



THE COLONY

TRAILS & BIKEWAYS MASTER PLAN

FEBRUARY 2017

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ACKNOWLEDGMENTS

Many individuals volunteered a significant amount of their time and energy in the preparation of this 2017 Trails & Bikeways Master Plan. This plan would not have been possible without the leadership and guidance provided by The Colony's citizens, elected and appointed officials and City staff.

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- Richard Boyer - Place 2: At-Large
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EXECUTIVE SUMMARY

This Trails and Bikeways Master Plan is organized into six chapters and an appendix. Each of these chapters details a major component of the master planning process.

INTRODUCTION (CHAPTER 1)

In addition to defining the purpose of this Master Plan and the process by which it has been produced, this chapter also reflects The Colony's vision and goals as the guiding principles for the development of the trails within the city.

COMMUNITY (CHAPTER 2)

Chapter 2 examines the internal and external factors influencing The Colony's trails and bikeway system including the city's history, its natural resources and Lewisville Lake, regarded as important image defining elements of the city, are briefly described. The community's demographics are analyzed along with the City's previous trail planning study to better understand the past, present, and future of The Colony. Regional and local trail connections related to trails are analyzed to understand their current Level of Service (LOS), and "connectedness" to The Colony's trails and bikeways network.

DEFINE NEED FOR TRAILS (CHAPTER 3)

Chapter 3 focuses on the community outreach and public involvement aspects that are core components of the planning process. The summary of this input directly relates to the recommendations of the Master Plan. In addition, regional benchmarks are considered and used to determine additional trail and bikeway mileage needed to accommodate The Colony's maturing population.

TRAILS NETWORK (CHAPTER 4)

Trail typologies are defined in this chapter and where the most feasible proposed routes would occur on and off-street. The opportunities and constraints of the existing trail network is also analyzed and the importance of trails, bikeways and off-street trails, that are existing and proposed in The Colony.

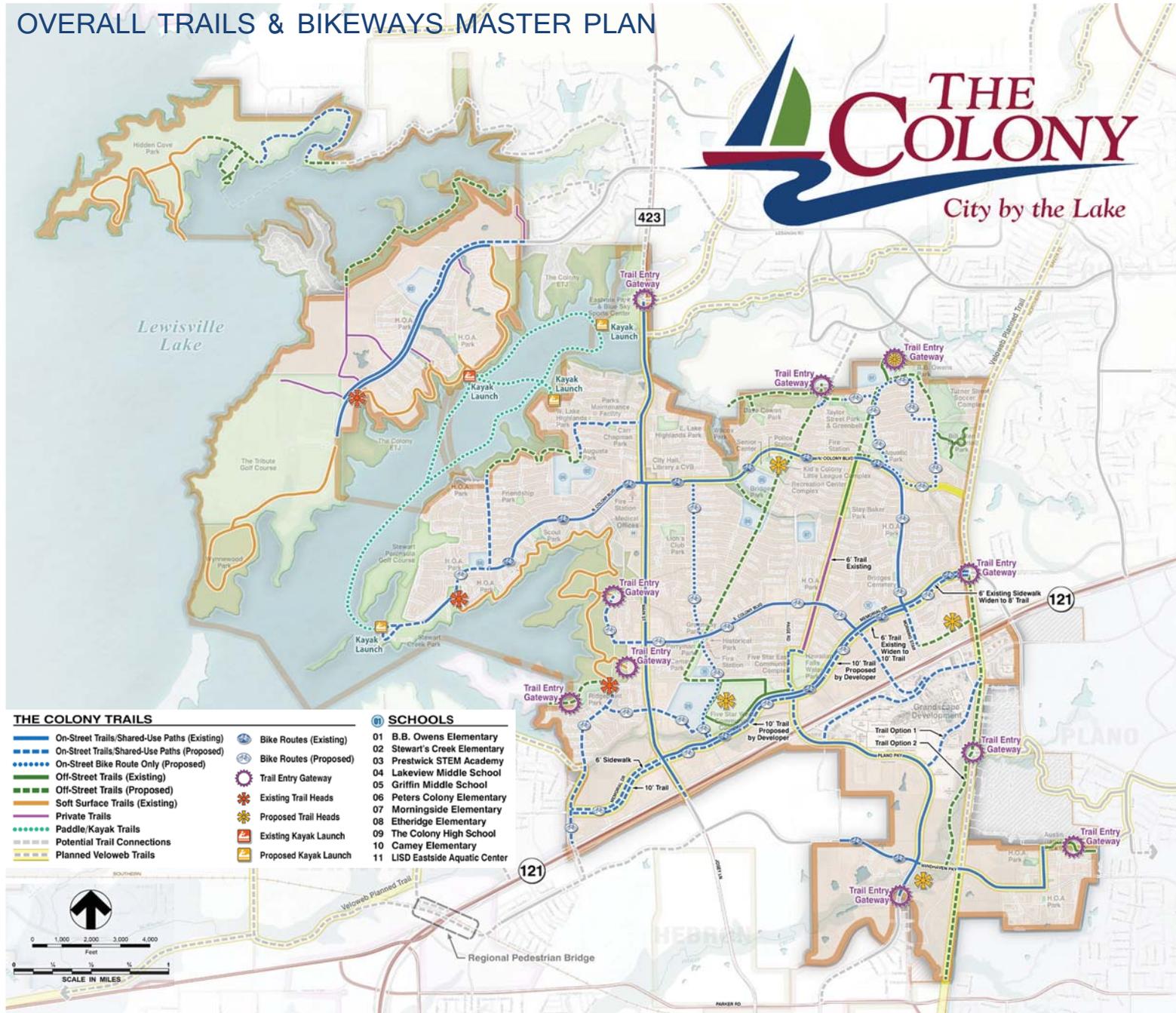
TRAIL DESIGN STANDARDS (CHAPTER 5)

The focus of this chapter is the development of a set of design guidelines that will help the City guide its safety, access, and constructibility for trails and bikeways. The chapter includes an analysis of existing and proposed trail types in the City, an overview of a trail elements, destinations and features.

DEVELOPMENT STRATEGIES & IMPLEMENTATION (CHAPTER 6)

Trail implementation and strategic policy recommendations are the focus of this chapter. A trails and bikeways implementation plan along with a recommended trail segment priorities and potential sources of funding. In addition, a summary of the key priorities resulting from this Master Plan and the costs associated with its implementation are provided.

OVERALL TRAILS & BIKEWAYS MASTER PLAN

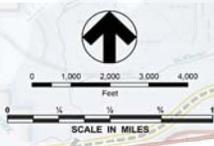


THE COLONY TRAILS

- On-Street Trails/Shared-Use Paths (Existing)
- - - On-Street Trails/Shared-Use Paths (Proposed)
- ⋯ On-Street Bike Route Only (Proposed)
- Off-Street Trails (Existing)
- - - Off-Street Trails (Proposed)
- Soft Surface Trails (Existing)
- Private Trails
- ⋯ Paddle/Kayak Trails
- - - Potential Trail Connections
- - - Planned Veloweb Trails
- Bike Routes (Existing)
- Bike Routes (Proposed)
- Trail Entry Gateway
- Existing Trail Heads
- Proposed Trail Heads
- Existing Kayak Launch
- Proposed Kayak Launch

SCHOOLS

- 01 B.B. Owens Elementary
- 02 Stewart's Creek Elementary
- 03 Preswick STEM Academy
- 04 Lakeview Middle School
- 05 Griffin Middle School
- 06 Peters Colony Elementary
- 07 Morningside Elementary
- 08 Etheridge Elementary
- 09 The Colony High School
- 10 Camey Elementary
- 11 LISD Eastside Aquatic Center



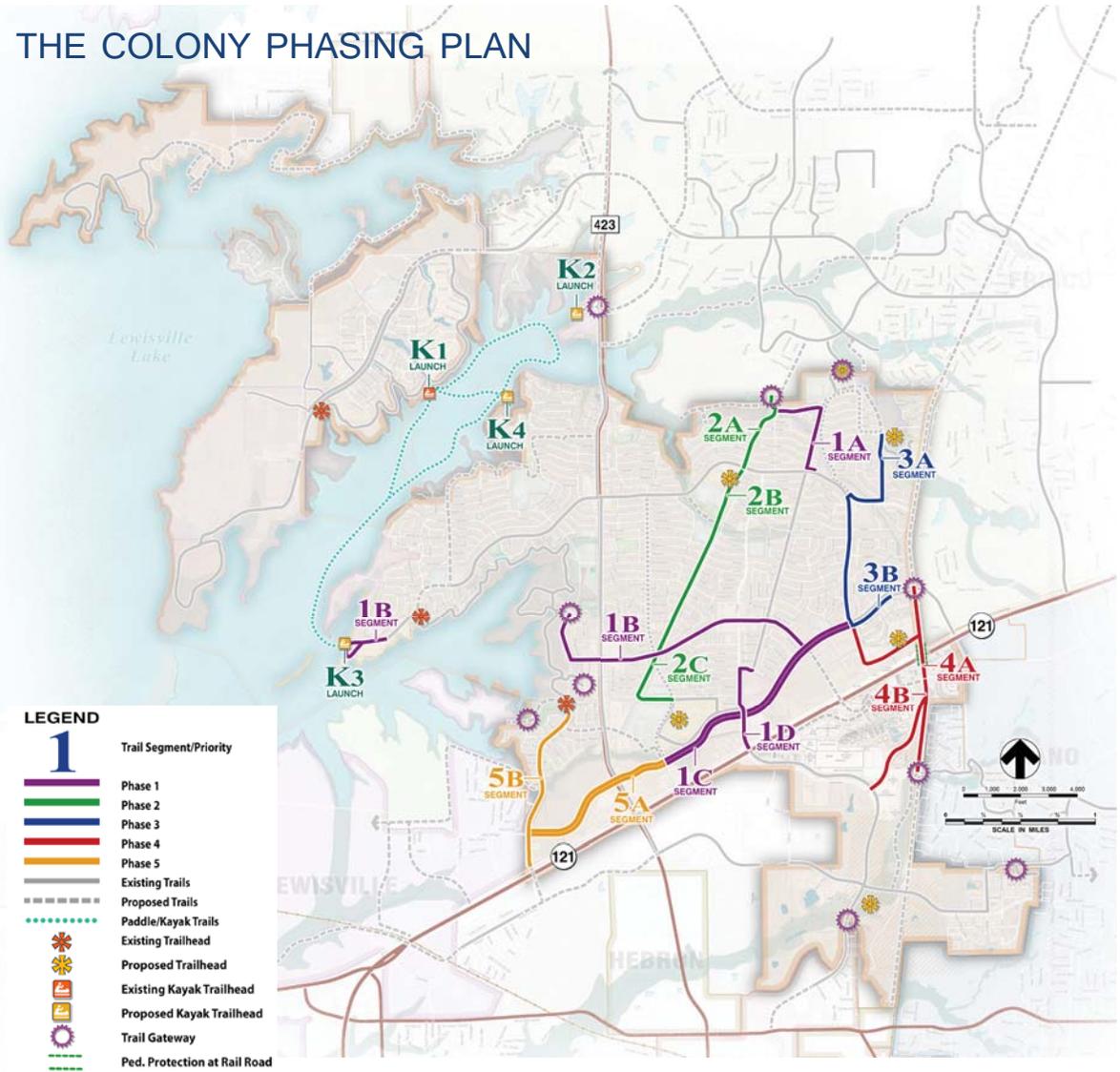
EXECUTIVE SUMMARY

Striving to create a premier trail and bikeway system in The Colony that provides “**Healthy / Adventure / Premier / Connections**” for the community is no small task. Achieving this will necessitate the commitment and dedication of City Officials, Staff, and the citizens of The Colony. The purpose of the Trails & Bikeways Master Plan is to provide a “map” that provides direction in accomplishing this task.

The master plan analyzes existing trail conditions and identifies nine individual spine segments that represent the primary priority trail projects for the City of The Colony. These nine (9) spine trail segments have been assigned to one of five (5) phases.

- Segment 1A - Phase 1: Segment 1A begins off-street and runs perpendicular to Squires Drive east across an open area to Vaden Street, then north to BB Owen Elementary School and South to Taylor Ballfield (this segment is under design for construction).
- Segment 1B - Phase 1: Segment 1B serves the neighborhoods surrounding South Colony Boulevard from Lewisville Lake at the intersection of Lakeshore Boulevard and Lake Ridge Drive to just north of Memorial Drive. This trail provides important east/west mobility to the center of The Colony. This trail segment will also include a trail access point at Angelina's and will include an ADA accessible route that ties into Shoreline Trail.
- Segment 1B-2 - Phase 1: Segment 1B-2 serves as a part of the primary east/west movement trail along North Colony Boulevard, west of Main Street to Lewisville Lake. This segment is centered on the Stewart Creek Park peninsula which extends and connects to an existing on-street shared-use path.
- Segment 1C - Phase 1: Segment 1C provides the missing 10' trail segments to complete a spine trail along Memorial Drive. This segment includes a trailhead at the Five Star Complex and some existing four and five foot wide sidewalks that will be replaced with 10' concrete pavement sections to complete the connection. Segment 1C also includes a signed bike route.
- Segment 1D - Phase 1: Segment 1D begins at the intersection of 121 and Paige Road extending the on-street trail along Plano Parkway north under SH 121. The segment runs north along Paige Road, crosses an open drainage channel and connects to the Legends Trail.
- Segment 2A - Phase 2: Segment 2A begins off-street at a proposed trail entry gateway and future connection to the City of Frisco trail system located west and north of Squires Drive. The northern leg of the trail will run southward through the core of The Colony linking together several neighborhoods. It meanders along the ROW of the overhead high-tension electric lines and crosses at Ragan Road ending at the existing trail at North Colony Boulevard. This segment includes a trail entry gateway, and pedestrian crossing signal.
- Segment 2B - Phase 2: Segment 2B begins on North Colony Boulevard and runs through the core of The Colony southward to South Colony Boulevard. This segment primarily runs along the R.O.W. of the overhead high-tension electric lines and parallel to Miller Drive and has several mid-block crossings. Adequate signage and safety measures should be placed at each crossing to help alert motorists. It also includes a trailhead at the Recreation Center.
- Segment 2C - Phase 2: Segment 2C begins at South Colony Boulevard at Perryman Park traversing southward through Perryman Park to the north side of The Colony High School where it turns east towards The Colony Five Star Complex. This segment primarily runs parallel to Alta Oaks Lane west of Camey Elementary School crossing Arbor Glen Rd and running east, north of The Colony High School.
- Segment 3A - Phase 3: Segment 3A begins at a proposed trailhead located at Turner Soccer Complex. It runs along Northpointe Drive, connecting into North Colony Boulevard extending the existing trail along North Colony Boulevard to Northpointe Drive. The segments continues south implementing an on-street signed bike route into the existing on-street shared-use path along Morning Star Drive.
- Segment 3B - Phase 3: Segment 3B runs along Memorial Drive from Morning Star east to the railroad (some existing six foot wide trail exists that will be widened to 8'in this segment).

- Segment 4A - Phase 4: Segment 4A serves as an important north/south connection in The Colony, and most importantly provides a pedestrian safe crossing under SH 121 (via pedestrian underpass using existing railroad bridge opening structure). This segment provides one of the three crossings for pedestrians and bicycles across SH 121. This segment also includes a trail entry gateway and trailhead.
- Segment 4B - Phase 4: Segment 4B consists of two segments. One segment begins on Destination Drive (.48 on-street and .09 off-street) creating a connection to an existing trail along Plano Parkway. As it meanders off-street it connects into the second segment that runs along the railroad and Indian Creek connecting into Grandscape Boulevard.
- Segment 5A - Phase 5: Segment 5A provides pedestrian connectivity to neighborhoods along Standridge Drive and helps to link them together with the Regional Veloweb trail network and the community features along Memorial Drive. The trail segment includes some existing trails requiring width expansion (some existing four and five foot wide trail exists that will be added to this segment).
- Segment 5B - Phase 5: Segment 5B provides pedestrian connectivity to the Ridgpoint neighborhood and helps to link them together with the Regional Veloweb Trail and community features along Memorial Drive.







INTRODUCTION

Trails & Bikeways Master Plan

1.0

VISION FOR THE COLONY

Within this document, you will see the concept “**Healthy/ Adventure / Premier / Connections.**” This phrase reflects the vision of the community to develop a high-quality trail system that provides miles of opportunities for recreation, exercise and connections between homes, schools, parks, shops and Lewisville Lake. This phrase, repeated throughout this Master Plan, is a helpful reminder of this vision, as it is truly an integral part of every component of the Trails & Bikeways Master Plan. As a whole, this phrase simplifies the vision; however, each of the words within this phrase relate to a very specific and important component of the vision.



Healthy

People enjoy trails because they provide opportunities for low-cost, healthy activities. Regardless of age or demographics, trails can be used by citizens of all physical abilities. Providing opportunities for people to be active and healthy is paramount to the success of The Colony’s trail system.



Adventure

Besides simply providing a place to walk or bike, trails should be exciting. Using a trail should include some level of adventure or exploration for its users, whether that be coming in close contact with nature or learning something new. The trail system should be fun to use and enjoyable; simply said, trails should enhance the City’s overall quality of life.



Premier

The Colony is a mature community quickly approaching its build-out. Creating a premier trail system requires looking for creative options and opportunities. In addition to creating a network of paved trails and natural surface trails, options for enhanced sidewalks, bikeways, and even paddle/kayak trails located on Lewisville Lake will be explored.



Connections

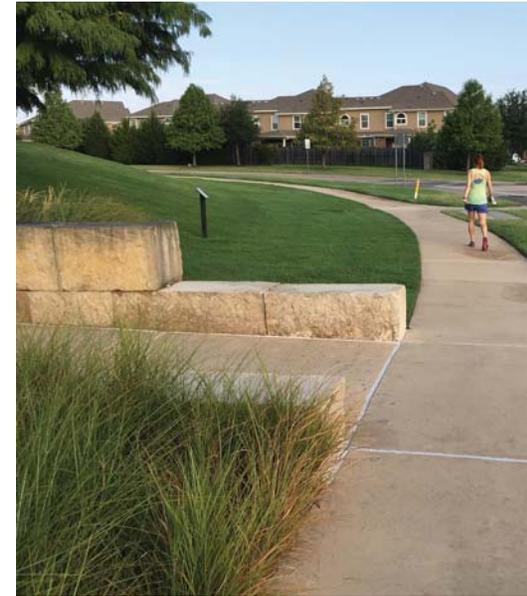
Finally, it is important that the trail system provide meaningful connections between where people are and where they want to go. With increased traffic congestion, and the growing desire for people to be more active in their lives, it is important to consider that trails, sidewalks, and bikeways serve transportation, as well as recreation roles.



1.1 GOALS STATEMENT

PURPOSE OF THE MASTER PLAN

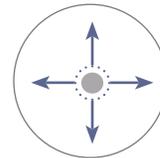
Goal statements are built around six (6) different themes listed below. Broadening the vision set forth, a series of goals and objectives for the Trails & Bikeways Master Plan and The Colony's trail system have been developed. These goals were directly developed based upon the input that was received from the citizens who responded to the online survey and from City Council, City staff and public meetings. This set of goals should be applied comprehensively to all trail and bikeway related decisions made by the City in the future.



FAMILY ORIENTED



CONTEXT



ENHANCE QUALITY OF LIFE



PROVIDE
CONNECTIONS & LINKAGES



INCREASE ACCESSIBILITY



IMPROVE SAFETY



GOAL 1

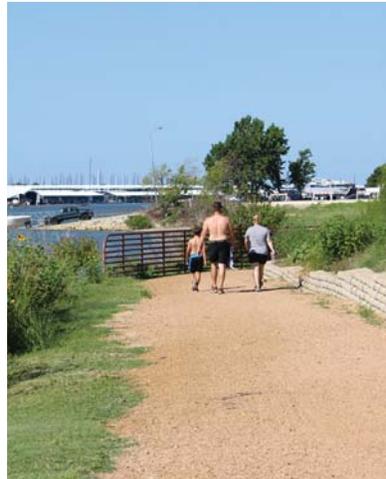
FAMILY ORIENTED



FAMILY ORIENTED

Create a trail system that is multi-functional and meets the needs of both recreation and transportation users, provides a multi-modal active/alternative transportation network, enhances recreation opportunities, and provides necessary end-of-route amenities in order to satisfy the needs of the community.

- F1 Create a safe and enjoyable citywide network for families and the general public.
- F2 Recognize that the trail bikeway system (including trails, sidewalks, and bikeways) serves both recreation and transportation functions; creates a system that effectively meets the needs of all functions.
- F3 Improve human mobility; enable active transportation; minimize traffic congestion; provide a multi-modal transportation system.
- F4 Enhance recreation opportunities and satisfy the needs of the community.
- F5 Provide necessary end-of-route amenities for recreation users (benches, water, etc.) and transportation users (bike racks, shade, etc.) at trailheads, parks and other key destinations.



GOAL 2



ENHANCE QUALITY OF LIFE

ENHANCE QUALITY OF LIFE

Ensure that the trail system enhances quality of life by being attractive, adventurous, enjoyable, high-quality, and reflective of the identity and history of The Colony.

- Q1 Locate trails in scenic, natural areas whenever possible so people can explore, experience nature and enjoy open space.
- Q2 Early phases of construction should provide the missing trail links between existing and proposed trails and bikeway corridors to create longer connected routes.
- Q3 Connect our citizens to adjacent communities, Lewisville Lake, shoreline trails, the lakefront trails, and boating amenities such as paddling/kayak trails.
- Q4 Provide quality trail amenities such as benches, overlooks, wayfinding and interpretive signage, bike racks, shade, etc.
- Q5 Reflect the identity and history of The Colony in trail design and theming.
- Q6 Enhance the physical beauty of the city through revealing natural areas, providing attractive facilities and landscaping.

GOAL 3

INCREASE ACCESSIBILITY



INCREASE ACCESSIBILITY

Provide an accessible trail system that is visible, easy to use, easy to understand, and easy to access. Construct trails and routes to meet the needs of the city's diverse population; provide maps, wayfinding, signs, and trailheads to help guide people along trails and routes; and ensure that trails and trail access points are distributed evenly across the city.

- A1 Establish a premier system of pedestrian and bicycle routes that connect off-street, on-street and natural environment routes.
- A2 Create safe walking and bicycling routes to schools from nearby neighborhoods.
- A3 Develop a network that includes a series of loops, some loops can be shorter and tied into neighborhoods while others can be longer.
- A4 Create connections to Grandscape Boulevard and the adjacent commercial development south of SH 121.
- A5 Wayfinding signage should be included to better define direction and attractions along routes.



GOAL 4

IMPROVE SAFETY



IMPROVE SAFETY

The trails and bikeways should be easy to understand and use: provide mapping, signage, wayfinding, and accessible trailheads. Make trails and bikeways safe by eliminating barriers for cycling, ensuring that trails are secure for all users, educate users on trail safety and bicycling etiquette.

- S1 Develop a network using passive and active security tools for the safety of our citizens.
- S2 Eliminate barriers for cycling and improve existing streets through the provision of signage, striping and improving surface conditions.
- S3 Encourage facility use and educate people on trail safety and bicycling etiquette.
- S4 Limit pedestrian/bicycle conflicts with automobile at all times.
- S5 Adopt design standards that dictate facility types, widths, construction methods, signage, and other facets of trail, sidewalk, and bicycle facility development.
- S6 Ensure adequate emergency access is provided for all trails so emergency personnel and vehicles can quickly and safely access all locations along the trail system.

GOAL 5

PROVIDE
CONNECTIONS & LINKAGES



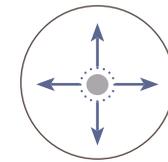
PROVIDE CONNECTIONS & LINKAGES

Develop a premier trail system that is continuous and that provides connections and linkages east and west across FM 423, north and south across Sam Rayburn Tollway (SRT), and between parks, schools, neighborhoods, shopping, jobs and adjacent cities.

- L1 Provide connections between east and west neighborhoods across Main Street (FM 423).
- L2 Create linkages between schools, parks, neighborhoods, shopping areas and workforce areas.
- L3 Create a trail system that is contiguous and ties into community amenities, shoreline trails, the lakefront trails, and boating amenities such as paddling/kayak trails.
- L4 Connect our citywide network into neighboring communities such as Plano, Lewisville, Frisco, and Carrollton as much as possible to create long regional routes for user groups.



GOAL 6

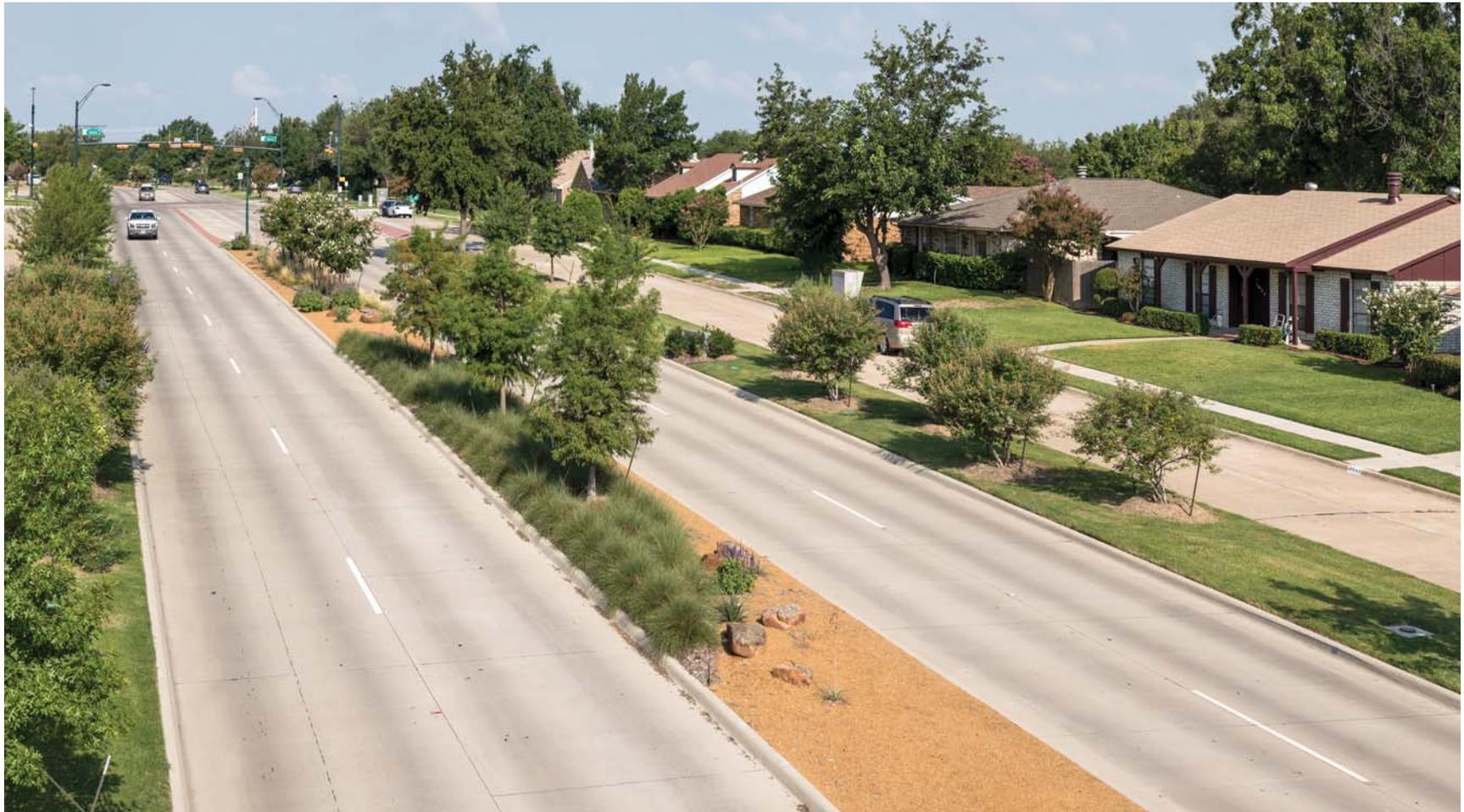


CONTEXT

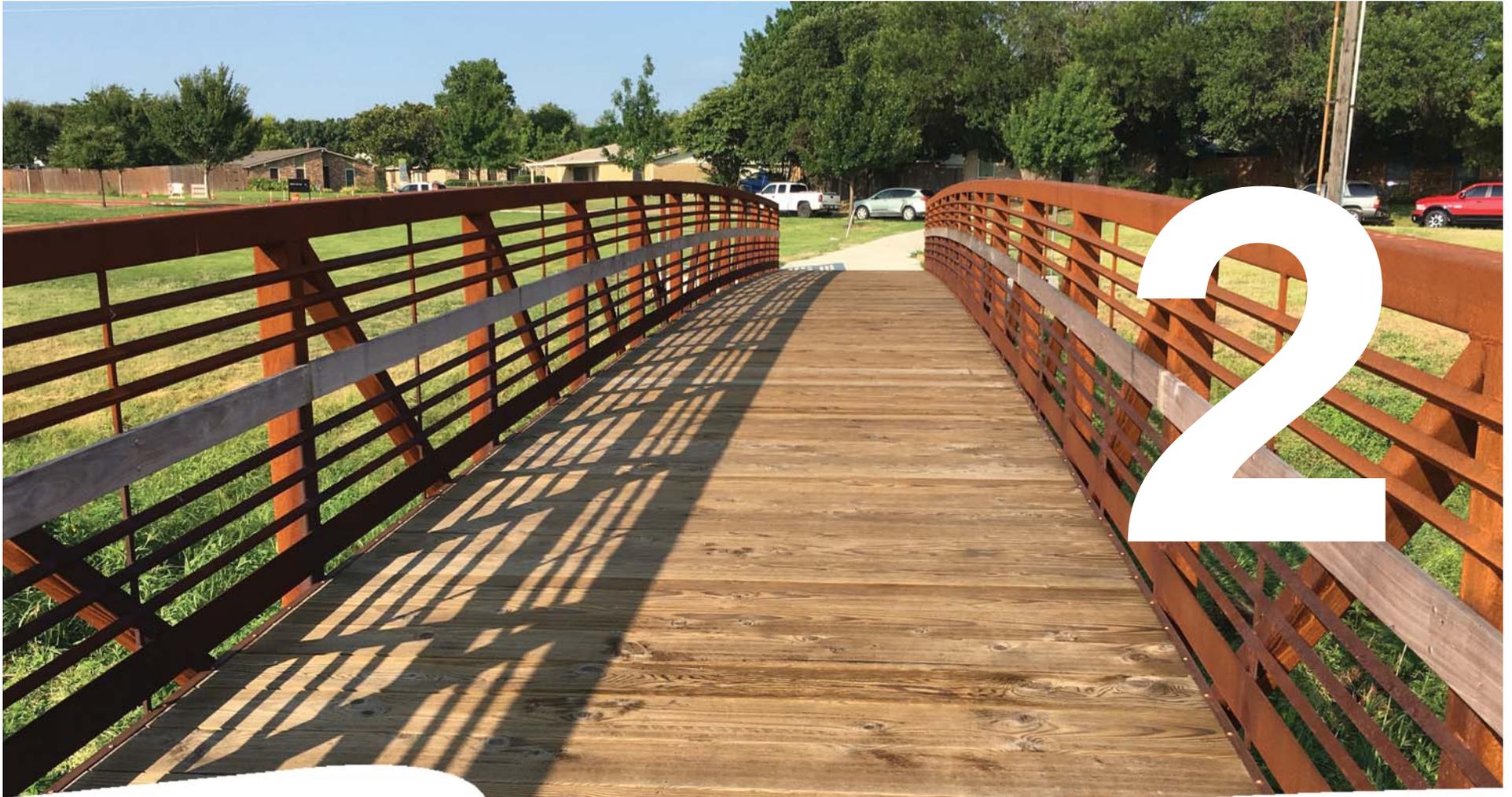
CONTEXT

Develop trails and routes in a context sensitive manner, which is sensitive to the natural environment and neighborhoods which enhance the built environment. Evenly distribute trails and trail access points across the city so that all people have easy access to a trail.

