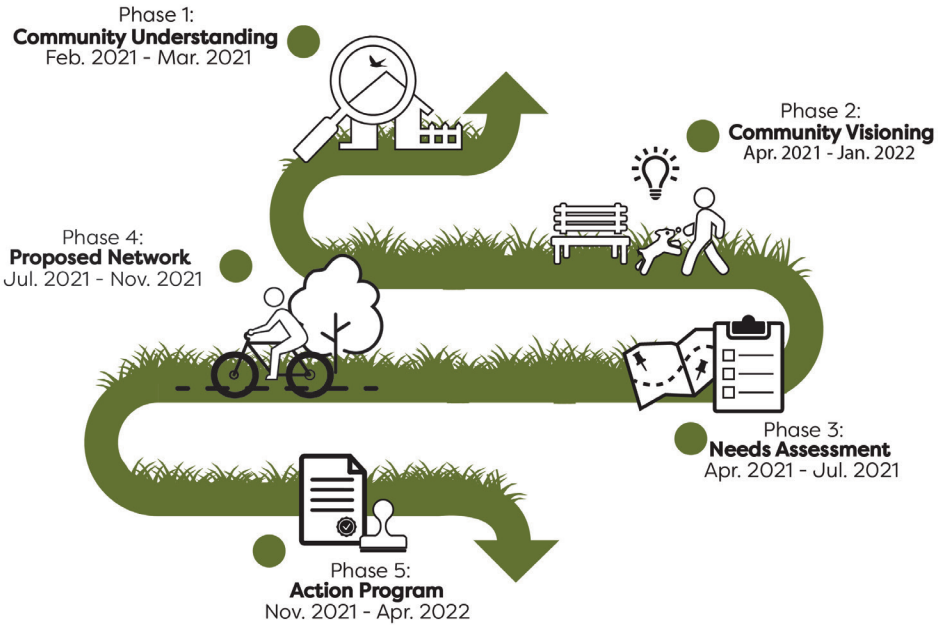
Phase 4: Proposed Network

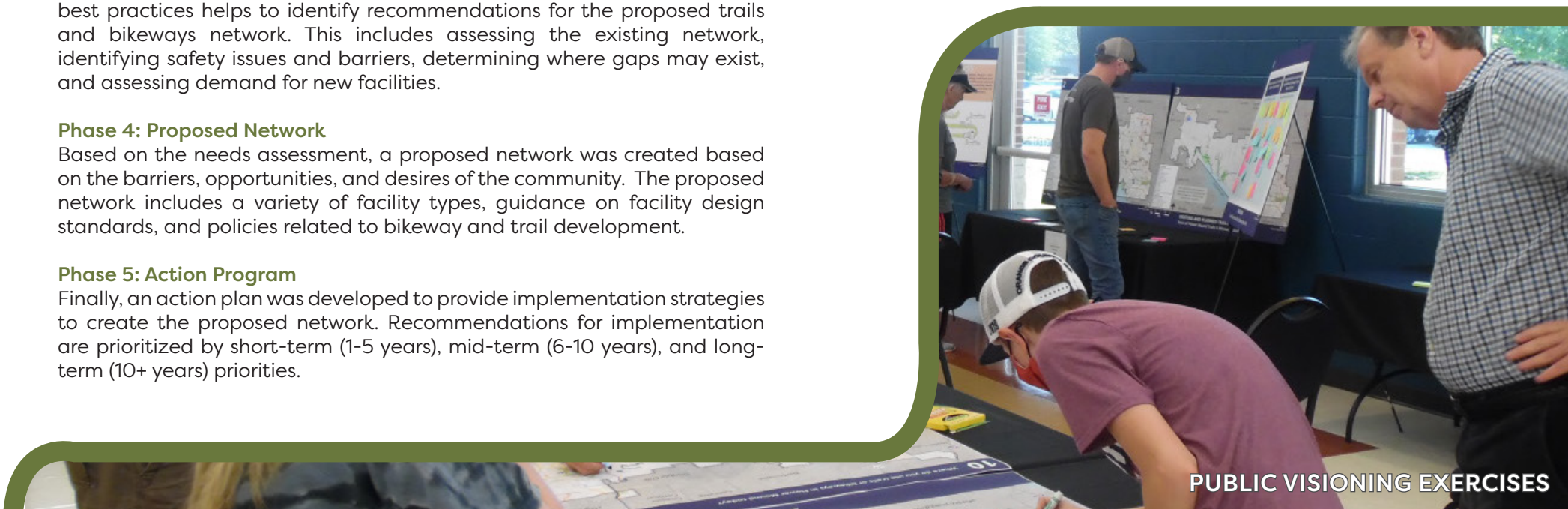
Based on the needs assessment, a proposed network was created based on the barriers, opportunities, and desires of the community. The proposed network includes a variety of facility types, guidance on facility design standards, and policies related to bikeway and trail development.

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.

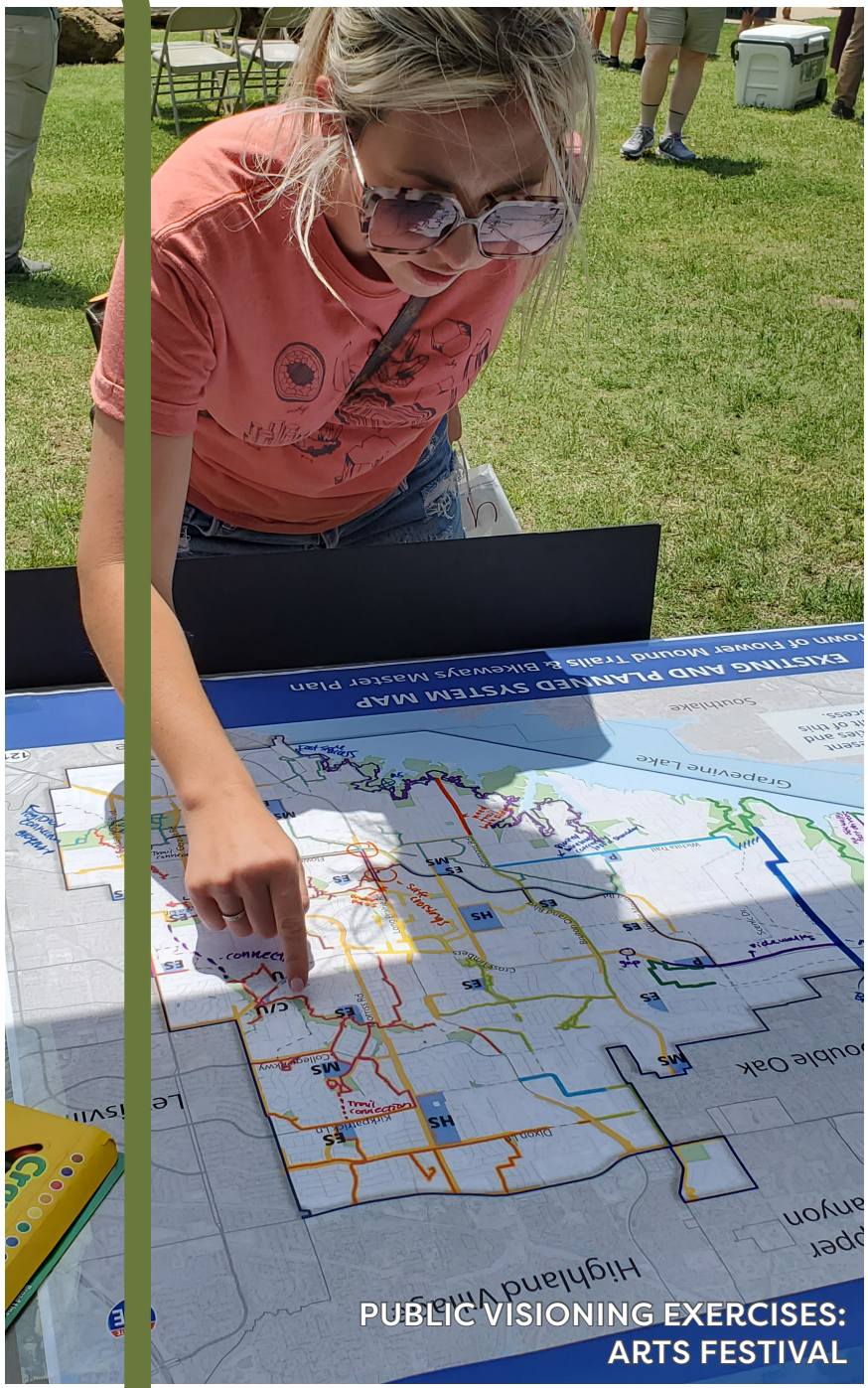
PLAN VISION

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



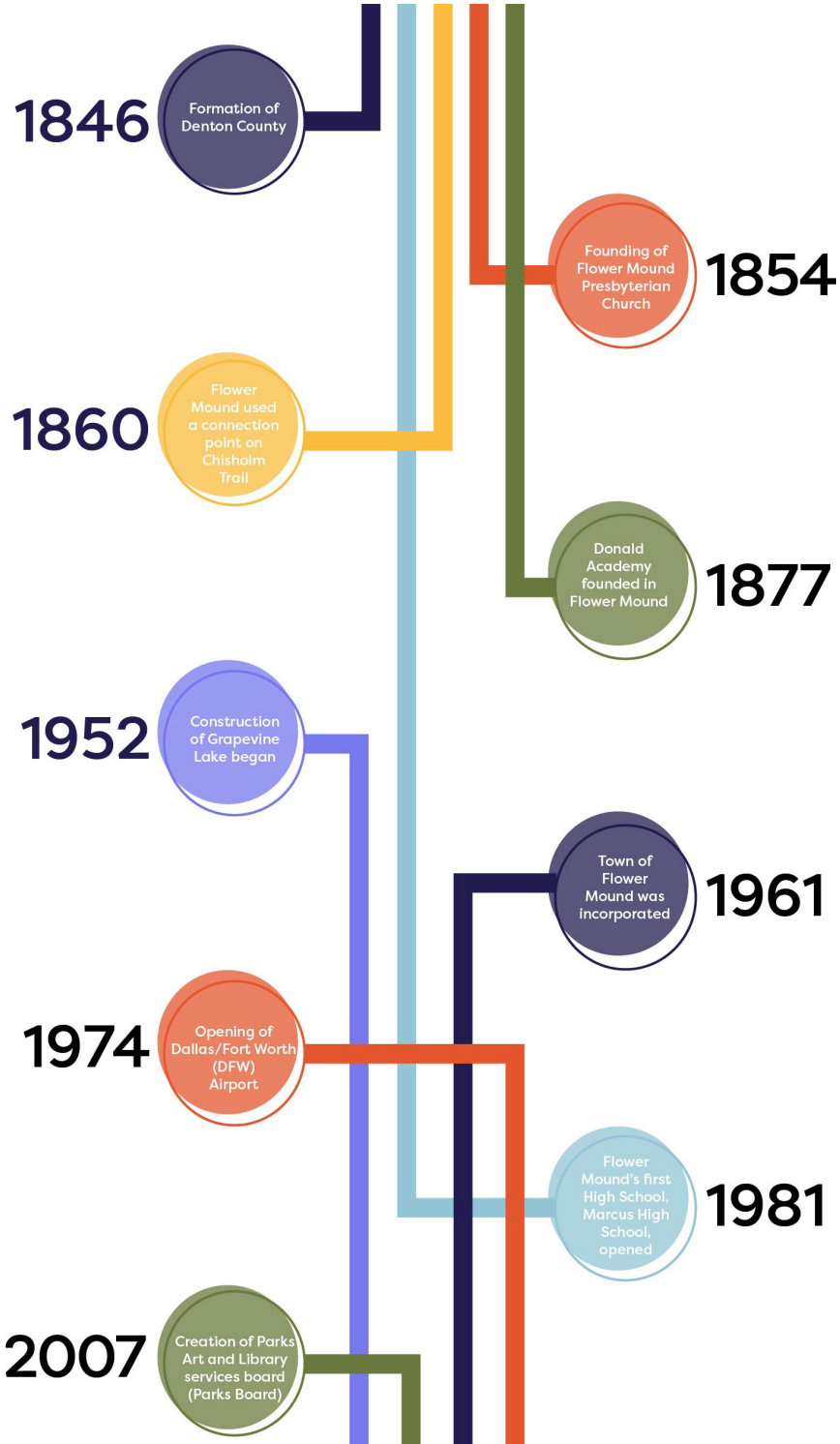
HISTORY

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

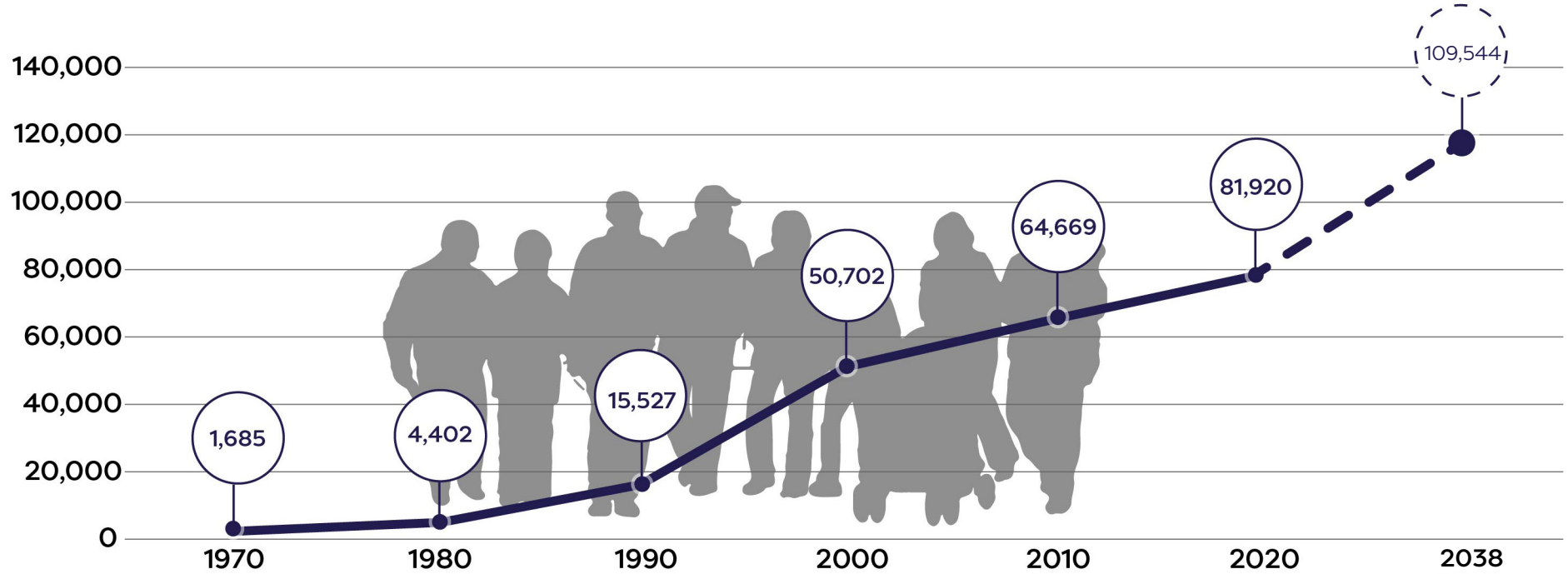
The demographic makeup of a community is significant in the beginning of the planning process. Demographic characteristics such as population growth, age, gender, race, and income help paint the landscape of a community and contribute to what the needs are for different trails and bikeways.

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% 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% increase over the next 20 years.



FIGURE 2.2: FLOWER MOUND POPULATION GROWTH



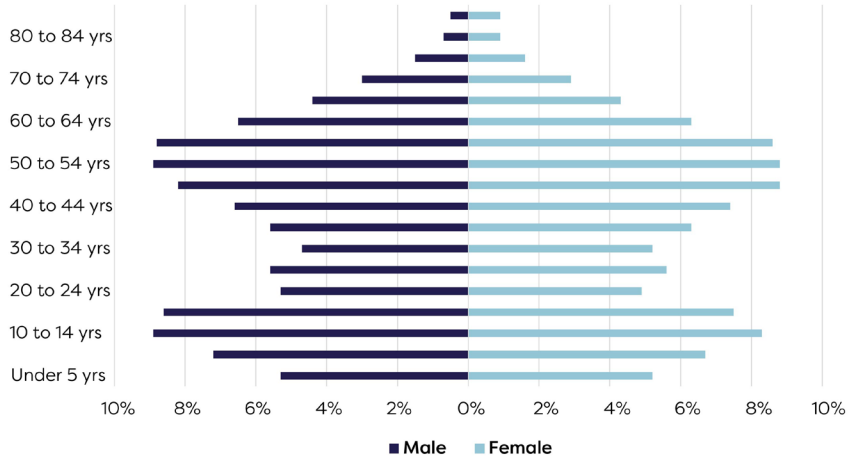
Source: Town of Flower Mound Planning Department

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.

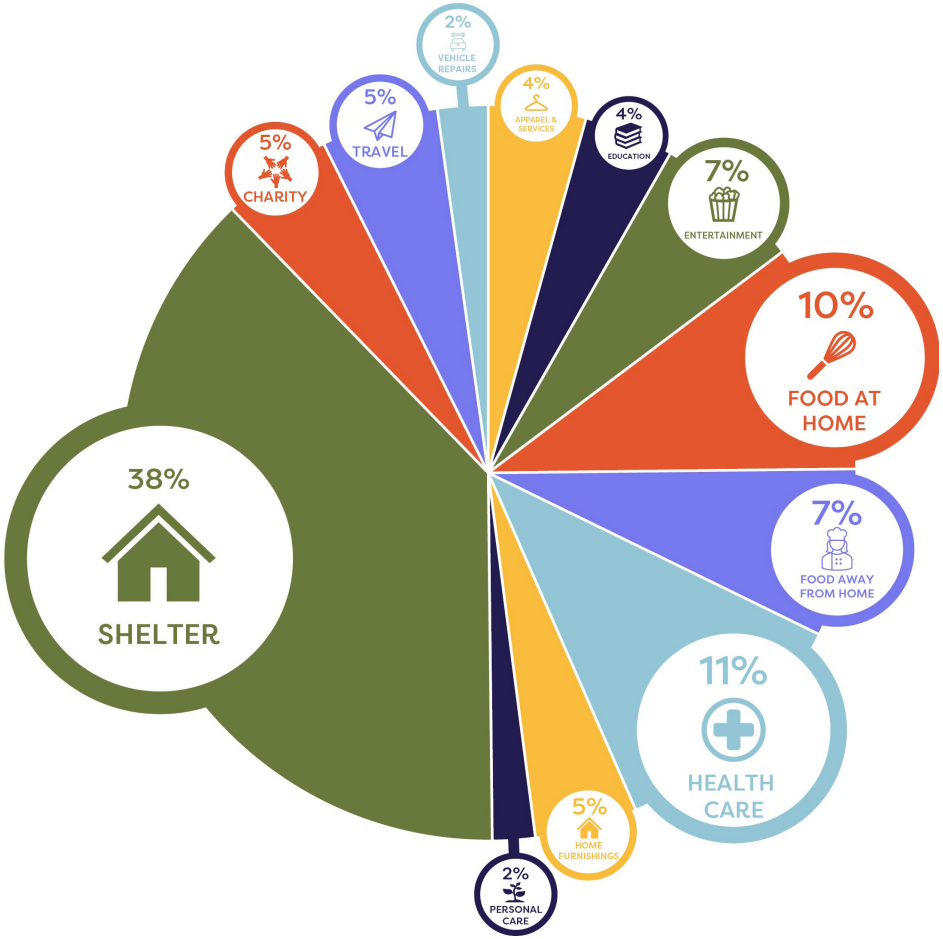
Figure 2.4 displays Flower Mound's consumer spending in 2020. Consumer spending shows the amount spent on a goods and services by households in Flower Mound in the year of 2020. The largest category individuals in Flower Mound spent money on was towards their houses (38 percent). The second largest category 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.%
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



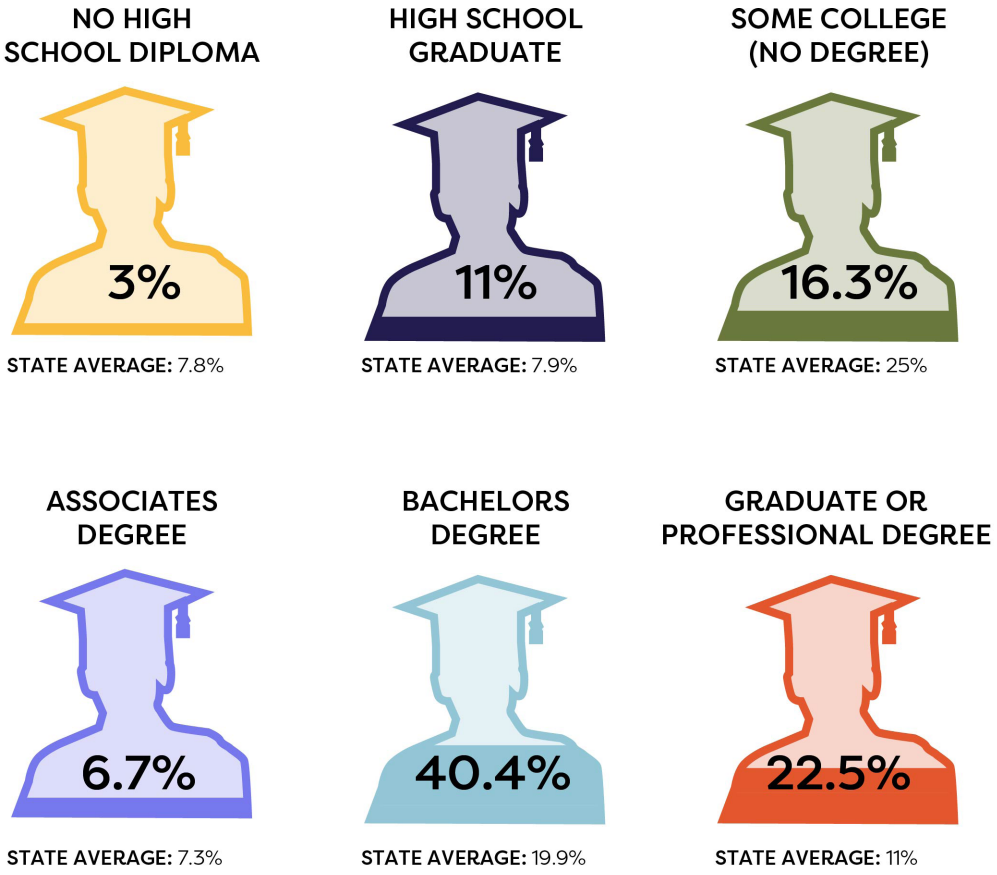
Source: U.S. Census Bureau, Census 2010 Summary File 1. ESRI forecasts for 2020.



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



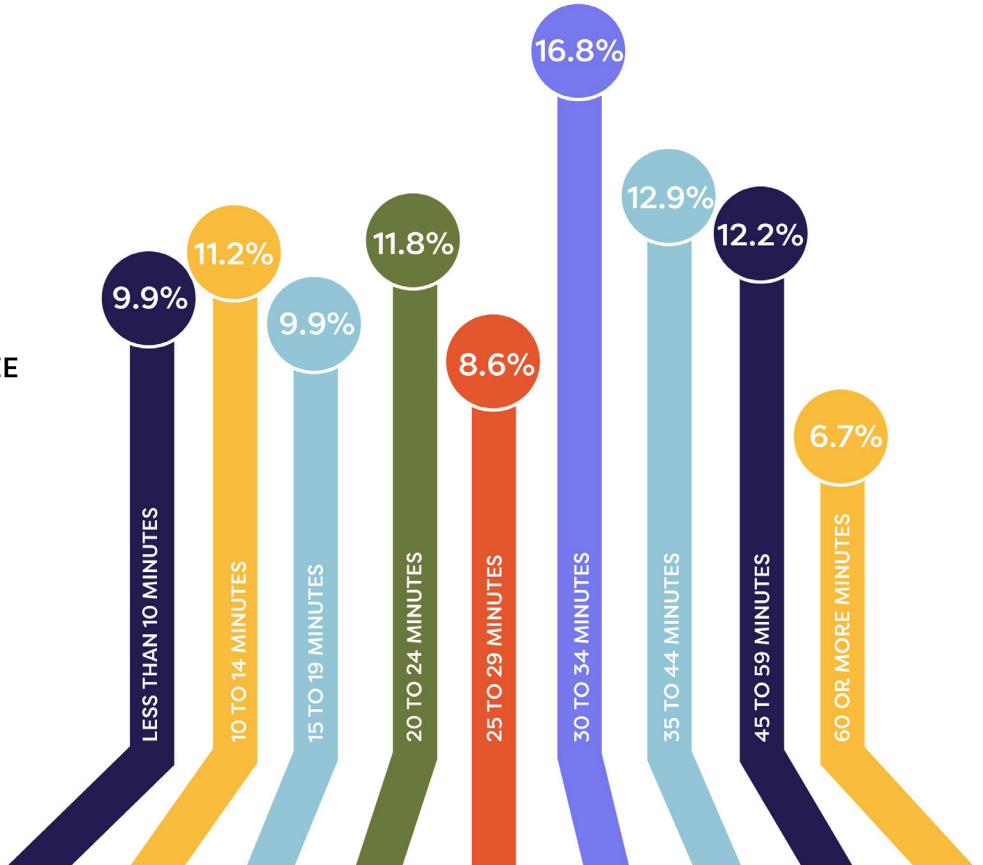
Source: U.S. Census Bureau, Census 2010 Summary File 1. ESRI forecasts for 2020.

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.



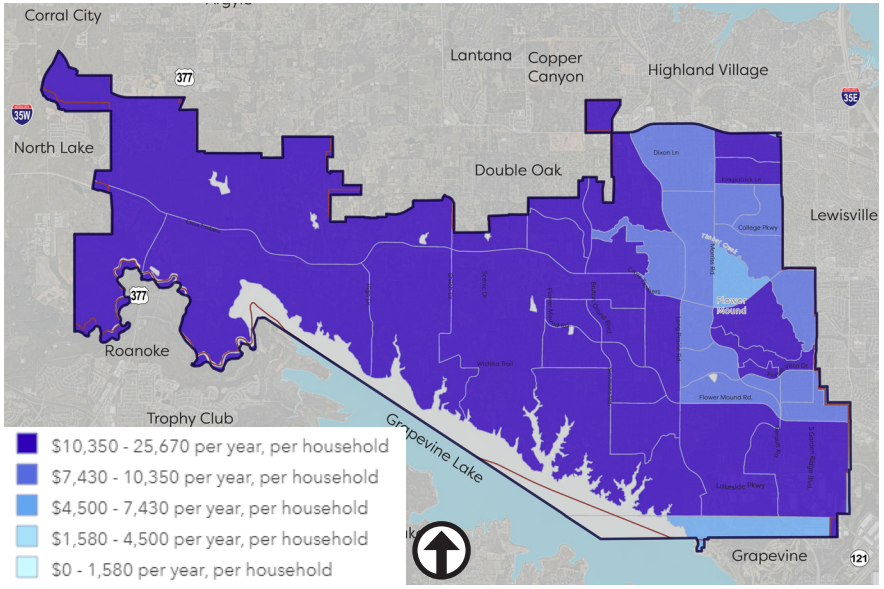
HEALTH

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.

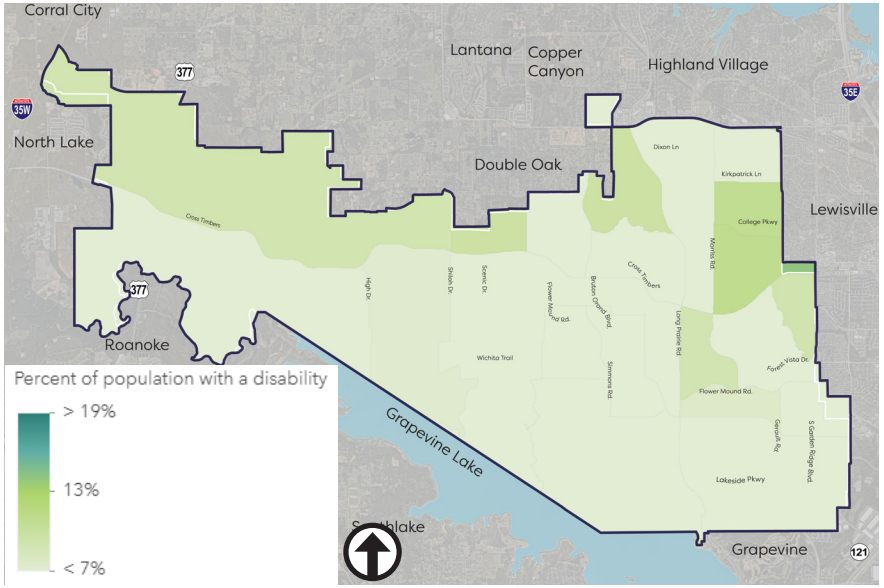


FIGURE 2.7: HEALTH SPENDING, 2021



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

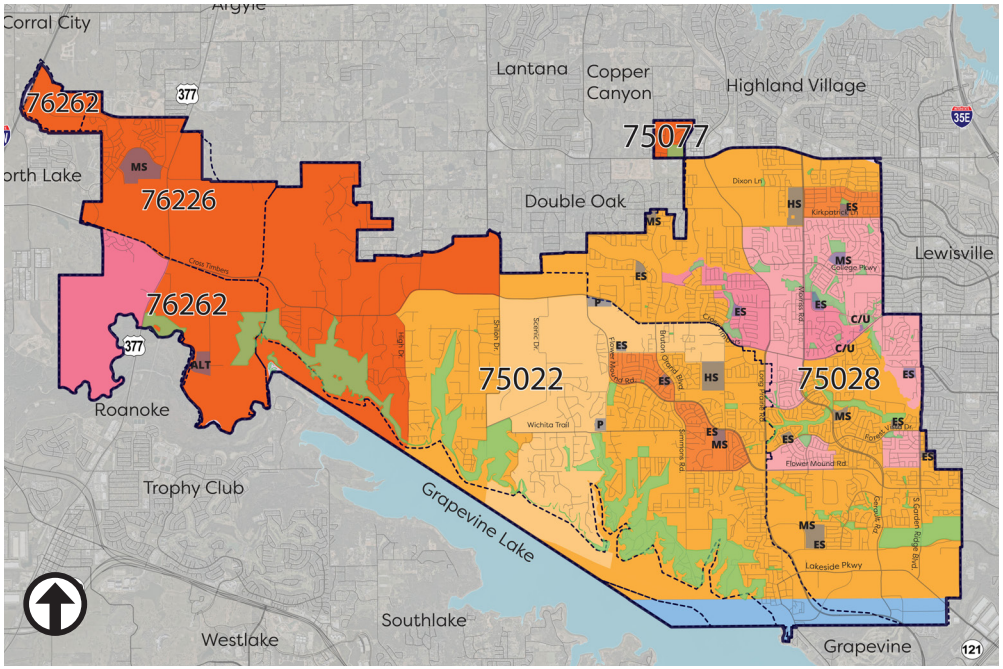


Source: 2010-2014 American Census Survey 5 year-data, Business Analyst.