- CS1 Be sensitive to the environment, wildlife, trees, and neighborhoods while still providing adequate facilities for the city.
- CS2 The trail system should have a neutral effect (low to no negative impact) on the natural and built environment.
- CS3 Use the city's existing utility right-of-ways (ROW), lakeshore and available crossings (under and over) to build a better connected network of pedestrian and bicycle trails.







THE COMMUNITY

Trails & Bikeways Master Plan

2.0

INTRODUCTION

The Colony is adjacent to Lewisville Lake near the intersection of State Highway 121 and FM 423 (Main Street), eight miles east of Lewisville, fifteen miles northeast of the Dallas/Fort Worth (DFW) International Airport, and twenty-four miles north of downtown Dallas in southeastern Denton County. The city is bordered on the west by Lewisville Lake and the City of Lewisville, on the north and east by Frisco, and on the south by the cities of Carrollton and Plano. Approximately 23 miles of shoreline on Lewisville Lake (including two peninsulas) are contained within the city's boundaries, thus providing the basis for the city's nickname "City by the Lake."

HISTORIC POINTS

Home developers, Fox and Jacobs, had a vision of a 'dream city' modeled after the City of Dallas, where single-family homes would be grouped as a "colony". They began making that dream reality in 1969 when they purchased most of the land located around State Highway 121 and FM423. In 1973 Fox & Jacob petitioned the City of Frisco to remove the area from its extraterritorial jurisdiction and in 1974 the first homes were built. A vote was held in January 1977, and the City of The Colony was officially incorporated at that time (the name Colony was already in use, and thus "The" current name with the definite article was chosen).

Details of the beginning of the settlement pattern in the area includes the following. Peters Colony was the common name of the first and most successful contract authorized by the legislature of the Republic of Texas to promote settlement. The legislation authorized the Republic to enter into a contract with William S. Peters and nineteen associates to promote settlement in North Texas and paid the company with free land in exchange for recruiting new settlers.

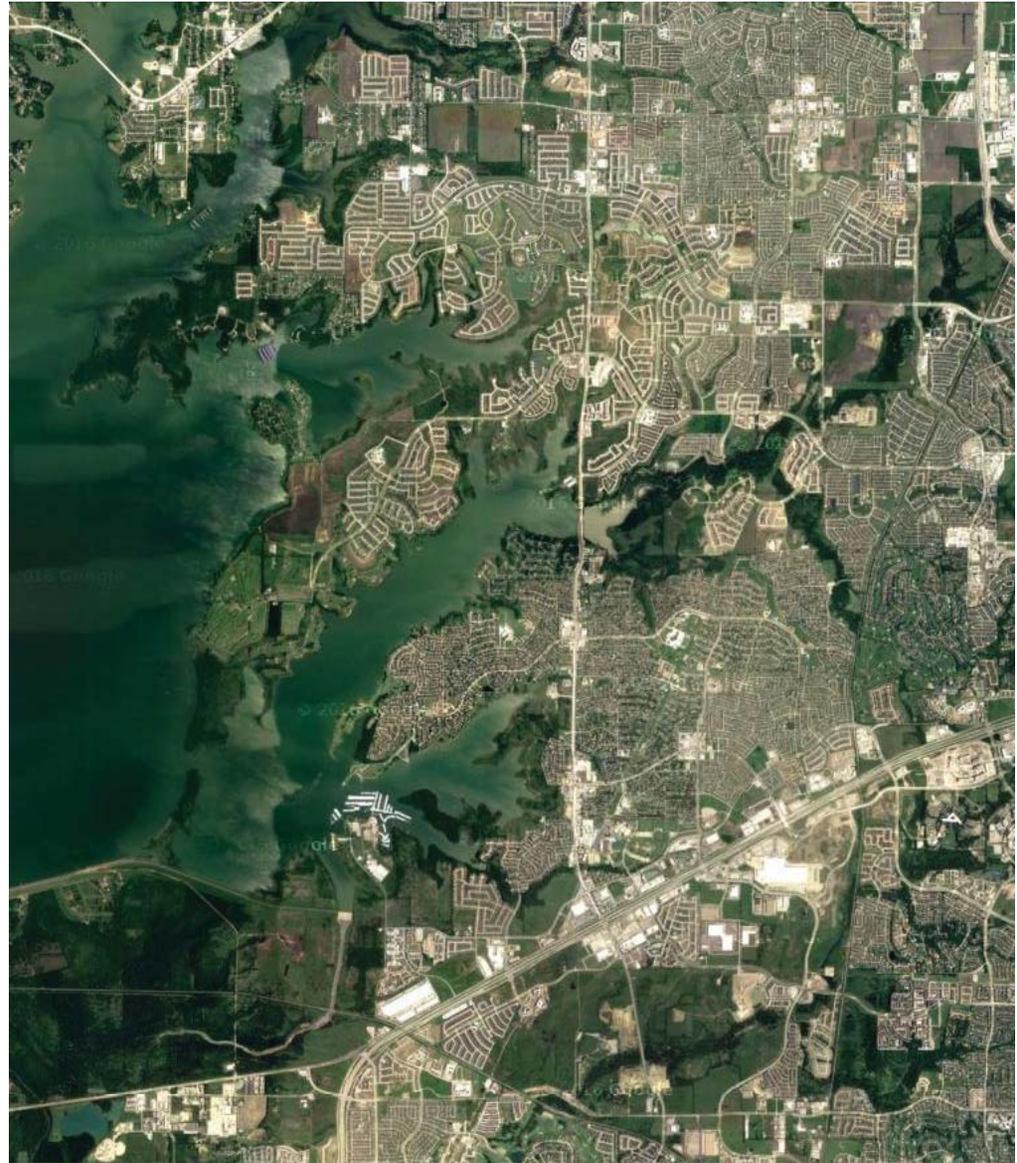


Image 2.1 (above) - The image above is an aerial of The Colony in 2015 taken by Google.

The contract authorized The Texas Emigration and Land Company of Louisville, Kentucky (the legal name of Peters Colony), to give up to 640 acres of free land to new immigrants in exchange for building a cabin, cultivating 15 acres of the land, and pledging allegiance to the Republic of Texas. In payment for its services, Peters Colony received over one million acres of what were called “premium lands” located in the western portion of “The Colony.”

Peters Colony is credited with recruiting approximately 1,800 families and single men who received land grants and are referred to as Peters Colonists. Within the city limits of The Colony, eight Peters Colonists received Peters Colony land grants. In addition to Bridges Settlement and Stewartville, The Colony is also the site of the following historic communities: Stewartville, Stewarts Creek, Stoverville, Rector, Camey and Eastvale, also known as Camey Spur. Records indicate that Camey was the most successful community, as it was founded around the time the St. Louis-San Francisco railroad line began operations in 1902. In the 1920s, Camey had a reported population of 50 and businesses included a school, grocery store, blacksmith shop, restaurant, and a cotton gin. The opening of a railroad line in 1902 shifted the local economy in the area from cattle-raising to cotton farming.

During the following years, the future City of The Colony would be positively impacted by two very important events: Item #1 - The construction of the Lewisville Lake dam. The Lewisville Lake dam was constructed by the US Army Corps of Engineers and began collecting water. Item #2 - In 1973, Fox and Jacobs, a Dallas-based residential land developer, purchased approximately 2,500 acres of land for housing development on the eastern shore of the recently constructed Lewisville Lake. The name The Colony was chosen because Fox and Jacobs felt a strong sense of kinship with Texas’ early history and also to memorialize the spirit of Peters Colony providing a new way of life - a goal Fox and Jacobs wanted their new development to share. For a relatively new city, The Colony has links to a history longer than the beginnings of the residential development. Historic markers designate the Bridges Cemetery on Morning Star Drive and Belz Bridge and Hedgcoxe War on South Colony Boulevard.



Image 2.2 - The image above is an aerial photo of The Colony in 2001.



Image 2.3 - Item #1 - The construction of the Lewisville Lake dam.



Image 2.4 - Item #2 - 1973 - Fox and Jacobs housing development.

CONTEMPORARY SETTING

Years of planning work by city leaders have translated into a strong pace of economic and community development in The Colony. Nebraska Furniture Mart broke ground September 25, 2012, on a \$1.5 billion, 433-acre complex along State Highway 121 between Plano Parkway and West Spring Creek Parkway. The Omaha-based furniture retailer is owned by Warren Buffett's Berkshire Hathaway, Inc. The complex is anchored by a 1.86 million-square-foot Nebraska Furniture Mart building, and includes a 600,000-square-foot showroom. The footprint for Nebraska Furniture Mart of Texas, which opened in May 2015, is equivalent to 40 football fields and sits on approximately 90 acres. It is a part of the largest retail and entertainment destination of its kind in North America. Nebraska Furniture Mart is expected to attract over 8 million visitors and generate \$600 million in sales annually.

Nebraska Furniture Mart of Texas is part of a larger, 433-acre development known as Grandscape. Grandscape is expected to draw high-quality retail, entertainment, hotels and office space, as well as tourist attractions.

Infrastructure projects underway in The Colony include the Main Street/FM 423 Widening Project by the Texas Department of Transportation, encompassing over 10 miles of construction in three cities. Improvements in The Colony involve widening four miles of Main Street which will include on-street shared-use walkways from Stewarts Creek Road to State Highway 121. Work should conclude in the last quarter of 2017. Widening of Plano Parkway has been completed, expanding the road from four lanes to six lanes and including 12' to 15' pedestrian walkways under State Highway 121. The Memorial-Spring Creek Connector linking Memorial Drive in The Colony to SH 121 in Plano via a railroad underpass was finished in May 2015.

In addition, a new overpass has been constructed to carry South Colony Boulevard over the Sam Rayburn Tollway



(SH 121) using a first-in-Texas design known as a diverging diamond interchange. This overpass includes a 5' on-street walkway that connects businesses, entertainment, lodging, retail and residential neighborhood. These linkages provides one of the key connections into the Grandscape development which includes extensive pedestrian amenities (water features, overlooks, benches and more).

While The Colony is growing, prime space is plentiful with more than 700 acres to develop including State Highway 121 frontage. Mixed use centers include The Cascades at The Colony, a 100-acre master-planned community consisting of 280 residences; flex office space; and multiple hotels. Another mixed use center is Austin Ranch, located west of the Dallas North Tollway and south of State Highway 121. The development has prime sites for corporate campuses, commercial offices, industrial distribution parks, retail strip centers, pad sites, multi-family and single-family homes.

The following awards shows the status of The Colony as an affordable, family friendly, healthy community growing in the 21st century.



– D Magazine, "Best Suburbs, 2013"

"The Colony Ranked Among the Top North Texas Suburbs"



"The Colony is a leader in quality parks, trails and play"



"The Colony Best Places to Live and Most Affordable"



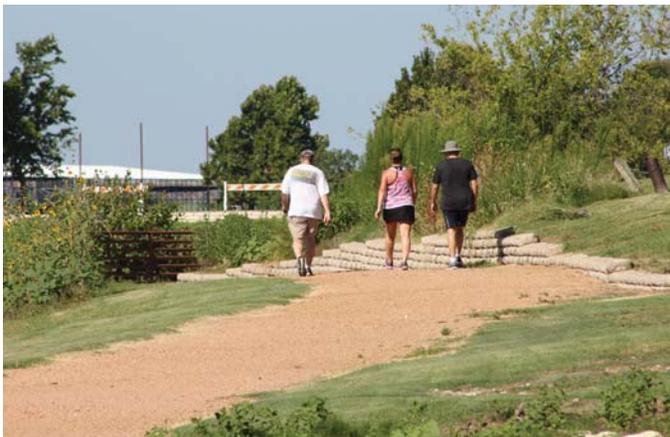
The Colony was designated as a "Tree City USA" since 2008



2.1 DEMOGRAPHIC PROFILE

Ranking the livability index for The Colony is an excellent method to understand their current status in the State and DFW Metroplex. From a demographic perspective this defines the current data set. The Colony has a livability ranking of 83 with 100 being a perfect family oriented community. The index is defined with a review of: cost of living, crime, education, amenities, employment, housing and weather.

Compared to the three other communities, The Colony is a relatively young city with a median age of 32.5. The median age in the Metroplex and Texas is 34.7 for both while the median age in the United States is 36.7. While not a direct reflection of citizens' propensity to walk, run, or bike, a low median age could indicate a larger percentage of the population able to participate in these activities.



POPULATION GROWTH IN THE COLONY



Figure 2.1 – The table above compares The Colony to many of their neighboring cities considering total population numbers defining growth. It is difficult to compare population growth between The Colony and much larger areas when only considering total population numbers. Sources: 1990, 2000, 2010 – U.S. Census Bureau; 2015, 2016 – NCTCOG Annual Population Estimates

2010 POPULATION BY AGE

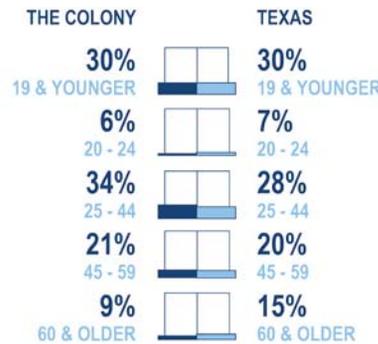
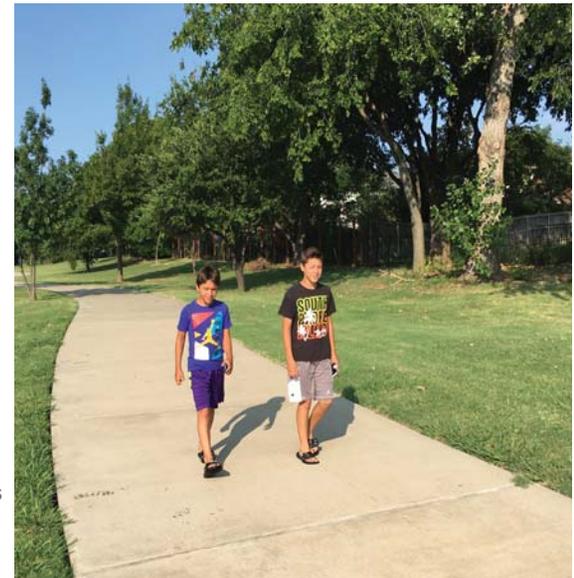


Figure 2.2 – Sources 2010 – U.S. Census Bureau



EDUCATION

The Colony provides wide access to higher education. The Colony is within commuting distance of 34 campuses of both private, state colleges and universities as well as community colleges. These include Southern Methodist University (SMU) in Dallas, The University of Texas at Dallas (UTD) in Richardson and The University of Dallas in Irving. The Colony is also less than fifteen minutes from the Preston Ridge campus of Collin County Community College, which has high-tech courses in telecommunications (including various certification programs) as well as high-level computer courses and accompanying certification programs.

The Colony High School is among the highest rated in Texas. The Lewisville Independent School District prides itself on its long-standing tradition of educational excellence. With more than 38 schools receiving the “Exemplary” rating and 20 schools earning the “Recognized” rating by the Texas Education Agency, families move into LISD because of a commitment to student success. LISD also has six National Blue Ribbon Schools of Excellence, which is the highest designation a school can earn by the United States Department of Education.

EDUCATIONAL ATTAINMENT

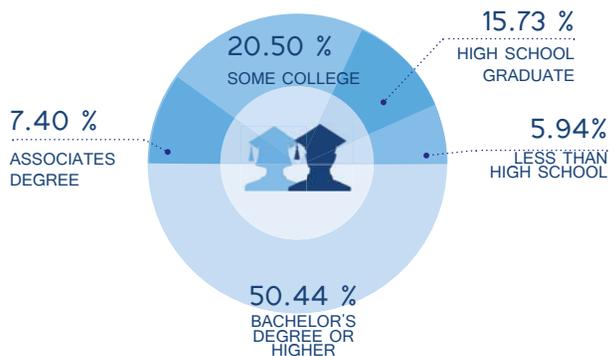


Figure 2.4 -Sources 2010 - U.S. Census Bureau

RECREATION

The City of The Colony features numerous parks, several miles of trails and open spaces which share the advantage of Lewisville Lake with other communities promoting the phrase, "healthy, adventure, premier connections." The Colony's diverse collection of parks offers a variety of amenities, including playground areas, tennis and basketball courts, fishing ponds, BBQ grills, jogging trails, bicycle riding routes, disc golf and family pavilions.

The Tribute development has two of the best golf courses in North Texas, bringing you lush green landscapes, rolling hills and beautiful lake vistas. The Tribute Golf Course, a Master Scottish links course, features wind-swept dunes and sea washed grasses. Also featured are The Old American, designed by Tripp Davis and PGA star and Dallas native Justin Leonard; and a 9-hole golf course at Stewart Peninsula.

Lewisville Lake encompasses over 29,000 acres of blue water recreational opportunities and features marinas, public parks, and boat ramp access. With our long summer weather, it's ideal for fishing, water skiing, boating and swimming. Lewisville Lake is also an excellent location for camping, picnicking, hiking, cycling, birding and all are readily accessible by the residents and visitors to The Colony.

The Colony's commitment to find creative and resourceful ways to enhance sports and the "quality of life" for the entire community was demonstrated when it was named #1 Sportstown for the State of Texas by Sports Illustrated Magazine and the National Parks and Recreation Association. Their efforts are further exemplified by all the sports venues which host local athletic leagues and regional, state and national tournaments at local parks and sport complexes.



THE COLONY TRAILS & BIKEWAYS MASTER PLAN 2017

2.2 REGIONAL CONNECTIONS

The Colony’s trail network links into the neighboring communities that include Lewisville, Frisco and Plano with potential linkages to Carrollton, creating a regional system of healthy pedestrian and bicycle transportation connections. Below highlights some of the primary adjacent communities and their networks.

THE REGIONAL VELOWEB

The Regional Veloweb is a network of planned off-street bicycle paths designated by the North Central Texas Council of Governments (NCTCOG). The Veloweb includes 1,876 linear miles of planned paths stretching across Denton, Collin, Tarrant, and Dallas Counties. Of these 1,876 miles, 442 have been constructed and another 146 have been funded. The identification of alignments for the Veloweb is a result of cooperative planning between the NCTCOG and local jurisdictions. While the NCTCOG provides varying levels of assistance in constructing Veloweb route segments, it is in effect the responsibility of each city to construct their segment of the Veloweb.



Image 2.5 – Combined Regional Veloweb, Community Paths, and On-Street Bikeway Network.





LEWISVILLE

There are a total 14 miles of existing trails in Lewisville; 5.4 of these miles consist of trails along linear corridors while 8.6 of these miles consist of loop trails segments. While loop trails have many benefits for the community, one of the primary goals for their new Trails Master Plan is to provide ample linear trails across Lewisville in order to provide connections to The Colony, Highland Village, Carrollton and the Town of Flower Mound. Proposed linkages will be provided on the eastern edge of Lewisville Lake to The Colony.



FRISCO

The Frisco Parks and Recreation Department is continually working to make the City of Frisco a bicycle and pedestrian friendly community. The Hike and Bike Trails Master Plan shows the potential development of a city-wide, hierarchical system of trails that will provide residents with safe and efficient recreational and commuter hiking and biking trails. Currently Frisco has just over 16 miles of trails with proposed and existing connections into The Colony from the north at BB Owen Elementary School and the city's eastern boundary along Memorial Drive.



CARROLLTON

The City of Carrollton has an adopted Trails Master Plan which focuses trails primarily along creeks and utility easements. The City of Carrollton does not have any existing or planned trails that provide connections to The Colony, but there are opportunities for connections. One opportunity is along Josey Lane running south of SH 121. This would serve as a continuation of Main Street and an on-street trail south of FM 544 and connect to several natural creek corridors.

PLANO

With 70 recreational trail miles available there are plenty of ways to see Plano. The City has an adopted Trails Master Plan which focuses trails primarily along creeks and utility easements which links together schools, neighborhoods and shopping districts with population centers. Existing connections are present at Austin Ranch along an overhead utility corridor at Sunset Park. Another potential connection would be to extend the Shady Brook Trail and go underneath the railroad underpass at Indian Creek and tie into the proposed trail connection in The Colony.

2.3 EXISTING TRAIL NETWORK

EXISTING TRAILS

The Colony has a good beginning for a premier network of trails for pedestrians and bicyclists. The trails are divided between on-street and/or parallel to streets, shared-use paths along utility rights-of-ways and open spaces, recreational soft surface (decomposed granite) shoreline trails and a sidewalk network. Several large sections of trails were constructed just a few years ago. These 3 trails added over 5 miles of trails to the network totaling 12.1 miles of built trails. The following sections describe the latest editions.



SHORELINE TRAIL

The Colony Shoreline Trail is a 10' wide linear, decomposed granite trail along the edge of Lewisville Lake. The 3.5 mile trail starts at Stewart Creek Park (a regional facility, leased from the US Army Corps of Engineers (USACE) and managed by the City) and meanders through park land as well as an USACE Wildlife Management Area (also leased/managed by the City), along the perimeter of Lewisville Lake, then terminates at Ridgepointe Park.

The Shoreline Trail primary trailheads are located at Stewart Creek Park (SCP) and at Ridgepointe Park. The SCP trailhead includes maps, signage, a bicycle repair station, a sundial and an entry feature to the trail. Benches, litter receptacles, and pet stations are located along the trail at half-mile intervals. A large part of the trail is located on USACE flood control lands and subject to flooding during prolonged rain events. Because of its location within the USACE wildlife management area, visitors can expect to see a variety of native flora and fauna. Interpretive signage is posted to provide educational opportunities and to enhance awareness of the natural systems.

Image 2.6 - Shoreline Trail

This figure illustrates the extent of Shoreline Trail that runs along the Lewisville Lake shoreline beginning at Ridgepointe Park and ending near Stewart Creek Park.





Image 2.7 - The Tribute Shoreline Nature Trail
This figure illustrates the extent of The Tribute Shoreline Nature Trail.

THE TRIBUTE SHORELINE NATURE TRAIL

The Tribute Shoreline Nature Trail, a 4.15 mile decomposed granite trail, begins near the Old American Golf Club on Lebanon Road and includes amenities such as a trailhead with parking and restrooms, interpretive signage highlighting cultural and native features of the lake and surrounding area, benches, bike stations, picnic tables and trash/recycle receptacles at selected areas.



Image 2.8 - The Lebanon Trail
This figure illustrates the location of Lebanon Trail and several future private developer trails.

LEBANON TRAIL

The Lebanon Trail, a 2.8 mile on and off-street concrete trail with poured-in-place rubber surface and soft surface material, connects the nearby neighborhoods to The Tribute Shoreline Nature Trail that begins at Lebanon Road and Boyd Road extending southwest to The Tribute Shoreline Nature Trail trailhead. There are several new and proposed trails that are being constructed by the Developer.

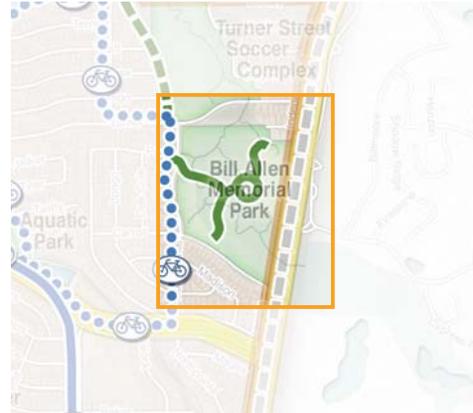


Image 2.9 - Bill Allen Trail
This figure illustrates the extent of the Bill Allen Trail

BILL ALLEN TRAIL

The Bill Allen Trail is located within Bill Allen Memorial Park. The park consists of 48 acres of natural tree vegetation, two playground areas, two basketball courts, a pavilion, amphitheater, pond and a newly expanded disc golf course and a .6 mile concrete loop trail.

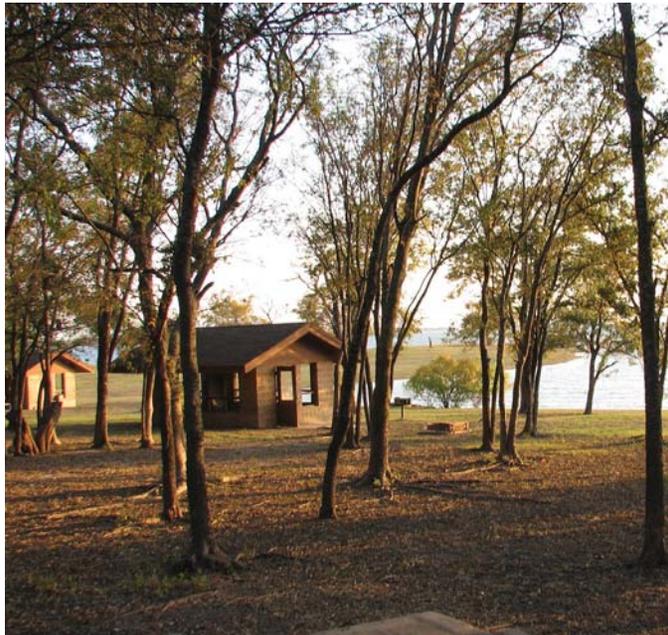


Image 2.10 - Hidden Cove Trail
This figure illustrates the extent of the Hidden Cove Nature Trail.

HIDDEN COVE NATURE TRAIL

This 2.28 mile nature trail is located along the Lewisville Lake shoreline within Hidden Cove Park. The trail meanders along the southern portion of the 720 acre park. Hidden Cove Park includes amenities such as boat ramps, sandy beach front, bank fishing, horseshoe courts, playground area, pavilions, picnic areas, BBQ grills, volleyball, restrooms with showers and a fish cleaning station as well as screened shelter, cabin and RV camping with full hook-ups.



PARK LOOP TRAIL

The City added approximately .5 mile of concrete paving to the Park Loop Trail that extends from the existing concrete section built in the Legends development. The first phase begins at Slay/Baker Park and continues to North Colony Boulevard through the utility easement. When complete, the Park Loop Trail will connect eleven parks and three schools.

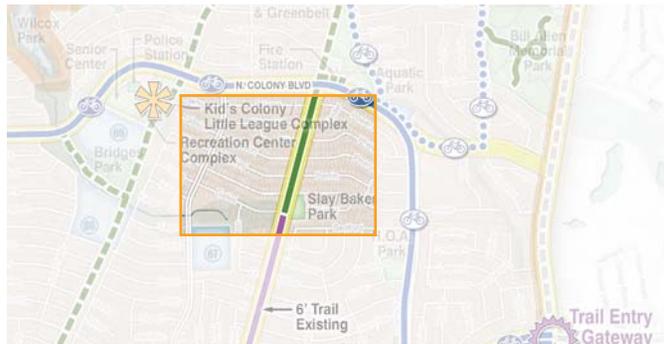
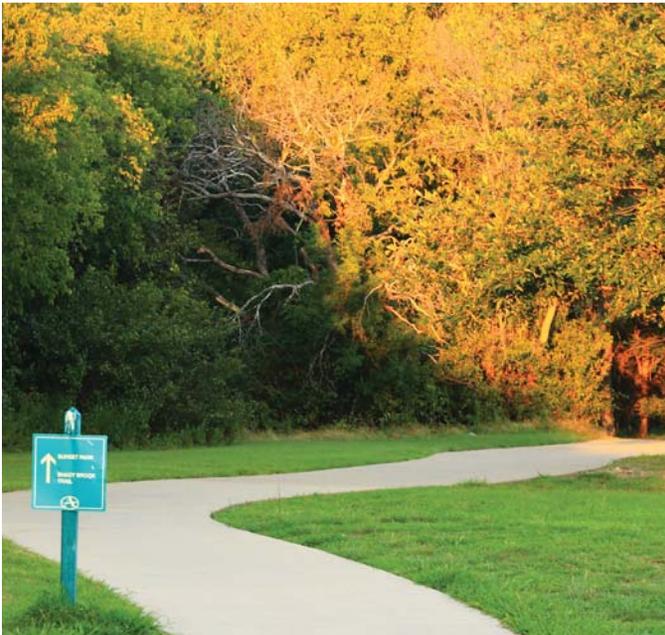


Image 2.11 - Park Loop Trail
This figure illustrates the extent of Park Loop Trails beginning at North Colony Blvd near the Aquatic Park. The trail runs within the neighborhood connecting to Slay/Baker Park.



AUSTIN RANCH TRAIL

Austin Ranch Trail, a 3.3 mile concrete trail, connects The Colony's trail system to the trail systems in Plano with potential connections to Carrollton. This first section starts at The Colony/Plano city limit line near Plano's Sunset Park. From Austin Ranch Park the trail winds through the existing Austin Ranch development to Windhaven. From the Saintsbury intersection the 10' trailheads west to Plano Parkway. Future additions to this phase will bring the trail up Plano Parkway, under SH 121 and join other phases of the trail system.



Image 2.12 - Austin Ranch Trail
This figure illustrates the extent of Austin Ranch Trail beginning as an on-street shared-use path at Plano Parkway traveling to Austin Ranch Park.



Image 2.13 – Five Star Trail
This figure illustrates the extent of Five Star Fitness Trail.

FIVE STAR QR FITNESS TRAIL

The Five Star Fitness trail is a 1.3 mile hike and bike trail loop that runs along the perimeter of The Colony Five Star Complex, an 80-acre sports facility located near Topgolf and The Colony High School. The trail features five QR F.I.T. stations where visitors can use their smartphone to scan the QR codes to receive a link to videos that provide examples of different exercises which can be performed in conjunction with their walk/run along the trail.



EXISTING TRAILS

| Trail | Linear Feet | Mileage | Type |
|---|-------------------|-----------------|---------------------------|
| 1 - Austin Ranch Trail | 17,421 LF | 3.30 mi | on-street shared-use path |
| 2 - Bill Allen Trail | 3,168 LF | 0.60 mi | off-street |
| 3 - Hidden Cove Nature Trail | 12,080 LF | 2.28 mi | off-street |
| 4 - Five Star QR Fitness Trail | 6,317 LF | 1.20 mi | off-street |
| 5 - Park Loop Trail | 7,625 LF | 1.40 mi | off-street |
| 6 - BB Owen Connector | 1,517 LF | 0.3 mi | off-street |
| 7 - Memorial Trail | 11,121 LF | 2.10 mi | on-street shared-use path |
| 8 - North Colony Trail | 24,274 LF | 4.60 mi | on-street shared-use path |
| 9 - Shoreline Trail | 17,522 LF | 3.32 mi | off-street |
| 10 - Lebanon Trail | 14,617 LF | 2.80 mi | on-street shared-use path |
| 11 - Main Street Trail * | 15,600 LF | 2.95 mi | on-street shared-use path |
| 12 - Stewart Creek Park | 2,562 LF | 0.50 mi | off-street |
| 13 - The Tribute Shoreline Nature Trail | 21,921 LF | 4.15 mi | off-street |
| Total | 155,745 LF | 29.50 mi | combined |
| | 83,033 LF | 15.75 mi | on-street |
| | 72,712 LF | 13.75 mi | off-street |

*Note: Main Street Trail to be completed by 2017.

EXISTING TRAILS MAP

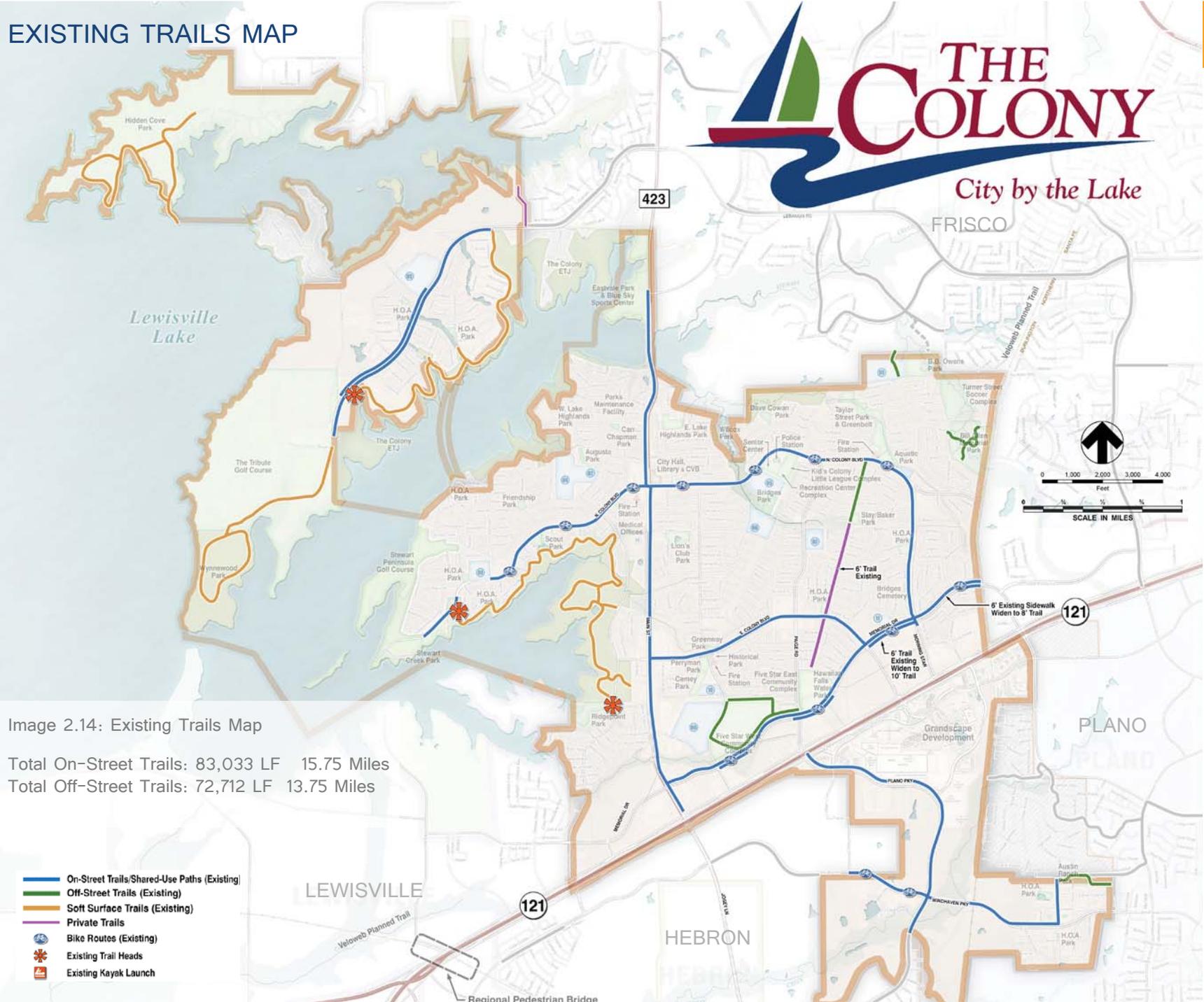
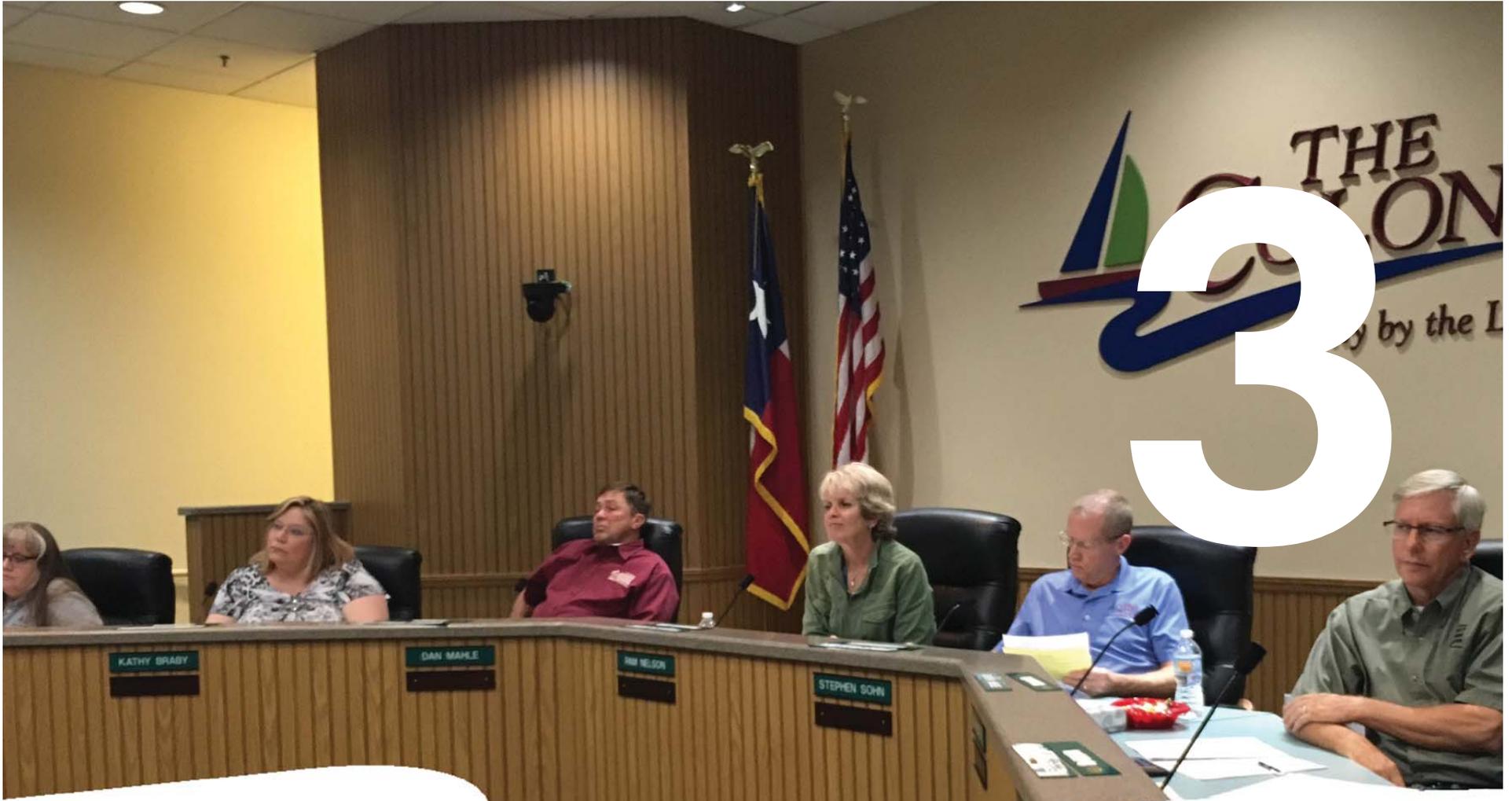


Image 2.14: Existing Trails Map

Total On-Street Trails: 83,033 LF 15.75 Miles
 Total Off-Street Trails: 72,712 LF 13.75 Miles

- On-Street Trails/Shared-Use Paths (Existing)
- Off-Street Trails (Existing)
- Soft Surface Trails (Existing)
- Private Trails
- Bike Routes (Existing)
- Existing Trail Heads
- Existing Kayak Launch





DEFINE NEED FOR TRAILS

Trails & Bikeways Master Plan

3.0

DEFINE NEED FOR TRAILS

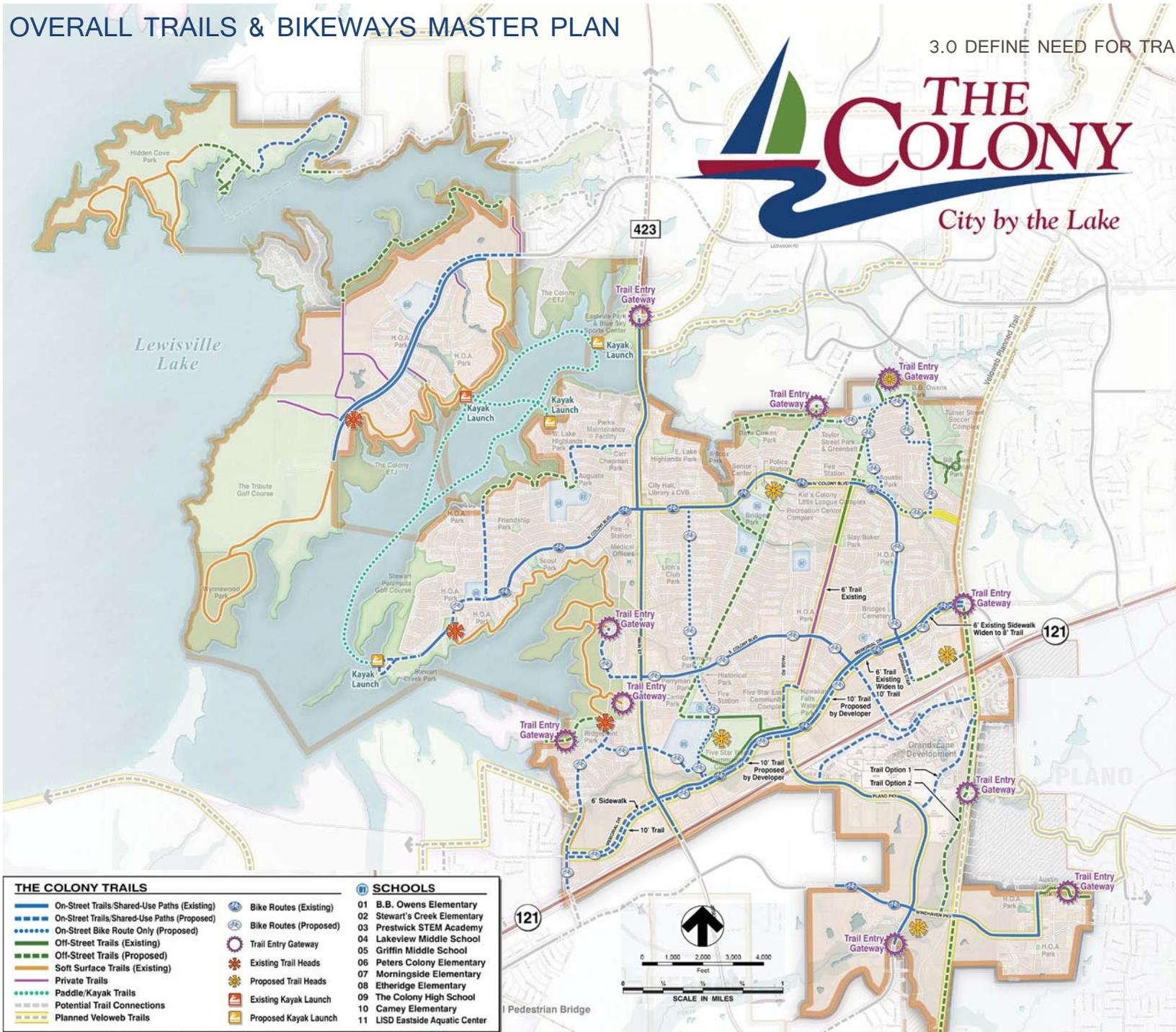
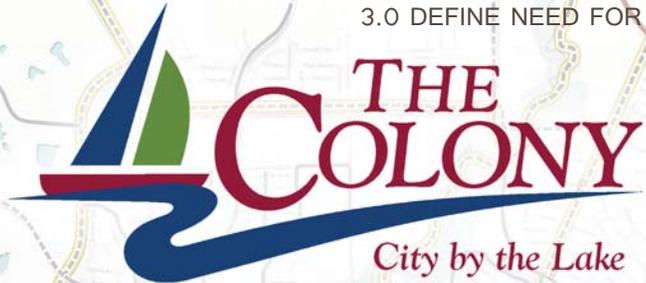
BACKGROUND

Before the Halff Planning Team could begin determining the quantity, location, and characteristics of future trails, it must first determine the overall need for trails in The Colony. There are many methods by which the need for trails, sidewalks, bikeways, and other pedestrian or bicycle-oriented facilities are determined. The three primary methods used in this Trails Master Plan used to assess needs are:

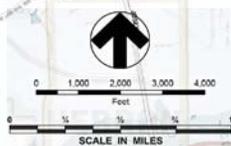
1. Public and community involvement process;
2. Community survey tool; and
3. Benchmark analysis, which compares The Colony with other cities

None of these methods alone can substantiate a comprehensive assessment of the need for bicycle and pedestrian facilities, and each of these methods has its own advantages and disadvantages. Therefore, each of these were utilized together to determine trail needs in The Colony.





| THE COLONY TRAILS | | SCHOOLS | |
|-------------------|--|---------|---------------------------------|
| | On-Street Trails/Shared-Use Paths (Existing) | | 01 B.B. Owens Elementary |
| | On-Street Trails/Shared-Use Paths (Proposed) | | 02 Stewart's Creek Elementary |
| | On-Street Bike Route Only (Proposed) | | 03 Prestwick STEM Academy |
| | Off-Street Trails (Existing) | | 04 Lakeview Middle School |
| | Off-Street Trails (Proposed) | | 05 Griffin Middle School |
| | Soft Surface Trails (Existing) | | 06 Peters Colony Elementary |
| | Private Trails | | 07 Morningside Elementary |
| | Paddle/Kayak Trails | | 08 Etheridge Elementary |
| | Potential Trail Connections | | 09 The Colony High School |
| | Planned Veloweb Trails | | 10 Camey Elementary |
| | Bike Routes (Existing) | | 11 LISD Eastside Aquatic Center |
| | Bike Routes (Proposed) | | |
| | Trail Entry Gateway | | |
| | Existing Trail Heads | | |
| | Proposed Trail Heads | | |
| | Existing Kayak Launch | | |
| | Proposed Kayak Launch | | |



3.1 PUBLIC & COMMUNITY INPUT

When people take the time to attend a meeting or complete a survey, it reflects the investment those individuals have made with the topic under consideration. In this case, the topic was creating a preferred vision for the City of the Colony and its Trail and Bikeways Master Plan. When it comes to the perceptions and preferences around such changes within a community there are no greater authorities than the people who live, work, learn, and play in that community.

Meeting with and gaining the input of the citizens of The Colony was a crucial part of the Trails and Bikeways Master Plan. The input, gained through a Community Development Corporation (CDC) Board Workshop, guided the development of each component of this plan. The goals of the public involvement process were to:

- 1) Understand the “culture of use” of bicycle and pedestrian facilities;
- 2) Understand user preference for facility variables such as surface material, width, character, and end-of-route facilities; and
- 3) Identify key destinations, obstacles and hazards.

The purpose of establishing these goals was to ensure that adequate levels and types of information were gathered during the process in order to successfully meet the needs of the community.



COMMUNITY DEVELOPMENT CORPORATION BOARD WORKSHOP PRESENTATION

The Halff Team presented some early findings to the CDC Board. At the end of that presentation the team was able to gather input from citizens during and dialogue session with the CDC Board. At the end of the meeting the team met with citizens and community stakeholders regarding possible trail connections, conflict areas and to share their personal trail experiences in The Colony.

3.2 WEB BASED SURVEY

While community outreach can form the basis for visioning, the use of a community survey helps to refine the aspects of that vision. An online survey conducted via SurveyMonkey was used to collect survey results and opinions of residents for this purpose. The questions were developed by the Halff Team and City Staff, to gather input from citizens. The survey ensured that an involved representation of community households and their opinions are included in the visioning effort.

In this instance, residents and trail users could complete the survey online with a password protected login. The survey was open from April to May 2016, with respondents totaling just short of 350. This is a good turnout response for a growing suburban community challenged with the wide ranging needs of young families today. The survey included 17 questions, many of which required several responses to complete. As a result 5,950 individual input and selections were recorded.

SURVEY RESULTS

Among the findings related to identifying citizen priorities for facilities and amenities the following results were compiled in no specific order.

1. What park or feature in The Colony do you generally visit for trail use?

The top three (3) were:



Shoreline Trail



Five Star Complex



Stewart Creek Park with Shoreline Trail

Item 3.1 – Survey Question 5: The entire list of response options, percentages and count can be found in the appendix on page 108.

SURVEY RESULTS

2. What are the five (5) recreational trail amenities that are most important to you and your family for trail enjoyment? The top four listed from the survey included:



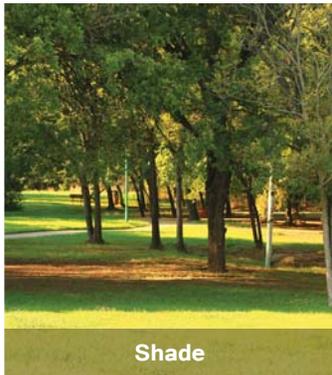
Natural Areas



Soft Surface Trails



Greenbelts, Creeks & Drainage Ways



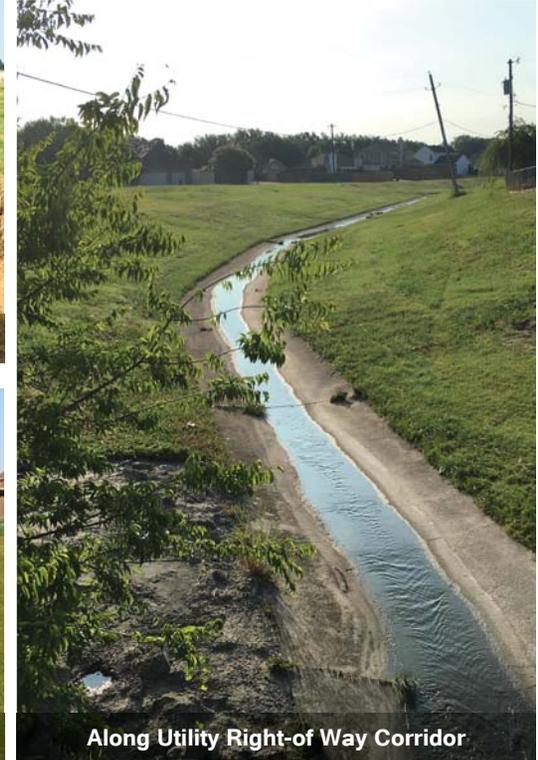
Shade



Neighborhood Access



Through Neighborhoods



Along Utility Right-of Way Corridor

3. What are the type of environments most desirable for trail development?

The top three (3) responses include;

Item 3.2 - Survey Question 7: The entire list of response options, percentages and count can be found in the appendix on page 120.

Item 3.3 - Survey Question 9: The entire list of response options and count can be found in the appendix on page 122.

SURVEY RESULTS

4. If The Colony had safe on-street and off-street pedestrian/bicycle trails connecting neighborhoods, schools, recreation and civic uses, would you use them instead of driving?

On-street: Approximately 57% of the responses replied yes.

Off-street: Approximately 80% of the responses replied yes.



Item 3.4 - Survey Question 11/12: The entire list of response percentages and count can be found in the appendix on page 124.

5. What is your main purpose for cycling in The Colony?

Primary reply was for recreation (48%) and next was for fitness (46%).



Item 3.5 - Survey Question 13: The entire list of response options, percentages and count can be found in the appendix on page 124.

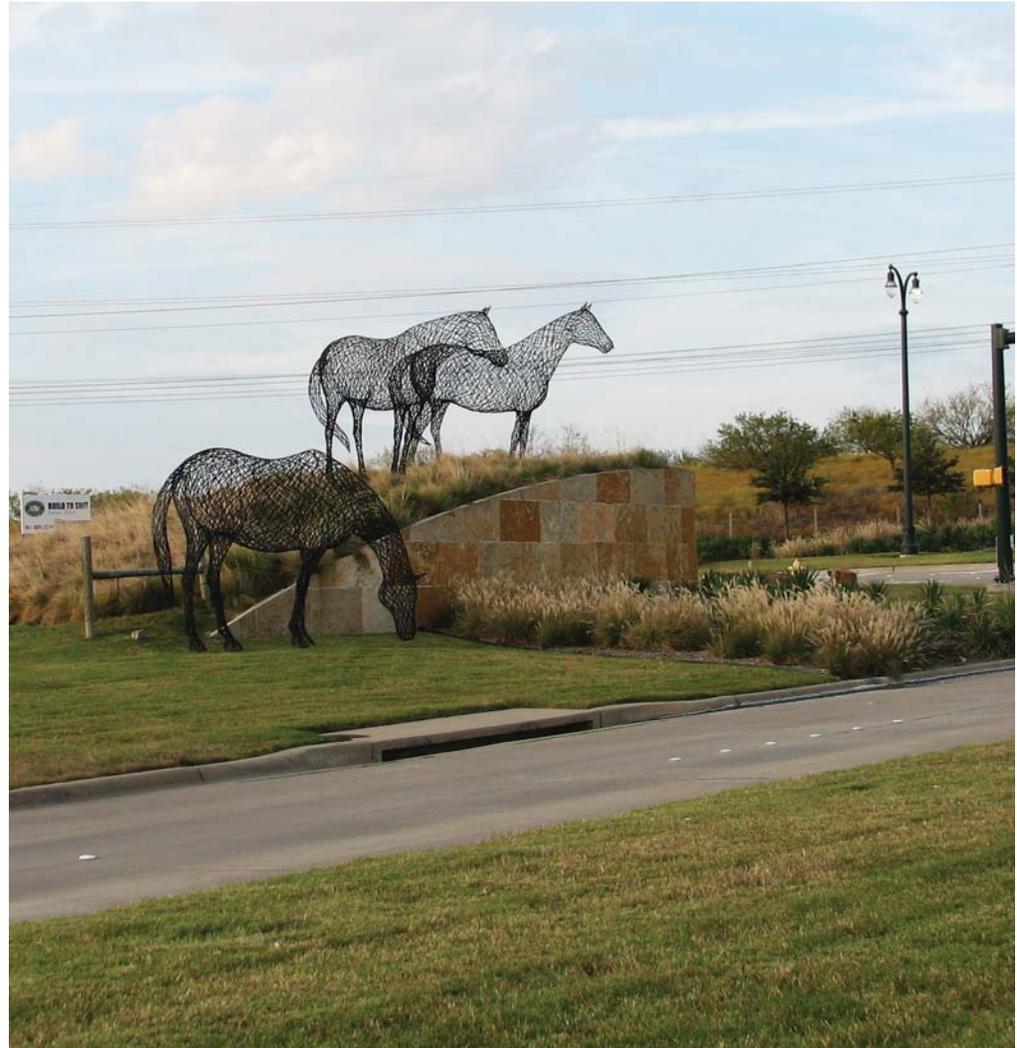
3.3

BENCHMARK CITIES

In determining the overall need for trails, it is important to compare The Colony's trail system with those of peer cities. The following includes an analysis of the trail systems of several cities similar or close to The Colony, an assessment of The Colony's current trail system in meeting the community's needs, and a target level of service for the amount of trails in the city.

Five benchmark cities were chosen for comparison to The Colony's existing trail system. Each of these cities are either adjacent to The Colony or are comparable to The Colony in terms of the cities' development status (that is, they are close to build-out, and have an above average amount of natural amenities). The following comparison considers only existing hard-surface and soft-surface trails.

In the following figure 3.1 (page 33), the number of existing miles of trails is compared to each city's current population. This results in a population-per-mile benchmark by which each city can be compared. A lower population-per-mile benchmark figure means that there are more miles of trail per capita in that city; this indicates a higher level of service. In simple terms, a lower population-per-mile benchmark figure is better (note that these figures consider only the quantity of each city's trails, not the quality).



2015 LEVEL OF TRAIL SERVICE (LOS) COMPARISON

This information reveals that Flower Mound, Grapevine, The Colony and Richardson, which provides between one mile for every 1,130 to 2,560 people, have a higher level of service (LOS) for their citizens than do the other benchmark cities. In addition, Flower Mound stands out as having the highest level of service than these other cities. Finally, an average population-per-mile benchmark figure of one mile per 2,765 people is identified when averaging the benchmark figures of each of these six cities.

In order to provide a premier system of trails in The Colony, it is necessary to establish a target level of service, which will help guide the development of the City's system as The Colony grows. This target level of service should not simply be high enough to match the benchmark city average level of service, but should aim beyond the average. Two of the cities analyzed in this section (Flower Mound and Grapevine) have excellent levels of service, and these cities are therefore known for their extensive trail systems. In order for The Colony to develop a trail system on par with these cities, it is recommended that the City adopt a target level of service of one mile per 1,300 people.

With all of this in mind, it is important to understand that a population-per-mile target should not be the sole determinant in the amount of trails planned for the future of The Colony. Rather, this figure must be considered alongside public demand, opportunities for recreation, and sound planning principles (including connectivity and the establishment of a network of trails that spans the entire community).



THE COLONY

1,710

(Population per trail mile)
Population : 39,310
Existing Trail Mile : 23
City Area : 10,079 Acres



COPPELL

5,700

(Population per trail mile)
Population : 39,880
Existing Trail Mile : 7
City Area : 9,416 Acres



RICHARDSON

2,560

(Population per trail mile)
Population : 102,430
Existing Trail Mile : 40
City Area : 18,562 Acres



GRAPEVINE

1,620

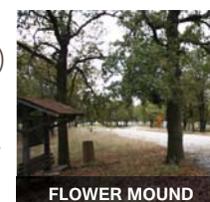
(Population per trail mile)
Population : 48,520
Existing Trail Mile : 30
City Area : 23,110 Acres



PLANO

3,870

(Population per trail mile)
Population : 271,140
Existing Trail Mile : 70
City Area : 46,229 Acres



FLOWER MOUND

1,130

(Population per trail mile)
Population : 66,820
Existing Trail Mile : 59
City Area : 28,789 Acres

Figure 3.1 – Level of trail service comparison information compiled from the North Central Council of Governments (NCTCOG) and various city website and trail master plans based on 2010 Census Data

2030 LOS GOAL

1,200

(Population per trail mile)

Estimated population projection : 63,000+

Trail Mileage needed : 55 (29 miles existing trails + 26 miles future trails needed to meet goal)

City Area : 10,079 Acres





TRAILS NETWORK

Trails & Bikeways Master Plan

4.0 TRAILS NETWORK

In this chapter, the alignments for different trail user groups are discussed, opportunities and constraints across The Colony are identified and studied, and the alignments of the various facility types that constitute “Healthy / Adventure / Premier / Connections,” for the Trails & Bikeways Master Plan are explained. Planning a trail system that is comprehensive in nature and meets the needs of multiple user groups requires more than simply drawing lines on a map. It requires carefully considering the diverse needs of various types of users and the challenges associated with each.

WALKERS



PADDLERS & KAYAKERS



RUNNERS & JOGGERS



CYCLISTS



4.1 USER GROUPS

One of the primary challenges in developing a system of trails that meets the needs of the entire community is understanding the characteristics, preferences, and challenges presented by the multiple user groups who will utilize the system. In addition to the traditional recreational walking and recreational cycling groups (these two groups represent the “hike” and “bike” in “hike and bike trail”), the spectrum of current and potential trail users in The Colony also includes runners and joggers, advanced and novice cyclists, and paddlers and kayakers. While it is truly important to consider and attempt to meet the unique needs of each of these groups, the City’s primary goal should be to identify the shared or overlapping needs of these groups and build a trails system that most efficiently meets these various needs.

WALKERS



Due to the affordability, accessibility, health benefits, and relative ease of this activity, the majority of trail users typically fall within this broad category. Overall, pedestrians generally utilize trails because of the recreational experience that they provide. It is important to provide connectivity between neighborhoods and destinations so people can walk to places instead of driving. However, the primary consideration when developing trails for pedestrians is that the trail is enjoyable, attractive, safe and comfortable.

Comfort and accessibility are typically the pedestrian’s primary determinants when judging the quality of a trail. Therefore, shade along trails; well-distributed amenities like benches, mile markers and wayfinding signage; and access points spaced no more than one mile apart are all essential considerations when designing a trail. It is also important to consider how pedestrian’s access trails; some will walk to the trail; but, many will drive, which requires the provision of adequate parking space at trailheads. The needs of people with physical disabilities and people pushing strollers also need to be considered. The maneuverability requirements of these two groups are similar and can be met by designing trails to meet the requirements of the Americans with Disabilities Act and the Texas Accessibility Standards.



PADDLERS & KAYAKERS



One of the major characteristics of walkers is they generally are more focused on the experience of using a trail, the aesthetics, scenery and amenities located along the trail than other user groups.

RUNNERS & JOGGERS



Since high-intensity exercise is the primary purpose or goal of running and jogging, the preferences of these users are likely to deal more with the physical characteristics of a trail or sidewalk than they do with aesthetics. Many runners and joggers prefer asphalt, rubberized surfaces, or natural surfaces over concrete because of this. Runners and joggers are often not as concerned with connectivity to destinations as they are with simply having a convenient facility of adequate length to accommodate their exercise routines. In addition, many runners and joggers prefer trails that include hills as these add an additional challenge and allow for more strenuous work outs.



Another user group to consider are “paddlers and/or kayakers.” As The Colony is blessed to have the Lewisville Lake adjacent its city limits, there is a great opportunity to develop a “paddling trail” in the city. Compared to other user groups, paddlers have very few needs. The primary need of this group include launches and take-outs (locations up-the shoreline where people can put their kayaks in the water and locations down-the shoreline where they can end their trip). These launches and take-outs must be located in areas with fairly flat banks or beaches and with shallow water near the shoreline.