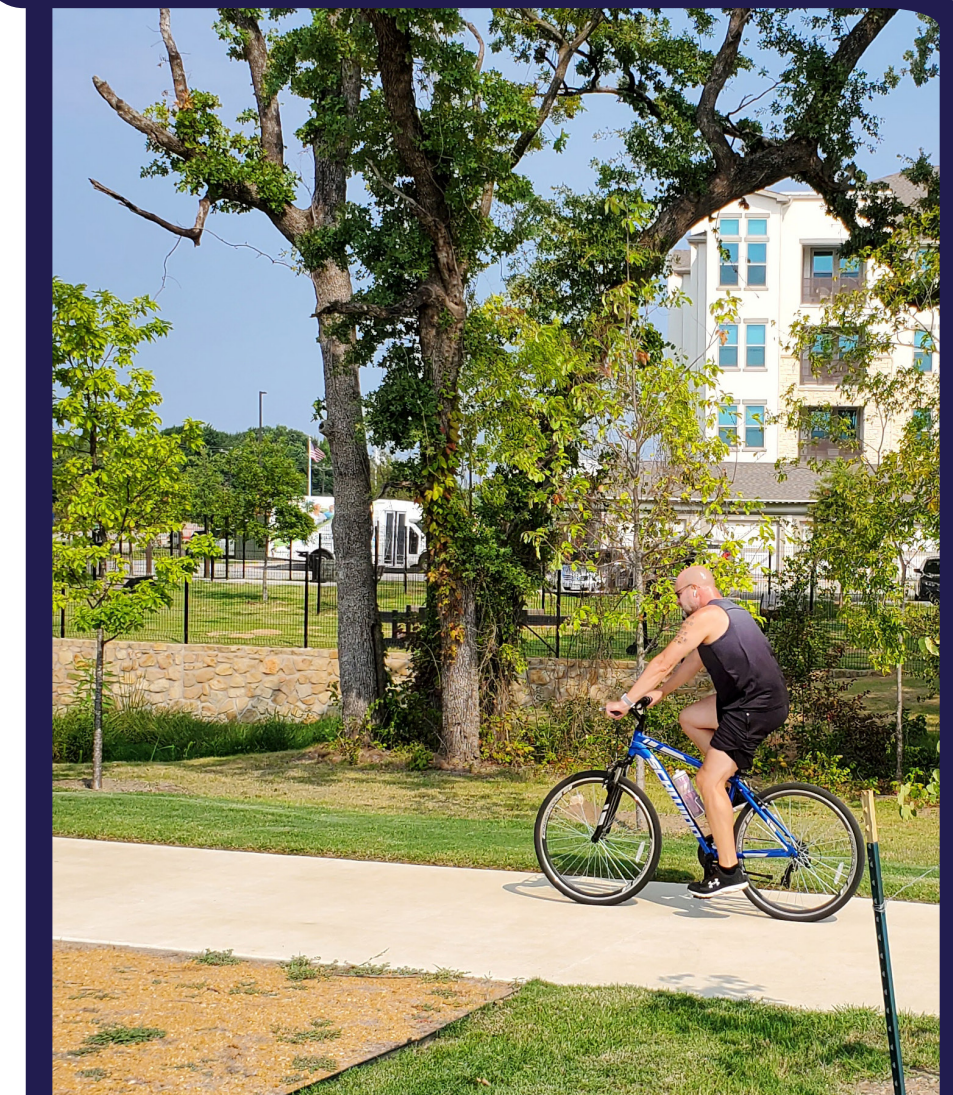
ESRI TAPESTRY SEGMENTS

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	
Community garden	Medium
Outdoor water splash pads	
Picnic areas/pavilions	
Outdoor tennis courts	
Playground equipment	
Indoor gymnasiums	
Outdoor basketball courts	
Disc golf course	
Outdoor fishing areas	
Soccer fields	Low
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%**	

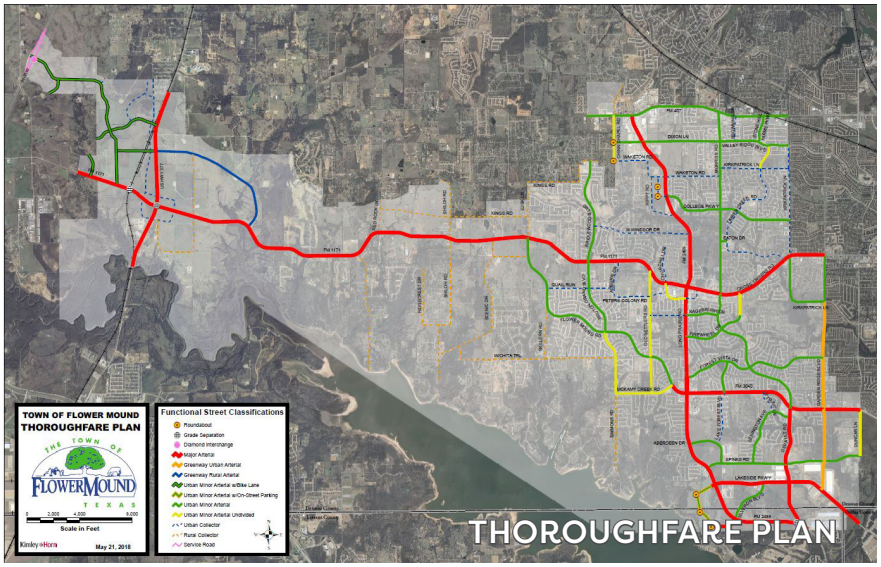
**Non-residential uses shall include retail, office, hospitality, entertainment, etc.*

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



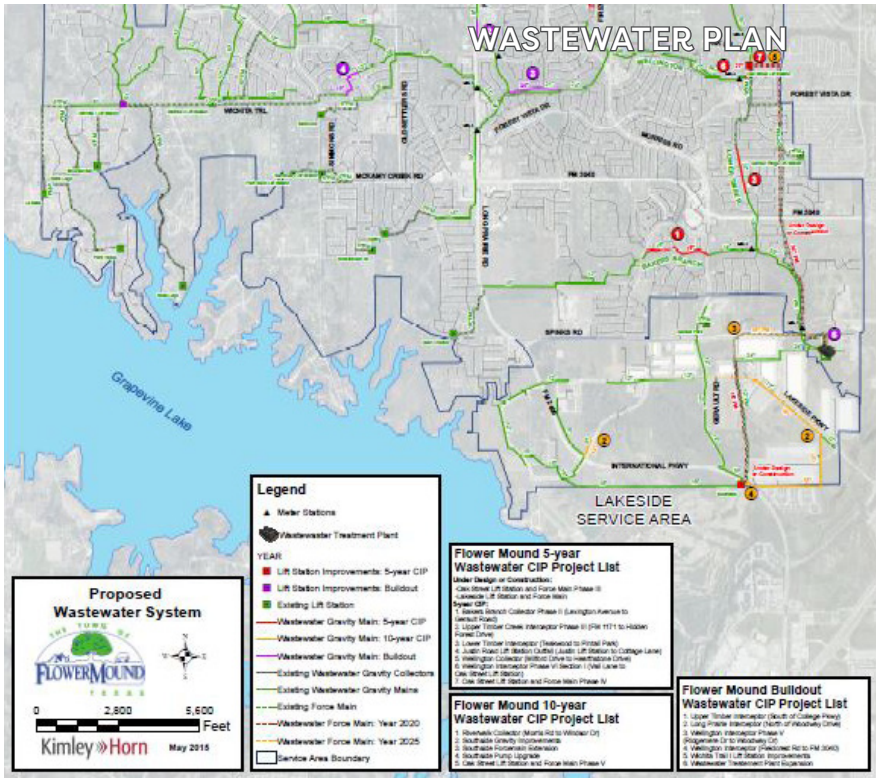
THOROUGHFARE PLAN

The thoroughfare plan uses projected land uses to guide the development of future thoroughfares. Recommendations were based off technical modeling and information obtained by the public in hearings as well. The features of this plan include a lakeside parkway connection to SH 121, Flower Mound Road, Kirkpatrick Extension, and collector street cross-sections. Recommendations display cross-sections that display the intended configuration of future roadways based on their purpose; the only proposed cross-section with on-street bicycle accommodations is the urban minor arterial with bike lanes. In this cross-section, a 5-foot bike lane is included in both directions with striping designating the bike lane from the travel lane. According to the 2018 thoroughfare map, roadways designated as the urban minor arterial with bike lanes are all located in the far western portion of the town which is currently primarily undeveloped.



WASTEWATER PLAN

The Wastewater Plan is an update from the Wastewater Master Plan adopted in 2009 and then amended in 2015 based on new demographics, land uses, and growth projections. The purpose was to provide strategies for the future of wastewater management within Flower Mound. The 2015 amendments projected growth for 2020, 2025, and community build out and provided a guide to infrastructure needs. These recommendations directly link to the community's land use plan. Two major planning areas were identified to project wastewater demands: Lakeside and Denton Creek. This plan provides recommendations for the wastewater treatment plant, service areas, and each of the five districts outlined in the land use plan.



WATER PLAN

The Water Plan is based on the updates created in 2015 to the 2009 Water Master plan. The purpose of this plan is to assess the existing conditions of the water storage and distribution system as well as to project future needs. The components that have been evaluated in this document are water supply, ground storage, elevated storage, pumping stations, and the distribution system. Other aspects of this plan outline the Denton Creek Reuse Water Master Plan and the Lakeside Reuse Water Master Plan. Both master plans were adopted to meet Flower Mound's reuse water system infrastructure needs, and to provide tools and strategies for current and future needs.

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

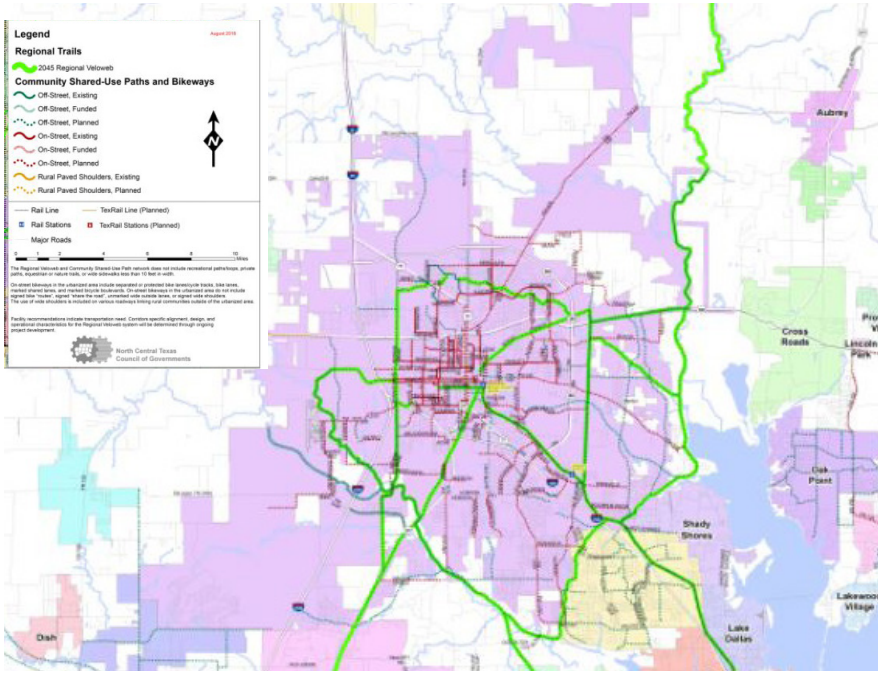


NCTCOG VELOWEB

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

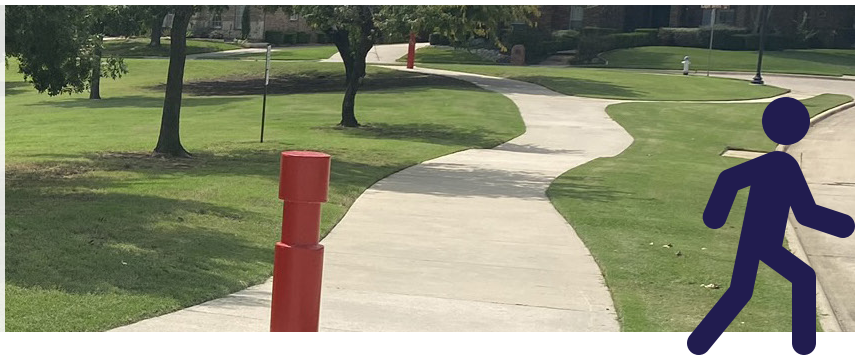


EXISTING TRAILS AND BIKEWAYS SYSTEM

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”.



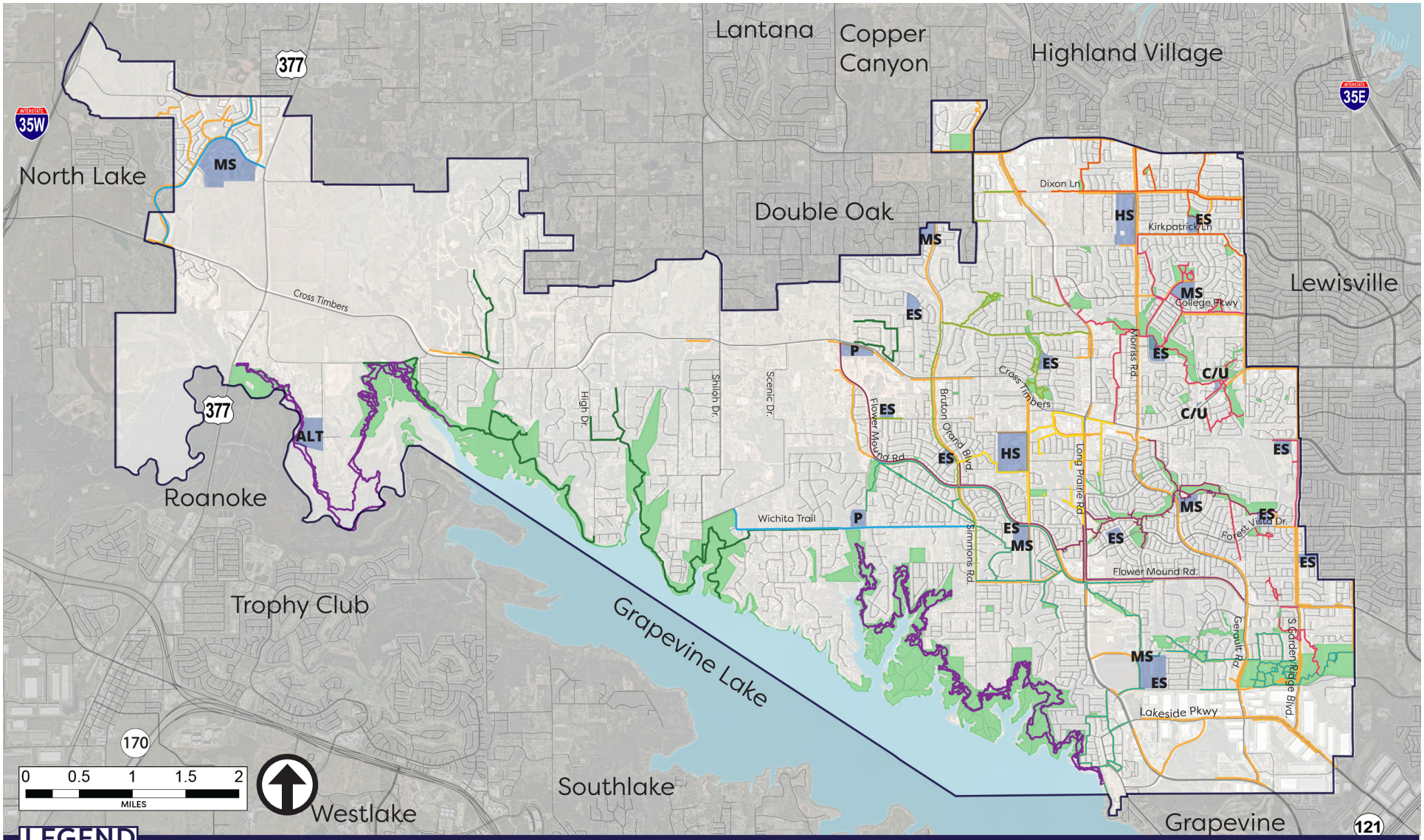
Other Trails:
Multi-use soft-surface paths for hiking and mountain biking that are located within the Town of Flower Mound but are not owned or maintained by the Town. The Dallas Off-Road Bicycle Association (DORBA) maintains over 30 miles of soft-surface trails on USACE land along the shores of Grapevine 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 62.2 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 13 miles of equestrian trails located within neighborhoods in the central portion of Flower Mound.

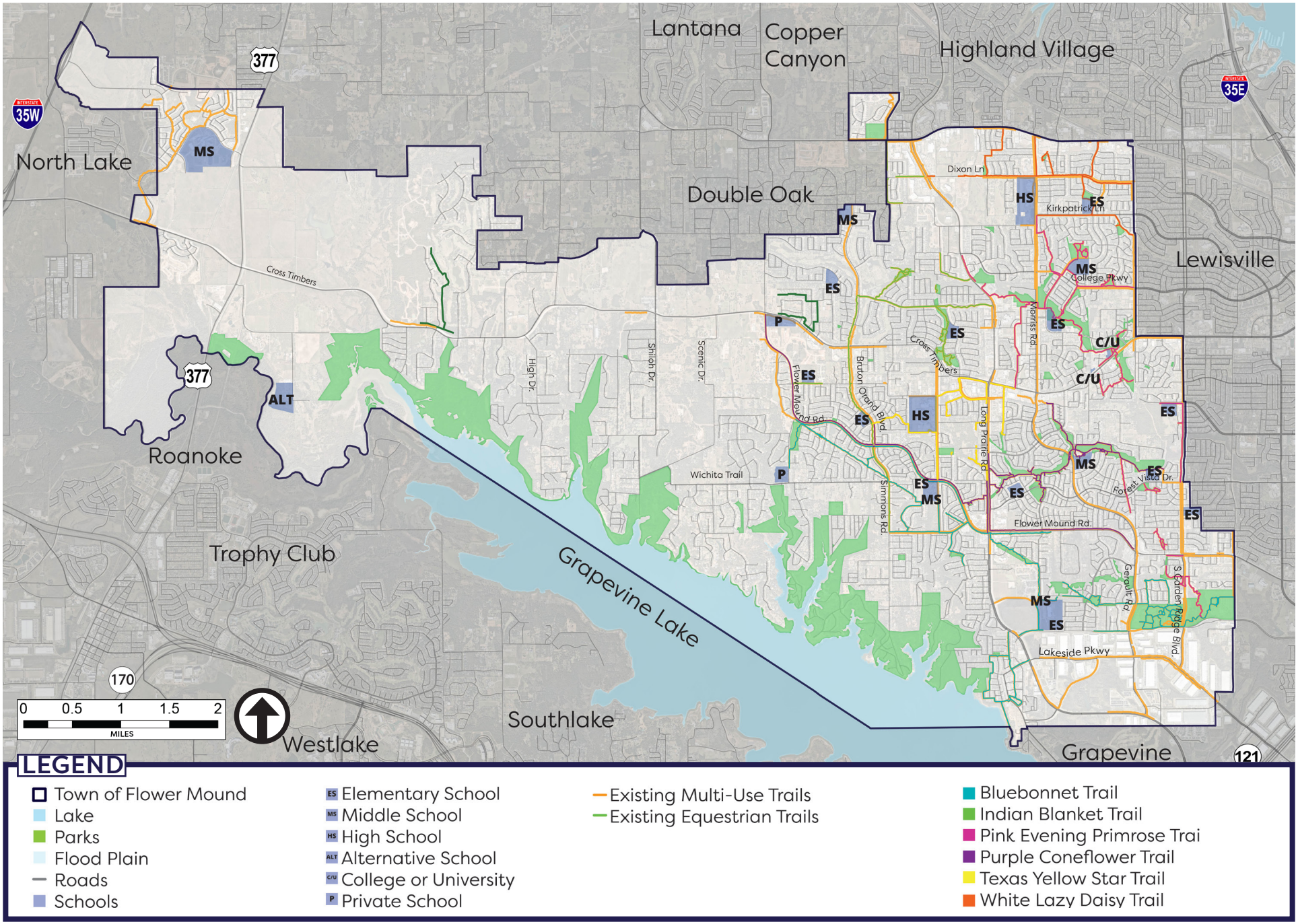
TABLE 2.3: TOWN TRAIL INVENTORY

Trail Name	Length (Miles)	Width (Feet)	Surface Type
Bluebonnet Trail	18.7	4'-10'	Cement
Indian Blanket Trail	8.4	5'-10'	Cement
Pink Evening Primrose Trail	13.0	4'-10'	Cement/Soft-Surface
Purple Coneflower Trail	12.0	4'-8'	Cement
Texas Yellow Star Trail	4.9	4'-8'	Cement
White Lazy Daisy Trail	5.7	4'-10'	Cement
Unnamed Multi-Use Trails	40.9	4'-10'	Cement
Connectors (Unnamed)	1.9	4'	Cement
Equestrian Trails	13.0	15'-50'	Soft-Surface
Total Length	**118.5**		
Total Length*((8ft or wider) (*Does not include equestrian or soft-surface trails)	**62.2**		
Total Length* (Less 8ft) (*Does not include equestrian or soft-surface trails)	**43.3**		



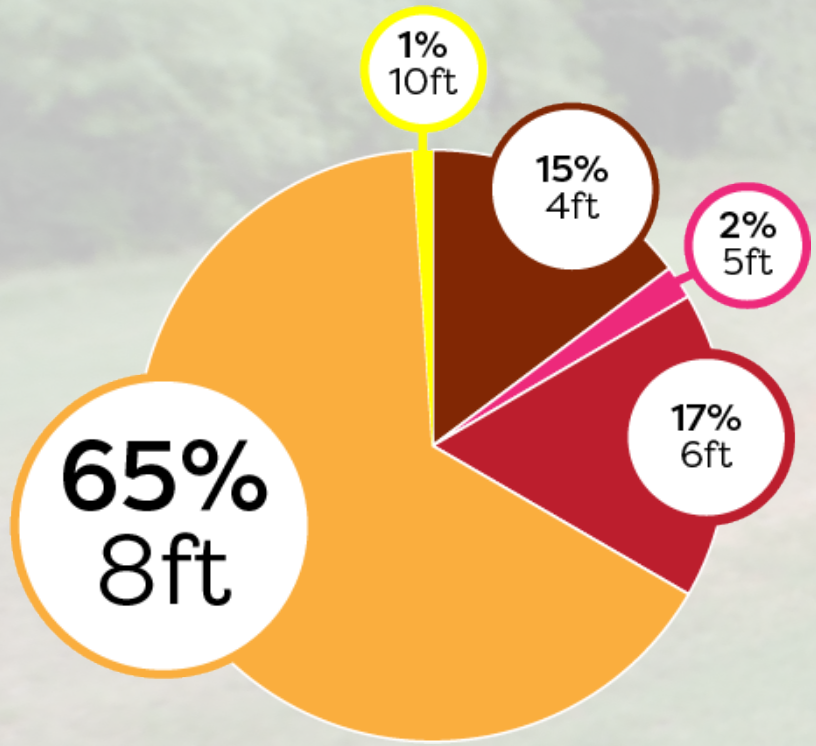


FIGURE 2.14: EXISTING TOWN TRAILS



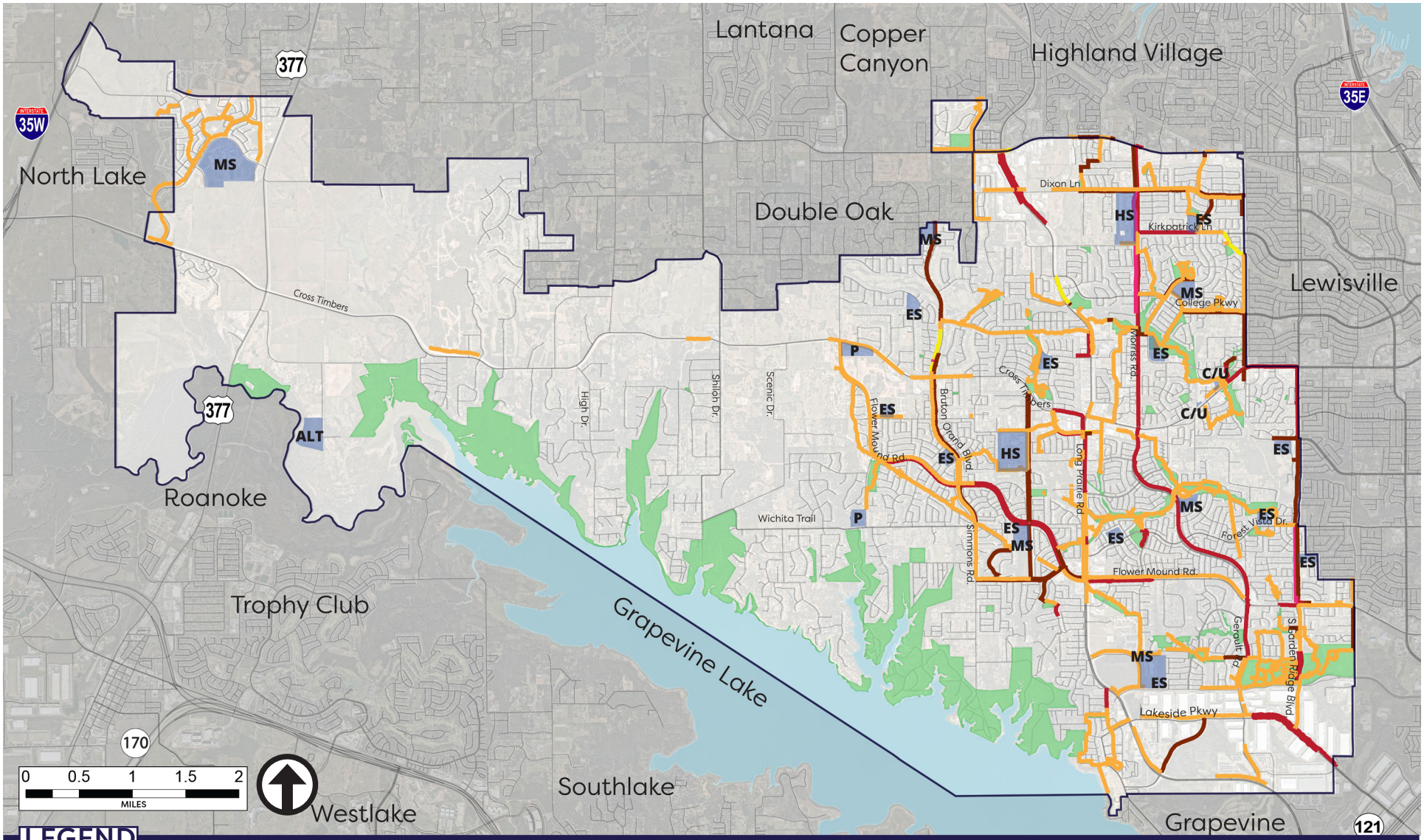
While there are segments of the existing branded trails that are 4-foot – 6-foot in width, to be considered multi-use trails, the facilities should be at least 8-foot wide, but preferably 10-foot. **Figure 2.15** depicts the breakdown of the widths of existing trails. The majority of trails today are 8-foot wide; but 34 percent are 6-foot or narrower. The needs assessment in Chapter 3 goes into more detail about the need for wider trails.

FIGURE 2.15: EXISTING TOWN MULTI-USE TRAIL WIDTH PERCENTAGES



PURPLE CONEFLOWER TRAIL

FIGURE 2.16: EXISTING TOWN MULTI-USE TRAILS 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.

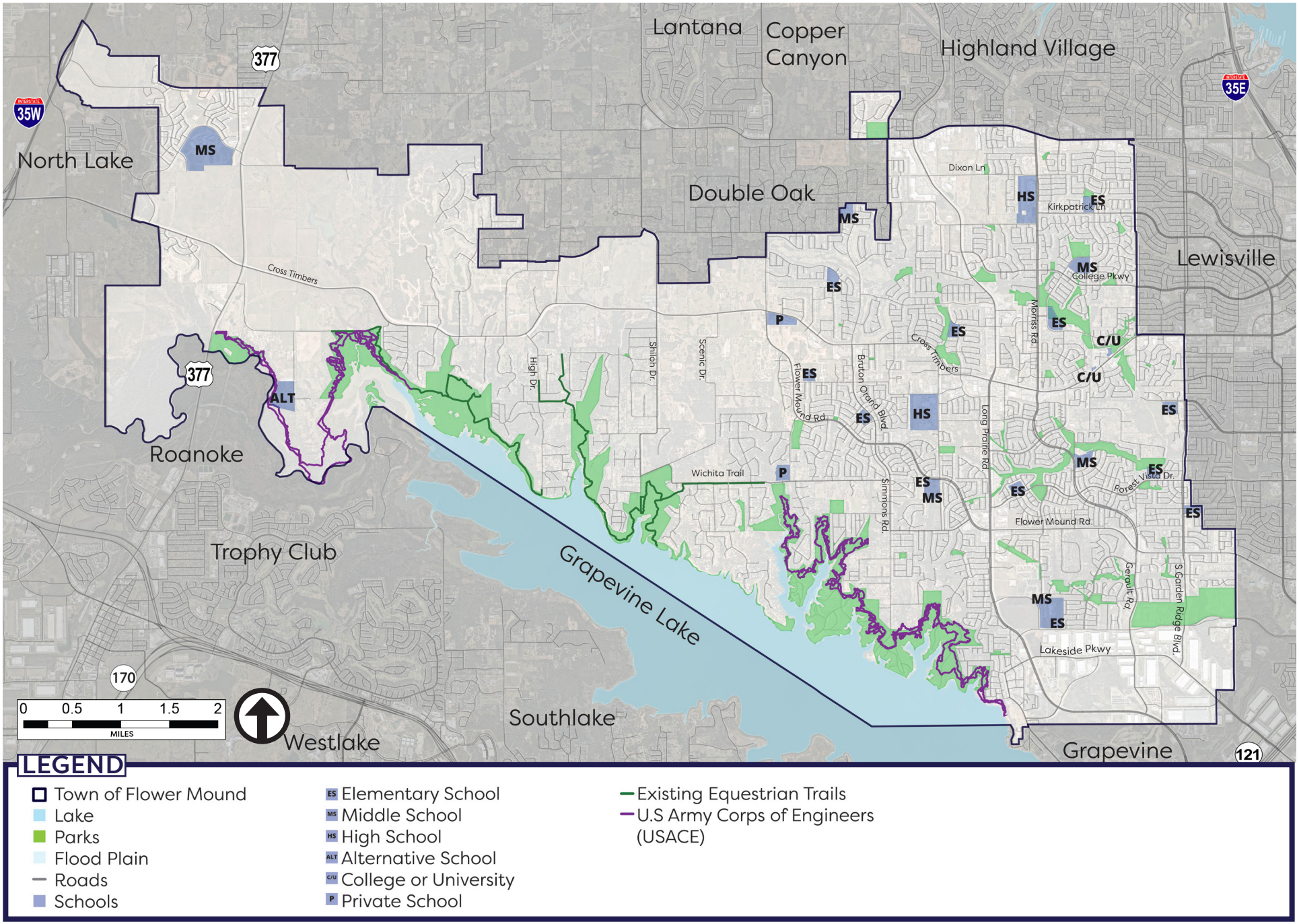
TABLE 2.4: OTHER TRAILS INVENTORY

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

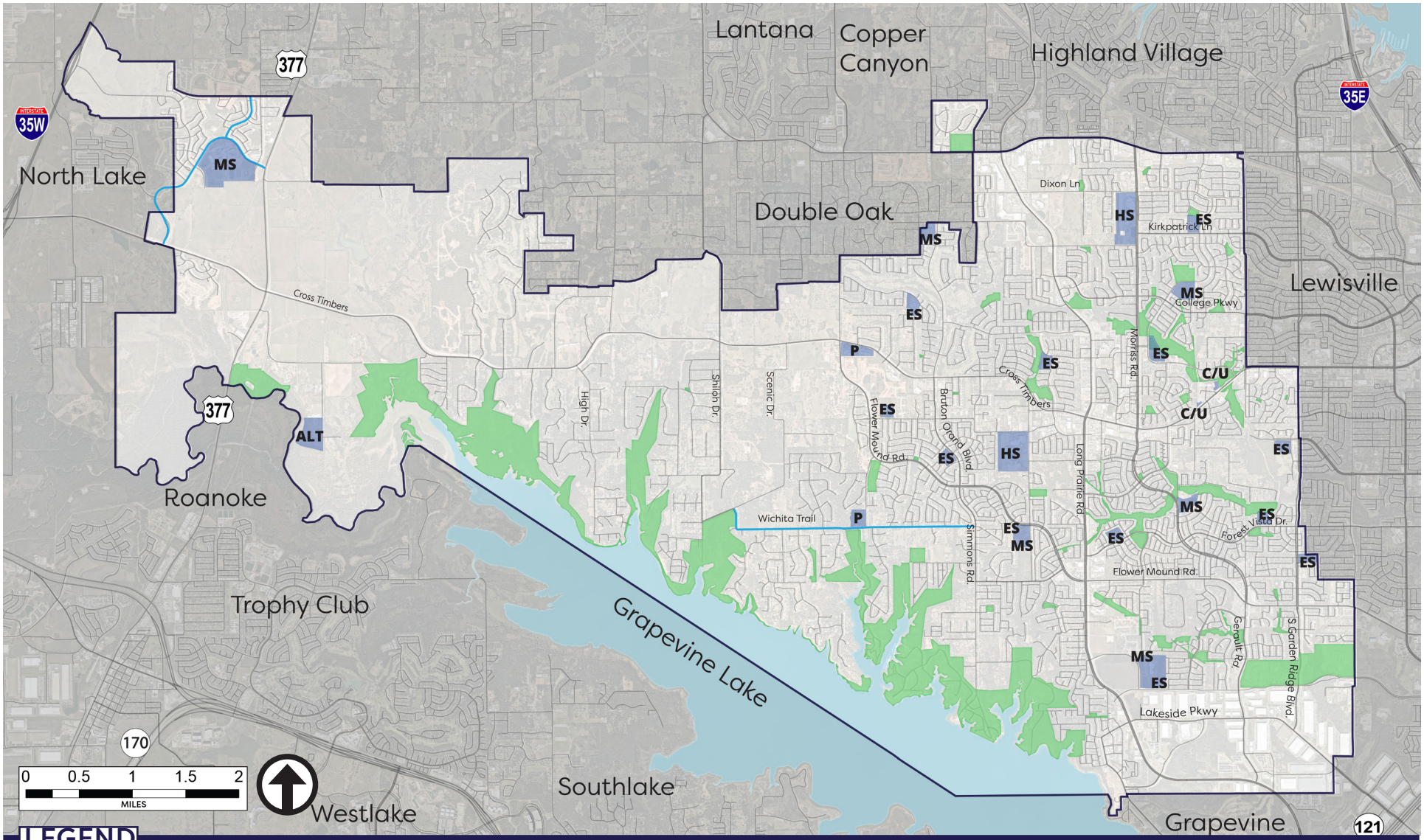
Bikeway Name	Length (Miles)	Accommodation
Canyon Falls Drive	1.9	Bike Lane
Prairie Ridge Road	0.5	Shared Lane Markings
Waketon Street	0.8	Shared Lane Markings
Wichita Trail	2.4	Bike Lane
Total Length	**5.6**	



SHARED-USE LANE


CYCLISTS

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.

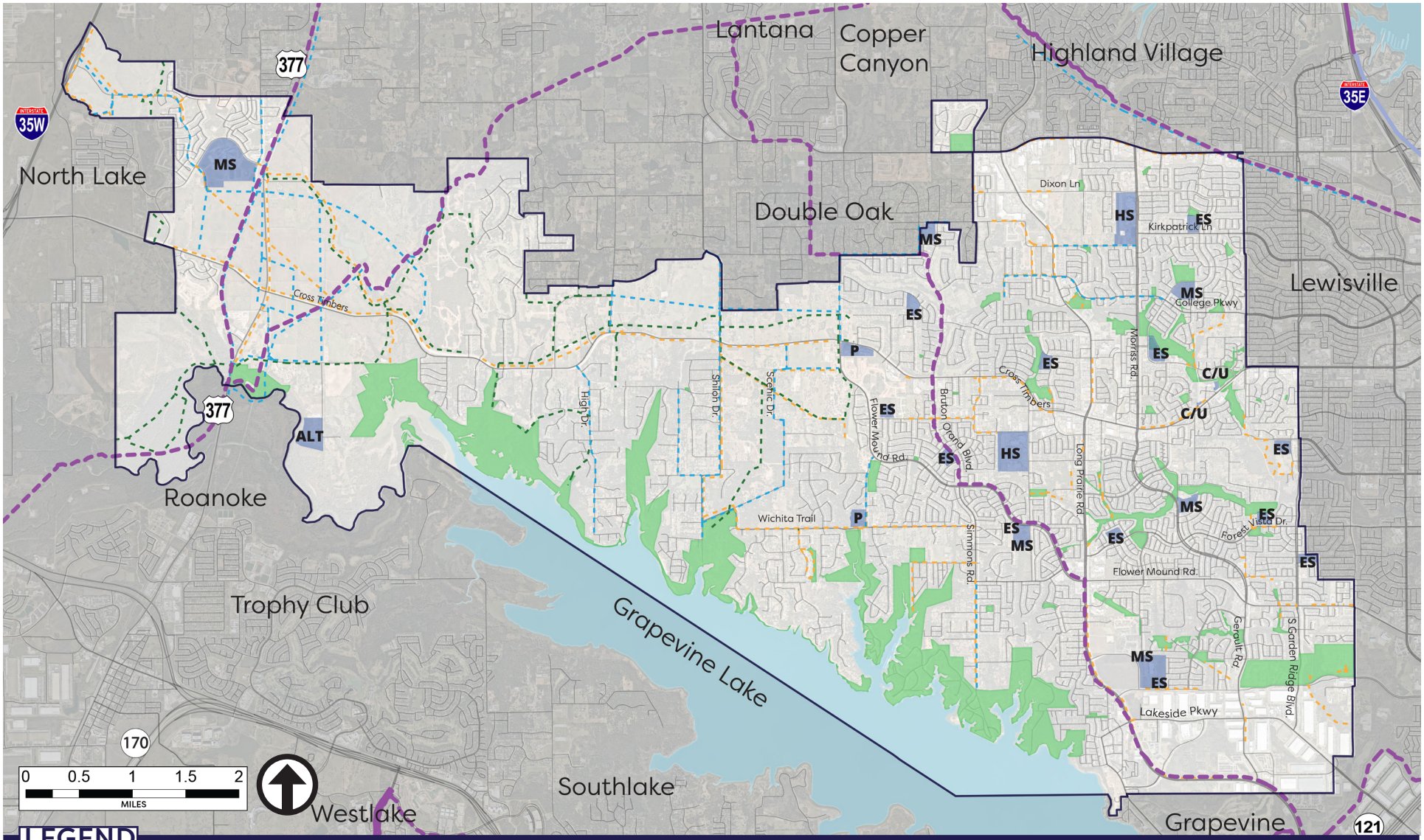
TABLE 2.6: EXISTING & CURRENTLY PLANNED SYSTEM

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**



CONSTRUCTION ON WAKETON

FIGURE 2.19: 2017 MASTER PLAN PROPOSED TRAILS & BIKEWAYS



System Users
Community Input
Needs Assessment
Barriers & Opportunities



03 TRAILS AND BIKEWAYS SYSTEM NEEDS





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.



STEERING COMMITTEE MEETING

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.


TECHNICAL WORKING GROUP

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.


STAKEHOLDER LISTENING SESSION

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.


PUBLIC MEETING

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.


ARTS IN THE PARK

BOARD & COMMISSION MEETINGS

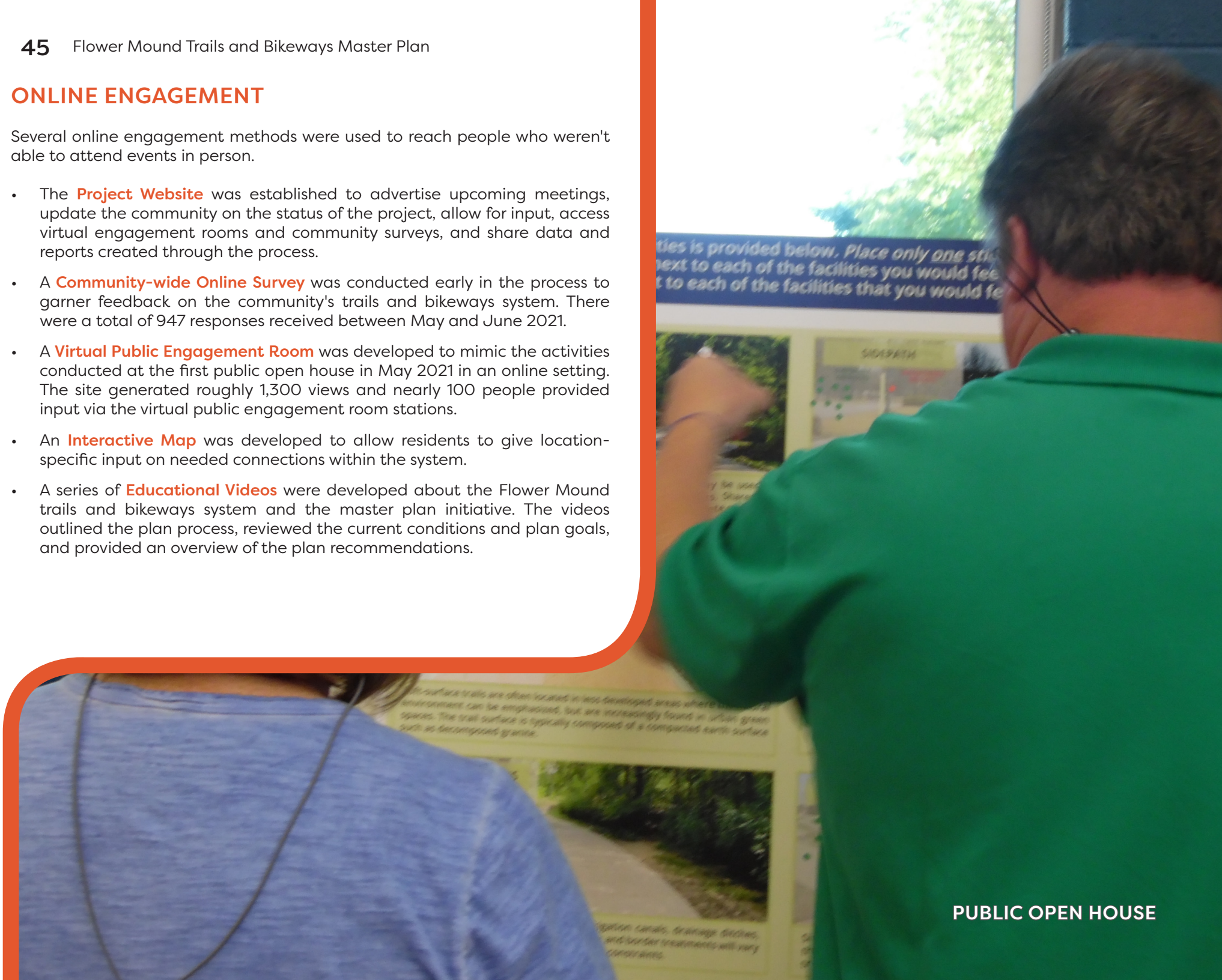
Presentations to the Parks Board, Transportation Commission, Planning & Zoning Commission, and Town Council during the process allowed the team to gather additional input and review draft recommendations for the plan.


PARKS BOARD MEETING

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

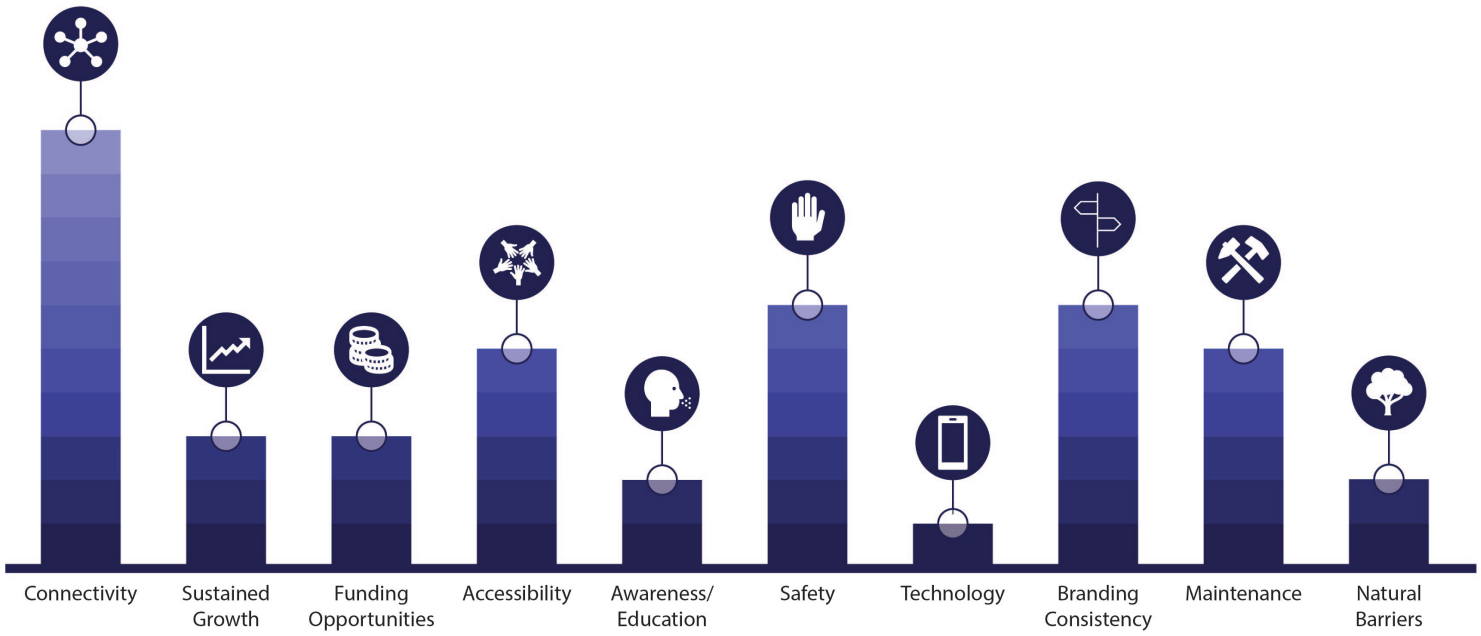
ENGAGEMENT RESULTS:
Steering Committee, Technical Working Group, and Stakeholder Listening Sessions

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?



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?

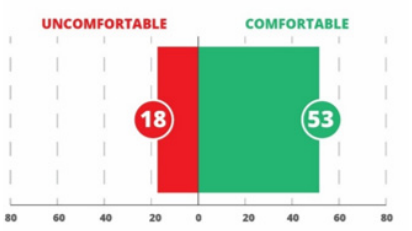


ENGAGEMENT RESULTS:
Public Open House & Virtual Public Engagement Room

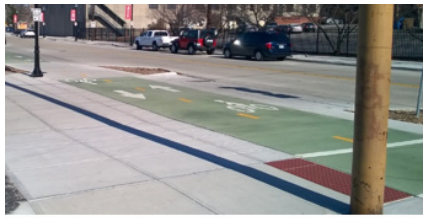
The following graphics summarize feedback received during the public open house and virtual public engagement room. Participants were asked to choose if they would feel comfortable or uncomfortable using the depicted facility. The number below each picture show the total responses for each.

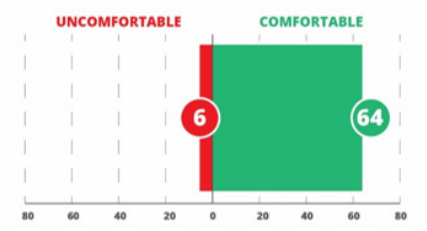
WHAT IS YOUR LEVEL OF COMFORT WITH THE FOLLOWING TYPES OF ON-STREET BICYCLE FACILITIES? (TOP 3 OF 6)





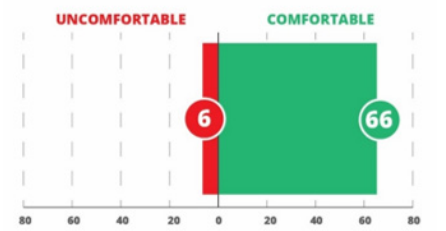
WIDE SHOULDER





CYCLE TRACK

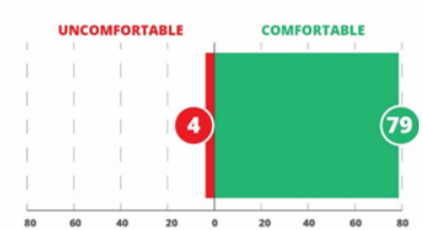




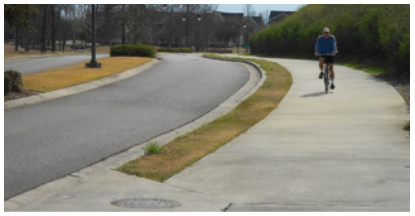
BUFFERED BIKE LANE

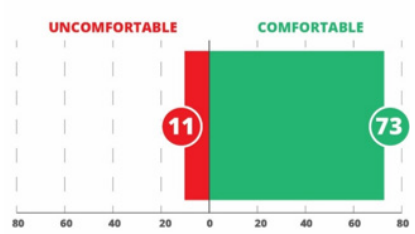
WHAT IS YOUR LEVEL OF COMFORT WITH THE FOLLOWING TYPES OF OFF-STREET TRAILS? (TOP 3 OF 6)





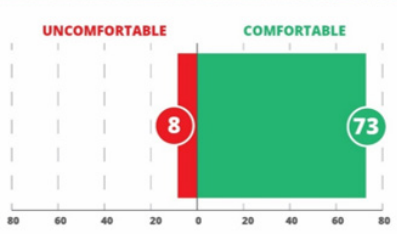
SHARED-USE PATH (PAVED)





SIDEPATH (PAVED)



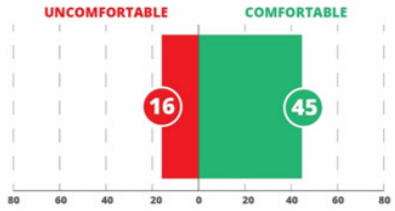


SHARED-USE PATH (SOFT SURFACE)

ENGAGEMENT RESULTS:
Public Open House & Virtual Public Engagement Room

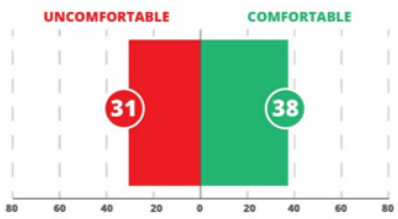
WHAT IS YOUR LEVEL OF COMFORT WITH THE FOLLOWING TYPES OF EQUESTRIAN PATHS?





SOFT-SURFACE (AWAY FROM ROAD)





SOFT-SURFACE (ADJACENT TO ROAD)

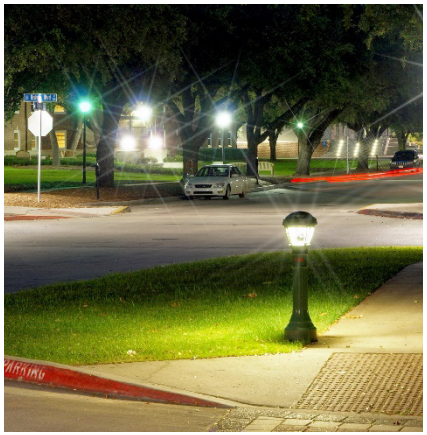
WHAT ARE YOUR TOP THREE PREFERRED TRAIL AMENITIES THAT YOU WOULD LIKE TO SEE ALONG TRAILS IN FLOWER MOUND?



WAYFINDING SIGNAGE



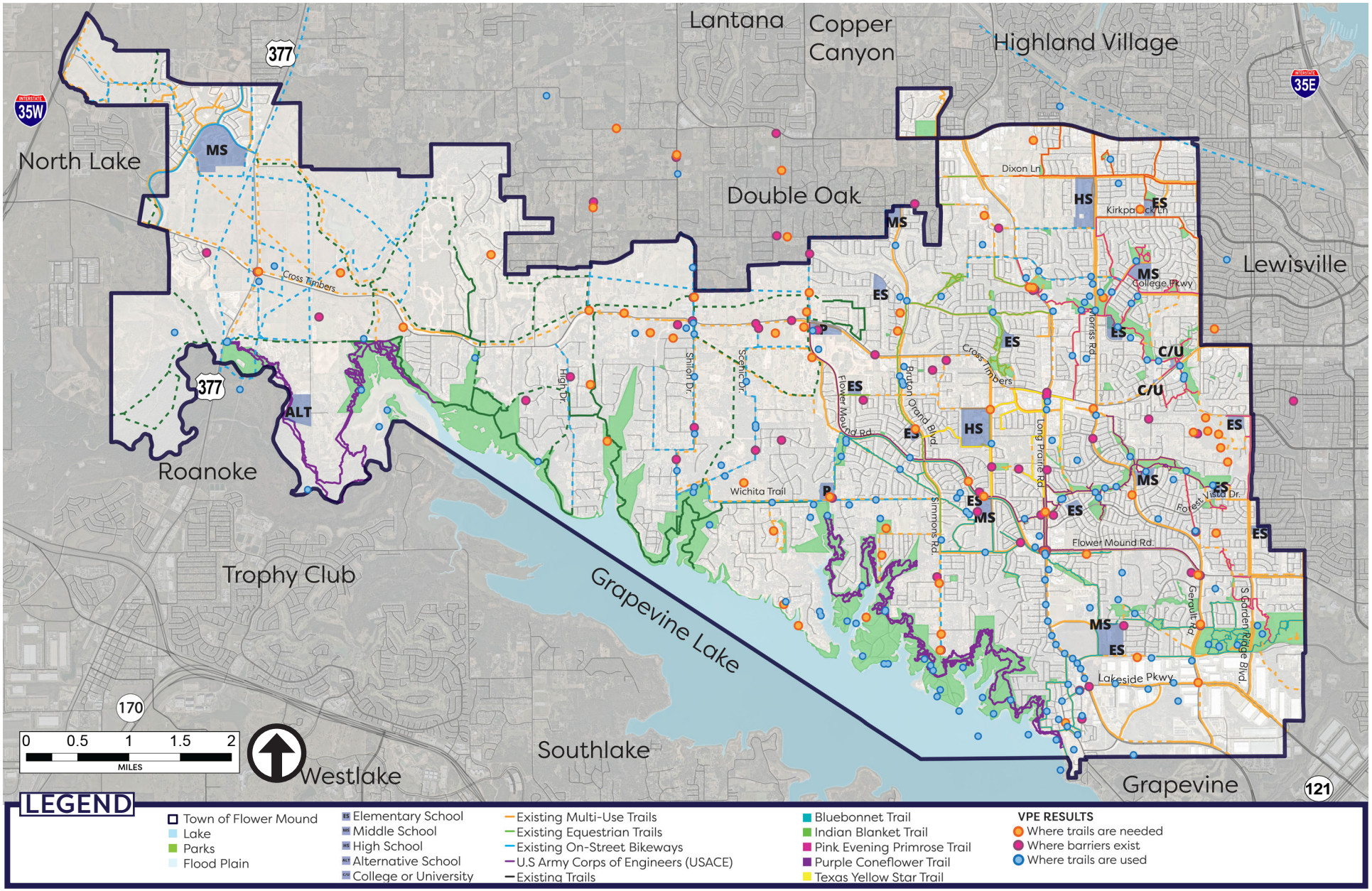
PARKING



LIGHTING

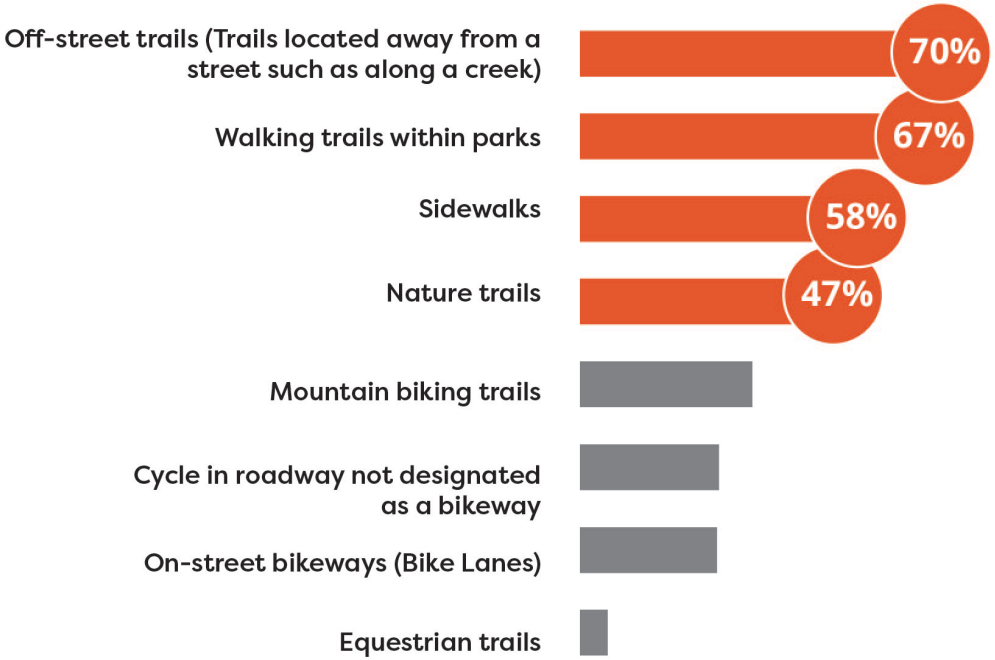
ENGAGEMENT RESULTS:
Virtual Public Engagement Room

FIGURE 3.1: VIRTUAL ENGAGEMENT ROOM RESULTS

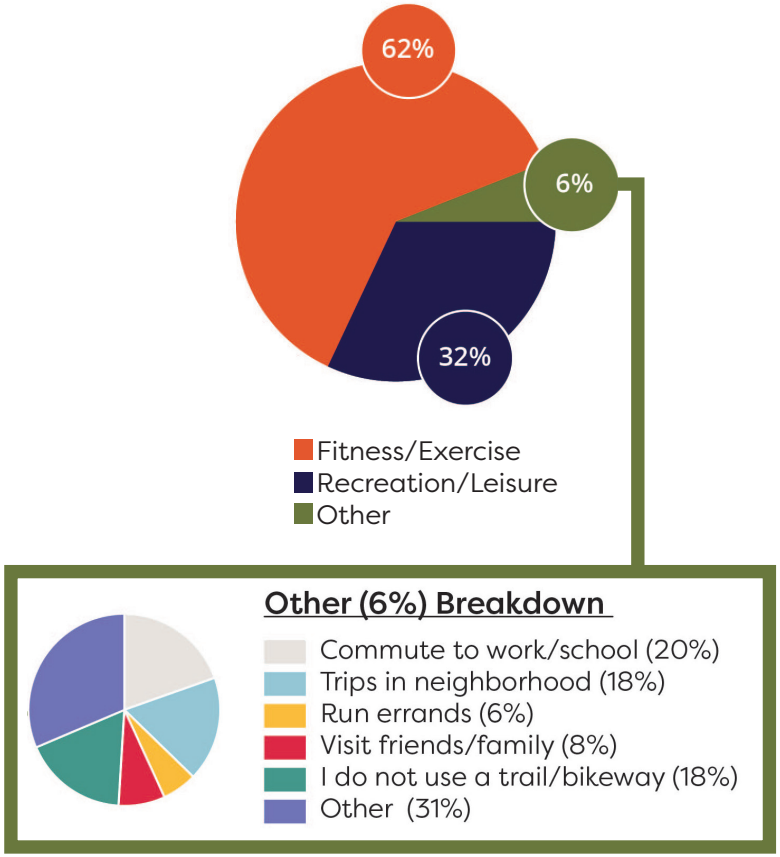


ENGAGEMENT RESULTS:
Public Open House & Virtual Public Engagement Room

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

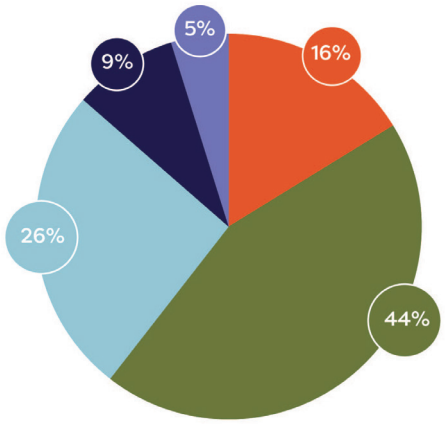


WHAT IS YOUR PRIMARY PURPOSE FOR USING A TRAIL OR BIKEWAY IN FLOWER MOUND?