CYCLISTS



Bicyclists comprise the second primary user group and, as with pedestrians, have much variability between individual users. As opposed to pedestrians, cyclists often move at a much faster speed, which means that they sometimes see much less detail in the landscape and present different design challenges for shared-use trails and other bicycle facilities. Designing facilities for bicycle use requires an approach similar to that used by transportation engineers when designing streets. Also, it is very important to consider the bicycle's place in American society. On the one hand, bicycles are ridden by people of all ages (including very young children) purely for recreational purposes; on the other hand, bicycles may also be ridden by skilled adults as a mode of transportation.

Most cyclists are decidedly either more recreation-oriented or more transportation-oriented and each type may have different preferences.



ADVANCED - These are cyclists that are very experienced in riding with motor traffic and generally prefer to ride on streets. These cyclists will often use on-street bicycle facilities (if they are provided), but will usually choose their own routes and feel comfortable riding in many places that do not have any bicycle facilities. People within this group may sometime see their bike as a replacement for an automobile.



BASIC - Most people, whether they consider themselves a "cyclist" or not, fall within this group when they straddle a bicycle. Basic cyclists might feel comfortable riding on-street in neighborhoods with low traffic or in areas with adequate on-street bicycle facilities. This group has the most potential for growth in The Colony and across the country.



CHILDREN & SENIORS - While many seniors (and some children) fall into one of the two above categories, they generally fall into a third category based on their experience levels and physical abilities. Generally slower and less quick to react, children and seniors often only ride their bikes on grade-separated paths or on very low traffic streets.



MOUNTAIN & OFF-ROAD BIKING - Mountain and off-road biking trails are best suited to large natural areas at Lewisville Lake.

4.2 FACILITY TYPES

The Colony's trail system is based on the common ground between pedestrians, cyclists, and other trail users on a network of off-street trails, on-street bikeways, paddle trails, shared-use paths and additional facility types to provide access to the system and "close the gap" in areas where off-street trails are not feasible. Most of the facility types recommended in this Trails & Bikeways Master Plan meet some or all of the needs of each user group.



OFF - STREET TRAILS

This facility type is the most common component of any city's trail system and is utilized for jogging, walking, recreational cycling, and general relaxation. Primarily designed to provide recreation opportunities, off-street trails are typically located along creeks, through forests, and in other scenic areas. Quite often, these types of facilities are provided along railroad tracks and utility corridors. These facilities are typically two-way, concrete pathways, but are sometimes built utilizing other materials such as asphalt or crushed decomposed granite.

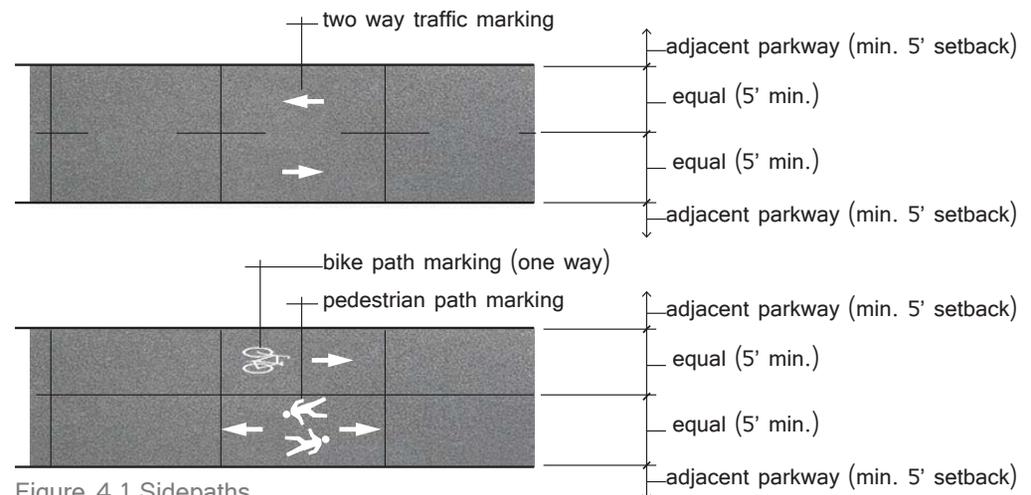


Figure 4.1 Sidepaths

Note: Refer to NACTO, AASHTO, MUTCD, for site specific conditions guidelines.

BIKEWAYS

Just as sidewalks are intended to specifically meet the needs of pedestrians that are not met by off-street trails, bikeways are intended to supplement off-street trails by providing connectivity where trails are not possible. There are several different types of facilities that fall within this bike route facility type - these include signed routes, shared lanes and bike lanes. Each of these facility types are described in more detail below.

SIGNED BIKEWAYS

The simplest of bike route facilities and the least expensive to construct, signed routes are simply an identified route with “bike route” signage. Signs used along bike routes typically include a route number and are placed every 1/4 to 1/2 mile and at all turns in the route. These facilities typically do not have any sort of pavement markings or striping and do not delineate space for bicycles from space for automobiles. As such, this type of facility is most appropriate along low-traffic, two-lane streets, and is often the most common type of bike route facility provided in most cities.

FACILITY TYPES

BIKEWAYS

| | Off-Street | On-Street |
|--------------------|---|---|
| Shared Lane |  |  |
| Signed Bikeways |  |  |
| Bike Lane | |  |
| Buffered Bike Lane | |  |
| Bicycle Boulevard |  | |
| Sidepath |  | |
| Shared-Use Path |  | |



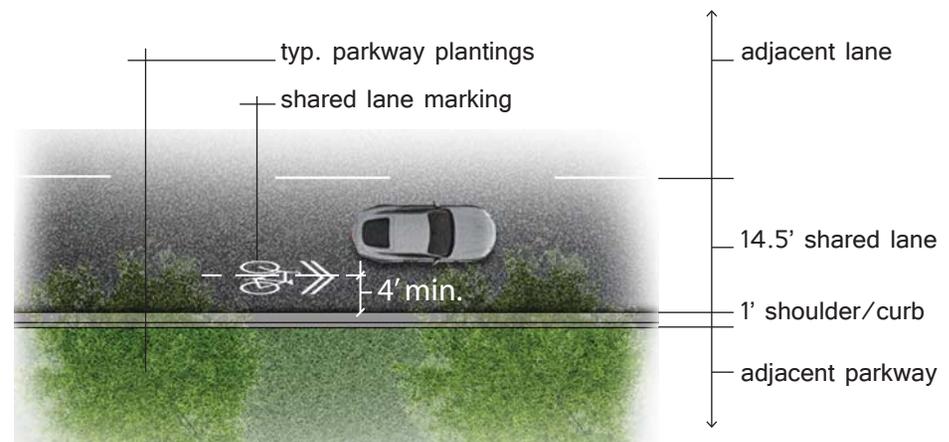
Figure 4.2: Bikeway Facility Network and Facility Type Relationships

SHARED LANE

This type of facility is similar to a signed route in that it does not include striping to delineate space for bicycles from space for automobiles. However, a shared lane bike route includes wider lanes (14.5' minimum, which gives room for a normal-sized automobile to safely pass a bicycle), pavement markings, and is most appropriate along lower- to moderate-traffic streets. The pavement markings used in shared lane facilities are sometimes referred to as “Sharrows” and consist of a double-chevron above an outline of a bicycle, which alerts motorists of the possibility of cyclists on the road. On four lane roads, only the outside lanes should be of increased width and have the Sharrow pavement markings.



Figure 4.3 Shared Lane



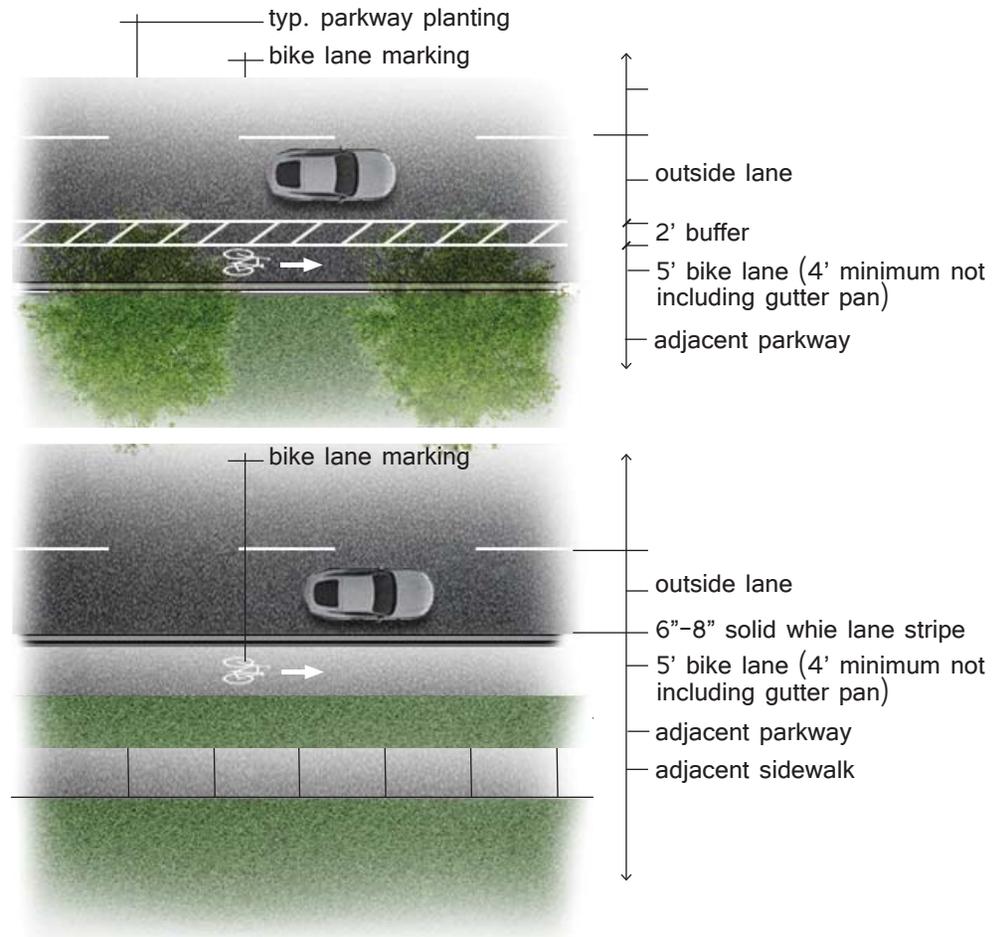
Note: Refer to NACTO, AASHTO, MUTCD, for site specific conditions guidelines.

ON-STREET

BUFFERED BIKE LANES



Figure 4.4 Buffered Bike Lane



Note: Refer to NACTO, AASHTO, MUTCD, for site specific conditions guidelines.

BIKE LANES

Besides signed routes, the bike lane is becoming the most common type of bicycle facility in Texas. The benefits of this type of facility, which is most appropriate along moderate-traffic streets, provide clear delineation between space for bicycles and space for automobiles, and they are highly visible to cyclists and motorists alike (which can improve safety as well as wayfinding). Bike lanes should be a 4' minimum width from the edge of pavement (not including the gutter) and ideally 5' wide whenever possible.



Figure 4.5 Typical Bike Lane



Note: Refer to NACTO, AASHTO, MUTCD, for site specific conditions guidelines.

4.3 TRAILS OPPORTUNITIES & CONSTRAINTS

Pedestrian and bicycle mobility in The Colony has been reviewed in a series of three (3) different villages or districts within the City. These districts are defined by the physical characteristics and development patterns existing within each area. The three areas are; Lake District - being all the residential neighborhoods and commercial development west of Main Street which is strongly linked to Lewisville Lake through topography and excellent water views. Residential Neighborhood District - being what can be considered the original core of The Colony's neighborhoods which are north of SH 121 and east of Main Street. The third district is the Commercial District - which is the regional serving commercial primarily south of SH 121 and includes much of the city in that direction.

The Halff Team has utilized a streamlined version of analyzing latent level of service (LOS) demand which basically involves mapping key opportunities and constraints and using judgement, experience, and public input in order to determine hot spots of pedestrian and bicycle activity and potential alignments by which to connect these areas.

OPPORTUNITIES



CHALLENGES



The primary physical constraint that we view which parallels with citizens comments from the survey is that there are numerous missing pedestrian trail segments which may cause a circuit or loop trail to be incomplete. These incomplete loops or spine trails are primarily located in the Residential Neighborhood and Lake Districts. The second major physical constraint is the challenges for pedestrians and bicycles to cross the two primary roadway corridors in The Colony. These two corridors are SH 121 to the south of the community and Main Street which divides the city east/west. The graphic on the following page highlights the primary intersections of these two roadways with local arterials that will require high-quality design treatments to safely get trail routes across them.

OPPORTUNITIES & CONSTRAINTS MAP

4.3 TRAILS OPPORTUNITIES & CONSTRAINTS

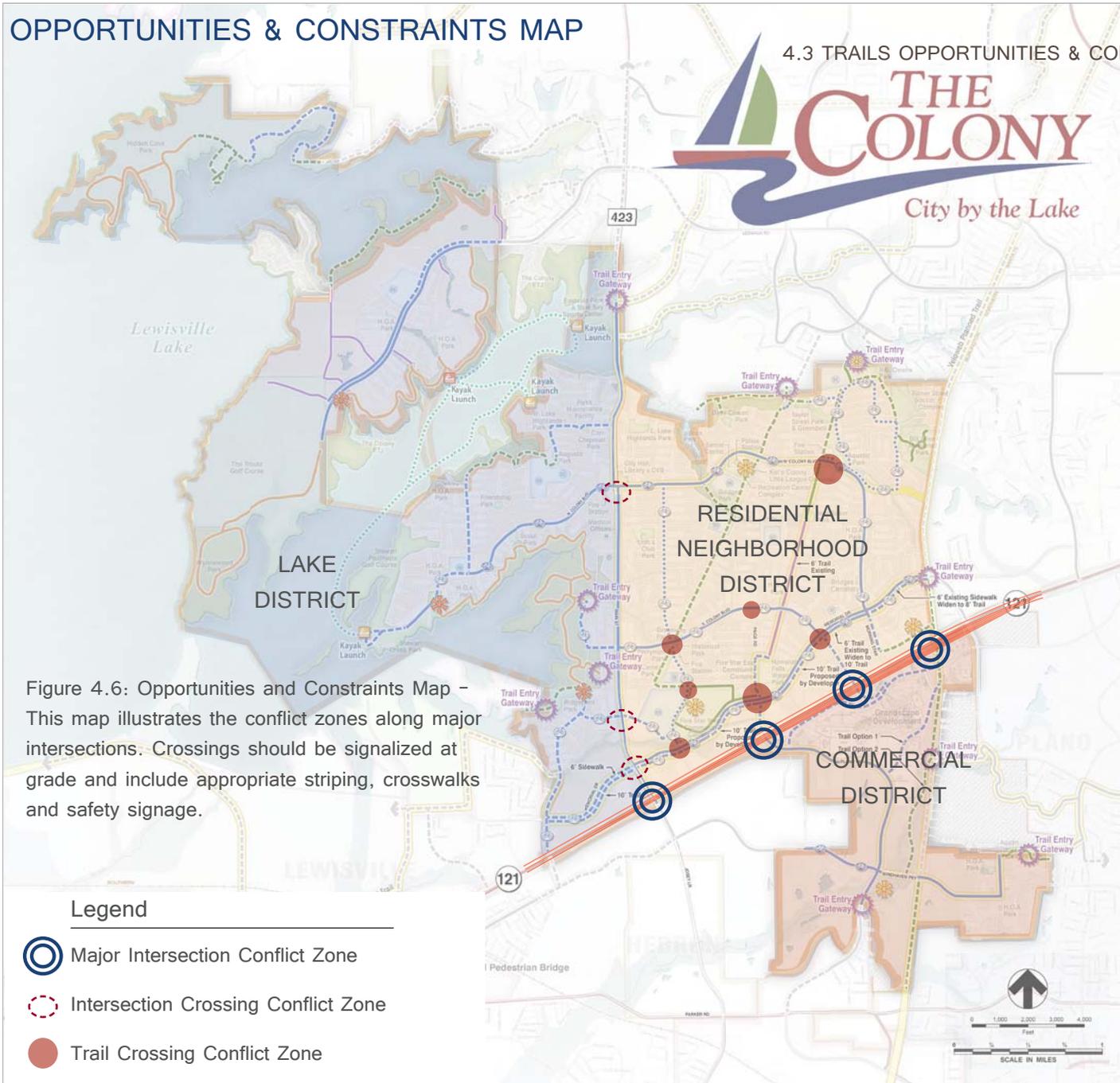
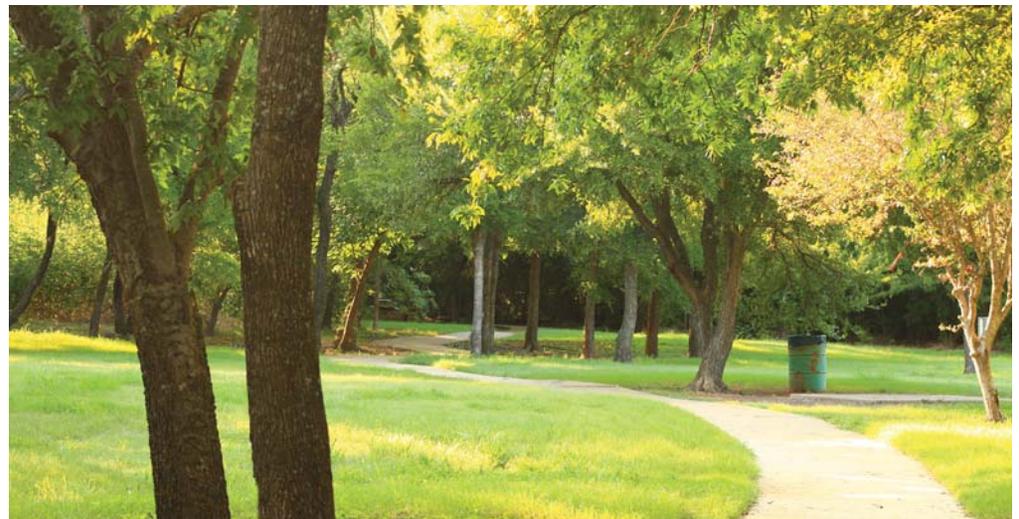


Figure 4.6: Opportunities and Constraints Map – This map illustrates the conflict zones along major intersections. Crossings should be signalized at grade and include appropriate striping, crosswalks and safety signage.

OFF-STREET TRAILS



OFF-STREET TRAILS MAP

4.3 TRAILS OPPORTUNITIES & CONSTRAINTS

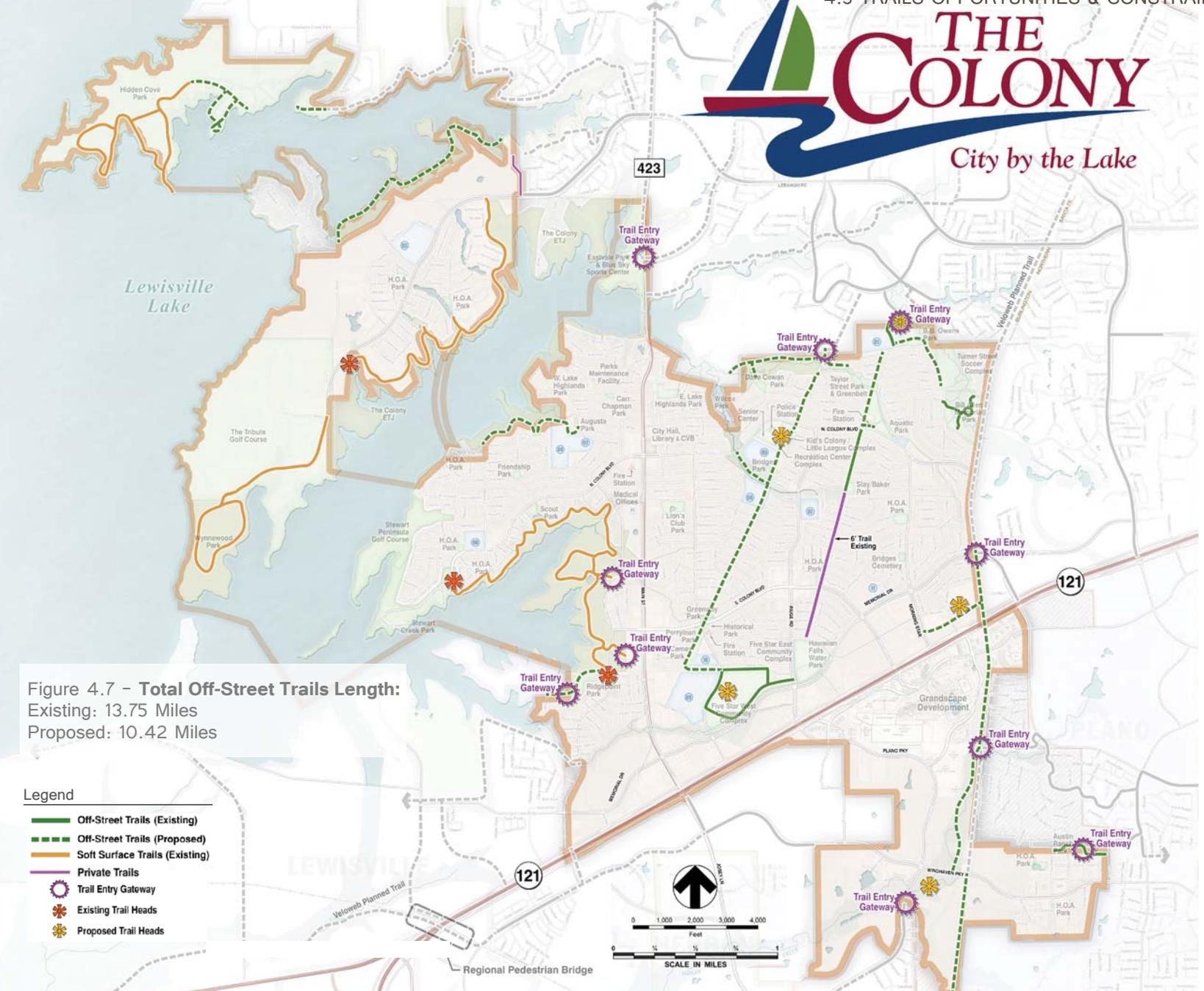
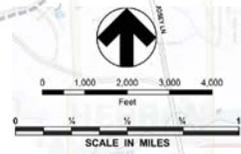


Figure 4.7 - Total Off-Street Trails Length:
 Existing: 13.75 Miles
 Proposed: 10.42 Miles

- Legend**
- Off-Street Trails (Existing)
 - - - Off-Street Trails (Proposed)
 - Soft Surface Trails (Existing)
 - Private Trails
 - Trail Entry Gateway
 - Existing Trail Heads
 - Proposed Trail Heads



ON-STREET | SIDEPATH | BIKEWAY TRAILS



ON-STREET | SIDEPATH | BIKEWAY TRAILS MAP

4.3 TRAILS OPPORTUNITIES & CONSTRAINTS

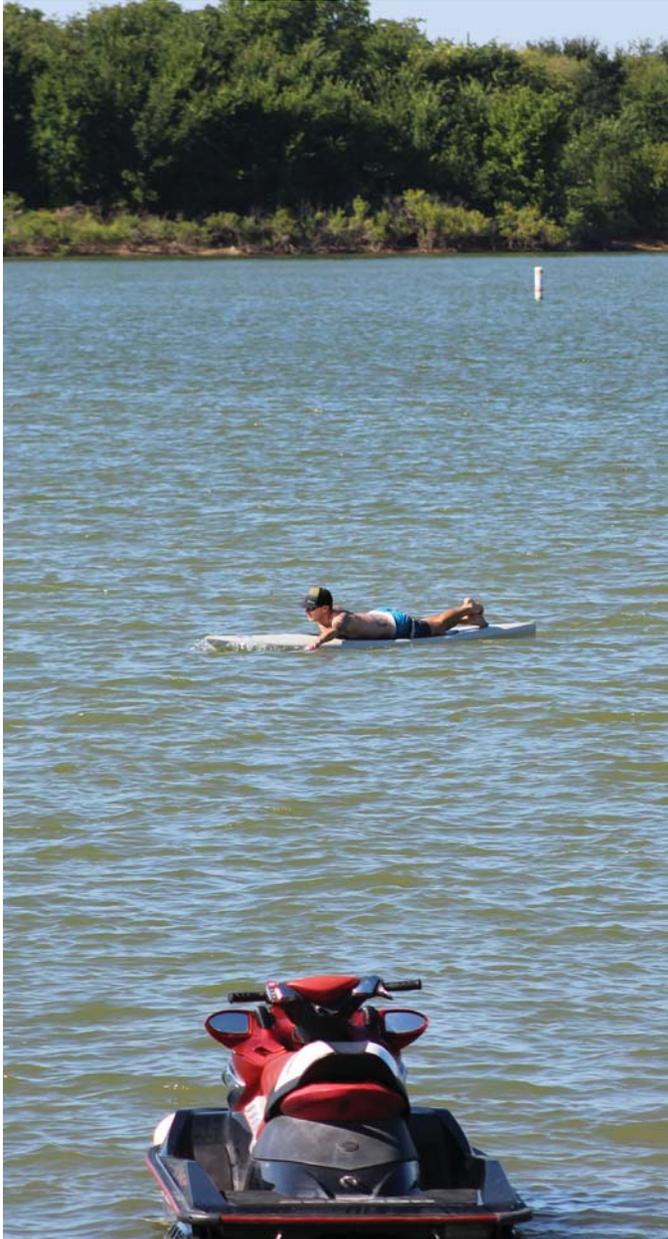


Figure 4.8 - Total Bikeway Trails Length:
 Existing On-Street: 15.75 Miles
 Proposed On-Street: 15.95 Miles

Legend

- On-Street Trails/Shared-Use Paths (Existing)
- - - On-Street Trails/Shared-Use Paths (Proposed)
- · · · · On-Street Bike Route Only (Proposed)
- Bike Routes (Existing)
- Bike Routes (Proposed)
- Trail Entry Gateway
- Existing Trail Heads
- Proposed Trail Heads

PADDLE TRAILS



PADDLE TRAILS MAP

4.3 TRAILS OPPORTUNITIES & CONSTRAINTS

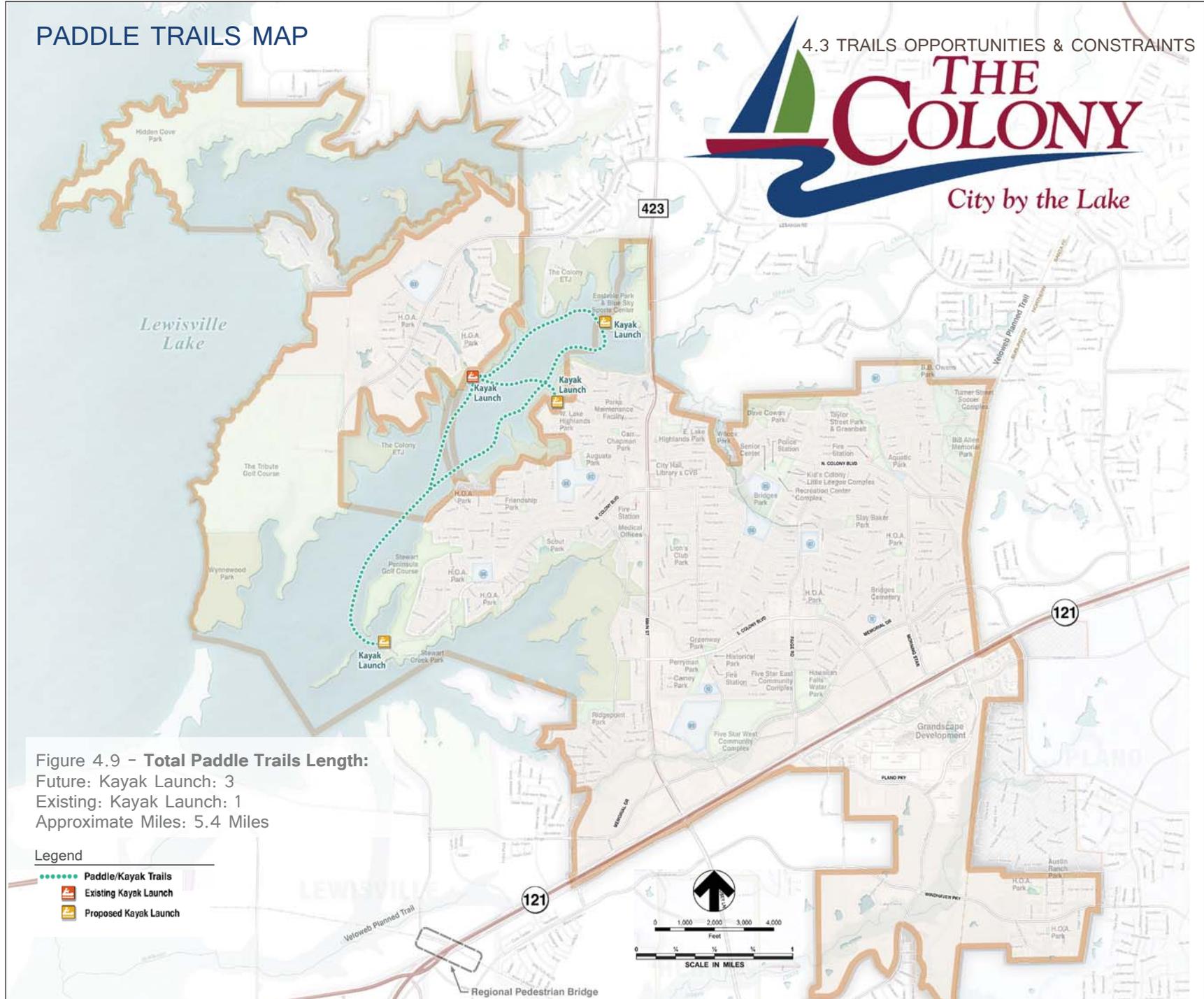
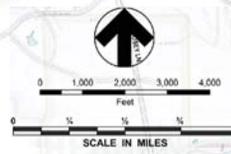


Figure 4.9 - Total Paddle Trails Length:
 Future: Kayak Launch: 3
 Existing: Kayak Launch: 1
 Approximate Miles: 5.4 Miles

- Legend**
- Paddle/Kayak Trails
 - Existing Kayak Launch
 - Proposed Kayak Launch







TRAIL DESIGN STANDARDS

Trails & Bikeways Master Plan

5.0 TRAIL DESIGN RECOMMENDATIONS & STANDARDS

ESTABLISH

The Colony Trails & Bikeways Master Plan is based on a core system of regional and community trails, supported by neighborhood trails and street enhancements that will provide “Healthy/ Adventure / Premier / Connections.” This trail system will link community destinations with an integrated network of trails designed for users of all ages, skill levels and environments. Design standards are an important component for a working trail system because they outline the recommended minimum requirements and additional support items for all types of trails.