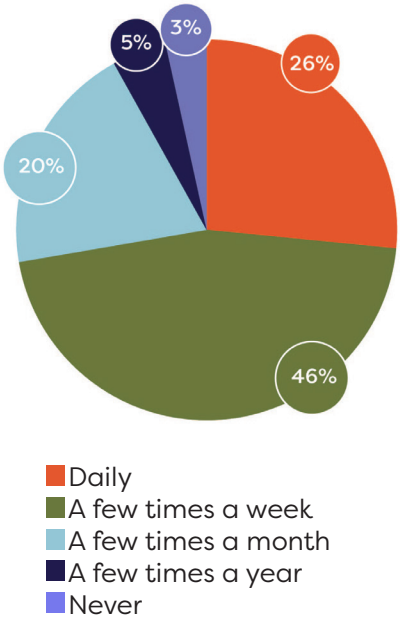


ENGAGEMENT RESULTS:
Public Open House & Virtual Public Engagement Room

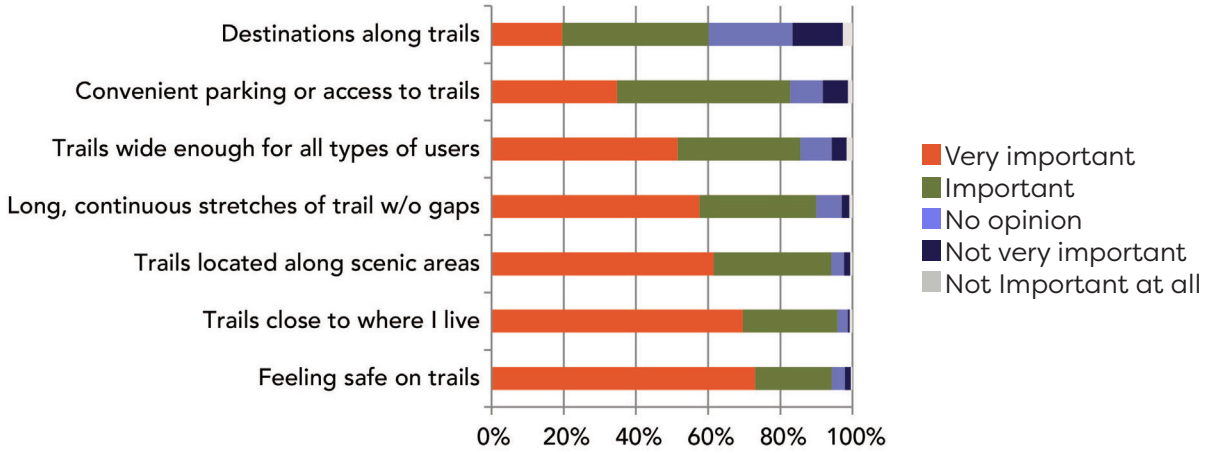
HOW OFTEN DID YOU USE TRAILS OR BIKEWAYS IN FLOWER MOUND PRE-COVID?



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

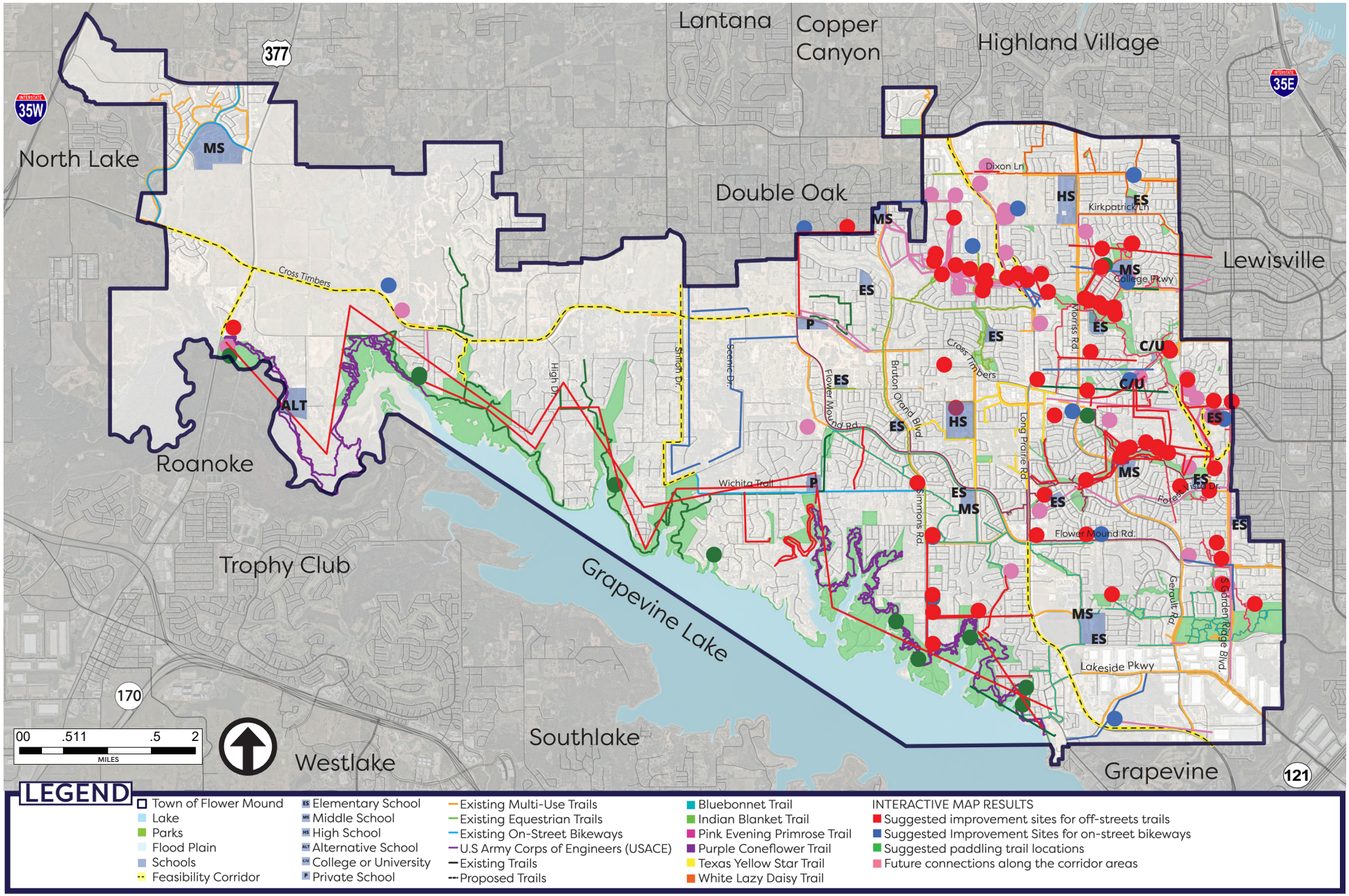


HOW IMPORTANT ARE EACH OF THE FOLLOWING FEATURES OF TRAIL FACILITIES?



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, trailway clearance, grades and slopes, roadside clearance, street intersections/trail crossings, constructed trailway 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

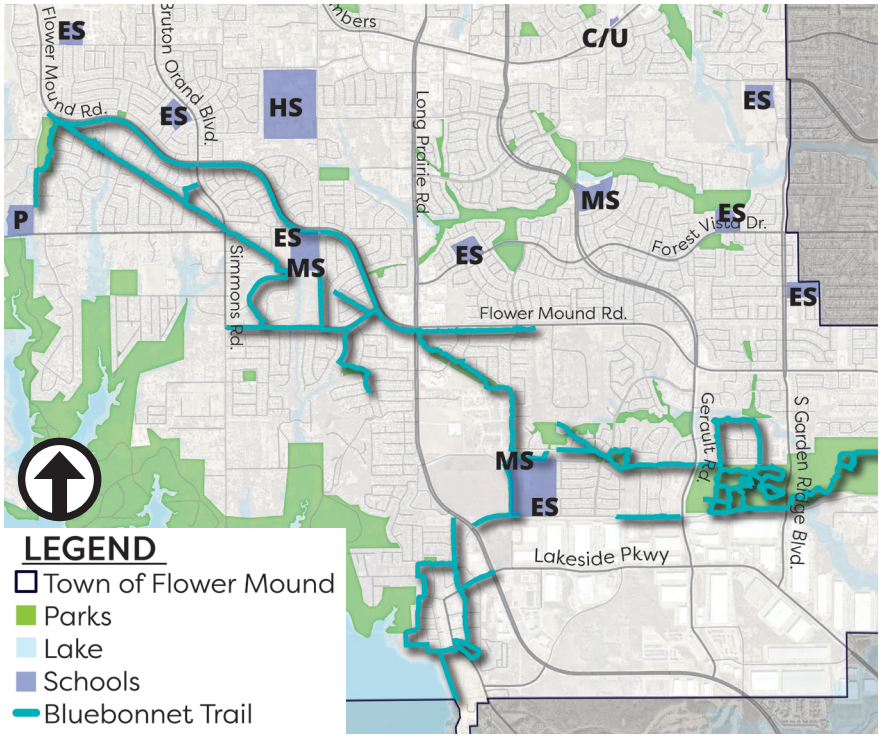
BLUEBONNET TRAIL

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

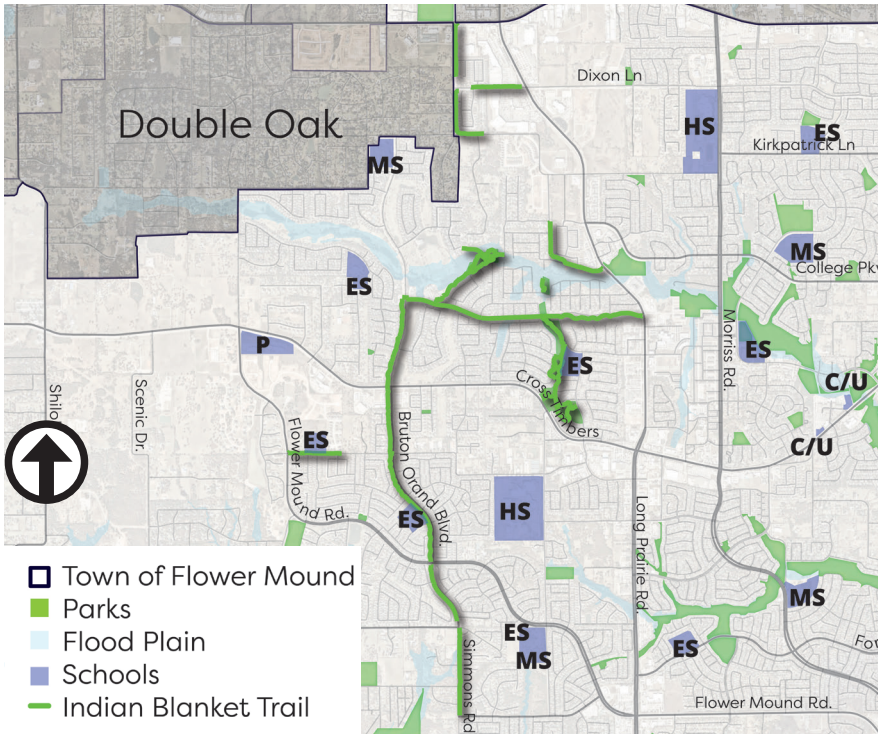
INDIAN BLANKET TRAIL

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

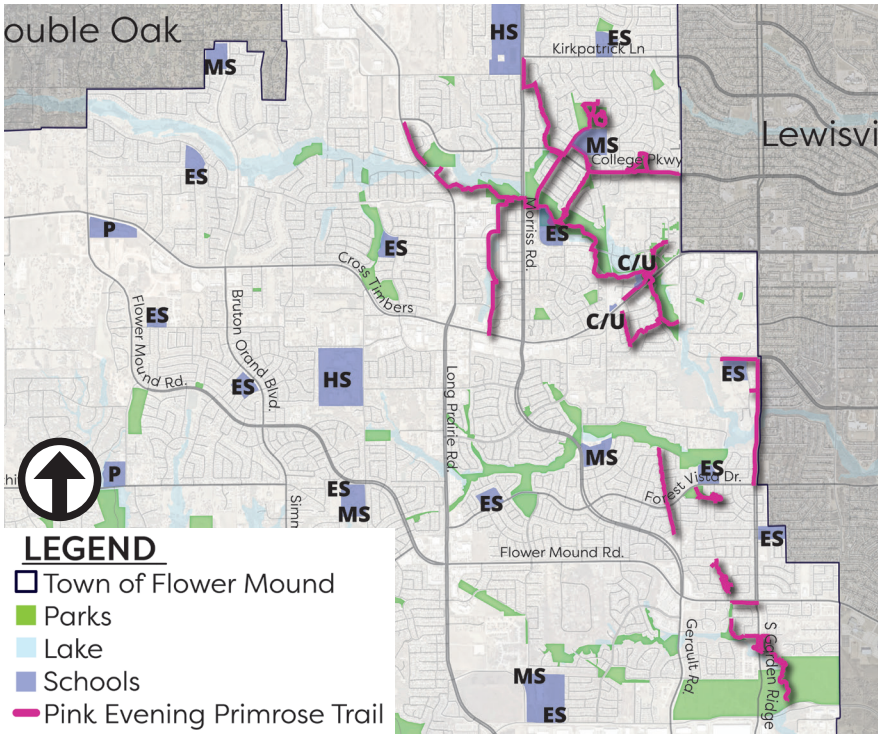
PINK EVENING PRIMROSE TRAIL

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

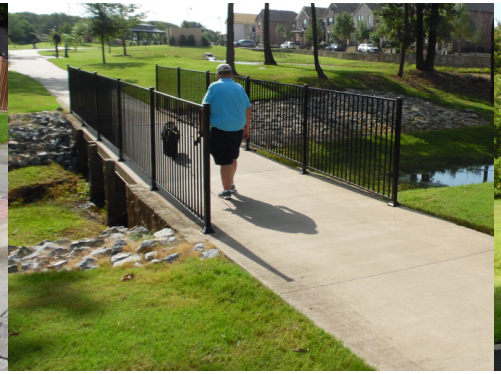




Red bollards designating trail



Intersection ramp



Trail bridge near Riverside



Fitness station along trail

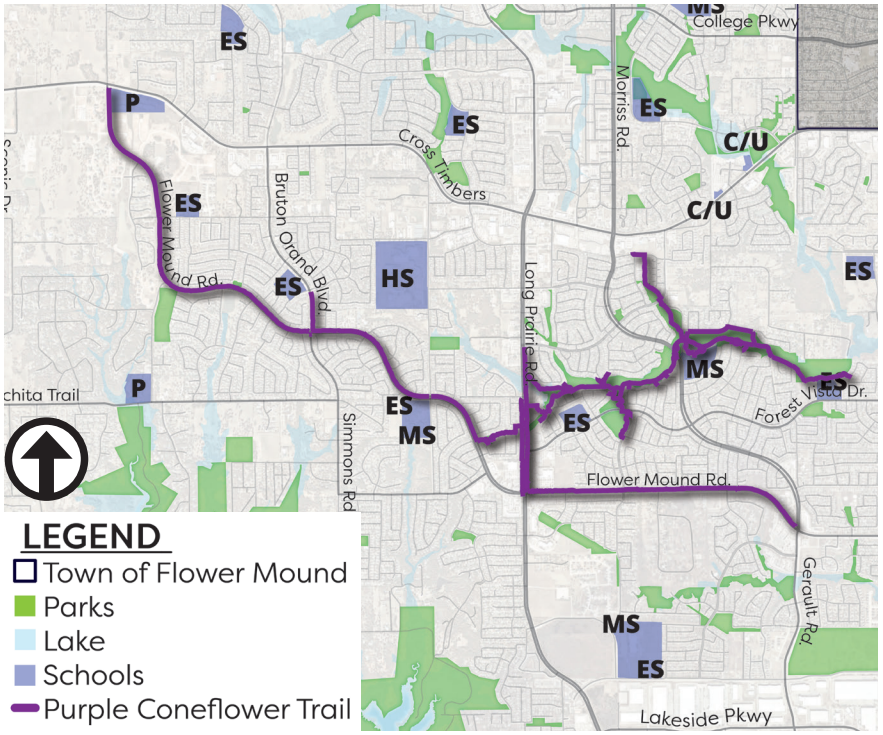
PURPLE CONEFLOWER TRAIL

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

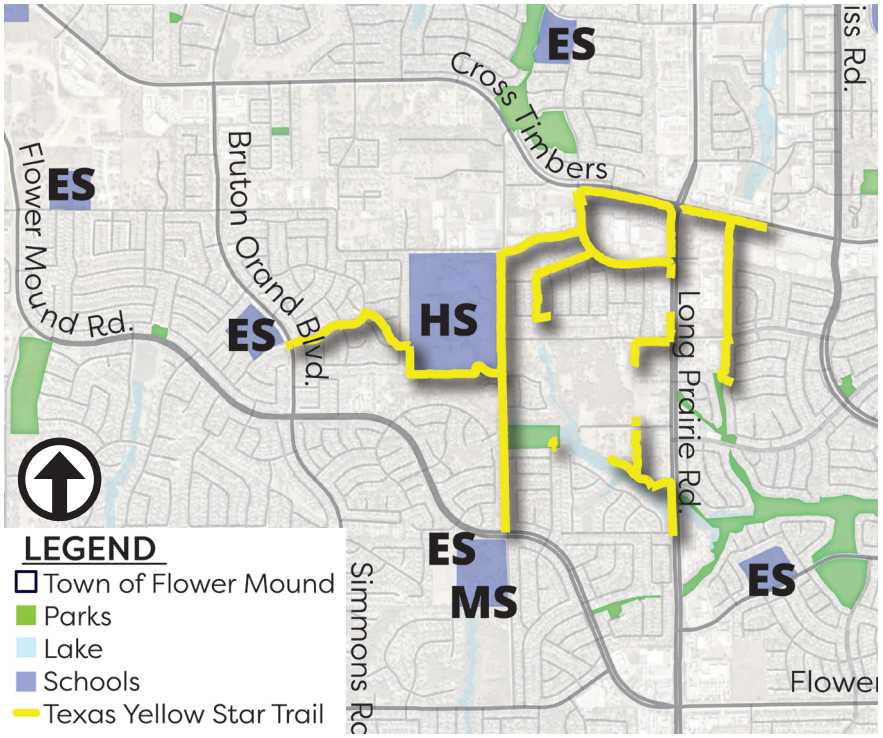
TEXAS YELLOW STAR TRAIL

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



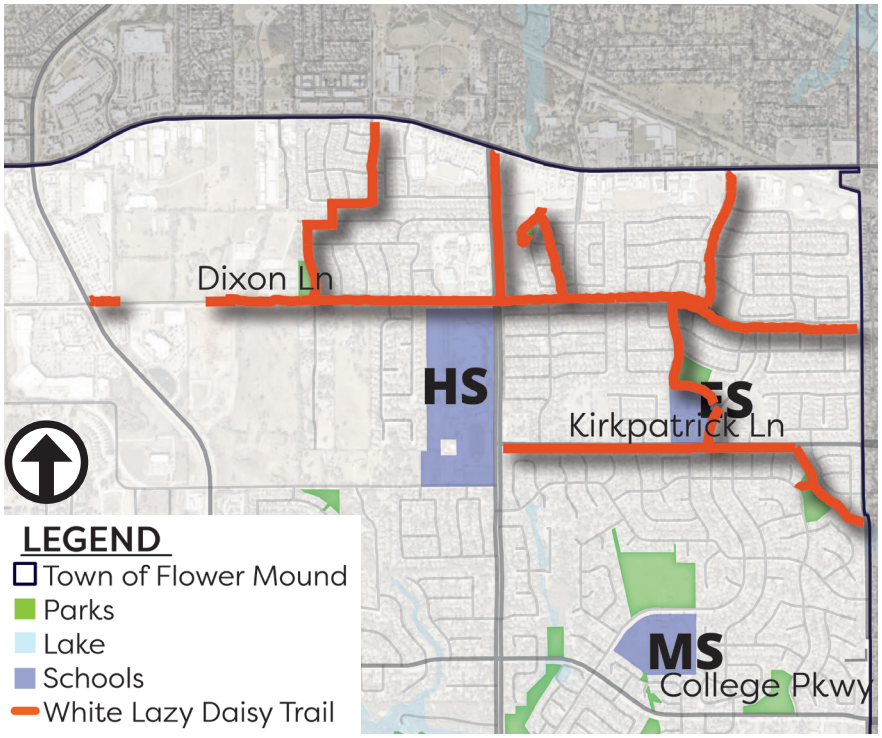
Neighborhood access point

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.


BLUEBONNET TRAIL

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

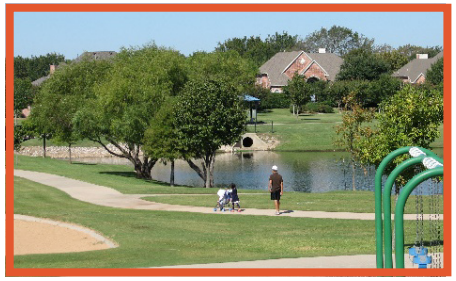
2020 Population* (Current Population)		78,080	
2038 Population (Projected Build-Out Population)**		**109,544**	
Trails = 6' or wider multi-use paths		**Trails = 8' or wider multi-use paths**	
Current LOS - 2020	1 mile per 867 residents (1.15 miles per 1,000)	**Current LOS- 2020**	1 mile per 1,251 residents (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.*


HERITAGE PARK

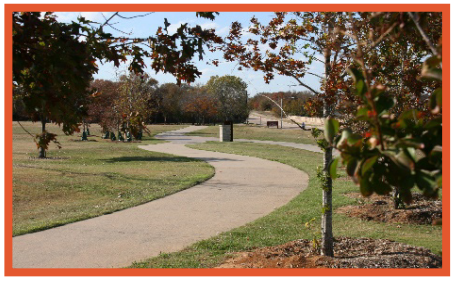
BENCHMARK COMMUNITIES

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



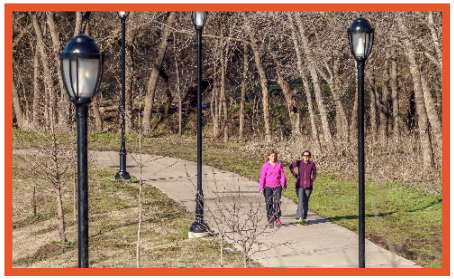
LEWISVILLE

1 mile per 5,172 residents
Population: 106,386
Existing Trail Miles: 21
City Area: 23,488 Acres



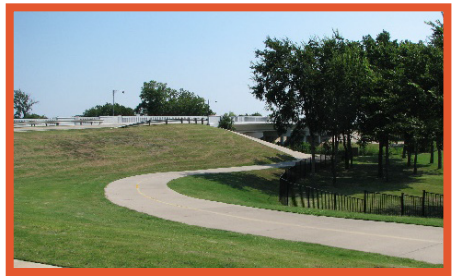
GRAPEVINE

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.

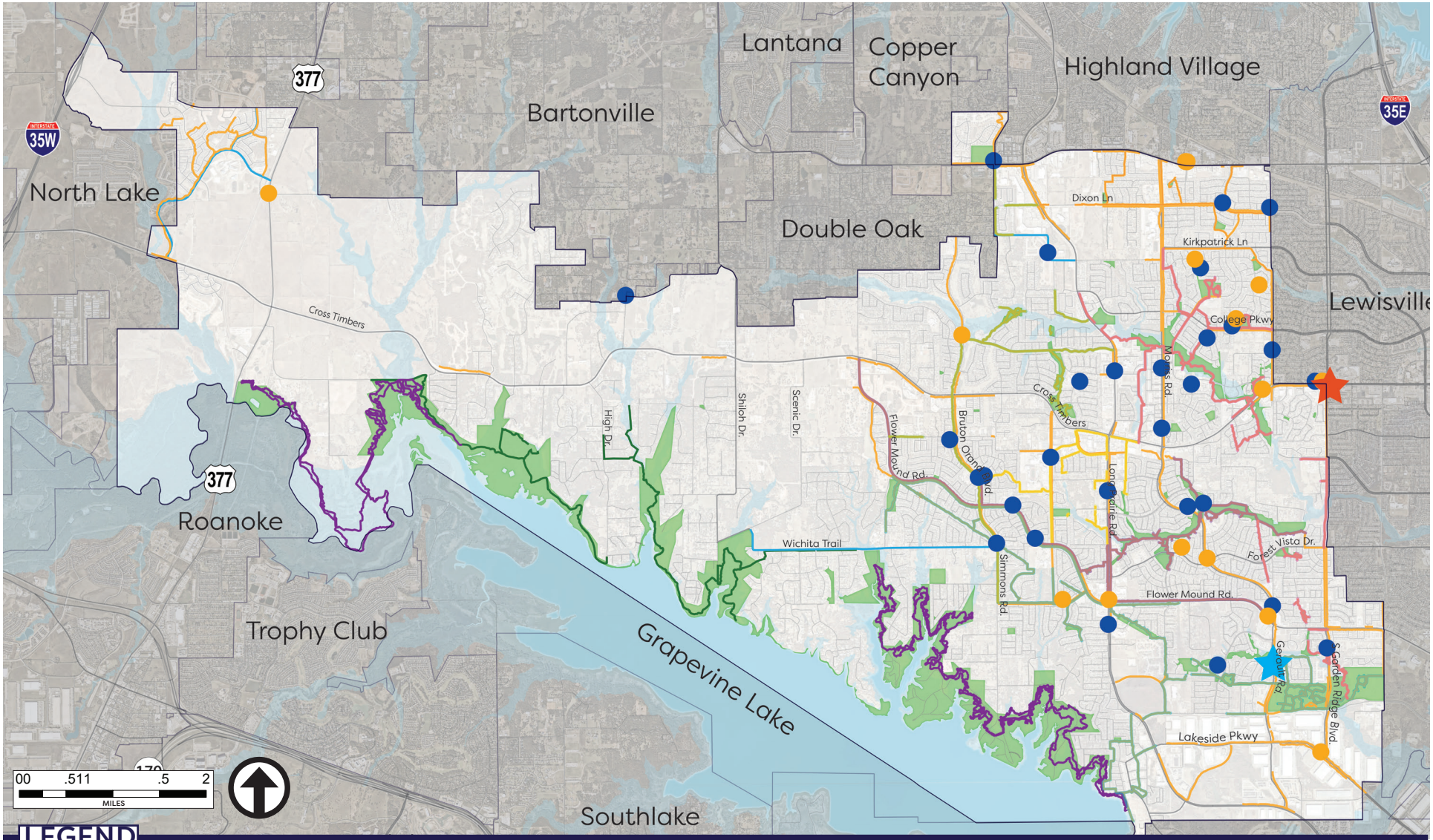
TABLE 3.2: BICYCLE AND PEDESTRIAN CRASH DATA

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.