The most familiar trail standards or guidelines are published by the American Association of State Highway and Transportation Officials (AASHTO). All trails, bike lanes and sidewalks should meet minimum AASHTO standards but where, possible, those standards should be exceeded. This is especially true for shared-use trails, signage, lighting, traffic signals and detectors. Many necessary trail-related improvements can be incorporated into the regular maintenance schedule of the existing road system, such as the upgrade of traffic lights, widening of roads and shoulders or addition of lighting with needed repairs.



To facilitate future development of The Colony, it is recommended to develop customized design standards in written and graphic format and make these available to all applicable builders and developers. Listed below are some sources for the most commonly used standards for trail design. This plan should comply with current and up to date standards:

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

THE COLONY TRAIL DESIGN RECOMMENDATIONS

The following set of design standards has been developed in order to ensure that The Colony's trail system is developed with a high level of safety, quality, and comfort for trail users and shall follow The Colony Engineering Design Manual and Standard Details. These standards are in addition to mandated national and state standards (AASHTO, NACTO, ADAAG/TAS, ITE, and TMUTCD). In some cases, such as when a certain component of the trail system cannot be standardized (crosswalks, for example), the following recommendations are provided as guidelines rather than standards.

SPINE TRAIL

DESIGN OBJECTIVES

- Spine trails are the primary trails which provide organization and a sense of place (location) within The Colony.
- Alignments should follow the contours of the land and its natural drainage patterns. The trail should not appear to be carved out of the terrain.
- Trails can be curvilinear, and may include a combination of curving and straight segments. Serpentine (extreme curves) or sinuous (straight) trail alignments are not desirable and should be limited to instances where tree preservation necessitates such alignments.
- Where conditions apply, trails should align with existing or future crosswalks at streets. These intersections should incorporate handicap accessible ramps that meet the design criteria of ADAAG/TAS.

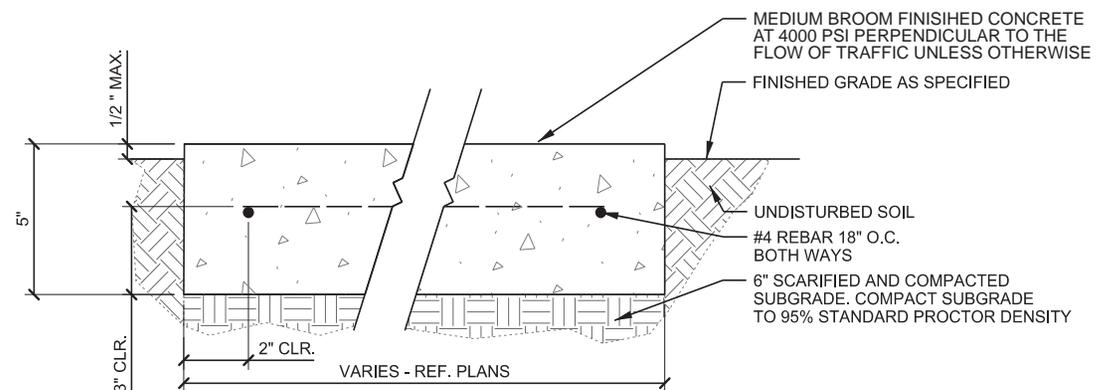
PAVEMENT STRUCTURE

The concrete thickness of trails and sidewalks should be 5" minimum depth on spine trail segments wherever heavy maintenance vehicles are expected to cross over the trail.

WIDTH & CLEARANCE

Off-street hard surface trails within the City's system, which include a mix of bicycle, pedestrian, other non-motorized transportation, and maintenance vehicles, should be 10'-12' in width. The optimum vertical clearance of obstructions over a trail is 10' or higher, which accommodates maintenance, patrol, and emergency vehicle access.

Figure 5.1 – Spine Trail Pavement Section



BIKEWAY FACILITIES

PURPOSE

Recommended bikeway facility types are highlighted on the following pages. Reference facilities include bikeway treatment that comprise the off-street and on-street facility classes first introduced in Figure 4:2 Bikeway Facility Network and Facility Type Relationships (page 40). A general description of each facility type is provided - as well as notes on applicability, design variations, benefits, and costs.



ON-STREET/SIDEPATH TRAIL

SIDEPATHS

Sidepaths are similar to shared-use paths, but are located adjacent to a roadway (typically within the street right-of-way). Unlike sidewalks, sidepaths are intended for use by both pedestrian and bicyclists, and are therefore wider than traditional sidewalks. In instances where there is a large amount of pedestrian traffic, the co-location of a sidepath and sidewalk may be appropriate.

Considerations

- May extend or connect shared use paths that diverge from the road right-of-way.
- May be used on streets that are heavily trafficked and/or contain high vehicle travel speeds.
- Provides two-way bicycle flow on one (1) side of the street.
- Appropriate where bicycle and pedestrian interaction won't create continual conflict.
- Suitable on corridors without high presence of driveway crossings.

Benefits

- Removes bicyclists from the roadway, while keeping them connected to the overall street network.
- Increases users' sense of safety and comfort.
- Encourages a wide variety of users.

Costs

From \$600,000 per mile for sidepath without border curbs to \$970,000 per mile for an asphalt surface with a separate sidewalk.



CYCLE TRACK

A cycle track is a 'protected' bicycle lane physically separated from traffic with a row of parked cars, raised curb, planters, or other barrier. A cycle track is intended for bicycle use only and is clearly differentiated from adjacent sidewalks or paths intended for pedestrians. May include two-way facilities.

Considerations

- May be used on streets where traffic speeds are high and/or congestion is common.
- The separating element should best determine the desired interaction with the vehicle lane. A deterrent like a tubular marker or 'armadillo' is appropriate when free flow in and out of the facility is desired. A curb will keep the bicyclist within the cycle track for controlled entrance and exit.
- Where street parking is common, parking can be used to maintain vehicle traffic separation from the bicycle facility.
- Two-way cycle tracks may be used on one-way streets.

Benefits

- Increases level of comfort and safety.
- Provides clear definition of travel for both cars and bicycles.
- Encourages a wide variety of users.
- Also separates bicycle and pedestrian traffic.

Costs

From \$240,000 per mile for markings and signage on an existing street surface to \$780,000 for markings, signage, paving, and barrier curbing as an addition to the roadway.

BICYCLE LANE

Bicycle lanes are designated by a lane stripe, pavement markings, and signage. Bicycle lanes promote the orderly flow of traffic by establishing specific lines of demarcation between areas reserved for bicycles and lanes to be occupied by motor vehicles. Typically, the solid stripe of the bike lane is either dropped or dashed prior to and through intersections, to allow for bicyclist and motorist turning movements.

Considerations

- Streets with enough vehicle traffic to warrant a designated bicycle facility (more than 3,000 vehicles per day).
- Appropriate for streets where speed limits exceed 25 mph.

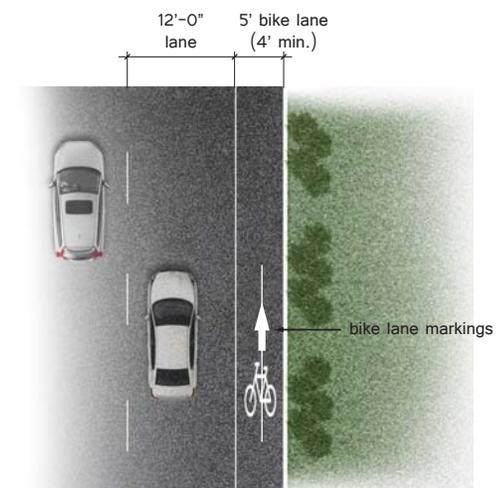
Benefits

- Communicates clearly defined areas of travel for bicyclists and motorists.
- Provides separation between bicyclists and pedestrians.
- Increases the perception of safety for bicyclists.
- Relatively low cost treatment for establishing a bicycle facility.

Costs

From \$55,000 per mile for markings and signage on an existing street surface to \$635,000 for markings, signage, and new paving as an addition to the roadway.

Figure 5.2 - Typical Bike Lane



Note: Refer to current NACTO, TMUTC and AASHTO Guidelines when developing bicycle facilities to determine required sign placement, pavement warnings and trail design.

BUFFERED BICYCLE LANE

A buffered bicycle lane – sometimes called a ‘comfort lane’ – is defined as a bicycle lane that is paired with a designated buffer space separating the bikeway from the adjacent motor vehicle lane travel and/or parking lane. The buffer typically consists of a zone incorporating diagonal striping or chevron markings.

Considerations

- Apply on streets with high volumes of traffic and high travel speeds.
- Suitable for streets with higher presence of truck traffic.
- Appropriate where existing paving allows for more substantive bicycle facility.
- Suitable where on street parking turnover is high. In these incidences, it is appropriate to consider placing the buffer between parking and the bicycle travel lane.
- Apply in areas with special considerations or increased need for visibility.

Benefits

- Increases the distance between vehicles and bicyclists, without making the facility appear as a motor vehicle travel lane.
- Increases space for bicyclists to maneuver – either to pass other bicyclists or avoid hazards.
- Separates bicyclists and pedestrians.
- Increases the perception of safety and comfort for bicyclists.

Costs

From \$75,000 per mile for markings and signage on an existing street surface to \$770,000 for markings, signage, and new paving as an addition to the roadway.

SHARED LANE

Shared lanes are streets where a travel lane is specifically designated to serve both bicyclists and motor vehicles. The combined relationship between mode is conveyed with pavement markings and signage. This application is often used on streets where there is insufficient width for a bicycle lane but where bicycle travel is also likely. The shared lane marking suggests that general location within the lane of travel where bicycles may likely be found but does not necessarily confine the bicyclist to a rigidly defined path.

Considerations

- Suitable on streets with low volumes of traffic and low travel speeds, and where room does not allow for a designated or separated bicycle facility.
- Typically incorporates shared lane markings (sharrows) in addition to bikeway signage.
- The use of shared lanes on streets with higher traffic speeds (greater than 35 mph) is not ideal and should be considered a short term solution. Other long term solutions should be developed and considered for any future road construction efforts.
- A pocket lane at intersections is an appropriate treatment to increase visibility and safety of bicyclist.

Benefits

- Motorists are made aware of the presence of bicycles within the travel lane.
- Relatively low cost to implement.
- Provides bicyclist guidance and contributes to way-finding within the street cross-section.

Costs

From \$50,000 per mile for markings and signage on an existing street surface. Additional paving costs are not included in this estimate.

Figure 5.3 – Typical Shared Lane



Note: Refer to current NACTO, TMUTCD and AASHTO Guidelines when developing bicycle facilities to determine required sign placement, pavement warnings and trail design.

SEPARATED BIKE LANES

Separated bike lanes must typically be a minimum 4' wide (5' is recommended) not including curb and gutter. Bike lanes are one-way, and should be indicated as such through pavement markings per TMUTCD. Bike lane markings should be placed at the bike lane centerline and should be of reflective, non-skid material. Bike lanes should be continuous along a corridor and should not terminate at major intersections. On major roads, bike lanes should terminate into off-street trails, cycle tracks, or bike lanes on intersecting streets. On minor roads, bike lanes can terminate into shared lanes or signed routes.

SIGNAGE

Bike route signs should be used on streets with bike routes, shared lanes, bike lanes, and cycle tracks as well as on shared-use trails where applicable. Route signs should include route number and destination information, yet be legible to moving cyclists. Route signs should be located at all intersections where the bike route changes direction. Additional route signs should be located in accordance with AASHTO and TMUTCD standards.

TABLE 5.1
ON-STREET ROUTE GUIDELINES

| | |
|------------------|---|
| FACILITY WIDTH | Signed Routes: no specific width Shared Lanes: 14.5' minimum outside lane (not including gutter) Bike Lanes: 4' minimum (not including gutter); 5' preferred Buffered Bike Lane; 4' minimum with 2' buffered striping; 5' preferred with buffer striping Cycle Tracks: 7.5' minimum |
| SURFACE | All Facilities: pavement surfaces should be smooth, uniform in width and free of utility covers/lids, wide cracks, or longitudinal joints. Utilize bicycle-safe grates without longitudinal openings. Concrete or asphalt preferred. Brick, pavers, or stamped concrete is not recommended. |
| OTHER FACILITIES | Provide "No Parking" signage where appropriate. Provide directional, informational signage and pavement markings in the rights-of-way. |

Note: These guidelines are in addition to AASHTO standards.

OFF-STREET TRAIL PAVED DESIGN OBJECTIVES

- The alignment should follow the contours of the land and its natural drainage patterns. The trail should not appear to be carved out of the terrain.
- Trails can be curvilinear, and may include a combination of curving and straight segments. Serpentine (extreme curves) or sinuous (straight) trail alignments are not desirable and should be limited to instances where tree preservation necessitates such alignments.
- Meanders in trails should appear to have a purpose and should not be haphazard or irregular.
- Create functional, efficient, trail alignments that present and preserve the natural terrain and vegetation to the greatest extent possible.
- Locate intersections where sight lines are not obscured at natural focal points such as scenic vistas and convenient access points.
- Where conditions apply, trails should align with existing or future crosswalks at streets. These intersections must incorporate handicap accessible ramps that meet the design criteria of ADAAG/TAS.

SHARED USE PATHS (TRAILS)

Shared use paths are intended to be used by both bicyclists and pedestrians. In some areas, shared use paths are also referred to as multi-use trails; but regardless, such facilities are commonly referred to by the layperson simply as "trails." Shared-use paths occupy corridors that are completely separated from streets, such as water ways, utility rights-of-ways, greenbelt corridors, or areas within parks.

PEDESTRIAN FACILITIES

While communities are increasingly accommodating pedestrian travel through the construction of shared use facilities (see shared use path and sidepath, pages 56 and 59), sidewalks remain the principal type of facility used exclusively for pedestrian travel. Nonetheless, the design of sidewalks will vary greatly depending on built context. A general description of sidewalks in residential, suburban, and auto-urban contexts; and, in urbanized areas.

STANDARD SIDEWALKS

The typical sidewalk, unlike other transportation facilities, is intended to serve all people regardless of age or ability. Sidewalks connect residential areas to the surrounding services and employment, and to adjacent neighborhoods. Sidewalks are located within or parallel to a street right-of-way, and are designated for pedestrian use only (since pedestrians and bicyclists travel at different speeds and sidewalks are often too narrow to accommodate both users). The use of the term 'standard' sidewalk refers to a basic facility that is necessary to establish a pedestrian network.



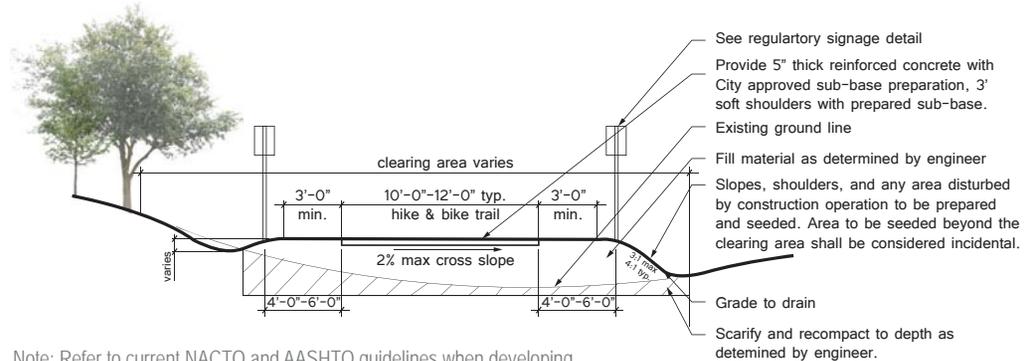
PAVEMENT STRUCTURE

The standard pavement should be reinforced 5" thick Portland cement concrete with a transverse light broom finish. Bituminous fiberboard board 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 should be of a depth of one-fourth the pavement thickness. The joints should be saw-cut and 1/4" wide. For optimum 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.

WIDTH & CLEARANCE

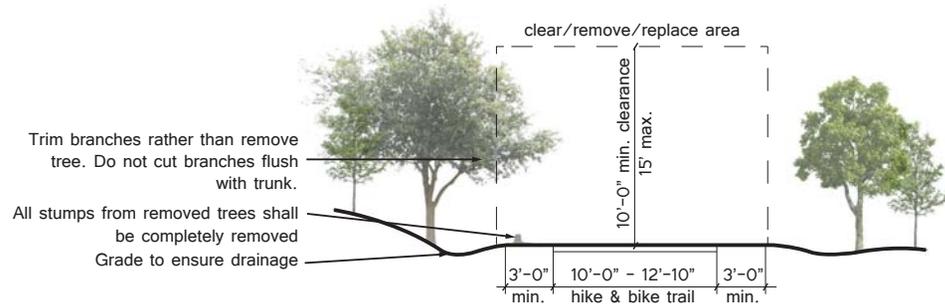
Off-street hard surface trails within the City's system, which will include a mix of bicycle, pedestrian, other non-motorized transportation (with the exception of approved ADA mobility devices), and maintenance vehicles, should be a minimum of 10' in width. The minimum width of a shared-use trail should be 10'-12' to accommodate maintenance access and passing room for cyclists (if the maintenance vehicles will navigate steep grades, the minimum width should be 12'). The optimum vertical clearance of obstructions over a trail is 10' or higher, which accommodates maintenance, patrol, and emergency vehicle access. All underpasses and tunnels should be a minimum of 8' in height. If vertical clearances under bridges and other structures are less than 10', the clearance should be clearly posted with warning signage to alert approaching trail users.

Figure 5.4 - Standard Hike & Bike Trail Section



Note: Refer to current NACTO and AASHTO guidelines when developing bicycle facilities to determine required sign placement and trail design.

Figure 5.5 - Standard Construction Limits Hike & Bike Trail (Typ.)



Notes:

1. Trails shall be aligned in such a way that tree removal or disturbance is minimized.
2. All vegetation within limited clearing area for trail shall not be removed or damaged unless tree trimming or grading is required. Only trees directly conflicting with construction shall be removed, only at the direction of the City, and when no better alignment is feasible.
3. Contractor should enter wooded construction area from designated access points as approved by the City.
4. Contractor should limit construction equipment to working/clearing area only to prevent damage to remaining trees.
5. The contractor shall construct temporary barricades along working area to protect existing vegetation, as required by the project manager.

DESIGN SPEED

In general, a minimum design speed of 20 mph should be used when trail grades do not exceed 5 percent. In those instances where strong prevailing tail winds exist or trail grades may exceed 5 percent, a design speed of 30 mph is advisable. Speed bumps or similar surface obstructions intended to slow down cyclists would pose a trip hazard for other trail users and should never be used. In instances where it is desirable to slow the speed of cyclists, chicanes may be used.

DRAINAGE

The cross-slope of areas adjacent to trails should be a minimum of 2% to provide for drainage. Trail pavement surfaces should have a cross slope of 2% in order to maintain compliance with ADAAG/TAS standards.

PADDLE TRAILS DESIGN OBJECTIVES

- Provide safe water recreation on Lewisville Lake
- Paddle trails from launch point to launch point.
- Links waterfront neighborhoods, park and connects the community together.

ROUTES

Paddle trails are a part of The Colony trail system and a component that is truly unique. These water based trails allow people with canoes, stand-up paddle boards (SUP's) and kayaks the recreational option to paddle from point to point. Kayak launch locations are located along Lewisville Lake and provide safe, non-intrusive neighborhood spots to enjoy a unique trail experience.

TABLE 5.1 OFF-STREET TRAIL GUIDELINES

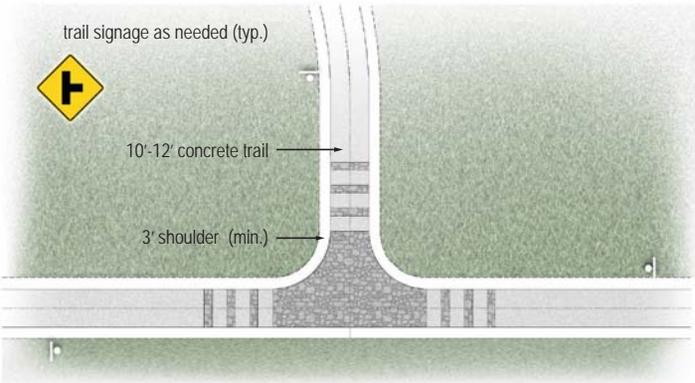
| | |
|------------------------|---|
| FACILITY WIDTH | 8' to 12' width (depending on anticipated volume) |
| SURFACE | Provide 5" thick reinforced concrete with City approved sub-base preparation, 3' soft shoulders with prepared sub-base. Increase concrete depth to 6" where heavy maintenance vehicles are expected to cross the trail. Alternatively, the use of natural surface (i.e., crushed granite) at 5" depth with City approved geo-webbing and sub-base preparation is acceptable for lower-traffic trails and/or trails in environmentally sensitive areas. |
| ACCESS POINTS | Access should be no greater than one mile apart, no more than ½ mile walk or ride to an access point. |
| MINIMUM CORRIDOR WIDTH | Provide 32' trail and shoulder corridor (typical, minimum preferred) |
| OTHER FACILITIES | Off-street trails benefit from the provision of parking at trailheads for trail access. The trailheads should include banners, lighting, directional and informational signage, kiosks, locator maps, mileage markers, water fountains, bicycle racks, benches, litter receptacles and interpretive/historic signage. It is recommended that electrical conduit for lighting be installed at key access points, trailheads and along trails which might be near heavily visited retail/restaurant/entertainment areas. Key access points and trailheads should be located in accordance with the Trails & Bikeways Master Plan. |

Note: These guidelines are in addition to AASHTO standards.

INTERSECTION TREATMENT

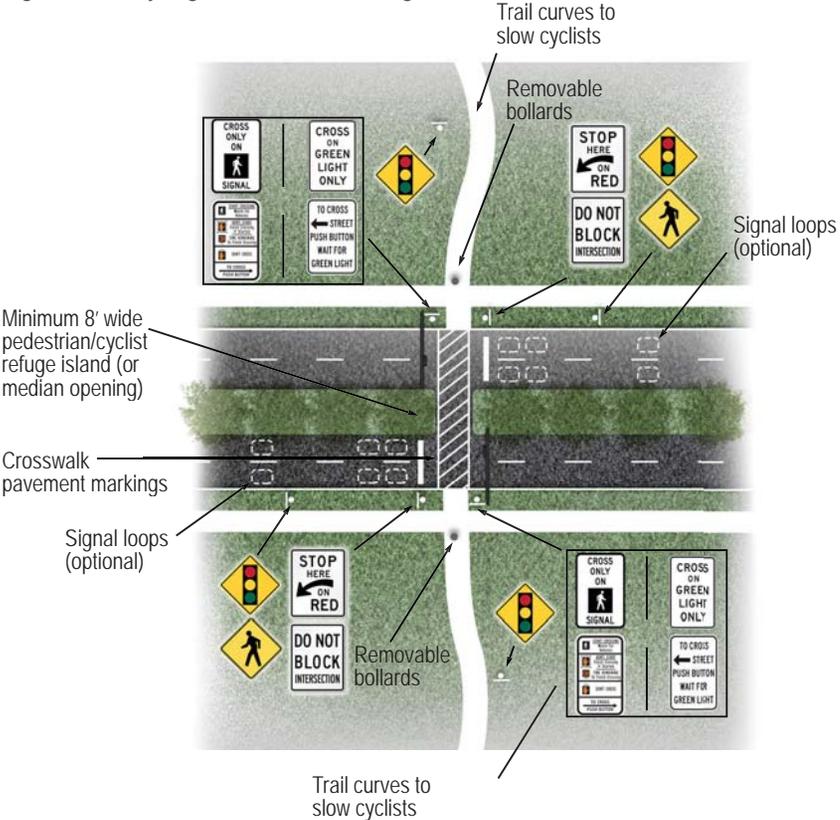
Intersections are important locations from a traffic flow and aesthetic point of view. The corner radius for 90 degree intersections should typically be 15' or smaller radii (10' minimum) may be appropriate in special circumstances such as at non-right-angle intersections and when trails intersect at planting beds, signage or other focal points.

Figure 5.6 - Typical Intersection Treatment



Note: Refer to current NACTO and AASHTO Guidelines when developing bicycle facilities to determine required sign placement and trail design.

Figure 5.7 Fully Signalized Trail Crossing



Note: Refer to current NACTO, TMUTCD and AASHTO Guidelines when developing bicycle facilities to determine required sign placement and trail design.

5.1 TRAIL SIGNAGE MARKINGS

TRAIL MARKER DESIGN STANDARDS

Trail markers should be placed at each trailhead, trail access point, and major trail intersection. Trail markers should also be placed along trails where they are visible from major roadways in order to increase the visibility of The Colony's trail system.

TRAIL SIGNING AND TRAFFIC CONTROL

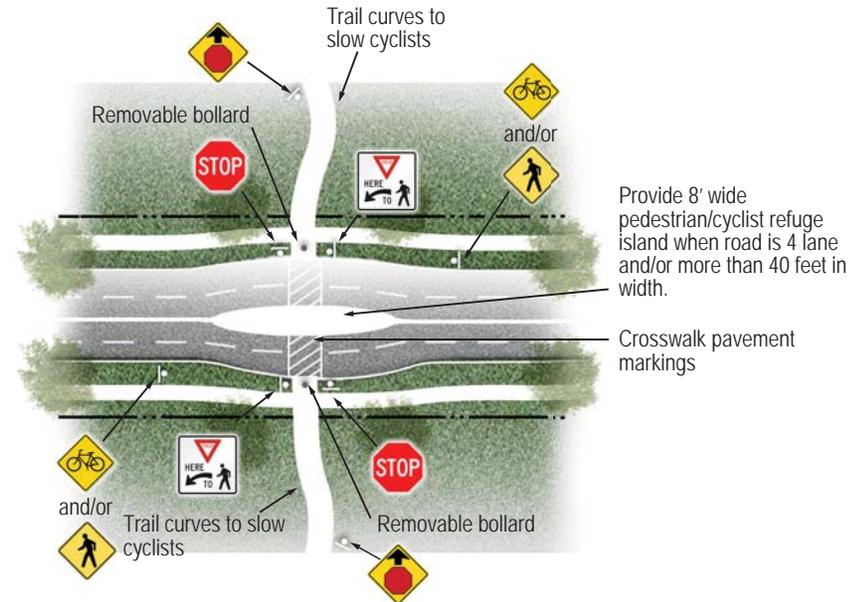
Crossing features for all roadways include warning signs both for vehicles and trail users. Type, location, and other criteria are identified in the TMUTCD. Adequate warning distance is based on vehicle speeds and line of sight. Signage should be highly visible; capturing the attention of motorists accustomed to roadway signs may require additional alerting devices such as flashing warning beacons, roadway striping, or changes in pavement texture. Signing for trail users must include a standard stop sign and pavement marking; these traffic control devices are sometimes combined with other features such as bollards or bike lane markings in the trail to alert cyclists. Care must be taken not to place too many signs or other traffic control devices at crossings as they tend to overwhelm the user and lose their impact.

Directional signing may be useful for trail users and motorists alike. For motorists, a sign reading "Bicycle Trail Xing" along with The Colony trail emblem or logo helps both warn motorists and promote use of the trail. For trail users, directional signs and street names at crossings help direct people to their destinations. A number of striping patterns have emerged over the years to delineate trail crossings. A median stripe on the trail approach will help to organize and warn trail users of an approaching intersection.

SIGNAGE

Bike route signs should be used on streets with bike routes, shared lanes, bike lanes, and cycle tracks as well as on shared-use trails where applicable. Route signs should include route number and destination information, yet be legible to moving cyclists. Route signs should be located at all intersections where the bike route changes direction. Additional route signs should be located in accordance with AASHTO and TMUTCD standards.

Figure 5.8 - Typical Unprotected/Marked Crossing



Note: Refer to current NACTO, TMUTCD and AASHTOS Guides when developing bicycle facilities to determine required sign placement and trail design.

COMMONLY USED BIKEWAY SIGNAGE



R9-7

The Shared-Use Path Restriction

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



D4-3

Bicycle Parking Area

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



R9-5

Use Pedestrian Signal

Location: At crosswalk
Size 12"x18" (min. for trails)



R9-6

Bicycle Yield to Pedestrian

Location: At crosswalk
Size 12"x18" (min. for trails)



D11-1

Bike Route

Location: At the beginning of each route and at intersections.
Size 24"x18" (min. for trails)



R3-17

BIKE LANE

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



R3-17a

AHEAD

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



R3-17b

ENDS

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



D1-1b, D3-1

Directional Signs

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



M4-11, 12, 13, M7-1,2,3,4,5,6,7

Bike Route Supplemental Plaques

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



COMMONLY USED BIKEWAY SIGNAGE



Bike May Use Full Lane

Location:



R1-1

Stop

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



R5-3

No Motor Vehicle

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



R1-2

Yield

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



W16-1

Share The Road

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



W3-1

Stop Ahead

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



W11-1

Bicycle Warning

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



W3-2

Yield Ahead

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



W11-2

Pedestrian Warning

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



W3-3

Signal Ahead

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





W1-1,2,3,4,5

Turn & Curve Warning

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



W2-1,2,3,4,5

Trail Intersection Warning

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



Please Stay on Trail

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

Trail Closed: No Entry Until Made Accessible & Safe for Public Use

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



Trail Regulations/Rules of the Trail

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



5.2 TRAIL DESTINATIONS

Trails connect people with places. As part of the trail system planning process, key locations and facilities throughout the City have been identified for premier trail system destinations. These destinations give purpose and reason for residents to utilize the system, whether for short errands, visiting a friend's home or even going to work or school. Of course, not all trails have or need a destination. Many trails simply provide residents an opportunity for physical activity, a means for enjoying the surrounding community and/or a chance to explore the city.

"Creating a system means learning where trails are and developing connections that link them together into networks and where desirable and necessary, building new trails that also connect."

- American Trails, Trails for All Americans report, 1999

Connecting trails to key city destinations can promote increased trail usage and foster a greater community need for the trail system. Some of the key destinations throughout The Colony and nearby in adjacent cities are illustrated on the following page.





SCHOOLS



PARKS



CIVIC FACILITIES



COMMUNITY GARDENS



LEWISVILLE LAKE



RECREATION FACILITIES



KEY CITY FACILITIES



MAJOR RETAIL AREAS



MAJOR ENTERTAINMENT FACILITIES

5.3 TRAIL FEATURES

Adding appropriate trail features to a local or regional trail system enhances the trail user’s experience. As identified during the community workshop, the public desires a variety of trail amenities at appropriate locations. The following is a summary of the trail amenities that should be considered along The Colony’s trail system. The Parks Department will need to consider construction and maintenance costs associated with each, and what the overall recreation and programming goals are for each trail.

BIKE RACKS

Parking for bicycles along the trail system and key destinations in the region was seen as an important trail amenity to participants in the community workshop. With the community-wide trail system providing connections to many key city destinations, providing parking for bikes allows trail users to safely park their bikes if they wish to stop along the way, particularly at parks and other desirable destinations. An ordinance should be developed requiring all commercial areas and public facilities to provide bike racks.