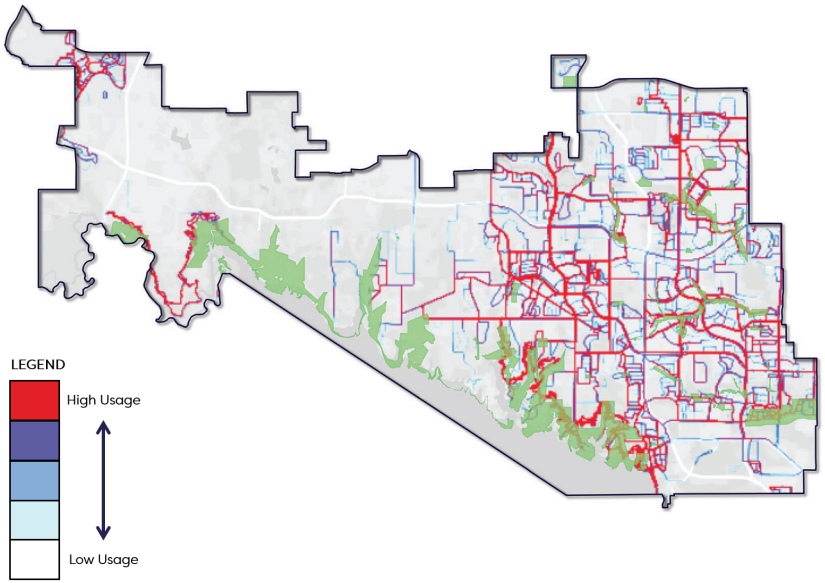
STANDARD BIKE LANES

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

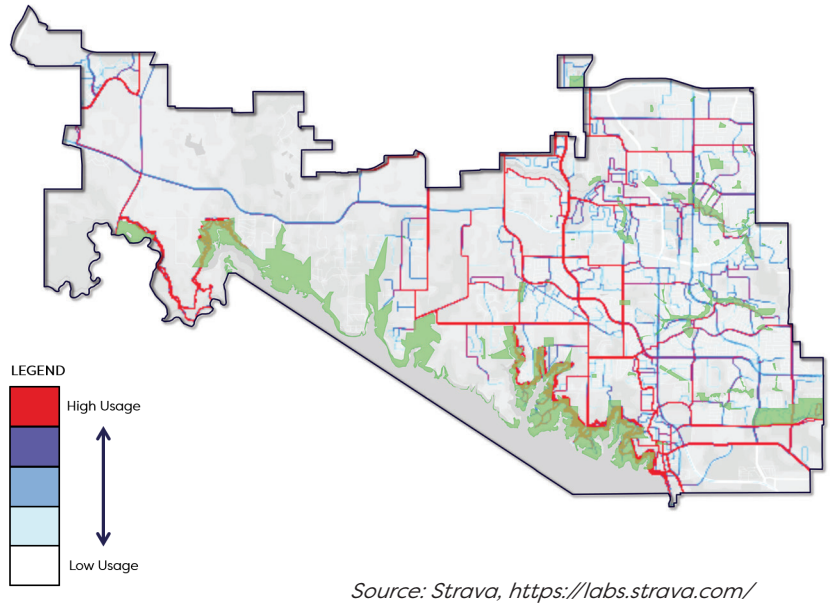
Similar to standard bike lanes, buffered bike lanes are offered along roadways that have higher speeds and volumes that need a spatial separation from the motor vehicles. However, these act as a major arterial for the bikeway network of a community. A buffered bike lane is used to connect major destinations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



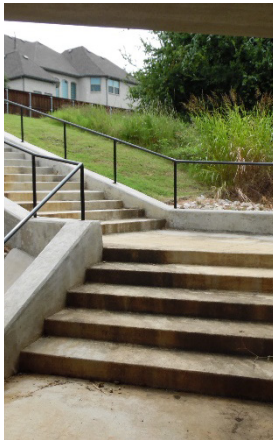
SAFETY ISSUES

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

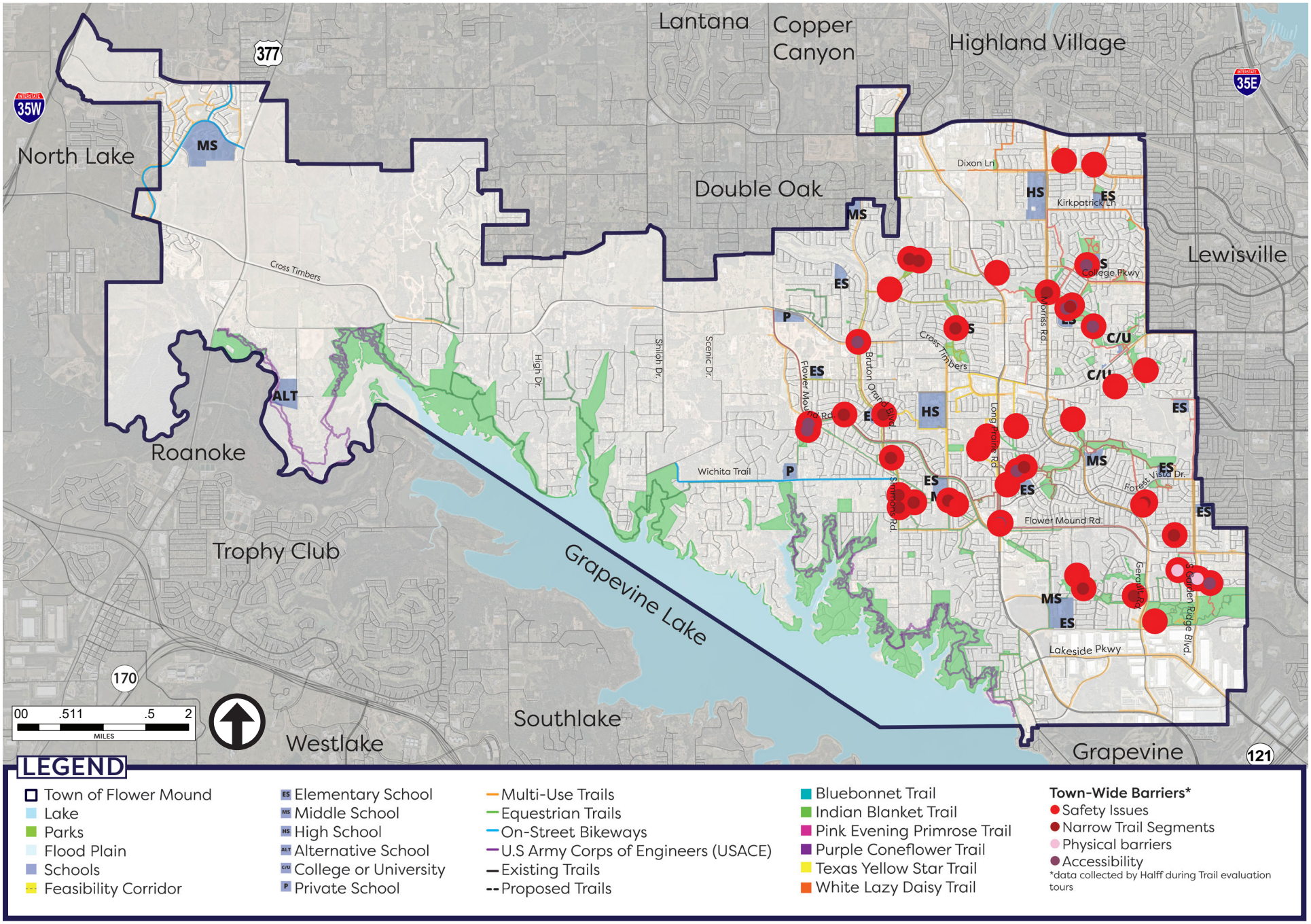
This type of barrier includes trail segments that are too narrow, including trails that are less than 8' in width. These segments may not be able to be widened due to right-of-way constraints, physical barriers, or may include bridges and infrastructure that cannot be widened. Narrow segments existing 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.

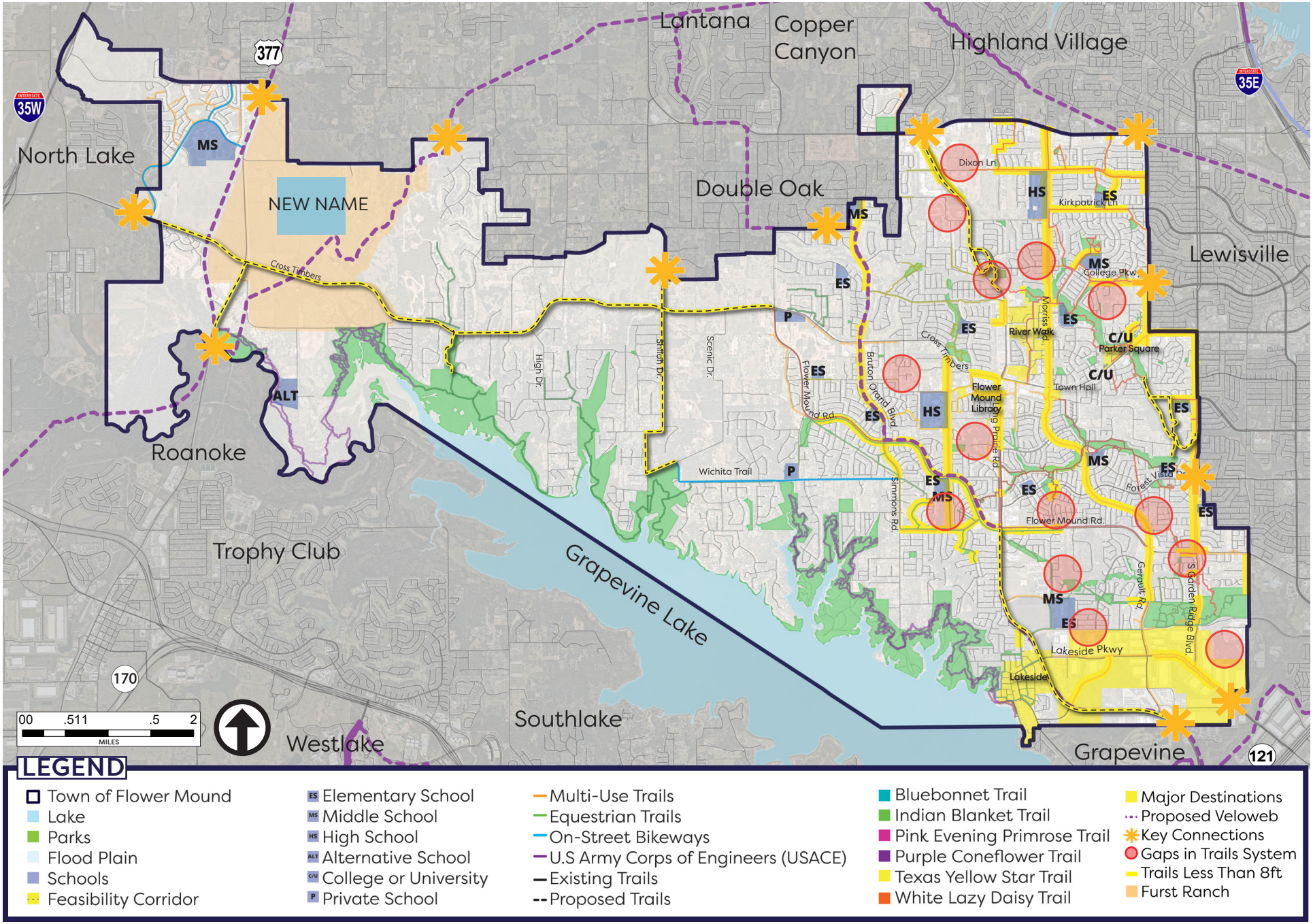


AMENITIES

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



04 TRAILS & BIKEWAYS SYSTEM NETWORK



INDIAN BLANKET TRAIL

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.

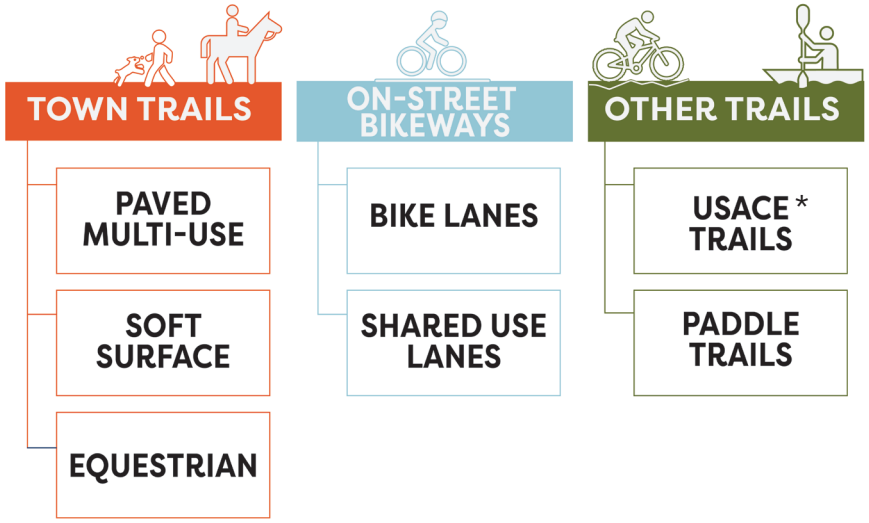
Connects the system – The segment would provide connections to the existing or planned system by filling a gap within the existing network.
Connects to destinations – The segment would provide connections to community destinations such as parks, schools, entertainment, and employment opportunities.
Addresses 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.

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.

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.


PAVED MULTI-USE TRAIL


SOFT SURFACE TRAIL


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. The width of these facilities vary and the surface material is typically compacted earth. Since these trails are located on USACE land, any changes to the proposed network will need to be coordinated with and approved by the USACE. Important considerations include implementing cautionary signage to reduce potential conflict from different users.



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 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.

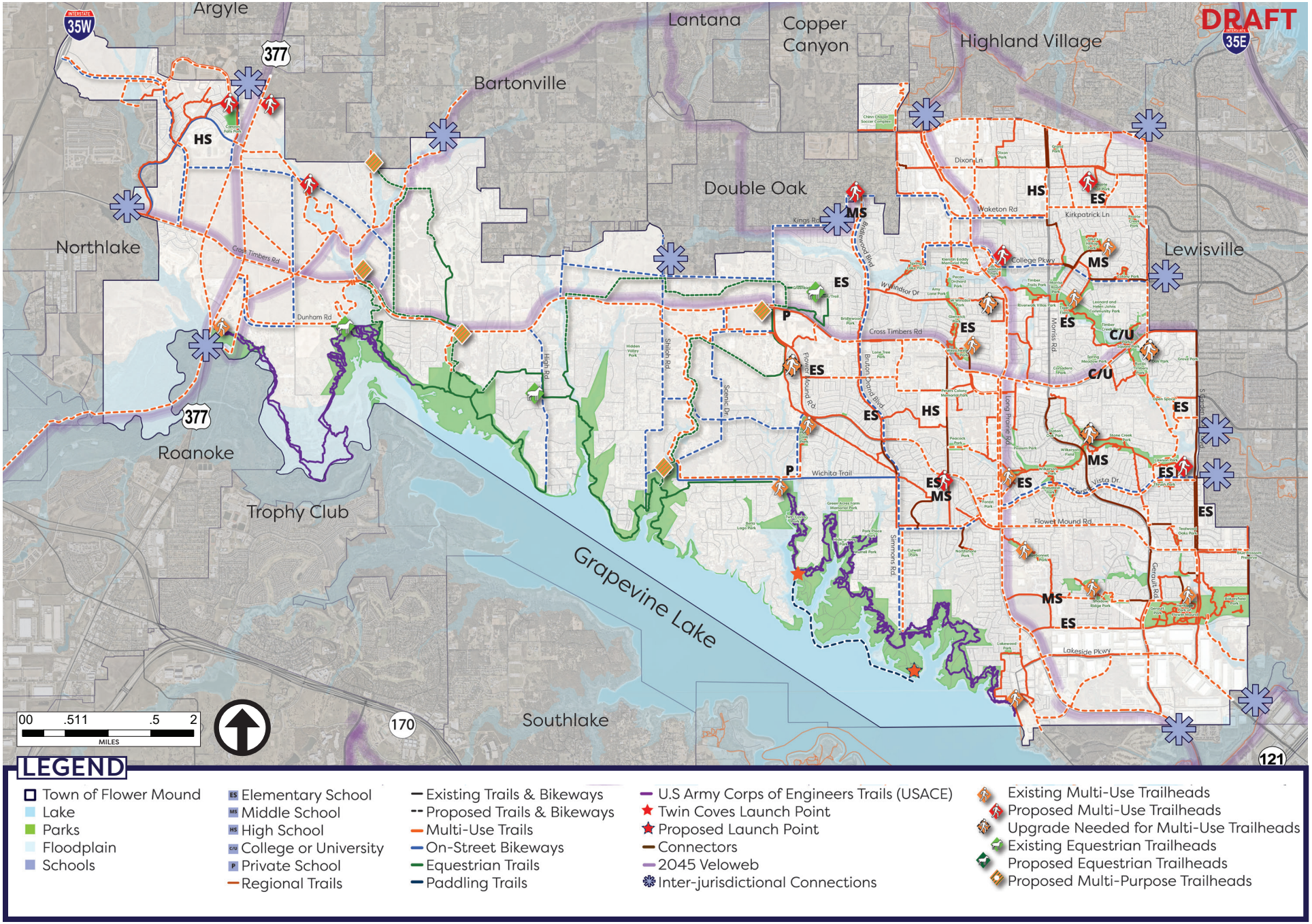
Figure 4.2 on the facing page represents the collective network recommendations for the Town of Flower Mound. Table 4.2 provides details on the existing and proposed mileage of all facility types. Table 4.3 shows how implementing these recommendations would change the Town's level of service.

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.

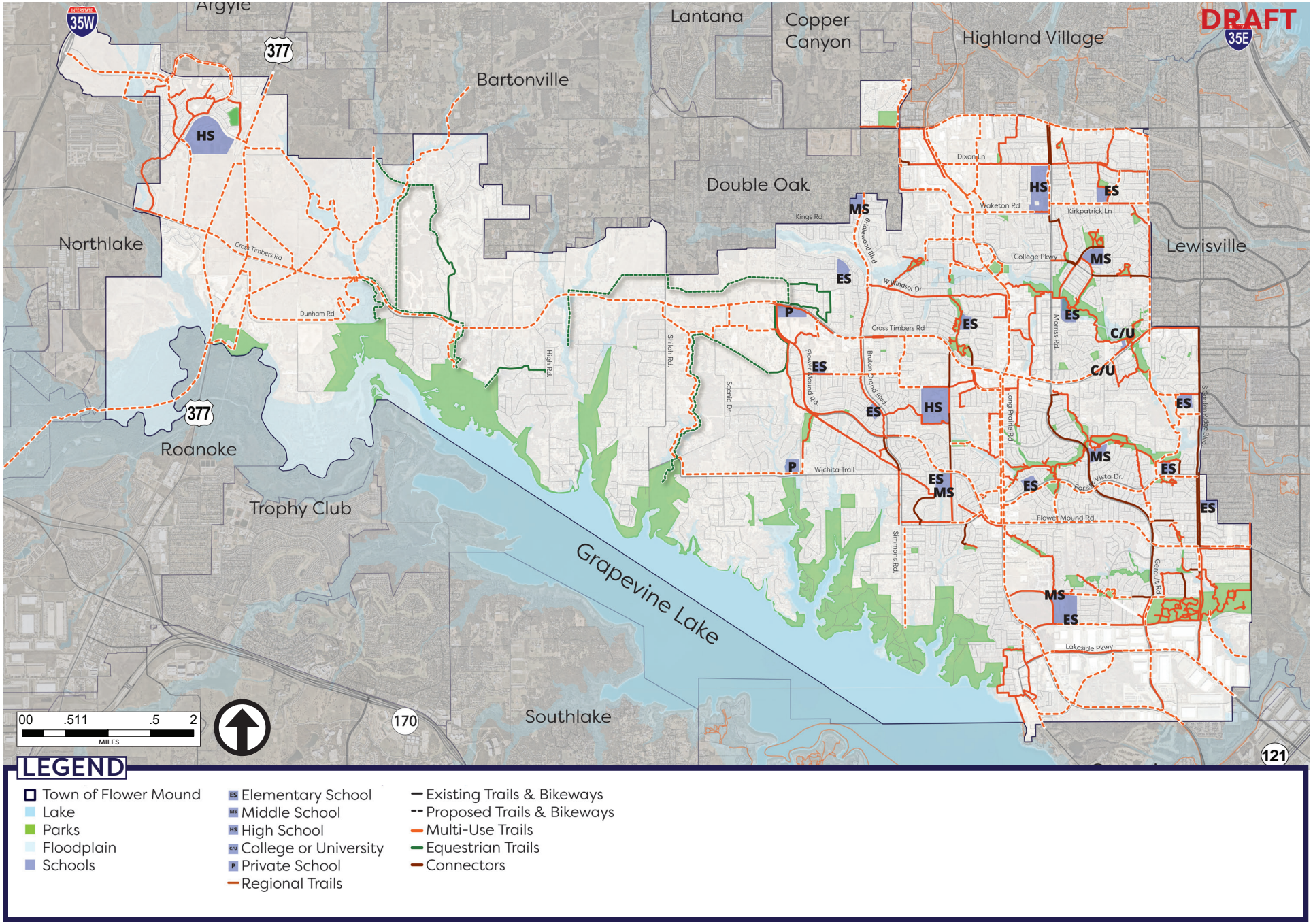
TABLE 4.4: TOWN TRAILS RECOMMENDATION SUMMARY

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**


INDIAN BLANKET TRAIL


TEXAS YELLOW STAR TRAIL

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 when roads throughout the Town are reconstructed, 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.



WICHITA TRAIL ROAD

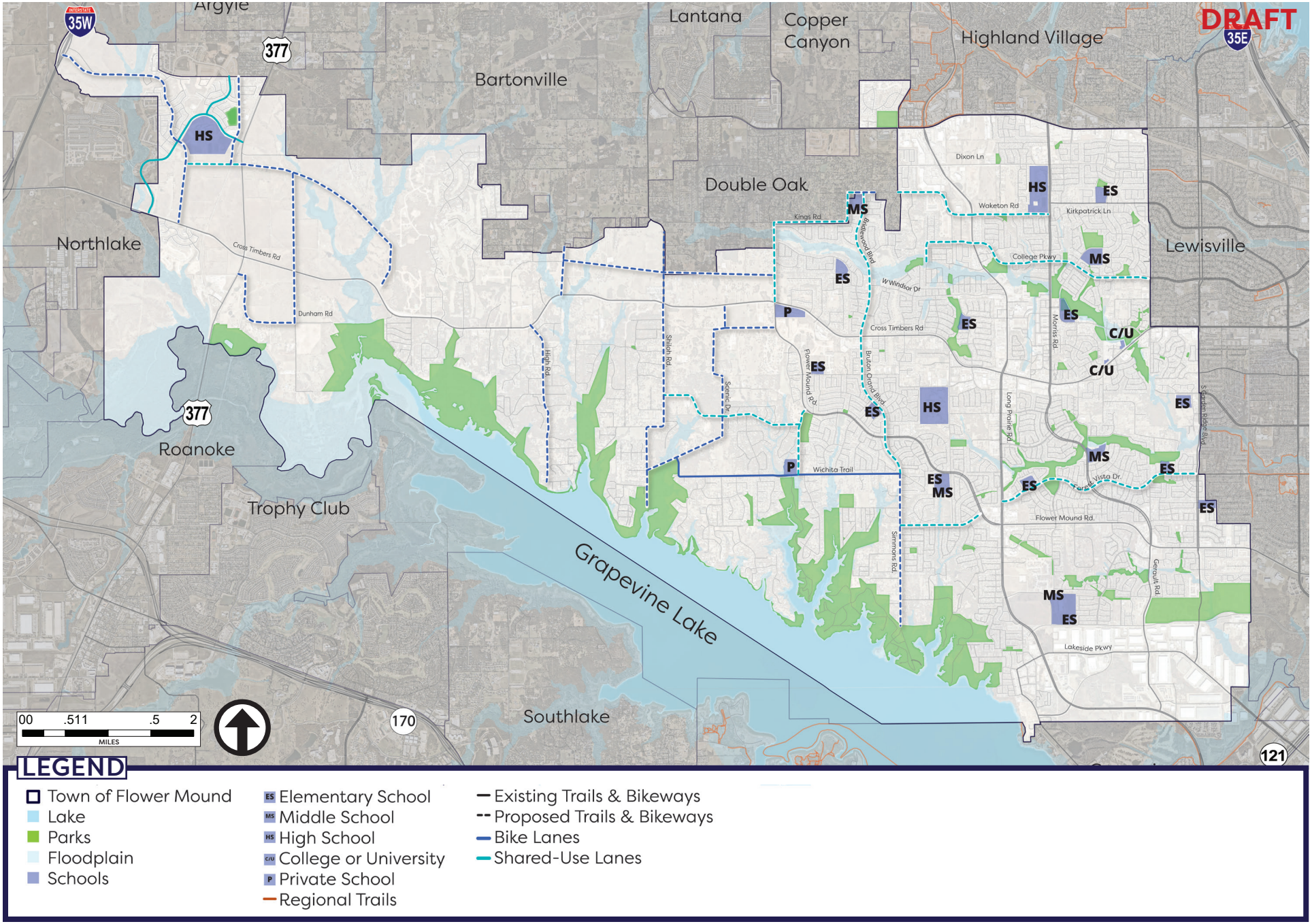
TABLE 4.5: ON-STREET BIKEWAYS RECOMMENDATION SUMMARY

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**



BIKE & PED SIGN IN LAKESIDE

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.



GRAPEVINE LAKE

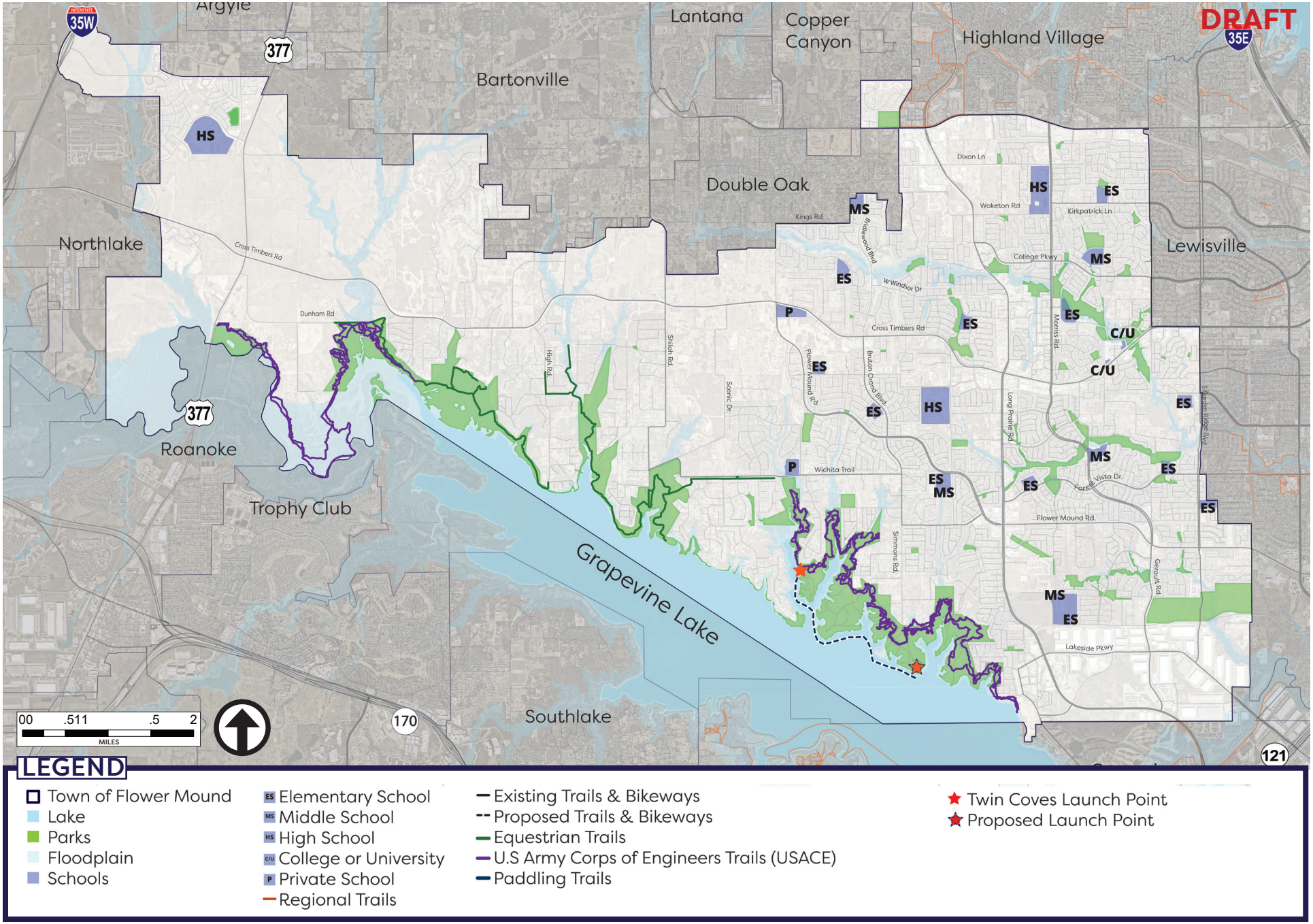
TABLE 4.6: OTHER TRAILS RECOMMENDATION SUMMARY

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**

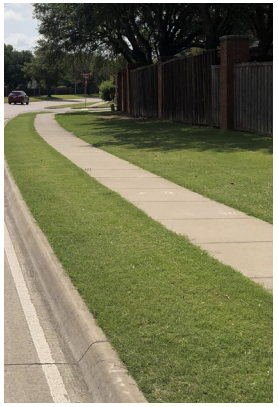


CYCLIST AT KNOB HILLS

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 roadways 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 should be enhanced for pedestrian crossings including signage, high emphasis pavement markings, and signalization. Major intersections include Long Prairie and Cross Timbers, Long Prairie and Flower Mound Road, and cross Timbers and US 377.



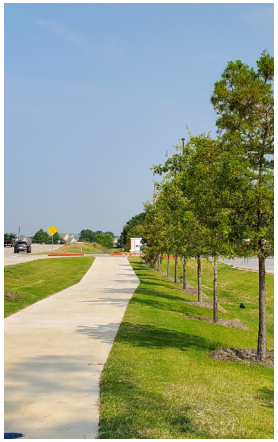
Mid-block Crossings

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 include along Gerault, Garden Ridge, and Morriss. 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, Copper Canyon, Highland Village, Grapevine, and Lewisville. Interjurisdictional connections allow Flower Mound residents to access amenities and entertainment throughout the DFW Metroplex.

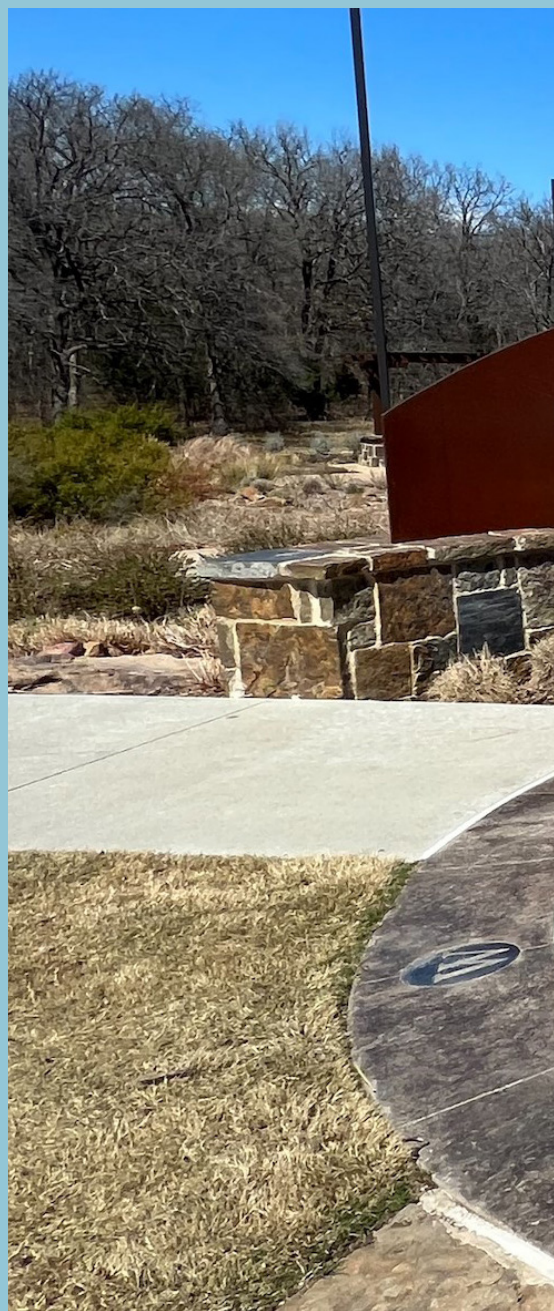


REGIONAL VELOWEB

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



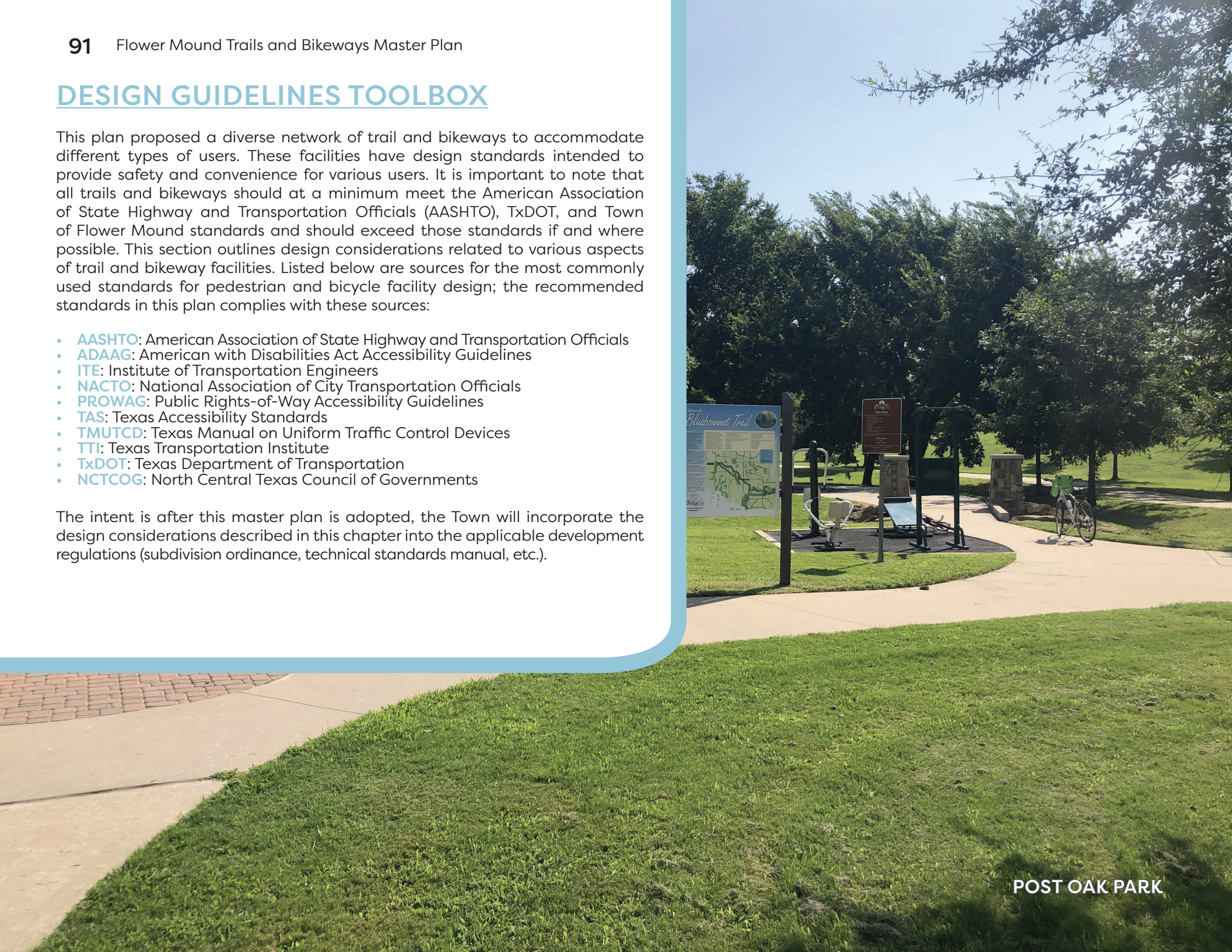
HERITAGE PARK NATURE TRAIL

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.).



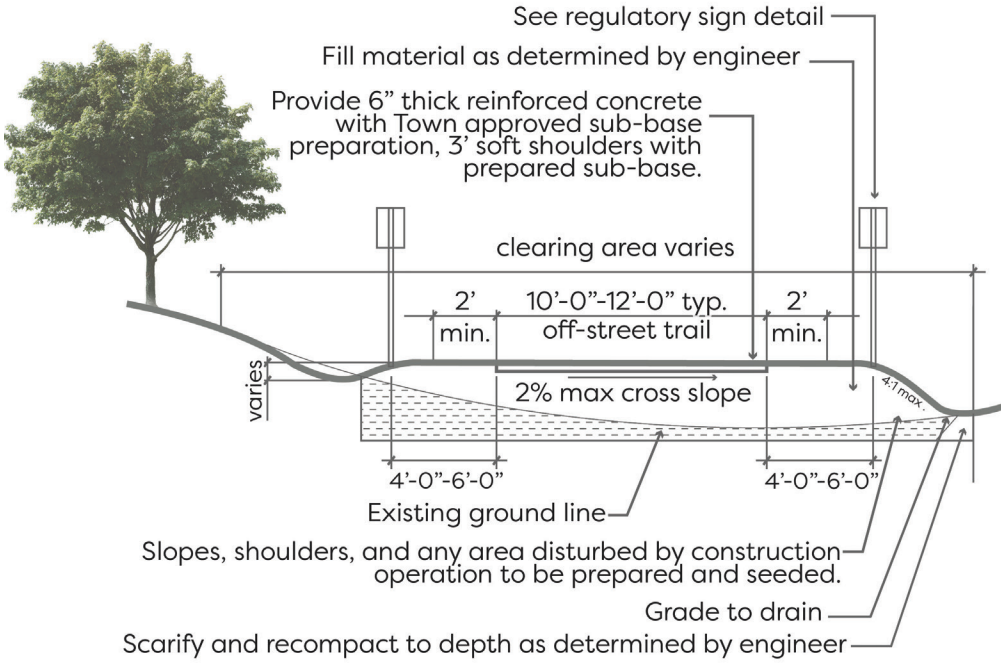
POST OAK PARK

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 handicap 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 foot stretch of 12' trail when the adjacent segments are eight feet.
- 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.



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.

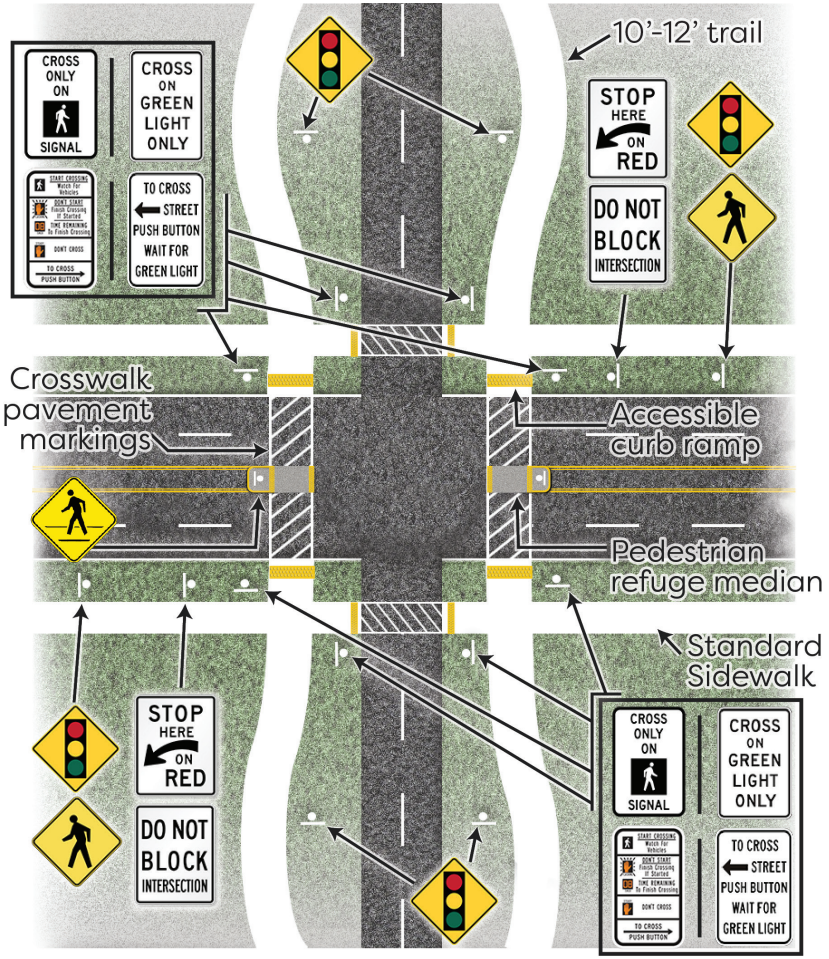
INTERSECTION TREATMENTS

Proper intersection treatments are important to reduce potential conflicts between trail users and motorists. In order to reduce conflict points, the corner radius for a 90-degree intersection should typically be 15'.

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 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.

VERTICAL AND HORIZONTAL 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.

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.

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.

Visual Clearance

All trails should be designed to prevent blindspots. Blindspots create conflicts between trail users and decrease safety along the corridor. Where blindspots exist, the trail should be widened, striped, and signed to provide the greatest awareness of oncoming trail traffic. Advanced warning can improve awareness along the trail.



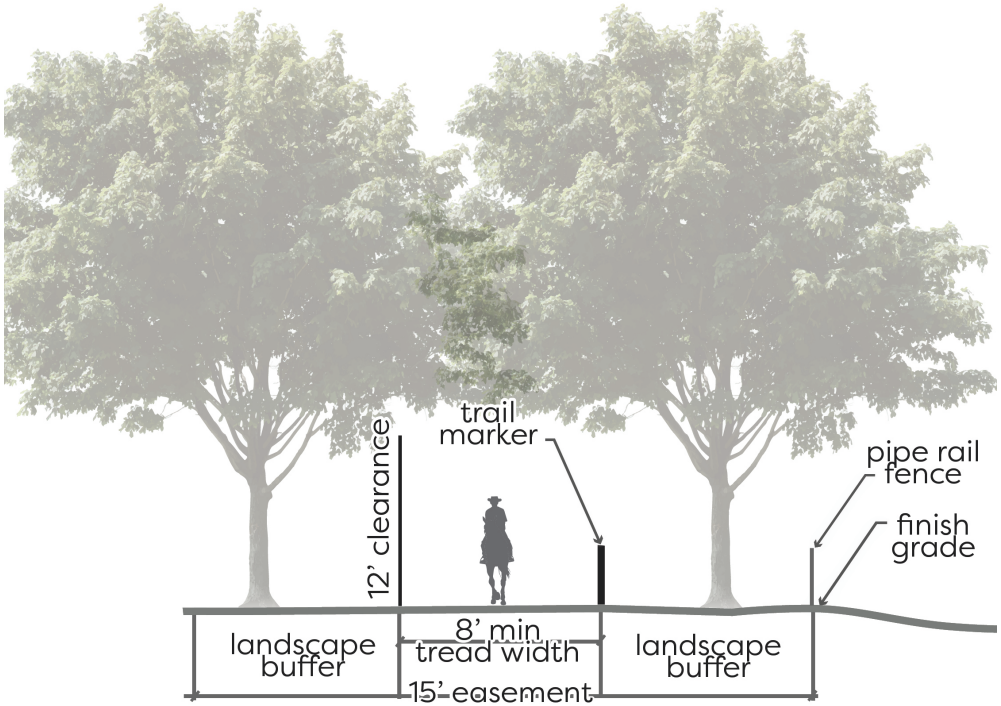
BLUE BONNET TRAIL

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. 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 5.3: 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.



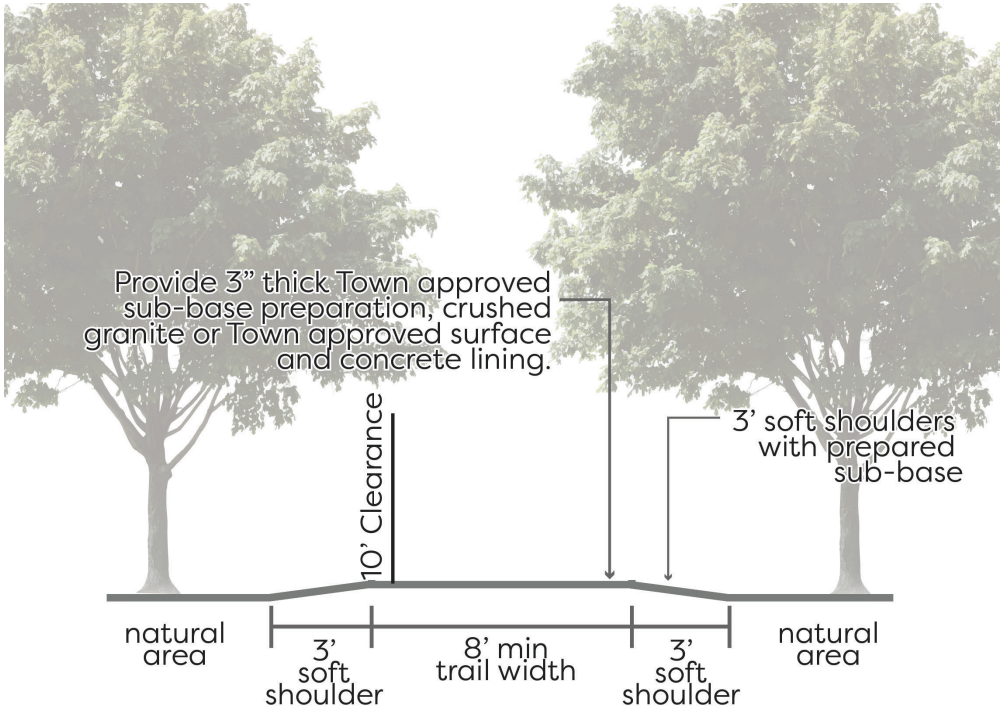
OTHER SOFT-SURFACE TRAILS

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 5.4: 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 5.5 and 5.6. 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.

Markings

Markings should follow the MUTCD, 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 MUTCD and AASHTO. Where a buffer exists, additional white striped hatches and an additional white stripe are needed. 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 5.5: TYPICAL STANDARD BIKE LANE

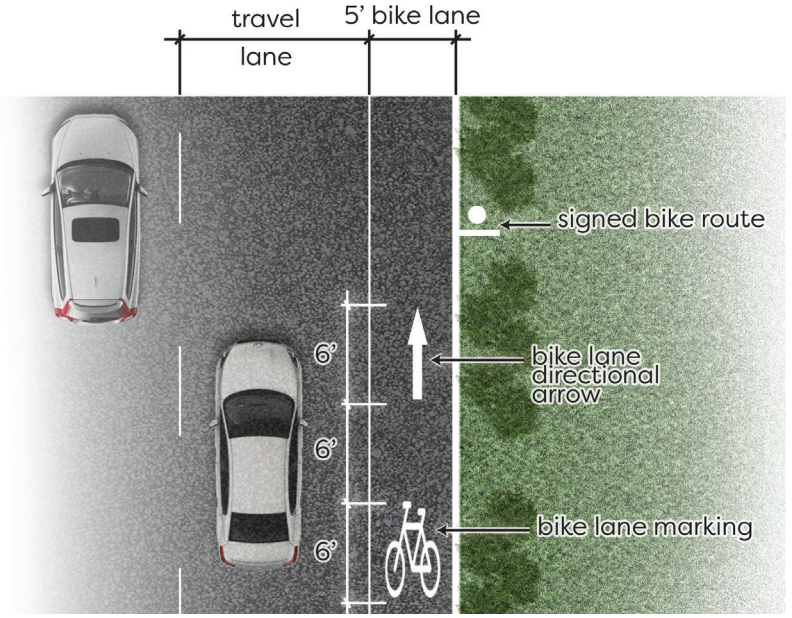


FIGURE 5.6: TYPICAL BUFFERED BIKE LANE

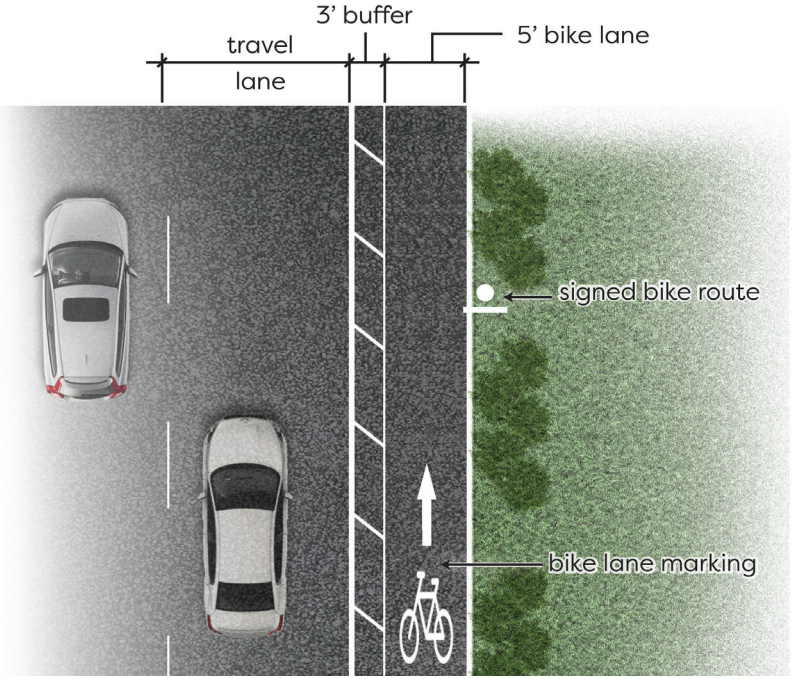
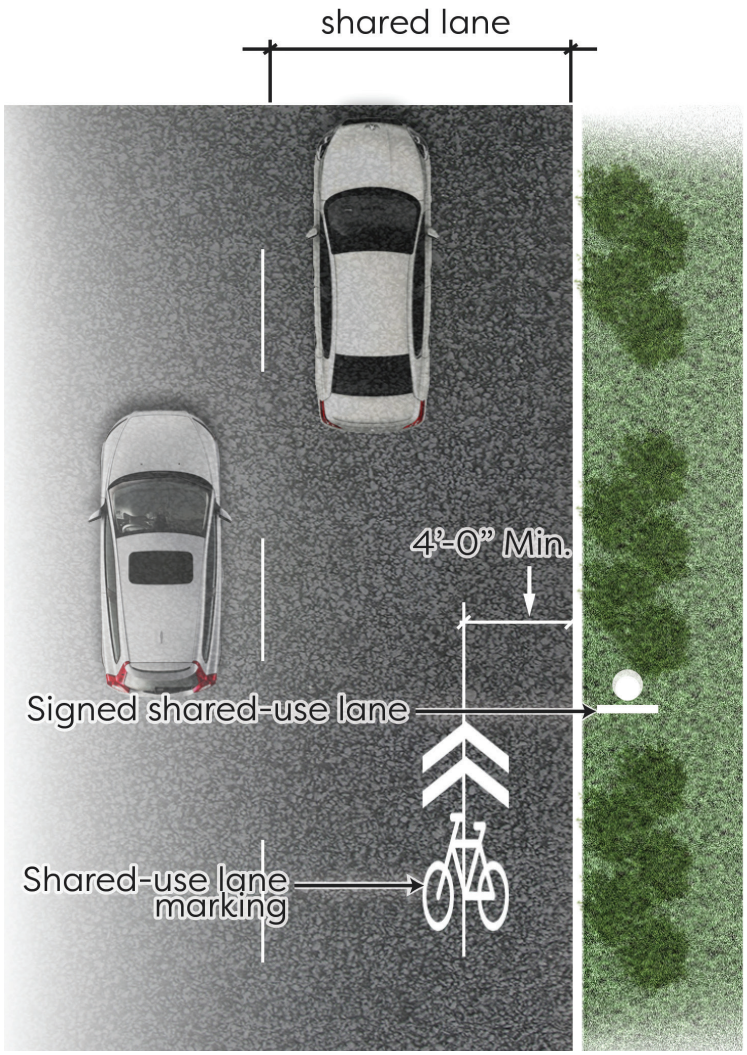
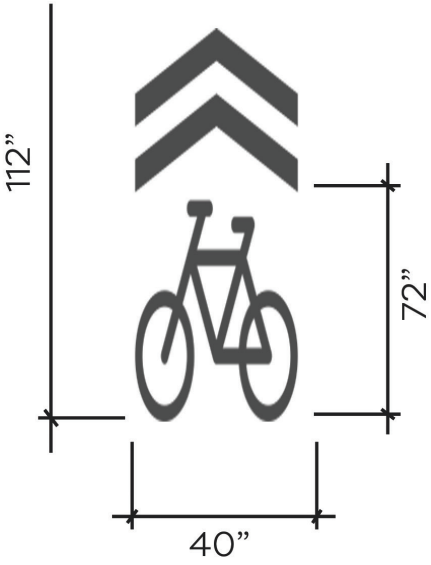


FIGURE 5.7: TYPICAL SHARED-USE LANE





SHARROW MARKING ENLARGEMENT

While sharrow markings should be min. 4' from gutter, it is often preferable to place them along the centerline of the lane to minimize wear and tear.

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. Some best practices for intersection treatments related to bikeways include:

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. 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.

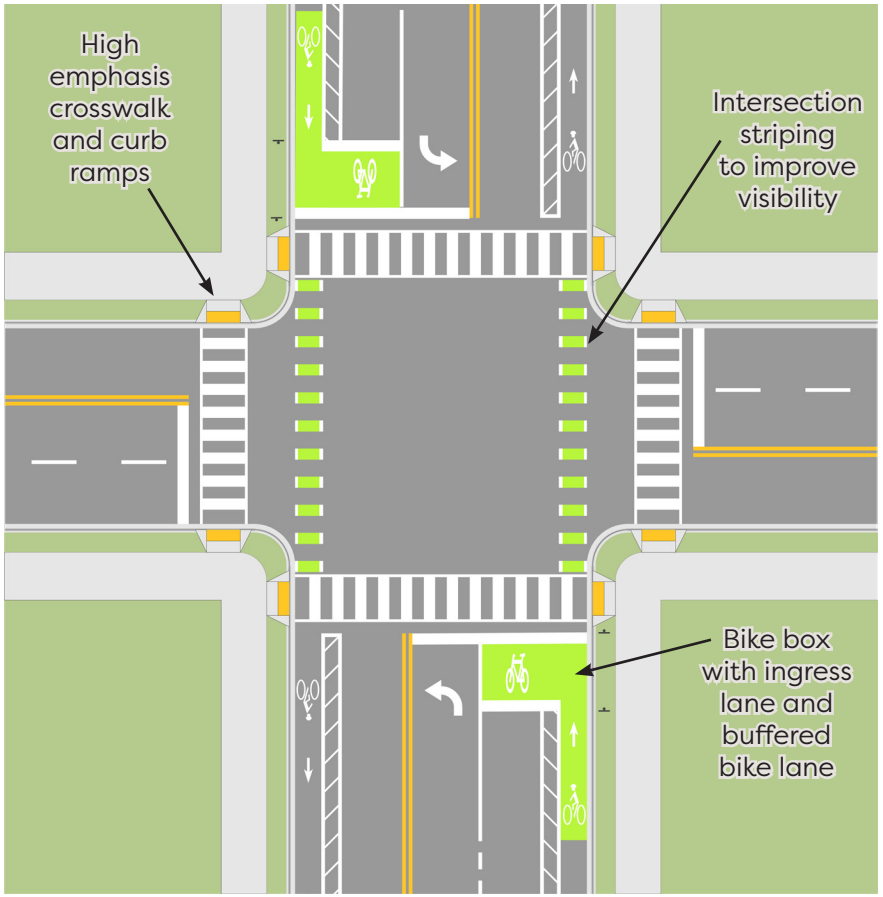
Driveway Crossings

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 5.8: 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 should 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 typically be 15'. 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.



ENHANCED CROSSWALKS

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.


CURB RAMPS

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.

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 protected 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.