SIGNAGE / MAPS / KIOSKS

To assist users in navigating the trail system, directional signage, maps and/or kiosks should be provided that contain important trail information. Such items can inform trail users of their location on the map, how long the trail is, where certain trail amenities are located, and what to expect in general from the trail.



WAYFINDING SIGNAGE

Wayfinding signage should be provided at each major and minor trailhead and should at a minimum include a map of the City's trail system.

FITNESS STATIONS

Fitness stations provide trail users with an opportunity to stretch and warm up and cool down at the beginning or end of their trail use. These fitness stations also provide users an opportunity to get more out of their workout with muscular training.

INFORMATIONAL SIGNAGE

Informational signage can provide a variety of information types to the trail user. Information can range from historical and environmental, to facts about native plants and animals potentially encountered. Informational signage enhances the user experience and provides interesting information for all.

LIGHTING

Pedestrian-scale lighting improves safety and enables the trail to be used for longer hours year-round. It can also enhance the trail's aesthetic beauty.

BIKE REPAIR STATION

Bike repair stations are self-served stations that are placed near bike parking where they are needed most. Repair stations generally include tools necessary to perform basic bike repairs and maintenance, from changing a flat to adjusting brakes and d erailleurs.



DRINKING FOUNTAINS

Water fountains provide trail users and their pets with an opportunity to remain hydrated and/or fill up their water containers. Where feasible, drinking fountains should be located at trailheads.

GATEWAY ENHANCEMENTS

Creating trailheads and entry gateways at key locations along the trail is important as a marker in the system. The trail system will connect to future trails and access points for the beginning and end of the network.

MILEAGE MARKERS

Mileage markers inform trail users of their distance traveled and allow them to determine whether their goals for the day have been reached and/or how much farther they must travel to obtain those goals. They also help users identify trail segments for emergency services.

PARKING

Where parking is not already provided in the parks, areas should be provided at regional trail entrances when appropriate. Parking at trail entrances is convenient for those living farther from the trail network and provides a place to park for those that transport their bicycle or canoe/kayak to a trail entrance or kayak launch with their truck or car.

PET AMENITIES

Where appropriate, dog waste pickup bag dispensers should be placed at trailheads and key neighborhood access points along the route. Signs should be placed along the trail encouraging dog owners to pick up after their dogs and keep them on their leash at all time.



REST AREA / SHADE

Rest areas should be relaxing places containing shelter, shading, benches and other places to sit. These areas may also contain enhanced landscaping, drinking fountains, trash receptacles and even informational signage. Rest areas should be strategically located to make trails more desirable and usable for all user groups.

TREES

Trees at/adjacent to trailheads should be provided as one (1) canopy tree per two (2) parking spaces (if parking) or a minimum of eight (8) canopy trees in total required. Three (3) ornamental trees should equal one (1) canopy tree if ornamentals are desired.

TRASH RECEPTACLES

Trash and recycling receptacles play an essential role in maintaining the cleanliness of a trail system. Trash and recycling receptacles allow trail users to dispose of any trash or other refuse generated while utilizing the trail system, and should be located at regular intervals, trail intersections, rest areas, fitness stations, trailheads and parking.

TRAILHEADS

Trailheads (for major trails) serve as primary access to the trail system. Trailhead stations should provide trail users with information and trail rules and regulations. Trailhead amenities should be considered such as parking areas, restrooms, drinking fountains, trash receptacles, information kiosks (maps and points of interest) and destination signage with mileage.



TRAILHEADS & ACCESS POINTS

DESIGN OBJECTIVES

- Provide transition between motorized and non-motorized transportation and recreational systems.
- Create a unique entry to the trail system through hardscape and landscape features that support aesthetic guidelines established in these standards.
- Encourage utilization of trail and bicycle routes as alternative transportation paths within the city.
- Provide access to a variety of destinations, streets, and trails.
- Utilize existing facilities such as schools, civic facilities (library, city hall, etc.) and parks as trailheads.
- Establish a hierarchy of major trailheads, minor trailheads, and access points.
- Encourage shared use of parking when appropriate and when such shared use would not have a negative impact on the parking availability of the primary parking lot user.



TRAILHEAD DESIGN STANDARDS

- Trail Markers: A minimum of one (1) trail marker shall be provided at each major and minor trailhead located such that it indicates the primary trail access point.
- Parking: A minimum of fifteen (15) parking spaces and one (1) handicap space shall be provided at major trailheads. A minimum ten (10) spaces and one (1) handicap space shall be provided at minor trailheads. In both instances, the handicap parking space must be van accessible. Sidewalks shall connect handicap spaces to the trails and the parking lot shall be signed for trailhead usage.
- Bike Racks: Bike racks approved by the City shall be provided at a ratio of one (1) bike space for every two (2) car parking spaces. No less than five (5) bike spaces shall be provided in a rack at any trailhead.
- Drinking Fountains: One (1) drinking fountain approved by the City shall be provided within 30' of benches and bike racks. Drinking fountains shall be per the City of The Colony standard, or approved equal. Drinking fountains shall comply with City standard specifications.
- Benches: One (1) bench approved by the City for every three (3) parking spaces shall be provided, with minimum five (5) benches provided at major trailheads and three (3) benches provided at minor trailheads.
- Lighting: Parking lots and trail intersections shall be lighted to a minimum of ½ footcandle with appropriate commercial light fixtures and no spillover to adjacent property.
- Trail Termination: Trails that terminate at trailheads shall receive landscape traffic control measures for buffering and guiding the direction of pedestrian and bicycle traffic.
- Trees: Trailheads shall provide one (1) canopy tree per two (2) parking spaces with a minimum of eight (8) trees required. Three (3) ornamental trees shall equal one (1) canopy tree. (See Landscape Ordinance for minimum sizes and specifications for shade and ornamental trees).
- Identification: Trailheads shall be identified by trail markers.
- Signage: Directional and wayfinding signage shall be provided at each major and minor trailhead and shall at a minimum include a map of the City's trail system

TRAIL GATEWAY ACCESS POINT DESIGN STANDARDS

- Trail Markers: One (1) trail marker shall be provided at each access point.
- Parking: Off-street parking is not required at trail access points.
- Bike Racks: One (1) bike rack (holding capacity of five bikes) shall be provided at any trail access points.
- Drinking Fountains: No drinking fountains are required at access points.
- Benches: One (1) bench approved by the City shall be provided.
- Trash Receptacle: One (1) trash receptacle approved by the City shall be provided.
- Trail Termination: Trails that terminate at trail access points shall receive landscape traffic control measures for buffering and direction of pedestrian and bicycle traffic.



BRIDGES & LOW WATER CROSSINGS

All bridge designs to be sealed by a registered Texas professional engineer and meet City of The Colony Engineering Guidelines. Low water crossings should not exceed 4' from path to flowline of the waterway or ravine unless approved by the The Colony's City Engineer. Low water crossings should have a widened shoulder to 5' on both sides of the trail. The headwall structure under the trail should have gently sloping wing walls constructed with the headwall no steeper than 8:1. The pipe ends shall be finished at the same repose of slope as the wing walls. Any crossing exceeding this 4' separation to permit the construction of ADAAG/TAS-compliant trail approaches to the crossing shall require a bridge.

CULVERT OUTFALL STRUCTURES

Existing culvert pipe structures may need modification to meet trail safety and aesthetic standards. Culvert outfalls should occur on the downhill side of trails. Outfall structures should feature stone veneer or concrete form liners to provide a more aesthetically pleasing appearance.

TRAIL SAFETY RAILING

Railings should be placed between the trail and embankments or other vertical displacements when such topographical features are within 5' of the trail shoulder. The top of railings, fences, or barriers on either side of a trail structure should be 4' higher than the trail surface. Railing ends should be angled downward and flared away from the trail at both ends to prevent cyclist and pedestrian injury. Railing rungs should be horizontal in orientation so as not to catch bicycle handlebars. The bottom rung of a railing should be 4" from the finished trail grade.



TRAIL OVERLOOKS

Overlooks should typically be placed at areas of scenic beauty such as creeks, rivers, lakes, prairie landscape and/or cultural or historical importance. It is preferable to place overlooks such that the removal of existing trees is not required. Ideally, overlooks should be situated every one to three miles along major trail corridors. The design of individual overlooks can vary based on unique site conditions such as topography and drainage.







DEVELOPMENT STRATEGIES & IMPLEMENTATION

Trails & Bikeways Master Plan

6.0 SAFETY AND PROPERTY VALUE IMPACTS

This chapter provides guidance to the city for the effective implementation of the on and off-street trails and bikeways, bike routes, and paddle trail networks. The focus of this chapter is to prioritize the trail segments, establish phasing, estimate system-wide costs, and provide guidance on funding strategies, maintenance issues, safety and security concerns.

Concerns over public safety and detrimental impacts to property values are common when discussing new trail developments. These concerns include loss of privacy by residents adjacent to the trail, vandalism, litter, arson, assault and even wild animal attacks. In response to these concerns, several documents were reviewed. This included the following:

1. Evaluation of the Burke-Gillman Trail's Effect on Property Value and Crime, by *the Seattle, WA Engineering Department*
2. The Impact of Brush Creek Trail on Property Values and Crime, by *Michelle Miller Murphy of Sonoma State University*



3. The Effect of Greenways on Property Values and Public Safety, by *Colorado State Parks*

Each of these studies was prompted by citizen concerns that trails may negatively impact adjacent properties. Each of the studies involved surveys of residents living adjacent to trails, law enforcement officers that patrol the trail and real estate agents actively involved with selling of homes adjacent to the trail.

Real estate agents often view trails as an amenity that helps to attract buyers and assist in shortening marketing time for homes close to trails. People who live along trails and greenways consider them lifestyle amenities. Though trails are not crime free, claims that trails are a detriment to public safety are not substantiated by these studies. The general consensus of these studies is that trails provide numerous benefits to the neighborhoods around them, and they increase the desirability of property close to the trail and provide space for people to recreate. Though these studies conclude that trails have an overall positive benefit to a community, this by no means implies that just building a trail will automatically mean a successful trail. Developing trail regulations, effective law enforcement, management, maintenance and building a strong sense of community ownership of a trail are essential.



DEVELOPING TRAIL REGULATIONS

The purpose of trail regulations is to promote user safety and enhance the enjoyment of the trail by all users. It is imperative that before a trail is opened, it must include posted trail use regulations at trailheads and other key access points. Trail maps and informational materials should include these regulations as well. Establishing that the trail facility is a regulated traffic environment like other public rights-of-way is critical for compliance and often results in a facility requiring minimal enforcement. The City may also desire to post penalties for violators. The City should review proposed trail regulations with their City's legal advisor for consistency with existing ordinances and enforceability. The proposed recommendations are outlined below:

- Motorized vehicles prohibited (except emergency, maintenance vehicles, and approved ADA mobility devices)
- Keep pets on a leash and pick up after them
- Stay to the right except when passing
- Give a clear, audible warning signal before passing
- As a courtesy to other trail users and neighbors, refrain from loitering near adjacent homes
- Cyclists yield to pedestrians
- Help keep the trail clean
- Exercise caution and obey all traffic laws at all intersections

This set of rules located at trailheads should be designed with the ability to close them (typically with a sunset to sunrise closure policy). These rules should be posted conspicuously at trailheads and other major access points along the trail. A trail brochure with a map and trail rules should be developed and updated as new trails are added.

ENVIRONMENTAL IMPACTS

Trails have the capacity to change the timing, quantity, and quality of runoff by "short-circuiting" the natural hydrologic system and delivering both sediments and water directly to streams, wetlands and riparian resources. Accurately locating wetlands, streams and riparian areas relative to the trail is an important element of trail planning. The location of these potential "receiving resources" for trail drainage and associated sediments will affect decisions about placement of trail drainage structures, maneuvering of maintenance equipment, season of work, interception and infiltration of trail drainage and disposal of earth materials generated during maintenance activities. For this reason, care should be taken to minimize the impacts of trails on these resources. Practices to achieve this protection include:

- Identify and map water resources within 200 feet of the trail system
- Minimize channel crossings and changes to natural drainage patterns
- Minimize the hydrologic connectivity of trails with streams, wetlands and other water resources
- Avoid operating heavy equipment on trails when they are wet
- Retain a buffer between trails and water resources by establishing riparian and streamside management zones, within which trail influences such as drainage, disturbance and trail width are minimized
- Post signs that explain and prohibit the use of natural surface trails by mountain bikes and horses during wet condition



6.1 INFRASTRUCTURE DEVELOPMENT

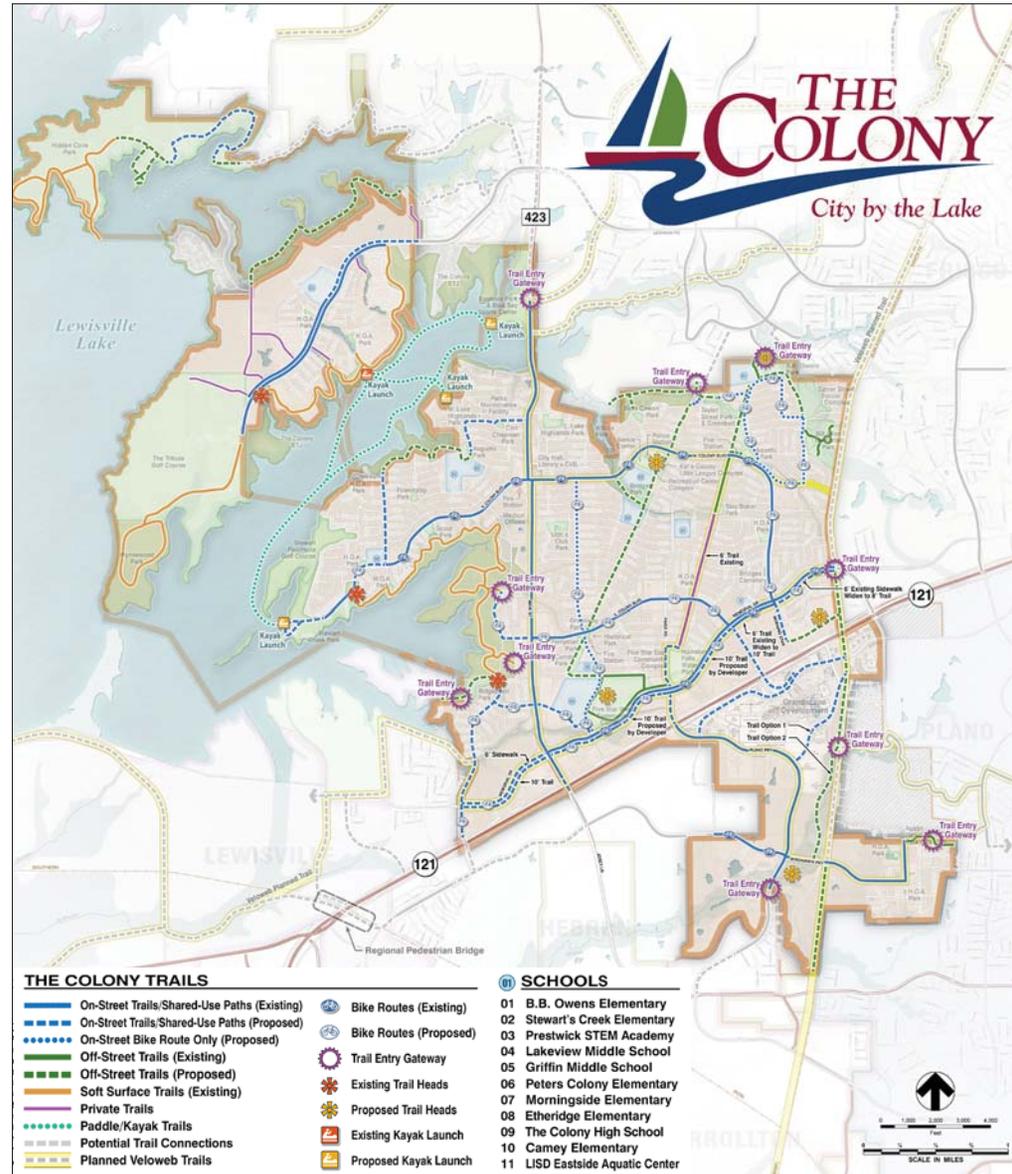
PRIORITY PROJECTS

The individual spine segments identified represent the primary priority trail projects for the City of The Colony. Due to their prominence and connectivity, only these spine segments have been prioritized. However, during the implementation of this Trails & Bikeways Master Plan, the City may identify minor facility segments in other locations that justify being given priority over certain spine segments based on their ease of implementation or degree of connectivity. We recommend to focus on building spine trails with other minor connections as the community requires.

PHASING

In addition to the priority rankings discussed in the following paragraphs, the ten (10) spine trail segments have been assigned to one of five (5) phases. Each phase represents a set of segments, which—once fully implemented—will achieve a major milestone in the completion of the City’s trail system. As such, it is recommended that the segments in each phase be implemented in rapid succession where possible.

OVERALL TRAILS & BIKEWAYS MASTER PLAN

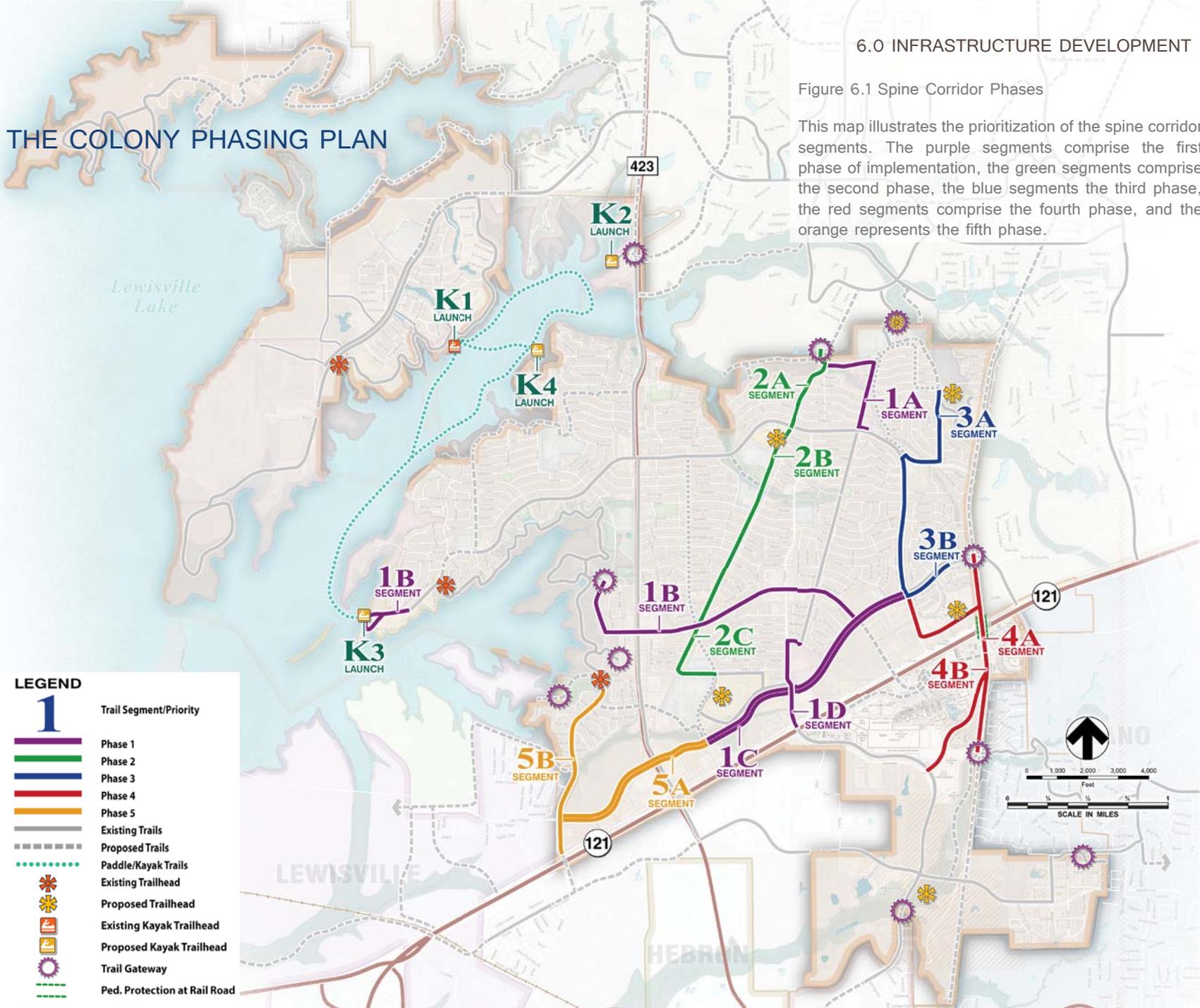


6.0 INFRASTRUCTURE DEVELOPMENT

THE COLONY PHASING PLAN

Figure 6.1 Spine Corridor Phases

This map illustrates the prioritization of the spine corridor segments. The purple segments comprise the first phase of implementation, the green segments comprise the second phase, the blue segments the third phase, the red segments comprise the fourth phase, and the orange represents the fifth phase.



SEGMENT 1A | PHASE 1

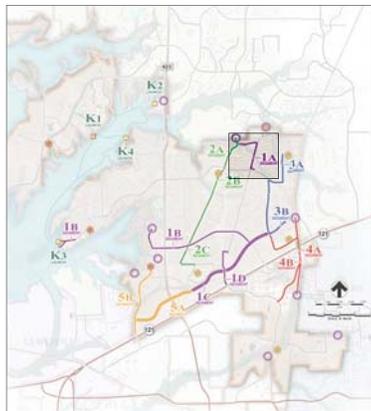
Description: Segment 1A begins off-street and runs perpendicular to Squires Drive east across an open area to Vaden Street, then north to BB Owen Elementary School and South to Taylor Ballfield (this segment is under design for construction).

Destination: This segment provides access to North Colony Boulevard Park, the Aquatic Center and Park Loop trail. It includes a ±150' pedestrian bridge across existing drainage channel.

Width and Type: 10' wide on-street concrete and 10' wide off-street concrete shared-use paths and an on-street signed bike route.

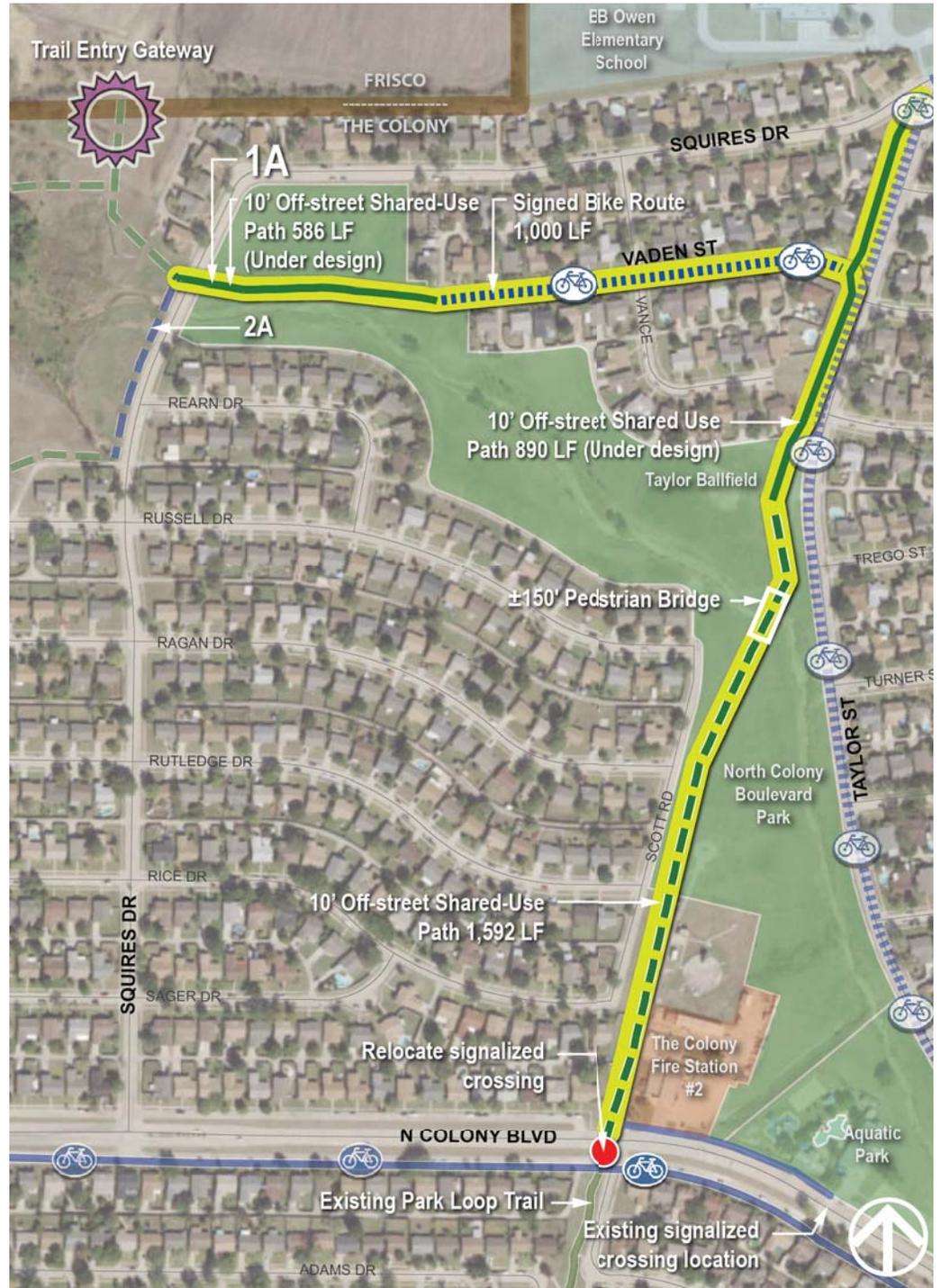
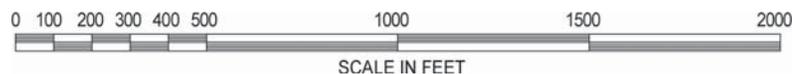
| TRAIL TYPE | LENGTH | COST |
|---|--------------------------|------------------|
| Off-Street Shared-Use Path (\$1,000,000 per mi) | 1,592 LF / .30 mi* | \$300,000 |
| Signed Bike Route (\$55,000 per mi) | 1,000 LF / .19 mi | \$10,450 |
| (1) Pedestrian Bridge (\$2,000 per LF) | ±150 LF / .03 mi | \$300,000 |
| (1) Rapid Flashing Beacon (\$30,000) | | \$30,000 |
| TOTAL | 2,742 LF / .52 mi | \$640,450 |

* Trail length does not include the existing off-street segment that is under design for construction.



LEGEND

- Highlighted Trail Segment
- Off-Street Shared-Use Path (existing)
- Off-Street Shared-Use Path (proposed)
- On-Street Shared-Use Path (existing)
- On-Street Shared-Use Path (proposed)
- Signed Bike Route (proposed)
- Recreation Trail (decomposed granite)
- Trail Entry Gateway
- Existing Trailhead
- Proposed Trailhead
- Rapid Flashing Beacon
- Existing Kayak Launch
- Proposed Kayak Launch



SEGMENT 1B-1 | PHASE 1

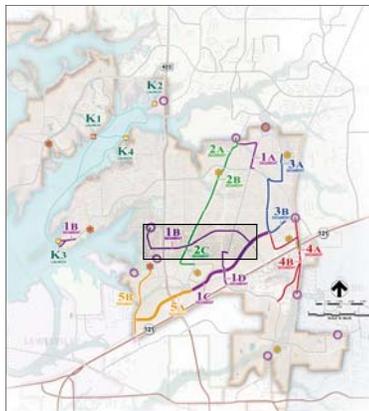
Description: Segment 1B serves the neighborhoods surrounding South Colony Boulevard from Lewisville Lake at the intersection of Lakeshore Boulevard and Lake Ridge Drive to just north of Memorial Drive. This trail provides important east/west mobility to the center of The Colony.

Destination: This segment provides an important linkage between Lewisville Lake and the residential neighborhoods to the east. Lewisville Lake is the primary natural resource in The Colony and one of the most visited lakes in North Texas. This segment also includes a trail access point at Lakeshore Boulevard.

Width and Type: 10' wide concrete on-street shared-use path and signed bike route.

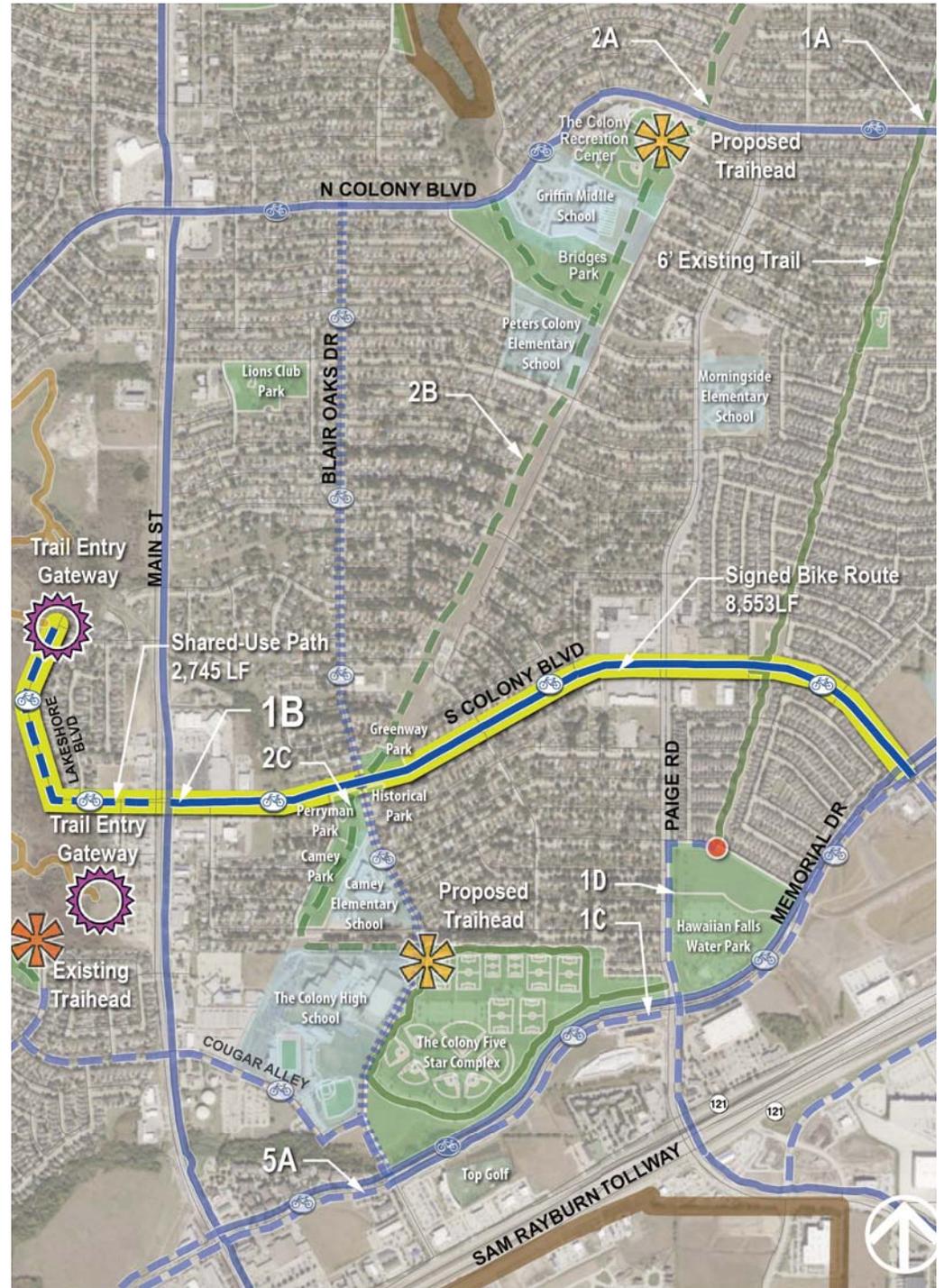
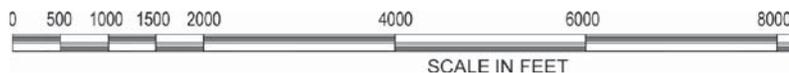
| TRAIL TYPE | LENGTH | COST |
|--|---------------------------|------------------|
| On-Street Shared-Use Path (\$600,000 per mi) | 2,745 LF / 52 mi | \$312,000 |
| Signed Bike Route (\$55,000 per mi) | 8,553 LF / 1.62 mi | \$89,100 |
| TOTAL | 8,553 LF / 1.62 mi | \$401,100 |

| MAJOR TRAIL ELEMENT | QUANTITY | COST |
|--------------------------|----------|----------|
| Trail Gateway (\$50,000) | 1 | \$50,000 |



LEGEND

- Highlighted Trail Segment
- Off-Street Shared-Use Path (existing)
- Off-Street Shared-Use Path (proposed)
- On-Street Shared-Use Path (existing)
- On-Street Shared-Use Path (proposed)
- Signed Bike Route (proposed)
- Recreation Trail (decomposed granite)
- Trail Entry Gateway
- Existing Trailhead
- Proposed Trailhead
- Existing Kayak Launch
- Proposed Kayak Launch
- Rapid Flashing Beacon





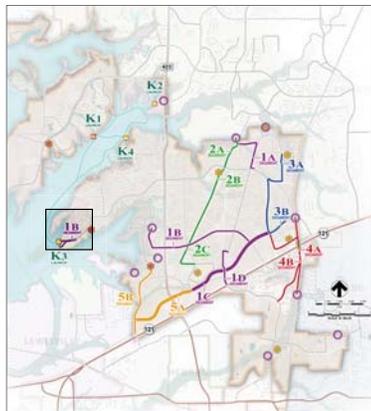
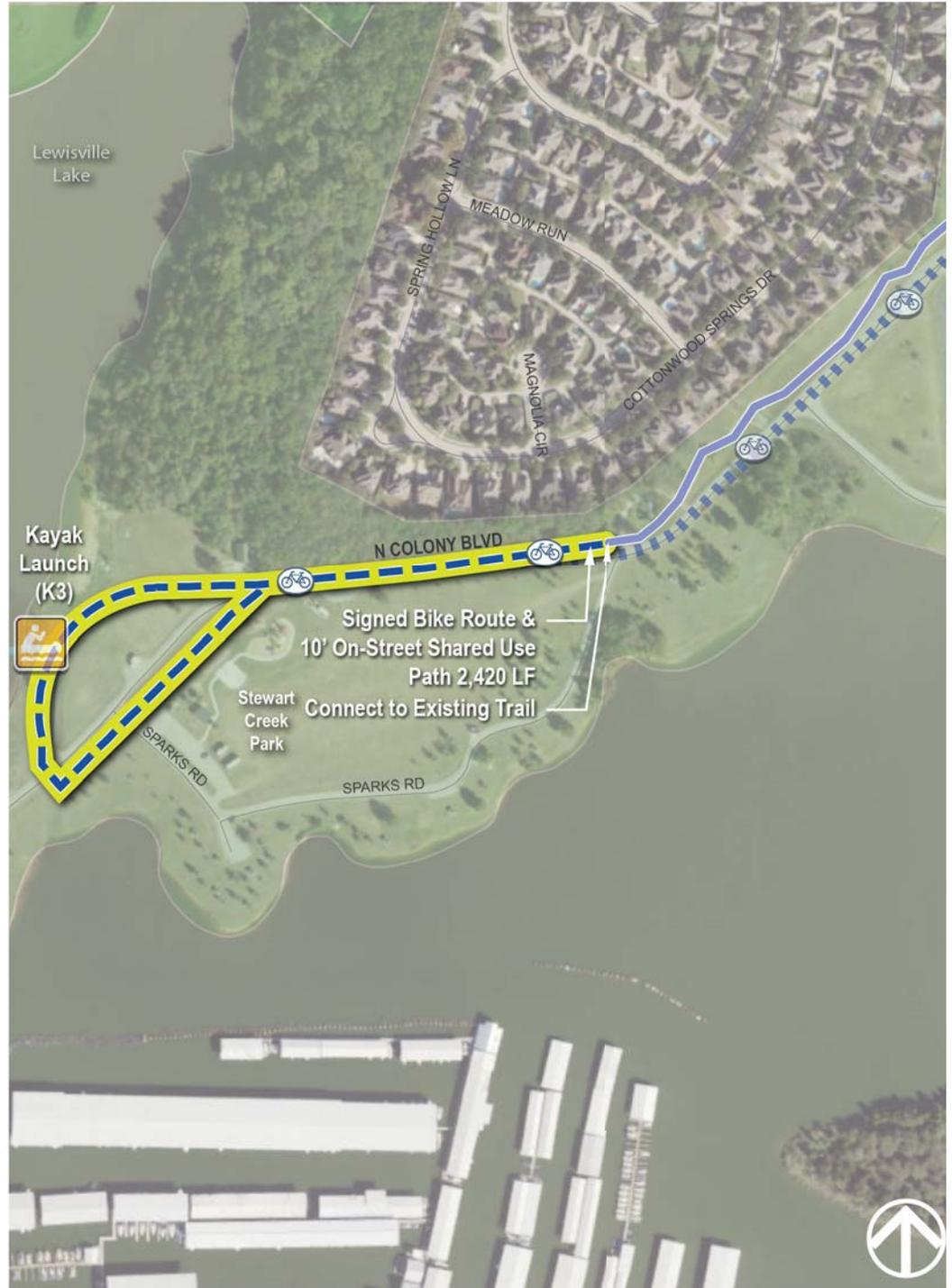
SEGMENT 1B-2 | PHASE 1

Description: Segment 1B-2 serves as a part of the primary east/west movement trail along North Colony Boulevard, west of Main Street to Lewisville Lake. This segment is centered on the Stewart Creek Park peninsula which extends and connects to an existing on-street shared-use path.

Destination: This segment connects the many neighborhoods along North Colony Boulevard westward to Stewart Creek park trailhead and the natural water amenities and boating at Lewisville

Lake Width and Type: 10' wide on-street concrete shared-use path and on-street signed bike route.

| TRAIL TYPE | LENGTH | COST |
|--|--------------------------|------------------|
| On-Street Shared-Use Path (\$600,000 per mi) | 2,420 LF/ 0.46 mi | \$276,000 |
| Signed Bike Route (\$55,000 per mi) | 2,420 LF/ 0.46 mi | \$25,300 |
| TOTAL | 2,420 LF/ 0.46 mi | \$301,300 |



LEGEND

- Highlighted Trail Segment
- Off-Street Shared-Use Path (existing)
- Off-Street Shared-Use Path (proposed)
- On-Street Shared-Use Path (existing)
- On-Street Shared-Use Path (proposed)
- Signed Bike Route (proposed)
- Recreation Trail (decomposed granite)
- Trail Entry Gateway
- Existing Trailhead
- Proposed Trailhead
- Rapid Flashing Beacon
- Existing Kayak Launch
- Proposed Kayak Launch



SEGMENT 1C | PHASE 1

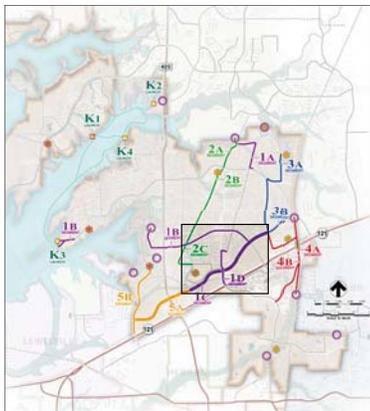
Description: Segment 1C provides the missing 10' trail segments to complete a spine trail along Memorial Drive. This segment includes a trailhead at the Five Star Complex and some existing four and five foot wide sidewalks that will be replaced with 10' concrete pavement sections to complete the connection. Segment 1C also includes a signed bike route.

Destination: This segment generally runs parallel to SH 121 to the north and provides the needed connectivity between three active destinations; Top Golf, Hawaiian Falls Water Park and the Five Star Complex which houses a wide array of sports fields and a future trailhead.

Width and Type: 10' wide concrete on-street shared-use path and on-street signed bike route.

| TRAIL TYPE | LENGTH | COST |
|--|---------------------------|------------------|
| On-Street Shared Use-Path (\$600,000 per mi) | 7,191 LF / 1.36 mi | \$816,000 |
| Signed Bike Route (\$55,000 per mi) | 8,356 LF / 1.58 mi | \$86,900 |
| TOTAL | 8,356 LF / 1.58 mi | \$902,900 |

| MAJOR TRAIL ELEMENT | QUANTITY | COST |
|--------------------------------|----------|-----------|
| Regional Trailhead (\$350,000) | 1 | \$350,000 |



LEGEND

- Highlighted Trail Segment
- Off-Street Shared-Use Path (existing)
- Off-Street Shared-Use Path (proposed)
- On-Street Shared-Use Path (existing)
- On-Street Shared-Use Path (proposed)
- Signed Bike Route (proposed)
- Recreation Trail (decomposed granite)
- Trail Entry Gateway
- Existing Trailhead
- Proposed Trailhead
- Existing Kayak Launch
- Proposed Kayak Launch
- Rapid Flashing Beacon





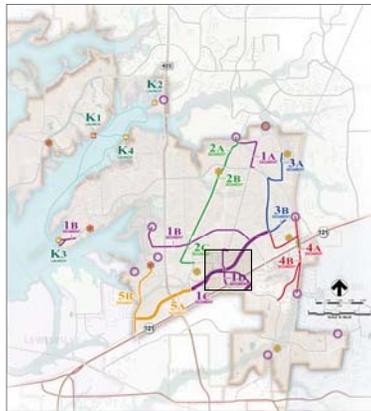
SEGMENT 1D | PHASE 1

Description: Segment 1D, a continuation of Park Loop Trail begins at the intersection of 121 and Paige Road extending the on-street trail along Plano Parkway north under SH 121. The segment runs north along Paige Road, crosses an open drainage channel and connects to the Legends Trail.

Destination: This segment connects the existing on-street trail along Plano Parkway to Hawaiian Falls and Park Loop trail. This segment also includes a pedestrian bridge to provide safer crossing to the off-street portion of the proposed trail near Hawaiian Falls.

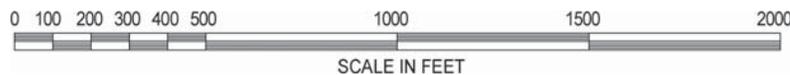
Width and Type: 10' on-street shared-use path.

| TRAIL TYPE | LENGTH | COST |
|--|--------------------------|------------------|
| On-Street Shared Use-Path (\$600,000 per mi) | 2,955 LF / .56 mi | \$336,000 |
| (1) Rapid Flashing Beacon (\$30,000) | | \$30,000 |
| TOTAL | 2,955 LF / .56 mi | \$366,000 |



LEGEND

- Highlighted Trail Segment
- Off-Street Shared-Use Path (existing)
- Off-Street Shared-Use Path (proposed)
- On-Street Shared-Use Path (existing)
- On-Street Shared-Use Path (proposed)
- Signed Bike Route (proposed)
- Recreation Trail (decomposed granite)
- Trail Entry Gateway
- Existing Trailhead
- Proposed Trailhead
- Rapid Flashing Beacon
- Existing Kayak Launch
- Proposed Kayak Launch



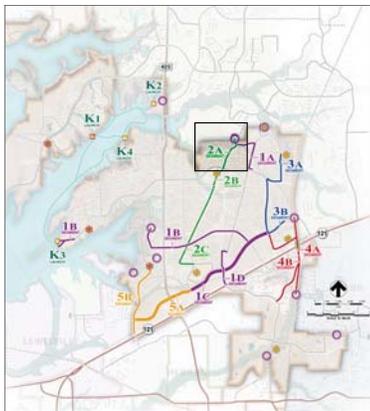
SEGMENT 2A | PHASE 2

Description: Segment 2A, a continuation of Park Loop Trail begins off-street at a proposed trail entry gateway and future connection to the City of Frisco trail system located west and north of Squires Drive. The northern leg of the trail will run southward through the core of The Colony linking together several neighborhoods. It meanders along the ROW of the overhead high-tension electric lines and crosses at Ragan Road ending at the existing trail at North Colony Boulevard. This segment includes a trail entry gateway, and pedestrian crossing signal.

Destination: This segment creates a connection to the northern trail entry gateway at Frisco's future trail connection, Segment 1A and through the core of the City along an existing utility easement.

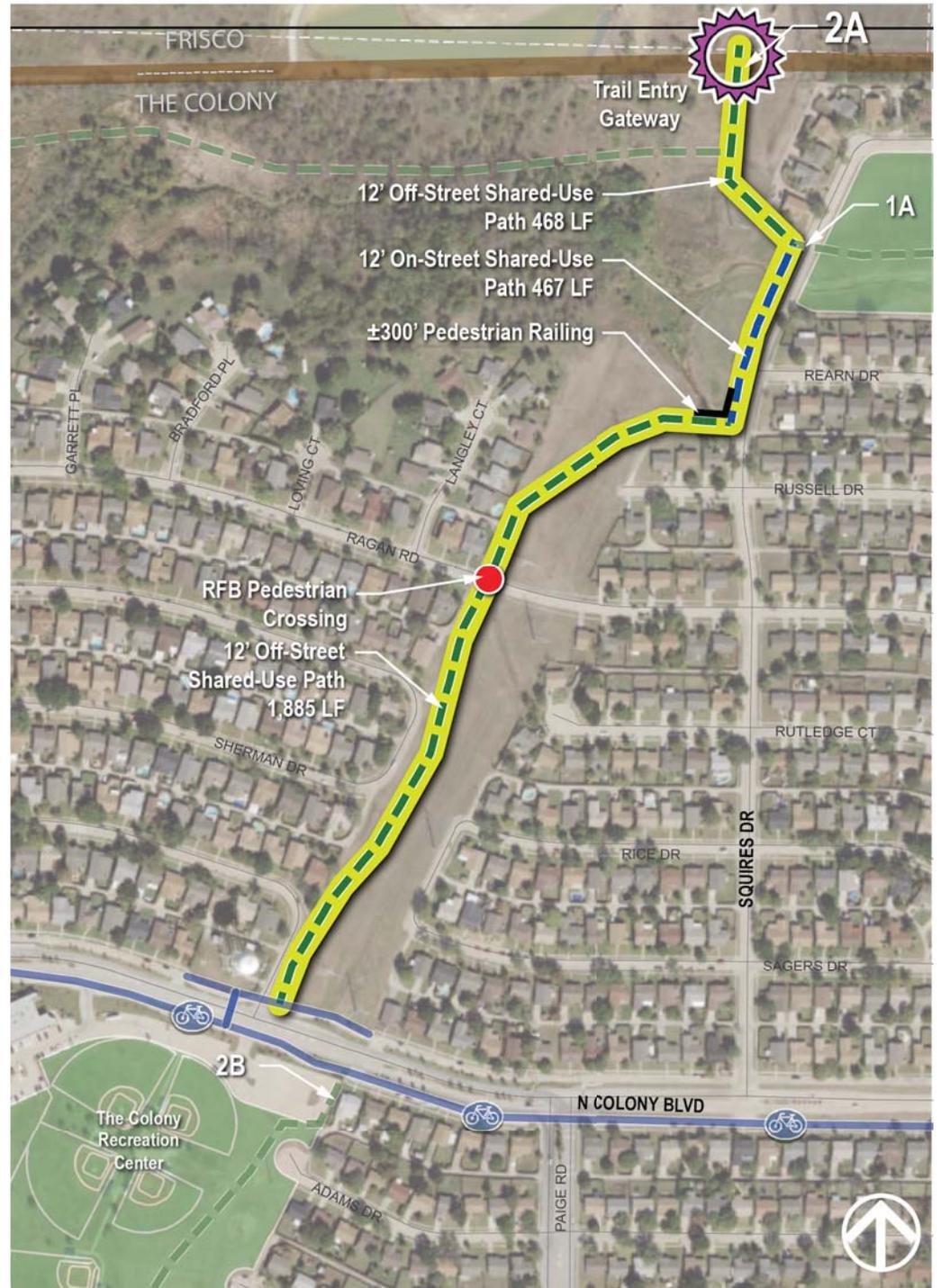
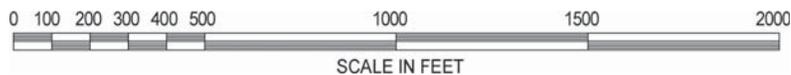
Width and Type: 12' off-street wide concrete shared-use path

| TRAIL TYPE | LENGTH | COST |
|---|--------------------------|------------------|
| Off-Street Shared-Use Path (\$1,000,000 per mi) | 2,325 LF / .44 mi | \$440,000 |
| On-Street Shared-Use Path (\$600,000 per mi) | 467 LF / .09 mi | \$54,000 |
| Pedestrian Railing (\$160 per lf) | ±300 LF | \$48,000 |
| (1) Rapid Flashing Beacon (\$30,000) | | \$30,000 |
| (1) Trail Entry Gateway (\$50,000) | | \$50,000 |
| TOTAL | 2,792 LF / .53 mi | \$622,000 |



LEGEND

- Highlighted Trail Segment
- Off-Street Shared-Use Path (existing)
- Off-Street Shared-Use Path (proposed)
- On-Street Shared-Use Path (existing)
- On-Street Shared-Use Path (proposed)
- Signed Bike Route (proposed)
- Recreation Trail (decomposed granite)
- Trail Entry Gateway
- Existing Trailhead
- Proposed Trailhead
- Rapid Flashing Beacon
- Existing Kayak Launch
- Proposed Kayak Launch



SEGMENT 2B | PHASE 2

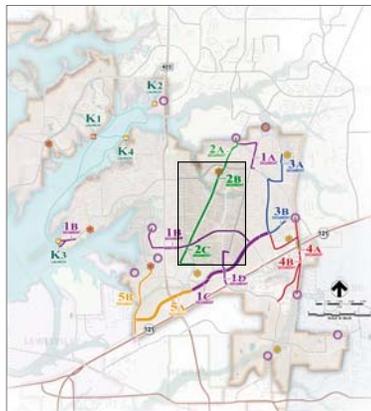
Description: Segment 2B, a continuation of Park Loop Trail begins on North Colony Boulevard and runs through the core of The Colony southward to South Colony Boulevard. This segment primarily runs along the R.O.W. of the overhead high-tension electric lines and parallel to Miller Drive and has several mid-block crossings. Adequate signage and safety measures should be placed at each crossing to help alert motorists. It also includes a trailhead at the Recreation Center.

Destination: This segment connects to Peters Colony Elementary School, Griffin Middle School, The Colony Recreation Center, Bridges Park and Greenway Park.

Width and Type: 12' wide concrete off-street shared-use path

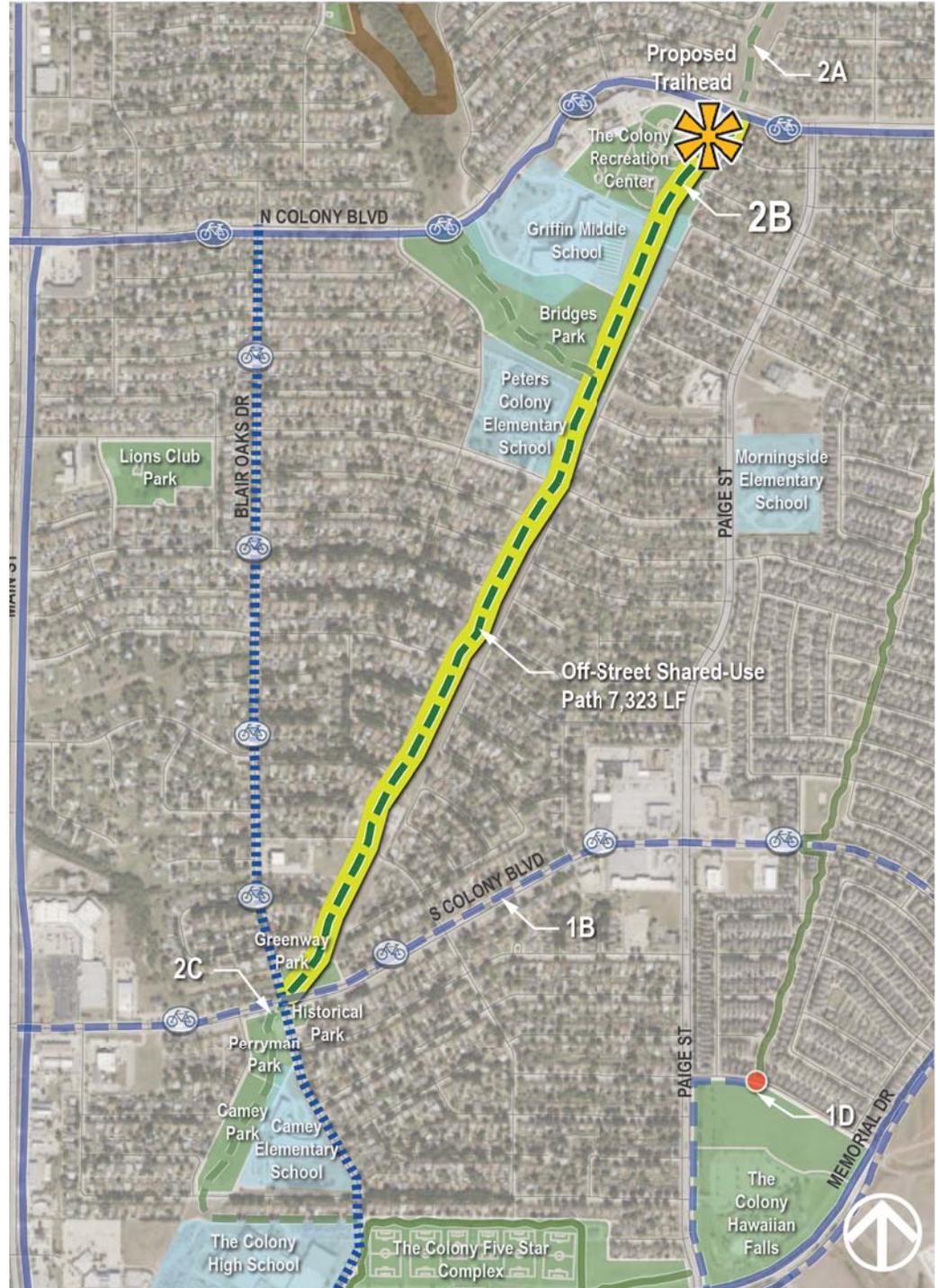
| TRAIL TYPE | LENGTH | COST |
|--|--------------------|-------------|
| Off-Street Shared-Use Path (\$1,00,000 per mi) | 7,323 LF / 1.39 mi | \$1,390,000 |

| MAJOR TRAIL ELEMENT | QUANTITY | COST |
|------------------------------------|----------|-----------|
| Neighborhood Trailhead (\$250,000) | 1 | \$250,000 |



LEGEND

- Highlighted Trail Segment
- Off-Street Shared-Use Path (existing)
- Off-Street Shared-Use Path (proposed)
- On-Street Shared-Use Path (existing)
- On-Street Shared-Use Path (proposed)
- Signed Bike Route (proposed)
- Recreation Trail (decomposed granite)
- Trail Entry Gateway
- Existing Trailhead
- Proposed Trailhead
- Rapid Flashing Beacon
- Existing Kayak Launch
- Proposed Kayak Launch



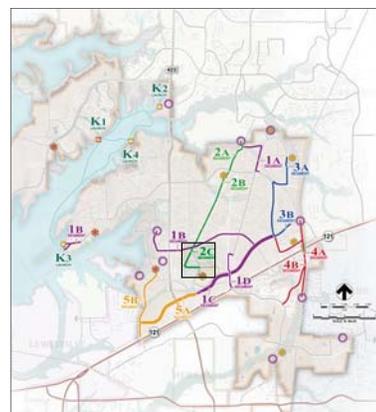
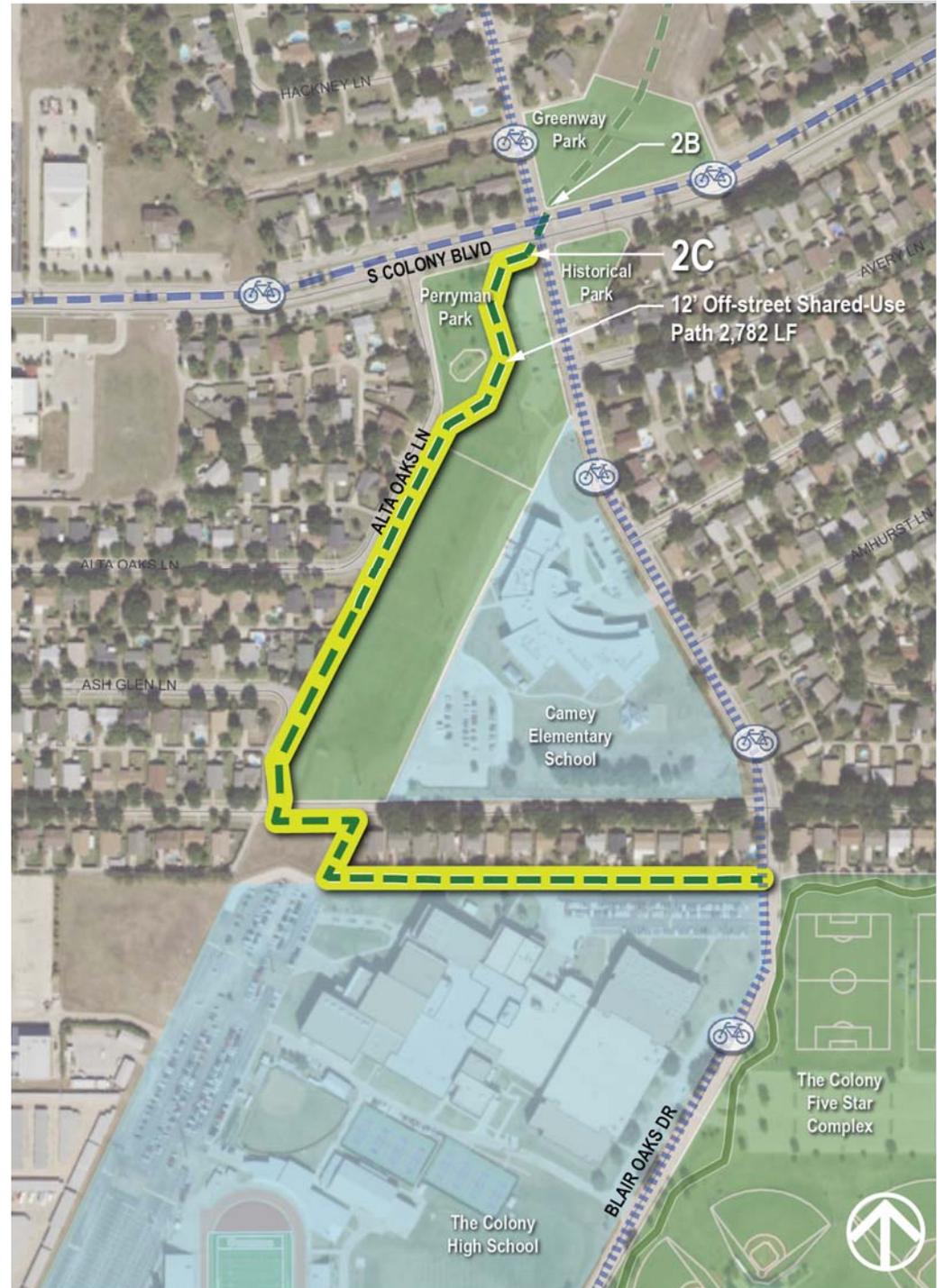
SEGMENT 2C | PHASE 2

Description: Segment 2C, a continuation of Park Loop Trail begins at South Colony Boulevard at Perryman Park traversing southward through Perryman Park to the north side of The Colony High School where it turns east towards The Colony Five Star Complex. This segment primarily runs parallel to Alta Oaks Lane west of Camey Elementary School crossing Arbor Glen Rd and running east, north of The Colony High School.

Destination: This segment connects with Greenway Park, Historical Park, Perryman Park, Camey Elementary School, Camey Soccer Complex, The Colony High School and Five Star Sports Complex.