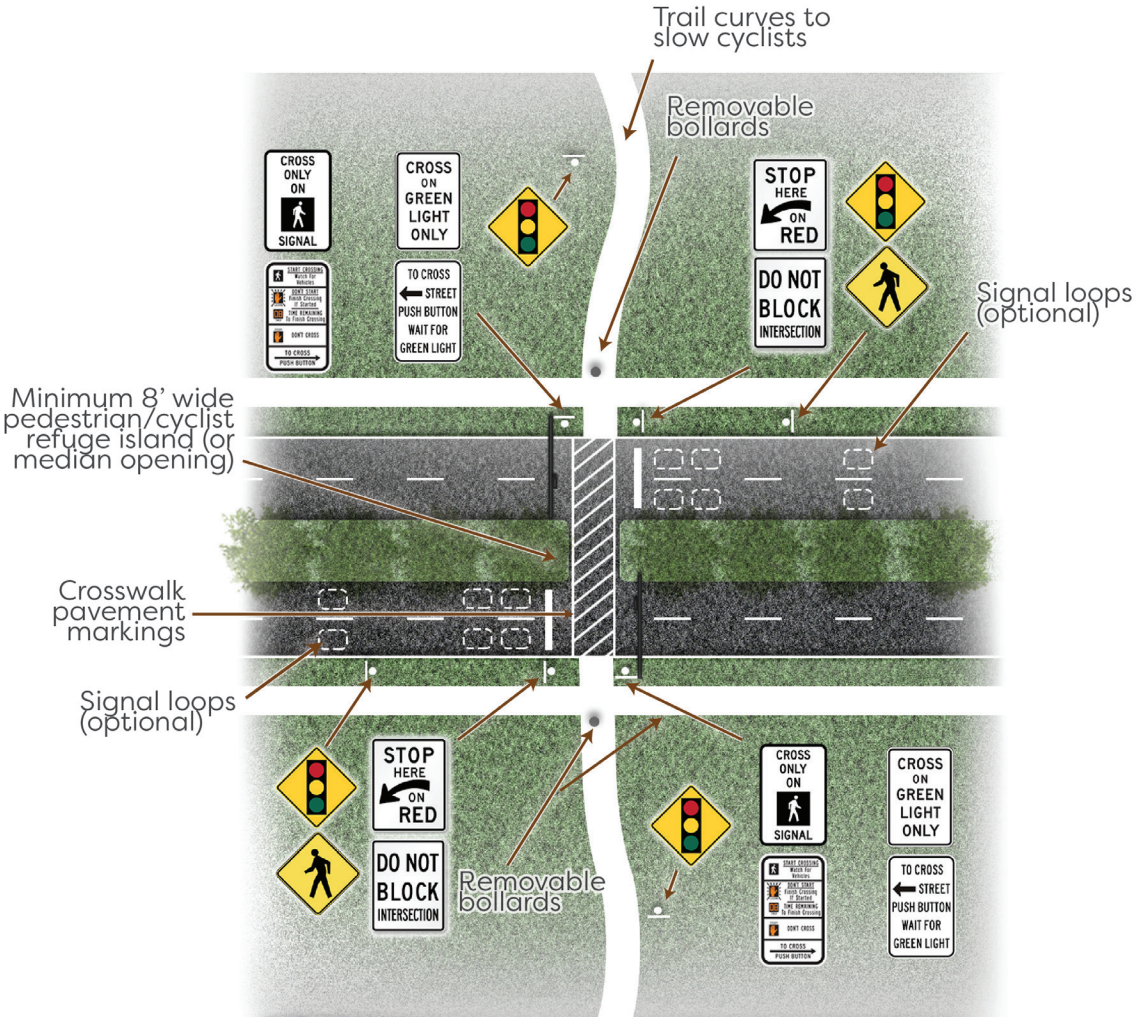
MID-BLOCK CROSSINGS

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 5.9 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 5.9: 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
- Informational Signage - map, rules and regulations, contact information
- Lighting
- Amenities: 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 10 and 11 show how major and minor trailheads can be designed, and how the different amenities can be included.

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 should be placed at the access points to aid users in wayfinding. Additional trail amenities at trail access points are not required.

TRAIL SIGNAGE

The trail network should be accessible to users, particularly trails located away from streets with limited access points. They can either be identified through access points and larger trailheads. The trail network should be identified by consistent branding, signage, and directional guidance. Branding is covered in more detail later in this section.

FIGURE 5.10: EXAMPLE MAJOR TRAILHEAD

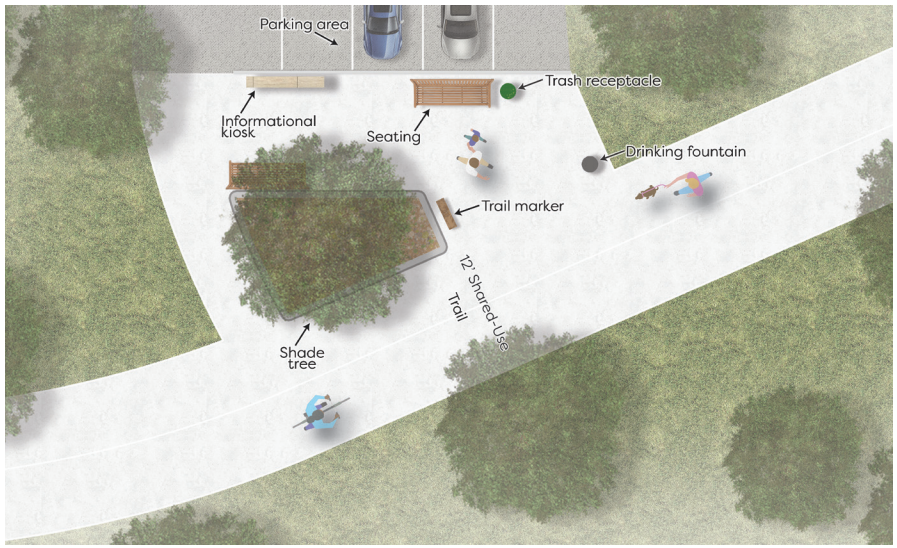
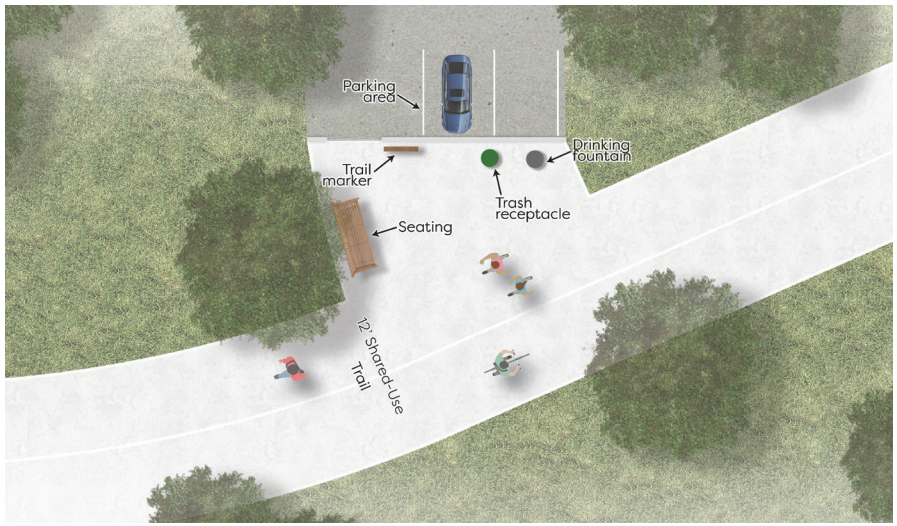


FIGURE 5.11: EXAMPLE MINOR TRAILHEAD



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 veiwing points, and other resting places along the trail.


BIKE RACK



BIKE REPAIR STATION

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 stagnate 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.



WASTE RECEPTACLES



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 5.12: 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

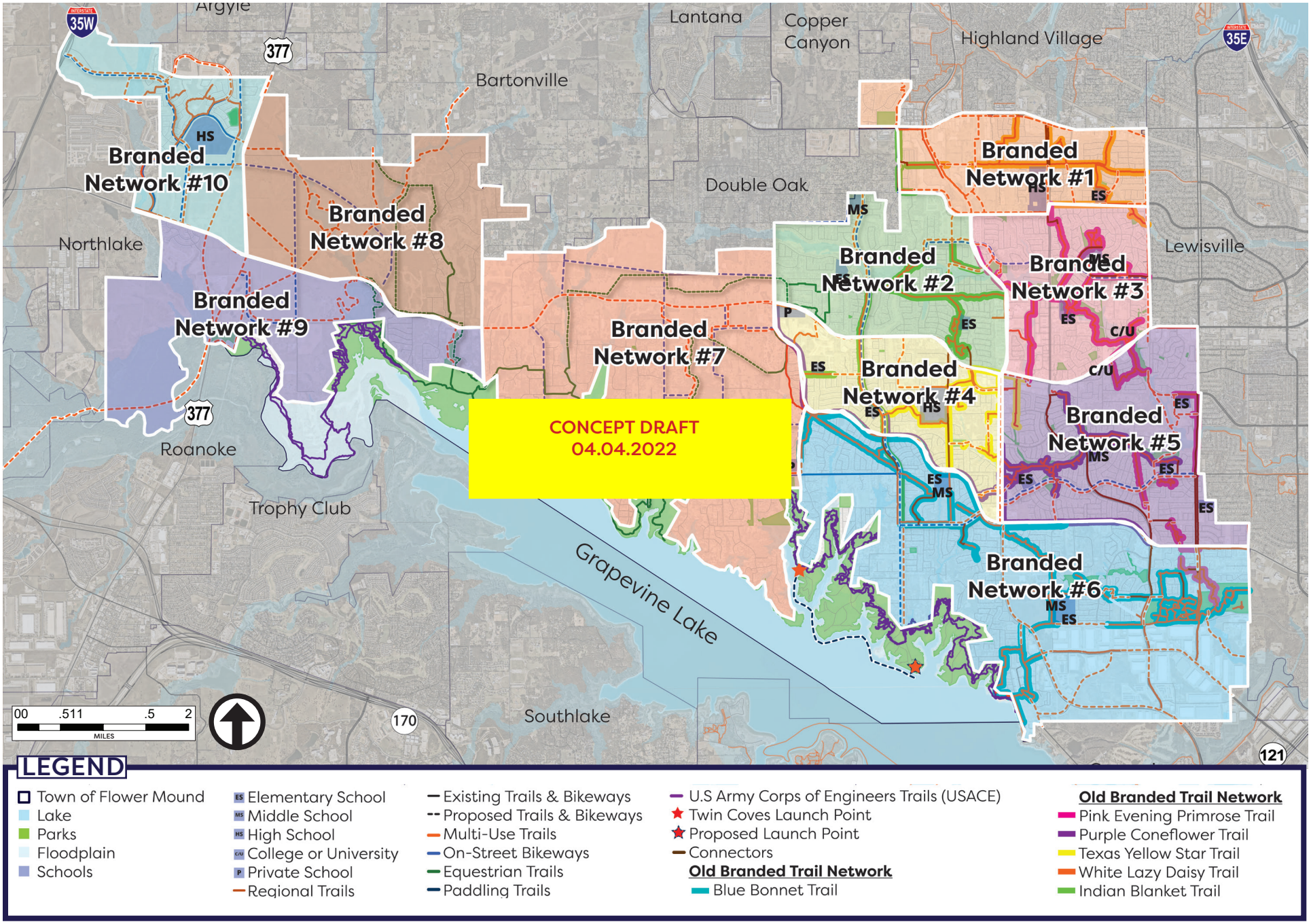
Trail markers should be placed at regular intervals along the trail to identify mileage, provide direction, and provide location information for emergency situations. They can help users be informed as to how far they've traveled. At a minimum, trail markers should be installed at every trailhead, trail access point, and trail intersection, however, trail markers should ideally be placed along the trail at ¼ to ½ 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 5.13: 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 5.13 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:

- Big and Little Bluestem (grass)
- 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 tandum 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.



LIGHTING ALONG TRAILS



RAILINGS AND CREEK CROSSINGS

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

In order to ensure there is no debris or obstructions encroaching on trail surfaces, routine mowing and weed wacking is recommended.

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.

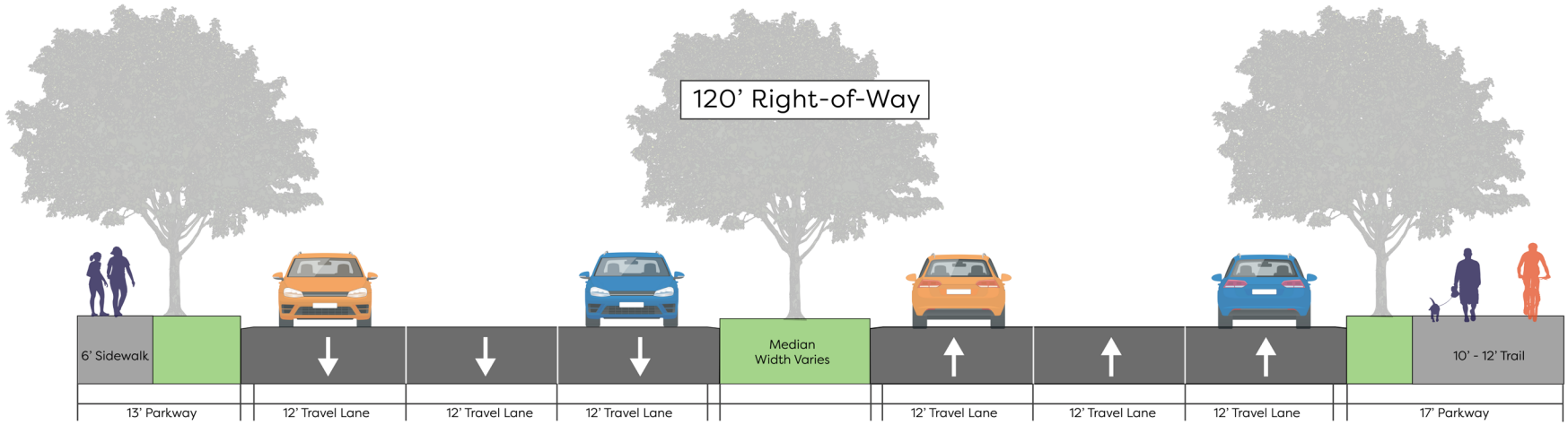
INTEGRATION WITH THOROUGHFARE PLAN

The Town Thoroughfare Plan was last updated in 2013, however 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 5.14 - 5.25 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

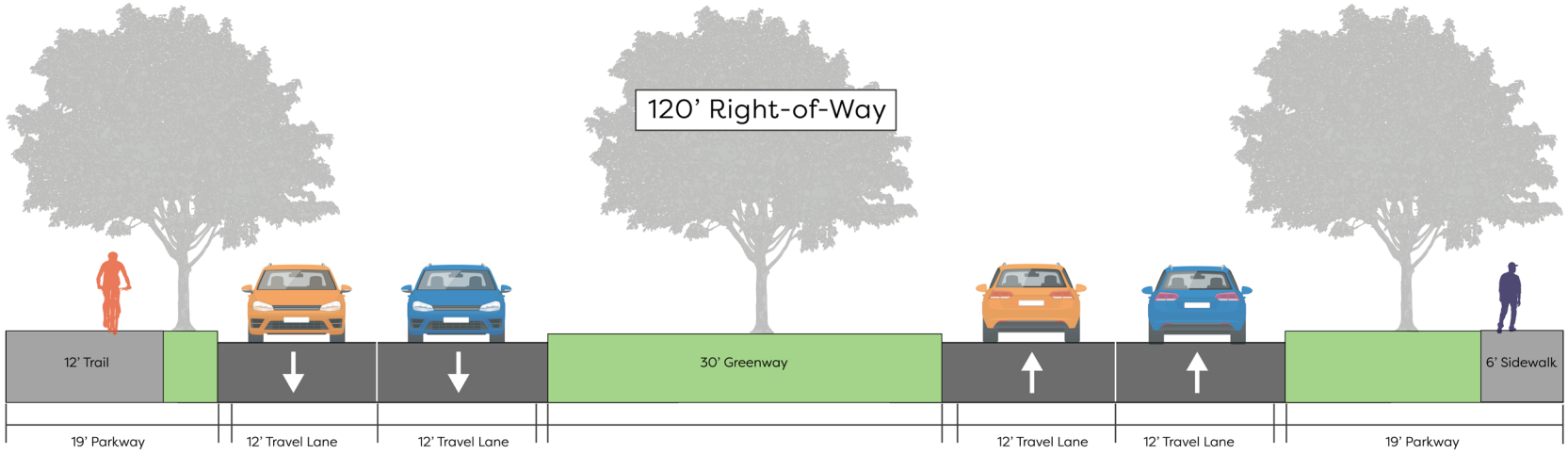
The thoroughfare plan is codified through Engineering Design Standards (EDS). The EDS should be updated to reflect recommendations outlined in this plan, including any lane widths, right-of-ways widths, design speeds considerations, driveway spacing to improve the pedestrian realm, and similar topics.

FIGURE 5.14: MAJOR ARTERIAL PROPOSED CROSS-SECTION



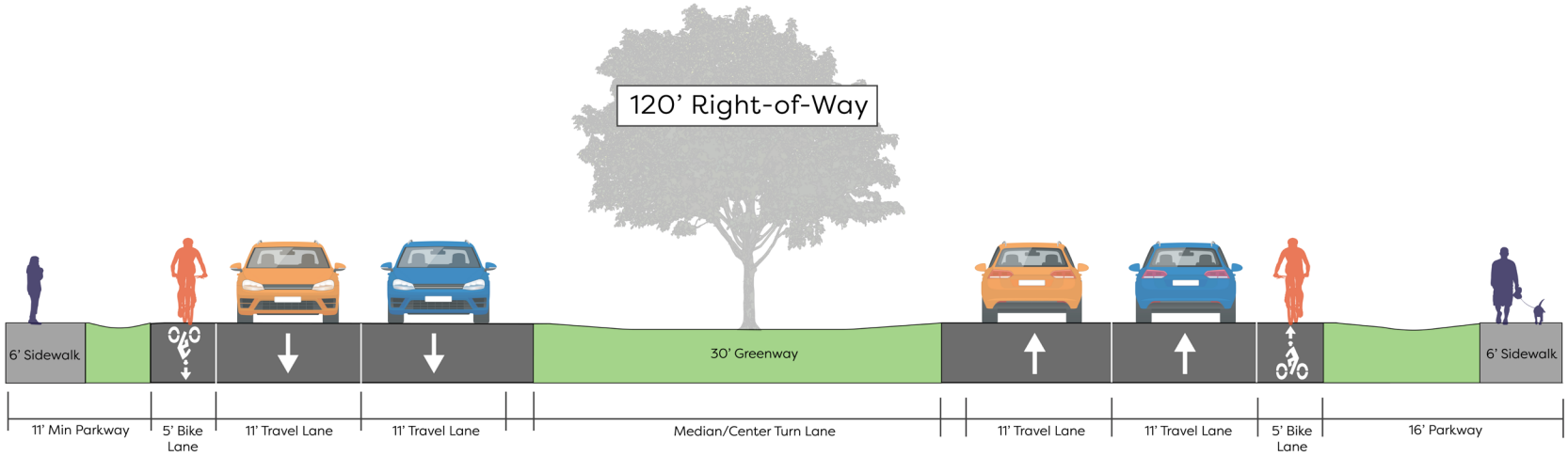
Major arterials include roads such as FM 1171, US HWY 377 and FM 2499. While these roads are mostly built-out, any new construction or reconstruction should consider minimizing the median in order to increase the buffer between pedestrian zones and motor vehicles. The road should also include a 6' wide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

FIGURE 5.15: GREENWAY URBAN ARTERIAL PROPOSED CROSS-SECTION



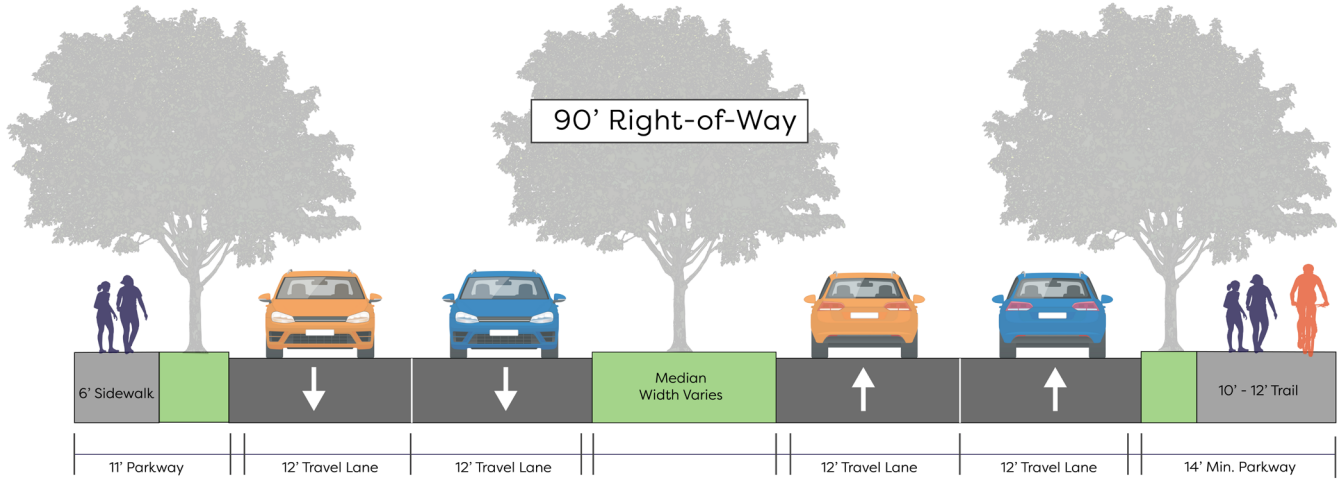
Greenway urban arterials include roads such as Garden Ridge Trail. This corridor should include a 12' wide shared use path where possible in order to create a comfortable shared realm. If the corridor is redeveloped, the median should be reduced in order to increase the width of the landscape buffer.

FIGURE 5.16: GREENWAY RURAL ARTERIAL PROPOSED CROSS-SECTION



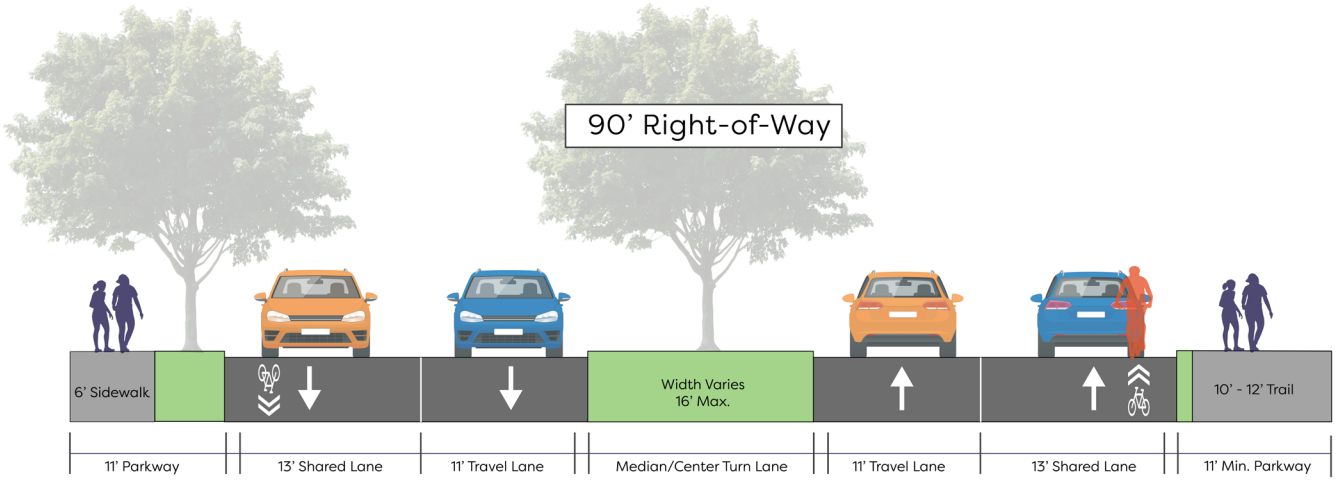
Greenway rural arterials are a future roadway classification in west Flower Mound. This roadway should include a landscaped median/center turn lane, bike lanes on each side of the road, and sidewalks with a minimum width of 6' on each side. If possible, the center turn lane should be reduced to the minimum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

FIGURE 5.17: URBAN MINOR ARTERIAL PROPOSED CROSS-SECTION



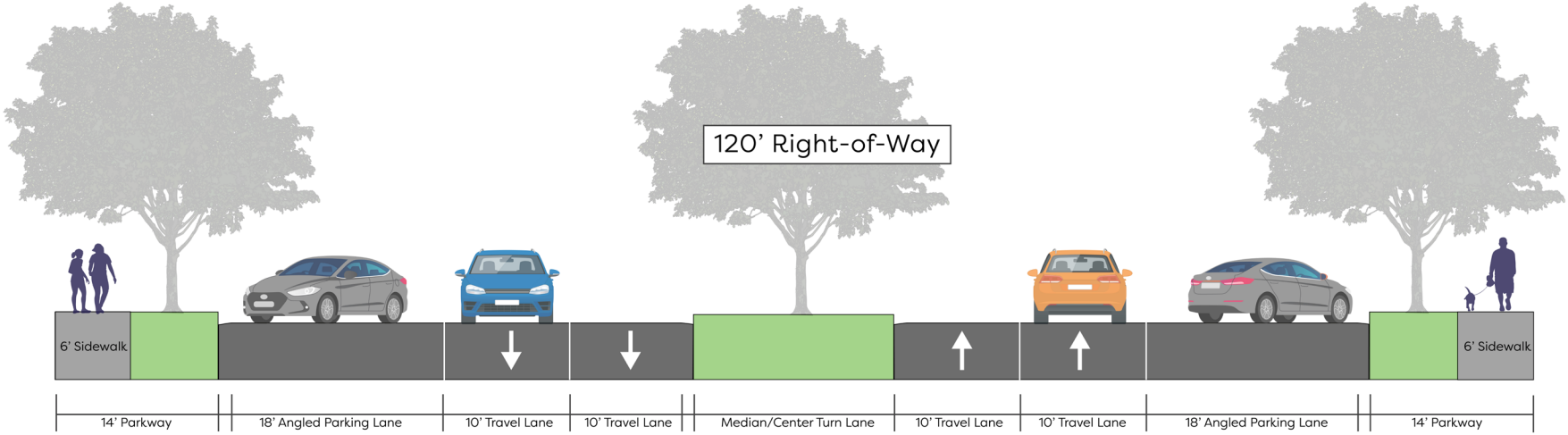
Urban minor arterials include a majority of the built roads in eastern Flower Mound, such as Flower Mound Road and Morris Road which move people and vehicles to destinations throughout the Town. Where able, this roadway cross-section should include a 10'-12' shared use path, a six foot sidewalk, and 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 5.18: URBAN MINOR ARTERIAL WITH SHARED LANE PROPOSED CROSS-SECTION



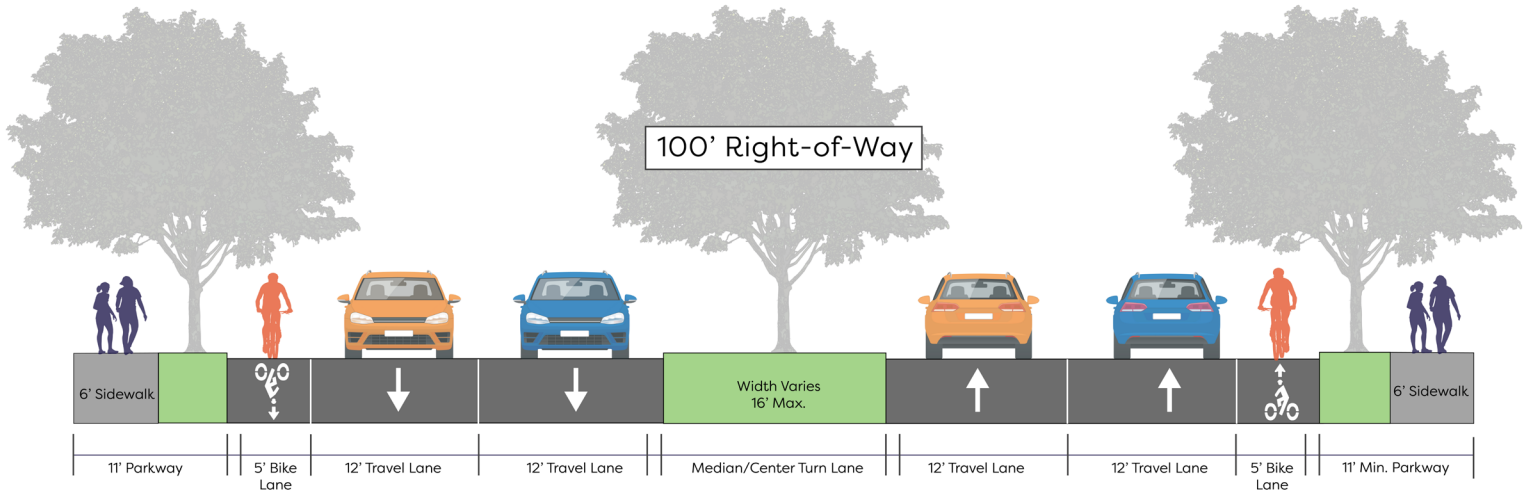
Urban minor arterials with shared-use lane is a new subclassifications of the urban minor arterial. In order to facilitate bicycle movement throughout the city, this roadway can include a shared-use lane by reducing the internal lane width, which allows the outside lane to be 13' with the additional 1' curb and gutter, making the total lane width 14'. This cross-section should include a 6' sidewalk and a 10'-12' shared use path.

FIGURE 5.19: URBAN MINOR ARTERIAL WITH ON-STREET PARKING PROPOSED CROSS-SECTION



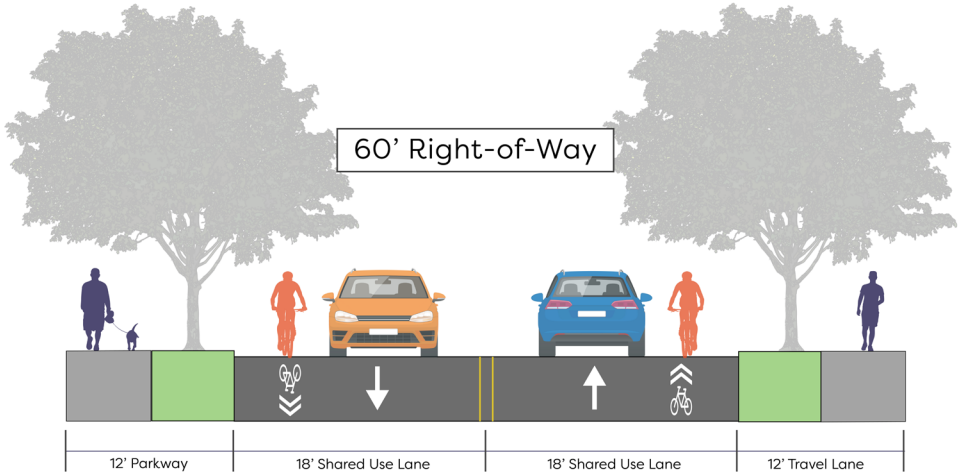
Urban minor arterials with on-street parking are found within the Lakeside Development. These roads are intended to provide parking for the shops and restaurants and provide wide sidewalks to encourage walking throughout the community. No changes have been proposed to this cross-section. Any new roadway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

FIGURE 5.20: URBAN MINOR ARTERIAL WITH BIKE LANES PROPOSED CROSS-SECTION



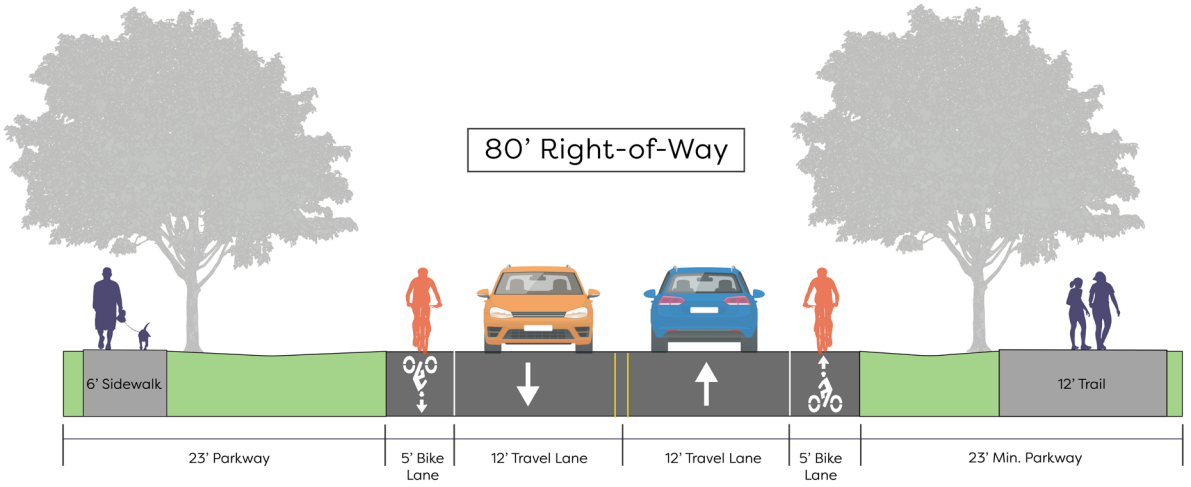
Urban minor arterials with bike lanes include roadways in west Flower Mound, including Canyon Falls Drive and other future corridors in the Canyon Falls Development. This cross-section provides 5' wide dedicated bike lanes, and 6' wide sidewalks on each side of the road.

FIGURE 5.21: URBAN COLLECTOR PROPOSED CROSS-SECTION



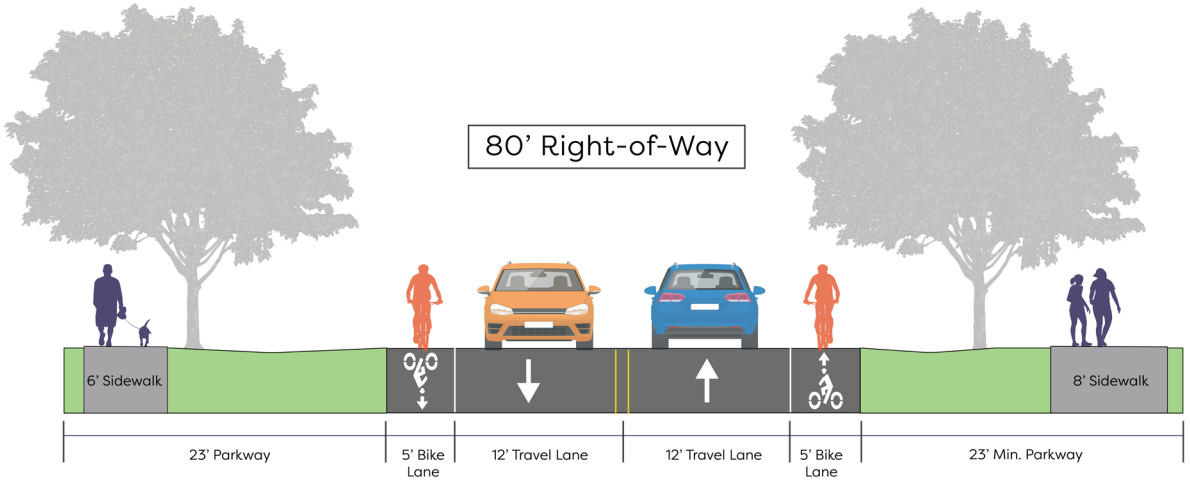
Urban collectors are roads in Flower Mound connect residents to arterial roadways. These include roads like Quail Run, Kirkpatrick Lane, and Lake Forest Boulevard. This cross-section should include shared-use lanes, and 6' wide sidewalks buffered by landscaping. It would be appropriate to consider 5'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

FIGURE 5.22: RURAL COLLECTOR PROPOSED CROSS-SECTION - A



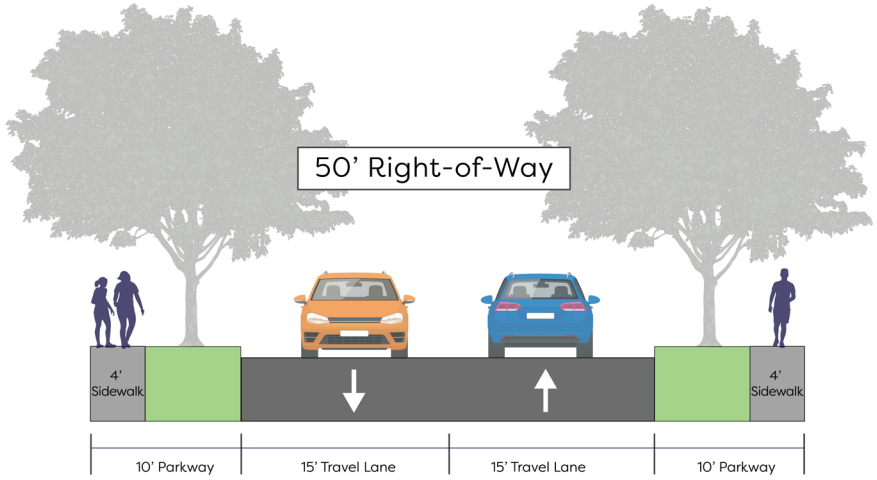
Rural collectors are roads in Flower Mound mainly found on the rural and undeveloped areas of the Town. These corridors should include bike lanes and 6' wide sidewalks. Where identified on the trails master plan, they should also include a 12' wide shared-use path.

FIGURE 5.23: RURAL COLLECTOR PROPOSED CROSS-SECTION - B



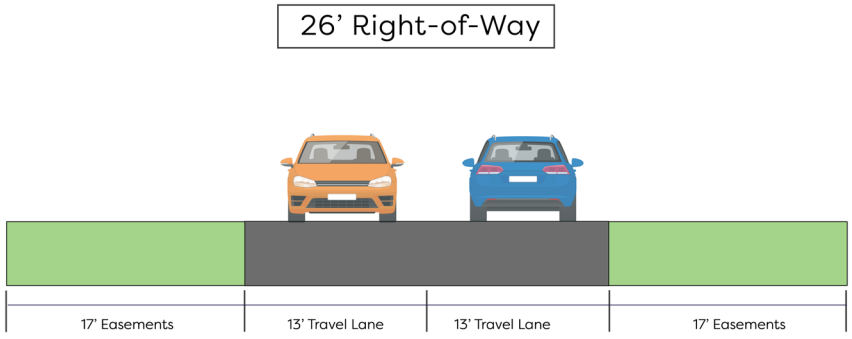
Rural collectors are roads in Flower Mound mainly found on the rural and undeveloped areas of the Town. These corridors should include bike lanes and collectors, with a 6' - 8' wide sidewalks.

FIGURE 5.24: 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 5.25: 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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Flower Mound Trails & Bikeways Master Plan
DRAFT RECOMMENDATION NETWORK

Attachment 2

Argyle
Lantana
Copper Canyon
Highland Village
Bartonville
Double Oak
Northlake
Lewisville
Roanoke
Trophy Club
Southlake
Grapevine
Grapevine Lake

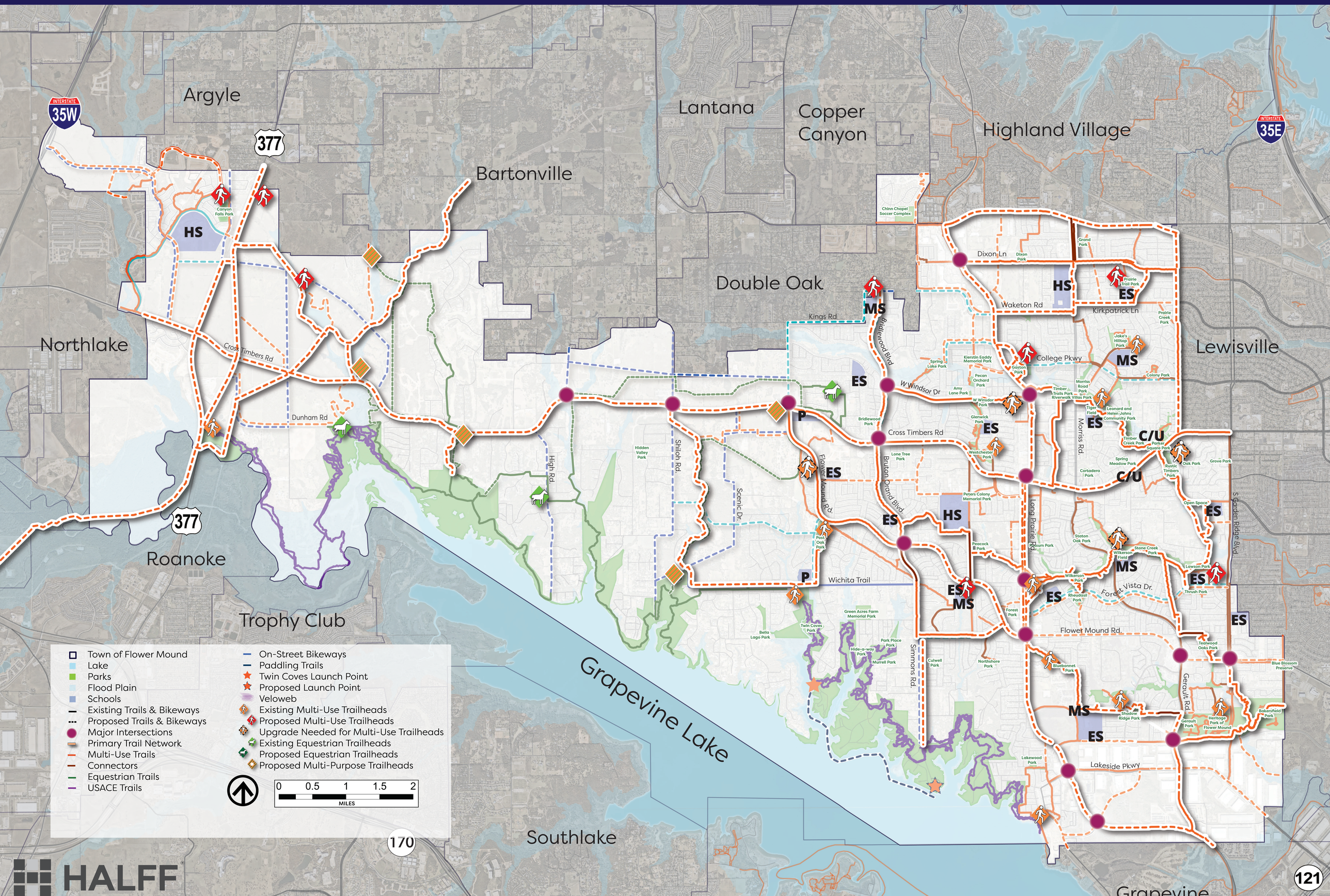
- Town of Flower Mound
- Lake
- Parks
- Flood Plain
- Schools
- Existing Trails & Bikeways
- Proposed Trails & Bikeways
- Multi-Use Trails
- Connectors
- Equestrian Trails
- USACE Trails
- On-Street Bikeways
- Paddling Trails
- Twin Coves Launch Point
- Proposed Launch Point

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MILES

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Flower Mound Trails & Bikeways Master Plan

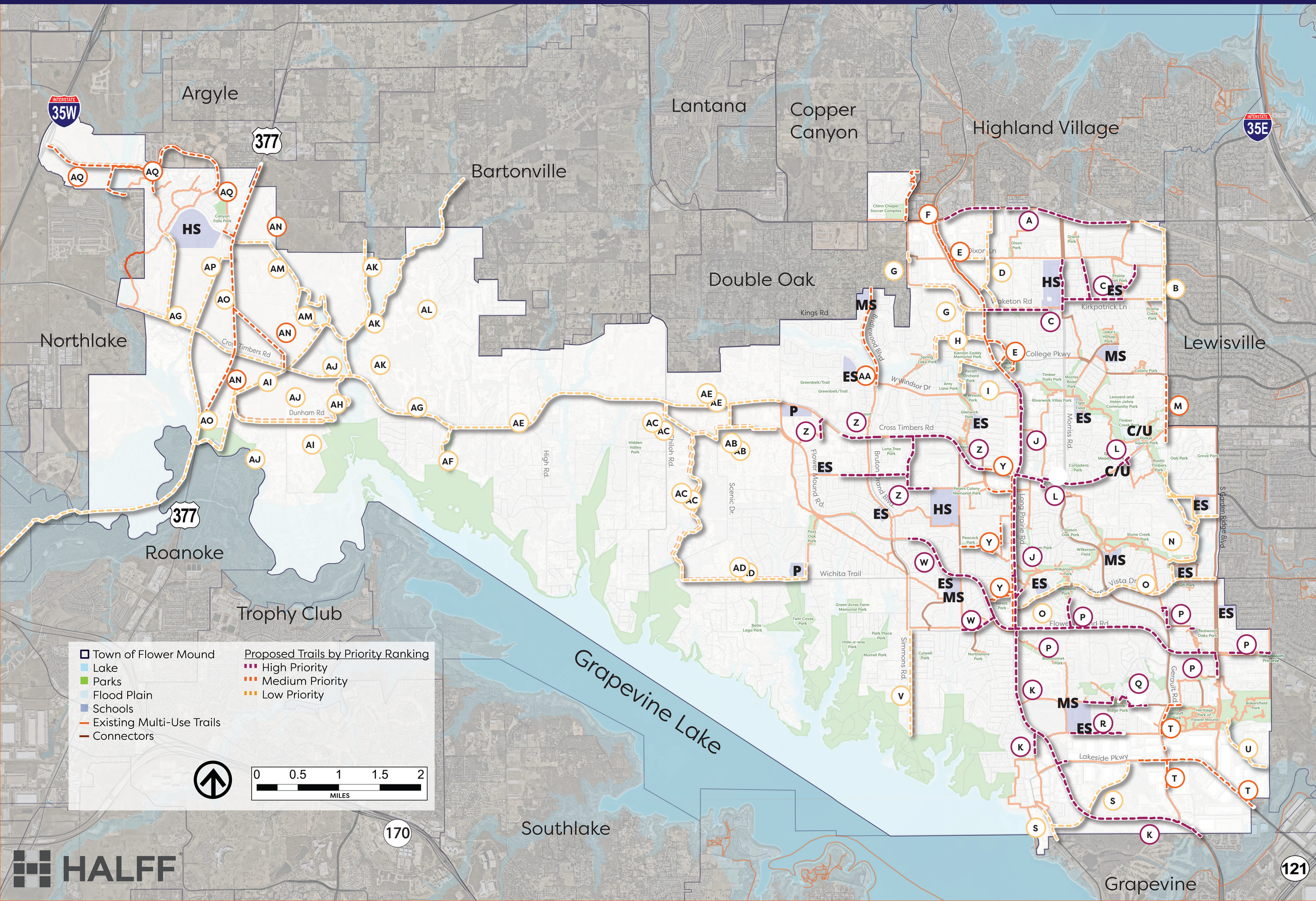
OTHER PRIORITIZATION CONSIDERATIONS | PRIMARY NETWORK, INTERSECTIONS & TRAILHEADS



HALFF

Flower Mound Trails & Bikeways Master Plan

Corridor Prioritization | Multi-Use Trails



Flower Mound Trails & Bikeways Master Plan

Corridor Prioritization | On-Street Bikeways

Argyle

Lantana

Copper Canyon

Highland Village

Bartonville

Double Oak

Northlake

Lewisville

Roanoke

Trophy Club

Southlake

Grapevine

Grapevine Lake

Cross Timbers Rd

Dunham Rd

Kings Rd

Waketon Rd

Kirkpatrick Ln

College Pkwy

W Windsor Dr

Cross Timbers Rd

Flower Mound Rd.

Wichita Trail

Lakeside Pkwy

Briarwood Blvd

Bruton Grand Blvd

Flower Mound Rd.

Simmons Rd.

Morriss Rd.

Long Prairie Rd.

S Garden Ridge Blvd

Gerault Rd.

High Rd

Shiloh Rd

Scenic Dr

Dixon Ln

Chinn Chapel Soccer Complex

Canyon Falls Park

Hidden Valley Park

Greenbelt/Trail

Bridlewood Park

Lone Tree Park

Westchester Park

Peters Colony Memorial Park

Peacock Park

Post Oak Park

Green Acres Farm Memorial Park

Park Place Park

Hide-a-way Park

Murrell Park

Bella Lago Park

Twin Coves Park

Culwell Park

Northshore Park

Forest Park

Lakewood Park

Dixon Park

Grand Park

Prairie Trail Park

Prairie Creek Park

Jake's Hilltop Park

Kierstin Eaddy Memorial Park

Spring Lake Park

Gastor Park

Colony Park

Pecan Orchard Park

Amy Lane Park

W Windsor Park

Timber Trails Park

Morriss Road Park

Riverwalk Villas Park

Tiger Field

Leonard and Helen Johns Community Park

Glenwick Park

Timber Creek Park

Parker Square Park

Spring Meadow Park

Rustic Timbers Park

Oak Park

Grove Park

Cortadera Park

Open Space

Staton Oak Park

Stone Creek Park

Possum Park

Wilkerson Field

Wilkerson Park

Lawson Park

Thrush Park

Meadowhill Park

Tealwood Oaks Park

Bluebonnet Park

Shadow Ridge Park

Gerault Park

Heritage Park of Flower Mound

Bakersfield Park

Blue Blossom Preserve

Interstate 35W

Interstate 35E

377

170

121

HS

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C/U

- Town of Flower Mound
- Lake
- Parks
- Flood Plain
- Schools
- Existing On-Street Bikeways

Proposed Trails by Priority Ranking

- High Priority
- Medium Priority
- Low Priority

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Flower Mound Trails & Bikeways Master Plan

Corridor Prioritization | Other Trails

Argyle
Lantana
Copper Canyon
Highland Village
Bartonville
Double Oak
Lewisville
Northlake
Roanoke
Trophy Club
Southlake
Grapevine
Grapevine Lake

INTERSTATE 35W
INTERSTATE 35E
377
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121

EF
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- Town of Flower Mound
- Lake
- Parks
- Flood Plain
- Schools
- Existing Equestrian Trails
- U.S Army Corps of Engineers Trails (USACE)
- Twin Coves Launch Point
- Proposed Launch Point

Proposed Trails by Priority Ranking
- High Priority
- Medium Priority
- Low Priority

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MILES

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Flower Mound Trails & Bikeways Master Plan

Combined High Prioirty Projects

Argyle
Lantana
Copper Canyon
Highland Village
Bartonville
Double Oak
Northlake
Lewisville
Roanoke
Trophy Club
Southlake
Grapevine
Grapevine Lake

INTERSTATE 35W
INTERSTATE 35E
377
170
121

Cross Timbers Rd
Dunham Rd
Kings Rd
Waketon Rd
Kirkpatrick Ln
College Pkwy
Dixon Ln
W Windsor Dr
Cross Timbers Rd
Flower Mound Rd
Wichita Trail
Forest Vista Dr.
Lakeside Pkwy
Bartlewood Blvd
Brutons Branch Blvd
Long Prairie Rd.
Morriss Rd.
Geraldt Rd.
S Garden Ridge Blvd.
Simmons Rd.
Scenic Dr.
Shiloh Rd.
High Rd.

HS
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BP
BQ
EE
ED

Chinn Chapel Soccer Complex
Canyon Falls Park
Dixon Park
Grand Park
Prairie Trail Park
Prairie Creek Park
Jake's Hilltop Park
Kiersten Eaddy Memorial Park
Spring Lake Park
Gaston Park
Colony Park
Pecan Orchard Park
Amy Lane Park
W Windsor Park
Timber Trails Park
Morriss Road Park
Riverwalk Villas Park
Tiger Field
Leonard and Helen Johns Community Park
Timber Creek Park
Parker Square Park
Glenwick Park
Lone Tree Park
Cortadera Park
Rustic Timbers Park
Oak Park
Grove Park
Peters Colony Memorial Park
Peacock Park
Open Space
Staton Oak Park
Stone Creek Park
Wilkerson Field
Wilkerson Park
Lawson Park
Thrush Park
Rheudasil Park
Forest Park
Tealwood Oaks Park
Bluebonnet Park
Meadow Ridge Park
Gerault Park
Heritage Park of Flower Mound
Bakersfield Park
Hidden Valley Park
Twin Coves Park
Green Acres Farm Memorial Park
Park Place Park
Hide-a-way Park
Murrell Park
Bella Lago Park
Culwell Park
Northshore Park
Blue Blossom Preserve

Town of Flower Mound
Lake
Parks
Flood Plain
Schools
Existing Multi-Use Trails
Existing On-Street Bikeways
Existing Equestrian Trails
Connectors
U.S Army Corps of Engineers Trails (USACE)
Twin Coves Launch Point
Proposed Launch Point

Proposed Trails by Priority Ranking
High Priority Multi-Use Trails
High Priority On-Street Bikeways
High Priority "Other" Trails

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MILES

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PARKS BOARD
AGENDA ITEM NO. 3

DATE: April 7, 2022

FROM: Chuck Jennings, Director of Parks and Recreation

WORK SESSION ITEM: **Review and discuss a recommendation of park projects for FY 2023-2027 to be incorporated into the Town's Five-Year Capital Improvement Projects list.**

Background Information: Each year the Parks Board reviews projects that have been identified through the Parks and Trails Master Plan, projects that have been requested by citizens, staff recommendations, and Town Council initiatives. The purpose of this work session item is for the Parks Board to review, discuss, and recommend proposed park projects for inclusion into the Town's Capital Improvement Plan (CIP) for fiscal years 2023 through 2027.

In March of 2017, the Town Council adopted the updated Parks and Trails Plan. The purpose of the Master Plan was to review and evaluate each of the Town's Parks and Recreation facilities, provide a 10-year plan for the updating/renovating of our current inventory, recommending future park acquisitions, addressing A.D.A. requirements, and prioritization of these recommendations.

The draft list of park projects was developed utilizing the current Five-Year CIP Plan and recommendations from the 2017 Parks and Trails Plan. Based upon the lists of projects identified and the amount of funding available, the Parks Board recommends projects by year, to be funded through the 4B sales tax revenues which are managed by the Community Development Corporation (CDC) and/or the Town's Park Development Fund.

Please see the attached draft of park projects for consideration and discussion.

Fiscal Impact: N/A

Legal Review: N/A

Attachments:

1. Draft of Recommended CIP Park Funding Projects

Draft Motion: This item is for discussion purposes only.

Draft Five Year Capital Improvement Plan

PARK PROJECTS	Prior Year	FY 22-23	FY 23-24	FY 24-25	FY 25-26	FY 26-27	Total
Bakersfield Park Improvements Phase I - Add sports field lighting to the 5 acre multipurpose field, retro fit parking lot lights to LED, and retro fit soccer sports lights to LED		$1,500,000					$1,500,000
Bakersfield Park Improvements Phase II - Upgrade Lighting to LED at baseball fields (1-8)			$1,600,000				$1,600,000
Chinn Chapel - Design Fees, ADA, drainage, & fence improvements, landscaping)	$650,000						
Colony Park Improvements (Renovate basketball pad & infield, trail improvements, trees, irrigation)					$250,000		$250,000
Dixon Park - Add Picnic pavilion and amenities		$100,000					$100,000
Dunham Ranch Master Plan	$100,000						
Dunham Ranch Design **			$950,000				$950,000
Dunham Ranch Construction **				$12,000,000			$12,000,000
Gerault Park Improvements - Renovate MP fields, Pavilion, electicity, grills, trash cans, picnic tables	$450,000						
Gerault Park - Retro fit ballfield lights and area lighting to LED				$1,200,000			$1,200,000
Glenwick Park - Lighting Upgrade to LED for baseball & tennis, landscape & irrigation improvements	$250,000						
Glenwick Park - Restroom Addition						$150,000	$150,000
Leonard & Helen Johns Park - ADA, Upgrade Tennis Court LED Lighting & Controls, Landscaping	$225,000						
Individual Park Improvements (Bluebonnet Park)				$100,000			$100,000
Park & Trail Amenities	$50,000	$75,000	$75,000	$75,000	$75,000	$75,000	$375,000
Parks & Recreation Master Plan					$300,000		$300,000
Park & Trail O&M	$275,000	$275,000	$300,000	$300,000	$325,000	$325,000	$1,525,000
Parker Square Park - Lifecycle replacement of amenities				$50,000			$50,000
2021-22 Playground Replacements (Peacock)	$250,000						
2022-23 Playground Replacements (Cortadera, Wilkerson, Possum)		$750,000					$750,000
2023-24 Playground Replacements (Northshore, Jake's Hilltop, Rustic Timbers)			$750,000				$750,000
2024-25 Playground Replacements (Thrush & Westchester)				$500,000			$500,000
Post Oak Park Improvements - signage(wayfinding & Interpretive), trail improvements, remove shallow stock pond, playground additions, add restroom, LED lighting in parking area				$700,000			$700,000
Prairie Trail Park Master Plan					$60,000		$60,000
Individual Park Improvements (Resurface playgrounds at Culwell, Shadow Ridge, Prairie Creek, Lone Tree & Colony)	$550,000						
Shade Fabric Replacements at various parks						$150,000	$150,000
Spring Lake Park Improvements- Drainage/sidewalk repairs, landscaping, adult fitness, site amenities, replace gazebo, lighting upgrades			$275,000				$275,000
Spring Meadow Park Improvements - looped trail; pavilion w picnic tabels, grill, trash cans; trees and Irrigation			$200,000				$200,000
Tealwood Oaks Park - ADA accessibility; pavilion w 2 picnic tables, grill; upgrade bridges & amenities	$400,000						
Tennis Center - Design *	$400,000	$750,000					$750,000
Tennis Center - Construction **			$11,500,000				$11,500,000
Trails Master Plan - Implementation	$250,000	$250,000	$250,000	$250,000	$250,000	$250,000	$1,250,000
Twin Coves Park Debt Service	$273,250	$270,950	$270,200	$271,250	$269,275	$272,075	$1,353,750
Twin Coves Park - Phase II Design					$700,000		$700,000
Twin Coves Park - Phase II Construction**						$6,000,000	$6,000,000
Total		**$3,970,950**	**$16,170,200**	**$15,446,250**	**$2,229,275**	**$7,222,075**	**$45,038,750**
Total Utilizing 4B Funds Only		**$3,220,950**	**$3,720,200**	**$3,446,250**	**$2,229,275**	**$1,222,075**	**$13,838,750**

*Park Development Fund

**Funding To Be Determined

Future Park Projects - Critical

PARK PROJECTS	Prior Year	FY 19-20	FY 20-21	FY 21-22	FY 22-23	FY 23-24	Total
Hideaway Park - ADA Accessibility							$50,000
Stone Creek Park - Replace older amenities; ADA/trail repairs, add shade over picnic tables							$50,000
Total							**$100,000**

Future Park Projects - Sustainable

PARK PROJECTS	Prior Year	FY 19-20	FY 20-21	FY 21-22	FY 22-23	FY 23-24	Total
Bakersfield Park Lighting Improvements - Softball Fields 9-11, Retro Fit Ballfield Lights to LED (FY2031)							$410,000
Chinn Chapel Soccer Complex Lighting Improvements - retro ballfield and parking lot lights to LED (FY2031)							$660,000
Equestrian Trailhead							$400,000
Equestrian Trails							$500,000
Forest Park - ADA compliant picnic station							$15,000
Gaston Park - Master Plan							$50,000
Green Acres Memorial Farm Park - Design & Construction							$2,200,000
Green Acres Park - Master Plan							$100,000
Indian Blanket Trail Connections							$2,000,000
Lawson Park - Wildflower improvements							$25,000
Peacock Park - Boardwalk; bioswale							$100,000
Pink Evening Primrose Trail Connections							$600,000
Purple Coneflower Trail Connections							$150,000
Texas Yellow Star Trail Connections							$850,000
Thrush Park - Master Plan							$50,000
Tiger Field - Restroom							$250,000
Timber Creek Park - Picnic stations; ADA accessibility							$100,000
West Windsor Park - landscape beautification							$100,000
Westchester Park - Restrooms; ADA; parking lot; splash pad; improve trails							$750,000
White Lazy Daisy Trail Connections							$100,000
Wilkerson Park Lighting Improvements - Retro fit lights to LED							$198,000
Total							**$9,608,000**

Future Park Projects - Visionary

PARK PROJECTS	Prior Year	FY 19-20	FY 20-21	FY 21-22	FY 22-23	FY 23-24	Total
Community Activity Center - Expansion							$22,000,000
Community Parks - Land Acquisition - 63 Acres							$6,300,000
Neighborhood Parks - Land Acquisition - 43 Acres							$4,300,000
Recreation Center - West Flower Mound - Facility Development							$30,000,000
Regional Parks - Land Acquistions - 52 Acres							$5,200,000
Total							**$67,800,000**