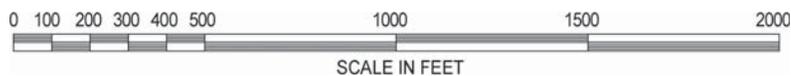
Width and Type: 12' wide concrete shared-use path

| TRAIL TYPE | LENGTH | COST |
|---|-------------------|-----------|
| Off-Street Shared-Use Path (\$1,000,000 per mi) | 2,782 LF / .53 mi | \$530,000 |



LEGEND

- Highlighted Trail Segment
- Off-Street Shared-Use Path (existing)
- Off-Street Shared-Use Path (proposed)
- On-Street Shared-Use Path (existing)
- On-Street Shared-Use Path (proposed)
- Signed Bike Route (proposed)
- Recreation Trail (decomposed granite)
- Trail Entry Gateway
- Existing Trailhead
- Proposed Trailhead
- Rapid Flashing Beacon
- Existing Kayak Launch
- Proposed Kayak Launch



SEGMENT 3A | PHASE 3

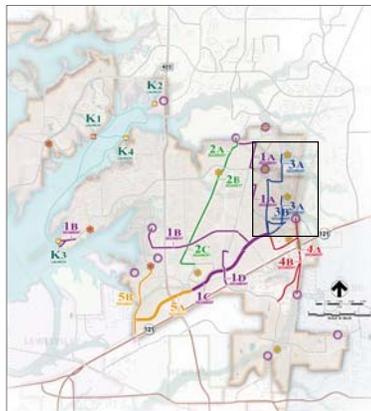
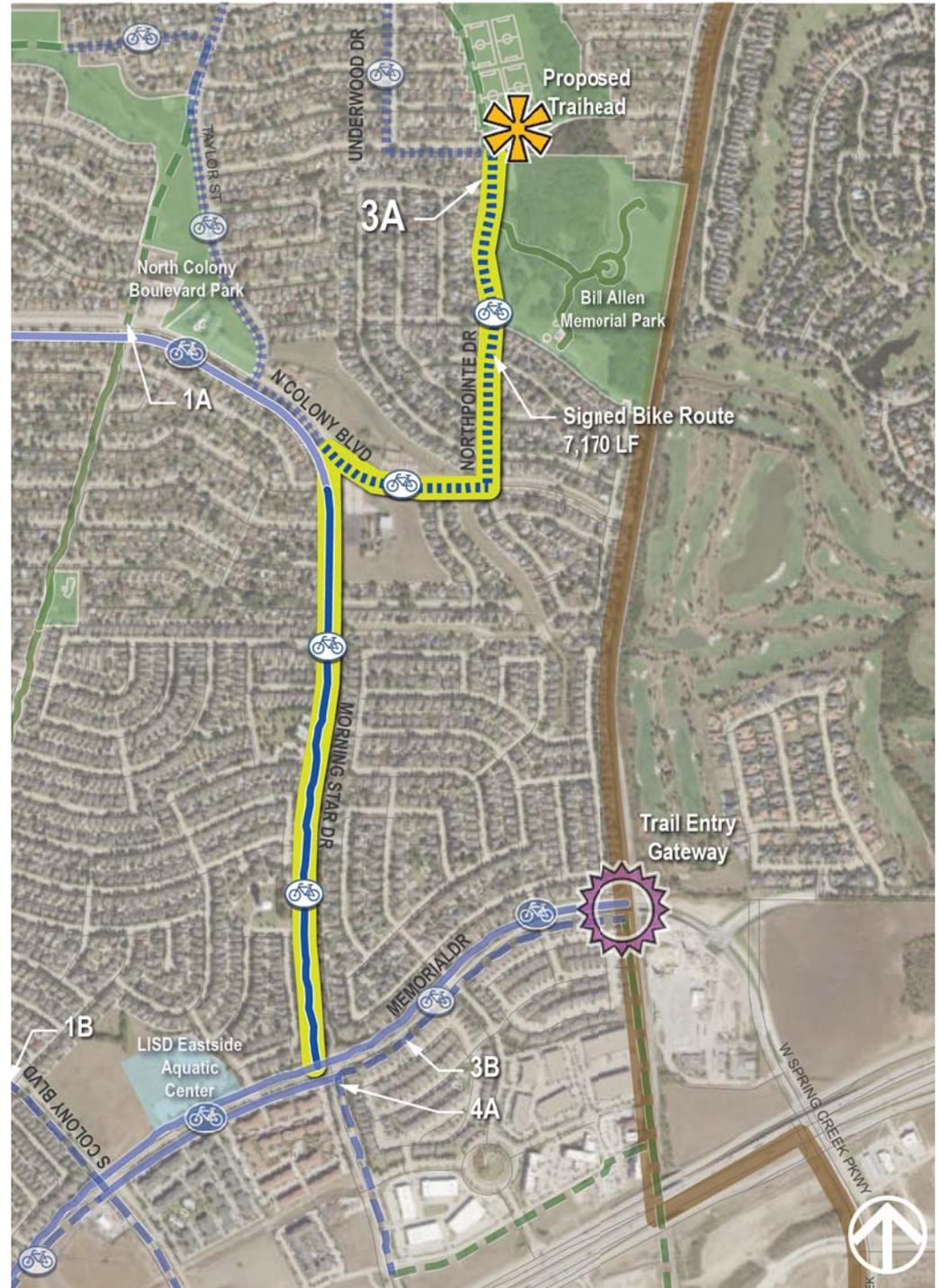
Description: Segment 3A begins at a proposed trailhead located at Turner Soccer Complex. It runs along Northpointe Drive, connecting into North Colony Boulevard extending the existing trail along North Colony Boulevard to Northpointe Drive. The segments continues south implementing an on-street signed bike route into the existing on-street shared-use path along Morning Star Drive.

Destination: This segment connects the neighborhoods along Morning Star Drive and Alister Park to Bill Allen Memorial Park, Bill Allen Disc Golf, and Turner Soccer Complex.

Width and Type: On-street signed bike route

| TRAIL TYPE | LENGTH | COST |
|---------------------------------------|--------------------|----------|
| Signed Bike Route (\$55,000 per mile) | 7,170 LF / 1.36 mi | \$74,800 |

| MAJOR TRAIL ELEMENT | QUANTITY | COST |
|------------------------------------|----------|-----------|
| Neighborhood Trailhead (\$250,000) | 1 | \$250,000 |



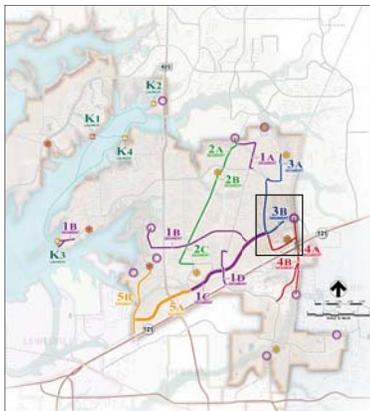
SEGMENT 3B | PHASE 3

Description: Segment 3B runs along Memorial Drive from Morning Star east to the railroad (some existing six foot wide trail exists that will be widened to 8'in this segment).

Destination: This segment adds east/west alignments and expands existing trail surfaces.

Width and Type: 8' wide concrete on-street shared-use path and on-street signed bike route.

| TRAIL TYPE | LENGTH | COST |
|--|-------------------|------------------|
| On-Street Shared-Use Path (\$600,000 per mile) | 2,548 LF / .48 mi | \$288,000 |
| Signed Bike Route (\$55,000 per mile) | 2,548 LF / .48 mi | \$26,400 |
| TOTAL | | \$314,400 |



LEGEND

- Highlighted Trail Segment
- Off-Street Shared-Use Path (existing)
- Off-Street Shared-Use Path (proposed)
- On-Street Shared-Use Path (existing)
- On-Street Shared-Use Path (proposed)
- Signed Bike Route (proposed)
- Recreation Trail (decomposed granite)
- Trail Entry Gateway
- Existing Trailhead
- Proposed Trailhead
- Rapid Flashing Beacon
- Existing Kayak Launch
- Proposed Kayak Launch



SEGMENT 4A | PHASE 4

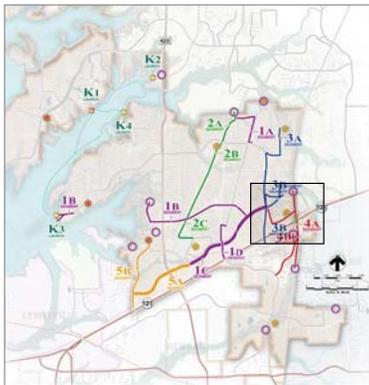
Description: Segment 4A serves as an important north/south connection in The Colony, and most importantly provides a pedestrian safe crossing under SH 121 (via pedestrian underpass using existing railroad bridge opening structure). This segment provides one of the three crossings for pedestrians and bicycles across SH 121. This segment also includes a trail entry gateway and trailhead.

Destination: This segment helps to connect The Legends neighborhoods, hotels and restaurants to the commercial and entertainment venues of The Colony to the south. This segment also connects the many neighborhoods in The Colony to the north with growing community development and restaurants to the south.

Width and Type: 12' wide concrete shared-use path and on-street signed bikeway.

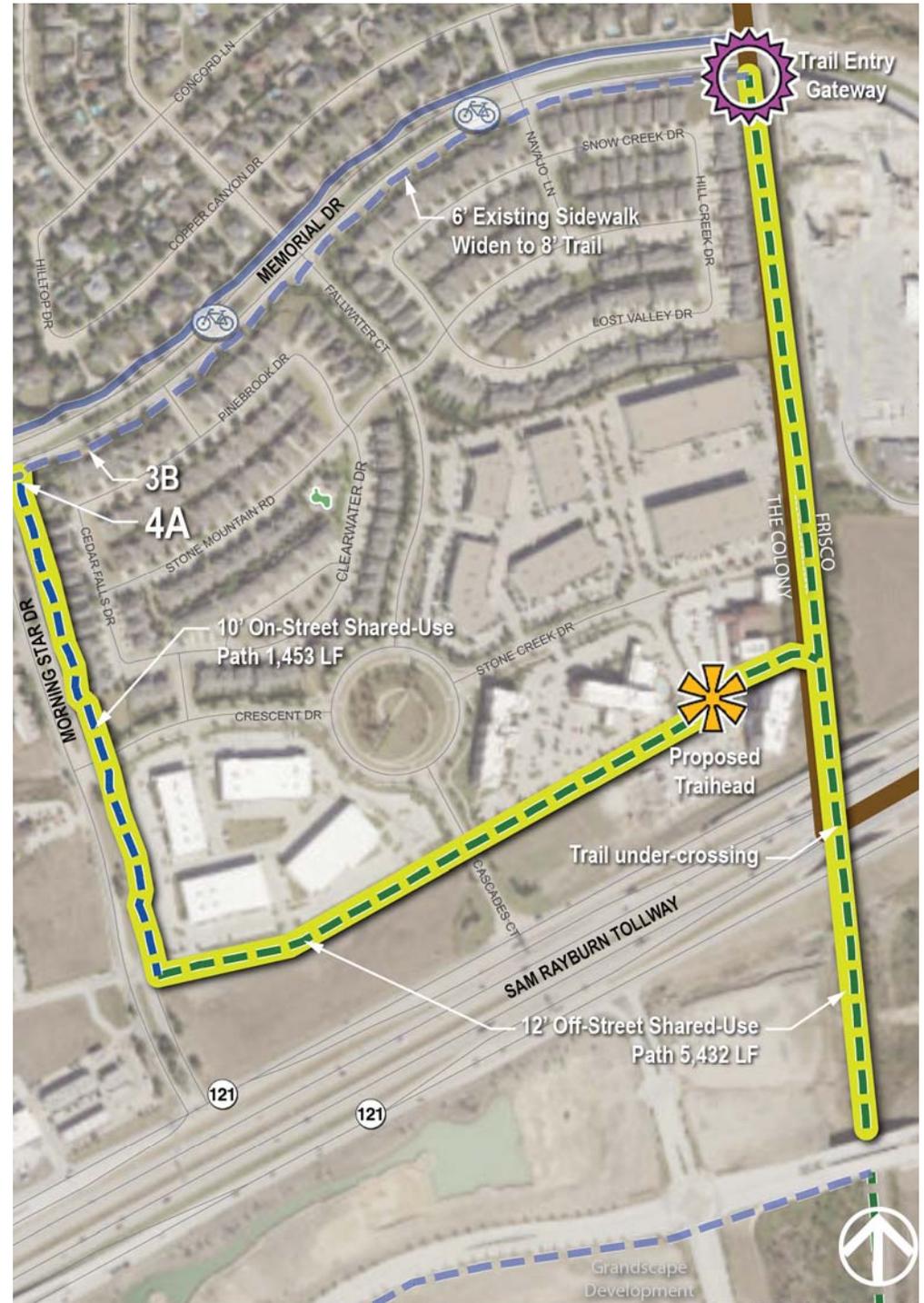
| TRAIL TYPE | LENGTH | COST |
|---|---------------------------|--------------------|
| Off-Street Shared-Use Path (\$1,000,000 per mile) | 5,432 LF / 1.03 mi | \$1,030,000 |
| On-Street Shared-Use Path (\$600,000 per mile) | 1,453 LF / .28 mi | \$168,000 |
| TOTAL | 6,885 LF / 1.31 mi | \$1,198,000 |

| MAJOR TRAIL ELEMENT | QUANTITY | COST |
|---------------------------------------|----------|-----------|
| Railroad Under-crossing (\$250,000) | 1 | \$250,000 |
| Neighborhood Trail Gateway (\$50,000) | 1 | \$50,000 |
| Neighborhood Trailhead (\$250,000) | 1 | \$250,000 |



LEGEND

- Highlighted Trail Segment
- Off-Street Shared-Use Path (existing)
- Off-Street Shared-Use Path (proposed)
- On-Street Shared-Use Path (existing)
- On-Street Shared-Use Path (proposed)
- Signed Bike Route (proposed)
- Recreation Trail (decomposed granite)
- Trail Entry Gateway
- Existing Trailhead
- Proposed Trailhead
- Rapid Flashing Beacon
- Existing Kayak Launch
- Proposed Kayak Launch



SEGMENT 4B | PHASE 4

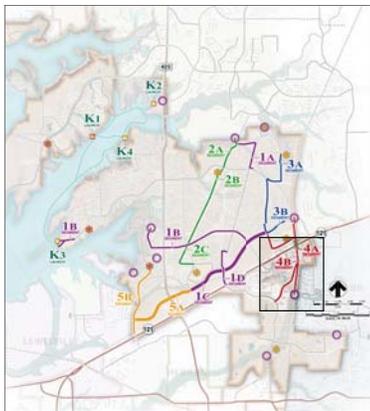
Description: Segment 4B consists of two segments. One segment begins on Destination Drive (.48 on-street and .09 off-street) creating a connection to an existing trail along Plano Parkway. As it meanders off-street it connects into the second segment that runs along the railroad and Indian Creek connecting into Grandscape Boulevard.

Destination: This segment provides connection into the Grandscape Development and Austin Ranch areas of The Colony.

Width and Type: 10' wide concrete on-street and 12 wide off street shared-use path

| TRAIL TYPE | LENGTH | COST |
|---|---------------------------|------------------|
| Off-Street Shared-Use Path (\$1,000,000 per mile) | 3,550 LF / .67 mi | \$670,000 |
| On-Street Shared-Use Path (\$600,000 per mile) | 2,550 LF / .48 mi | \$288,000 |
| TOTAL | 6,100 LF / 1.15 mi | \$958,000 |

| MAJOR TRAIL ELEMENT | QUANTITY | COST |
|--------------------------|----------|----------|
| Trail Gateway (\$50,000) | 1 | \$50,000 |



LEGEND

- Highlighted Trail Segment
- Off-Street Shared-Use Path (existing)
- Off-Street Shared-Use Path (proposed)
- On-Street Shared-Use Path (existing)
- On-Street Shared-Use Path (proposed)
- Signed Bike Route (proposed)
- Recreation Trail (decomposed granite)
- Trail Entry Gateway
- Existing Trailhead
- Proposed Trailhead
- Rapid Flashing Beacon
- Existing Kayak Launch
- Proposed Kayak Launch



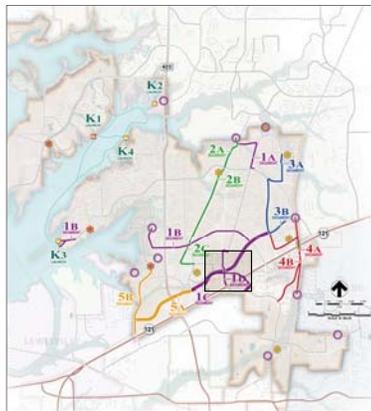
SEGMENT 5A | PHASE 5

Description: Segment 5A provides pedestrian connectivity to neighborhoods along Standridge Drive and helps to link them together with the Regional Veloweb trail network and the community features along Memorial Drive. The trail segment includes some existing trails requiring width expansion (some existing four and five foot wide trail exists that will be added to this segment).

Destination: This segment is located within the Regional Veloweb trail network and provides much of the mobility in the southwestern region of The Colony and connects the amenities along Memorial Drive to Standridge Drive.

Width and Type: 10' wide concrete on-street shared-use path and on-street signed bike route.

| TRAIL TYPE | LENGTH | COST |
|--|--------------------------|------------------|
| On-Street Shared-Use Path (\$600,000 per mile) | 5,280 LF/ 1.00 mi | \$600,000 |
| Signed Bike Route (\$55,000 per mile) | 5,280 LF/ 1.00 mi | \$55,000 |
| TOTAL | 5,280 LF/ 1.00 mi | \$655,000 |



LEGEND

- Highlighted Trail Segment
- Off-Street Shared-Use Path (existing)
- Off-Street Shared-Use Path (proposed)
- On-Street Shared-Use Path (existing)
- On-Street Shared-Use Path (proposed)
- Signed Bike Route (proposed)
- Recreation Trail (decomposed granite)
- Trail Entry Gateway
- Existing Trailhead
- Proposed Trailhead
- Rapid Flashing Beacon
- Existing Kayak Launch
- Proposed Kayak Launch



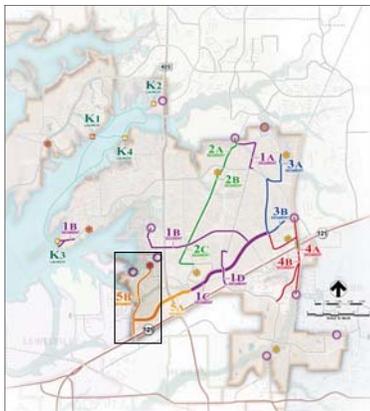
SEGMENT 5B | PHASE 5

Description: Segment 5B provides pedestrian connectivity to the Ridgepoint neighborhood and helps to link them together with the Regional Veloweb Trail and community features along Memorial Drive.

Destination: This segment provides much of the mobility in the southwestern region of The Colony. This segment connects the amenities along Memorial Drive to the Standridge Dr., Ridgepoint Park trailhead and neighborhoods adjacent to Lewisville Lake. The segment also serves as a connection to the Regional Veloweb trail network along Standridge Drive from Memorial Drive to north of Camoerom Bay Drive (providing an off-street connection to Lewisville).

Width and Type: 10' wide concrete on-street shared-use path and on-street signed bike route.

| TRAIL TYPE | LENGTH | COST |
|--|-------------------------|------------------|
| On-Street Shared-Use Path (\$600,000 per mile) | 6,371 LF/ 1.21mi | \$726,000 |
| Signed Bike Route (\$55,000 per mile) | 6,371 LF/ 1.21mi | \$66,550 |
| TOTAL | 6,371 LF/ 1.21mi | \$792,550 |



LEGEND

- Highlighted Trail Segment
- Off-Street Shared-Use Path (existing)
- Off-Street Shared-Use Path (proposed)
- On-Street Shared-Use Path (existing)
- On-Street Shared-Use Path (proposed)
- Signed Bike Route (proposed)
- Recreation Trail (decomposed granite)
- Trail Entry Gateway
- Existing Kayak Launch
- Existing Trailhead
- Proposed Kayak Launch
- Proposed Trailhead
- Rapid Flashing Beacon





HEALTHY | ADVENTURE | PREMIER | CONNECTIONS

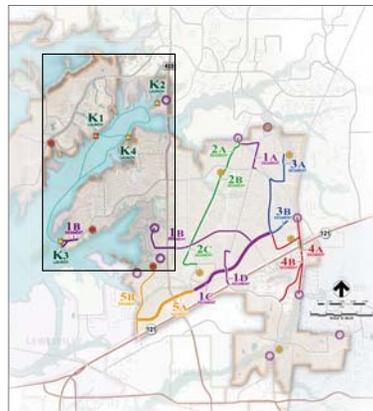
SEGMENT K2, K3, K4

Description: Segments K2-K4 includes three proposed kayak launches, one existing kayak launch and one Trail Entry gateway at the northern most of Main Street point in The Colony.

Destination: This is a water-based segment used by small water craft, canoes, kayaks, etc. linking four launch trailheads at Lewisville Lake.

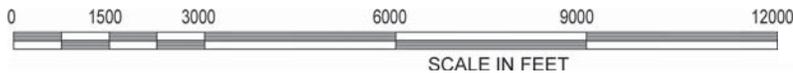
Width and Type: Kayak/paddle trail

| MAJOR TRAIL ELEMENT | QUANTITY | COST |
|--------------------------------|----------|-----------|
| Canoe/Kayak Launch (\$275,000) | 3 | \$825,000 |



LEGEND

- Highlighted Trail Segment
- Off-Street Shared-Use Path (existing)
- Off-Street Shared-Use Path (proposed)
- On-Street Shared-Use Path (existing)
- On-Street Shared-Use Path (proposed)
- Signed Bike Route (proposed)
- Recreation Trail (decomposed granite)
- Trail Entry Gateway
- Existing Trailhead
- Proposed Trailhead
- Rapid Flashing Beacon
- Existing Kayak Launch
- Proposed Kayak Launch





6.2 FUNDING STRATEGIES

A variety of potential funding sources are available to construct the proposed trail improvements. These include local, state, regional, federal and private programs. Most funding programs are competitive and involve the completion of extensive applications with clear documentation of the project’s needs, costs and benefits.

Local funding for these projects would typically come from the City of The Colony, private development, potential future bond programs or other local revenues. The primary Federal funding source is the U.S. Department of Transportation (USDOT). Private funding may be found through foundations, advocacy organizations, businesses and private developers.



SUMMARY OF COSTS

Cost are based on order-of-magnitude estimates for each of the currently unfunded segments and total \$11.4 million.

For the cost provided in Chapter 6, approximated planning level-of-order-of-magnitude (OOM) unit cost estimates were based on typical per-unit costs for various trail amenities, which were based upon recent project bids, current market, and engineering mean and methods. Typical per-unit costs for major elements that comprise the Trails & Bikeways Master Plan are as follows:

- 12’ wide concrete trail: \$1 million per mile
- 12’ wide prefabricated pedestrian bridge: \$2,000 per linear feet
- Existing roadway or railroad bridge undercrossing: \$250,000 each
- Neighborhood access point/trail gateway: \$50,000 each
- Community-scale trailhead with parking and minor amenities: \$250,000 each
- Regional trailhead with amenities: \$350,000 each
- Kayak launch with amenity: \$275,000 each

Based upon these estimates, the following potential costs per segment were developed.

| TABLE 6.1 SPINE TRAIL IMPLEMENTATION SUMMARY | | | |
|--|----------------|----------------------------|---------|
| SEGMENT | LENGTH (MILES) | PROJECTED COSTS | PHASE |
| 1A | 0.52 | \$640,450 | PHASE 1 |
| 1B-1 | 1.62 | \$451,100 | PHASE 1 |
| 1B-2 | 0.46 | \$301,300 | PHASE 1 |
| 1C | 1.58 | \$1,252,900 | PHASE 1 |
| 1D | 0.56 | \$366,000 | PHASE 1 |
| 2A | 0.53 | \$622,000 | PHASE 2 |
| 2B | 1.39 | \$1,640,000 | PHASE 2 |
| 2C | 0.53 | \$530,000 | PHASE 2 |
| 3A | 1.36 | \$324,800 | PHASE 3 |
| 3B | 0.48 | \$314,400 | PHASE 3 |
| 4A | 1.31 | \$1,748,000 | PHASE 4 |
| 4B | 1.15 | \$1,008,000 | PHASE 4 |
| 5A | 1.0 | \$655,000 | PHASE 5 |
| 5B | 1.21 | \$792,558 | PHASE 5 |
| K2-K4 | | \$275,000 X 3* = \$825,000 | |
| TOTAL | 13.70 | \$11,471,508 | |

Note: * Number indicates the proposed kayak launch quantity.

SUMMARY COSTS

The proposed improvements for The Colony Trails & Bikeways Spine Trail totals 13.70 miles in length. The total estimated potential costs for all segments is \$11,470,000 or approximately \$837,000 per mile.

FUNDING OPPORTUNITIES

A critical component to implementing bicycle and pedestrian infrastructure improvements includes identifying funding sources and potential partners. Since local funds for specific bicycle and pedestrian infrastructure can be limited, it is crucial to identify and explore opportunities through various funding sources, such as the federal government, national bicycle and pedestrian organizations, the State of Texas (TxDOT), and alternative local cost-sharing strategies. This section outlines the most applicable federal, state, and local funding opportunities to fund bicycle and pedestrian infrastructure investment in the region

Many federal government funding sources are available to assist with the implementation and construction of bicycle and pedestrian infrastructure improvements; however, many of those sources require a local match or percentage share of the total cost. Various funding through the Federal Highway Administration (FHWA), United States Department of Transportation (USDOT), and the Federal Transit Authority (FTA) is provided to TxDOT each year. TxDOT coordinates closely with local MPOs to prioritize local transportation projects and administers federal funding accordingly. FHWA funds distributed to each state are divided among individual apportioned programs—such as the National Highway Performance Program (NHPP), Surface Transportation Block Grant Program (STBG), and the Highway Safety Improvement Program (HSIP) – and then distributed to municipalities. This section highlights the most relevant federal funding sources for bicycle and pedestrian infrastructure improvements and summarizes program guidelines, key eligibility requirements, and types of eligible projects.

TABLE 6.2 FACILITY TYPES COSTS

| Bikeway Type | Type | Cost |
|---------------------------------------|-------------------------------------|--------------------|
| Shared Lane (existing roadway) | markings, signage | \$55,000 per mile |
| Bike Lane (existing roadway) | markings, signage | \$75,000 per mile |
| Bike Lane (roadway addition) | markings, signage, new paving | \$635,000 per mile |
| Buffered Bike Lane (existing) | markings, signage | \$75,000 per mile |
| Buffered Bike Lane (roadway addition) | markings, signage, new paving | \$770,000 per mile |
| Sidepath (existing roadway) | concrete | \$600,000 per mile |
| Shared-Use Path | Decomposed granite | \$575,000 per mile |
| Shared-Use Path | Asphalt surface with concrete curbs | \$750,000 per mile |

TABLE 6.3 AMENITIES COSTS

| Item | Cost |
|---------------------|----------|
| Trail Marker | \$10,000 |
| Kiosk | \$15,000 |
| Trail Monument | \$13,000 |
| Bench | \$1,200 |
| Bike Rack | \$2,000 |
| Bike Repair Station | \$5,500 |
| Drinking Fountain | \$3,000 |



TRANSPORTATION INVESTMENT GENERATING ECONOMIC RECOVERY DISCRETIONARY GRANT PROGRAM (TIGER)

TIGER grants are competitive/discretionary grants that can be utilized to fund surface transportation infrastructure capital investments. TIGER grants primarily focus on projects that provide both economic benefits and improve access to reliable, safe and affordable transportation options. TIGER grants may be used for, but not limited to, bicycle lanes, cross walks, lighting, and bridges. Capital funds provided through the TIGER program are unique in that individual municipalities, counties, and MPOs can receive them directly from the federal government, as opposed to most federal funds that are distributed at the State or transit agency level and then allocated to individual municipalities. It is important to note that many bicycle and pedestrian projects will only be competitive if they are part of a larger project with proven economic benefits. To date, the TIGER program has provided nearly \$4.6 billion dollars of investment to support 381 projects. Five hundred million dollars in TIGER funding was recently secured for the 2016 fiscal year through the 2020 fiscal year.

FEDERAL TRANSIT ADMINISTRATION (FTA)

The FTA provides funds for bicycle and pedestrian investment as they relate to transit. FTA funds may be used to fund improvements such as bicycle lanes, bicycle parking, bus shelters/benches, sidewalks and lighting among others. To qualify for FTA funds, projects must provide or improve access to existing or planned transit facilities such as stops and stations. Multiple FTA grant programs exist that are able to assist with funding bicycle and pedestrian infrastructure.

FIXING AMERICA'S SURFACE TRANSPORTATION (FAST ACT)

The FAST Act, enacted in late 2015 and administered by the FHWA, provides secure surface transportation program funding for 2016 through 2020. The FAST Act is meant to improve mobility, enhance economic growth, and accelerate project delivery by providing funding for roadway improvements. The FAST Act requires MPOs to consider all users when designing and constructing transportation infrastructure projects and provides flexibility to use funds for bicycling and walking improvements. Individual programs under the FAST Act have varying requirements and eligible projects.

The FAST Act authorizes funding to each State in a lump sum for all apportioned programs. Programs related to bicycle and pedestrian infrastructure include the Surface Transportation Block Grant Program (STBG), Congestion Mitigation and Air Quality Improvement Program (CMAQ), Highway Safety Improvement Program (HSIP), and National Highway Performance Program (NHPP).

SURFACE TRANSPORTATION BLOCK GRANT PROGRAM (STBG)

As the most flexible federal funding program, the STBG Program - redesigned from the traditional Surface Transportation Program - provides funds that are eligible for use on nearly all projects that include bicycle and pedestrian improvements. Typically, STBG funds are not used on local or rural minor collectors; however, bicycle/pedestrian projects are exceptions to that standard. STBG funds are sub-allocated to the local level based on a municipality's relative share of the state's population and classification as one of the following: an urbanized area with population greater than 200,000, urbanized area with population greater than 5,000 but no more than 200,000, or areas with population less than 5,000. TxDOT prioritizes projects and administers STBG funds.

NATIONAL HIGHWAY PERFORMANCE PROGRAM (NHPP)

NHPP funding availability is continued through the FAST Act and provides funding for the construction of new facilities on the National Highway System (NHS). NHPP funds can be utilized to fund bicycle lanes, bicycle parking, curb cuts and ramps, separated bicycle facilities, and shared use paths, among others. NHPP funds are administered by TxDOT.

CONGESTION MITIGATION AND AIR QUALITY IMPROVEMENT PROGRAM (CMAQ)

CMAQ funds are lump sum, state-apportioned funds available through the FHWA as a continuing program under the FAST Act. CMAQ funding availability is a proportion of the overall apportionment for each state. CMAQ funds are meant to assist in funding projects that improve air quality and relieve congestion. Eligible projects are likely to contribute to the attainment of air quality standards and reduce air pollution, and the projects must be included in an MPO's Transportation Improvement Program (TIP). CMAQ funds may be used on, but not limited to, the following transportation improvements: bicycle lanes, separated bicycle lanes, sidewalks, shared use paths, and signage. In Texas, CMAQ funds are included within TxDOT's Category 5 funding.

SAFE ROUTES TO SCHOOL (SRTS)

SRTS is continued under the FAST Act as a set-aside program under the STBG Program. SRTS funds are meant to assist local municipalities in funding projects that improve connectivity and access to schools. Eligible bicycle and pedestrian projects include bicycle lanes, crosswalks, separated bicycle lanes, and signed bicycle routes, among others.

RECREATIONAL TRAILS PROGRAM (RTP)

The RTP was reauthorized under the FAST Act and is now a set-aside of funds from the TAP. The RTP is administered by the TPWD, who also receives the grant applications. Eligible projects include maintenance and restoration of existing facilities, construction of new trails, acquisition of easements or property for trails, and the development and rehabilitation of trailside/trailhead facilities and trail linkages.

HIGHWAY SAFETY IMPROVEMENT PROGRAM (HSIP)

Continued under the recently enacted FAST Act, the HSIP aims to assist public agencies in improving safety along public roadways. HSIP funds are dedicated to projects that reduce conflicts between pedestrian/bicycles and automobiles, such as pedestrian hybrid-beacons and roadway improvements that provide separated facilities (e.g. medians or pedestrian islands). As part of the HSIP, a performance-based approach is used to determine funding projects. To be eligible for HSIP funds, projects must be consistent with State level Strategic Highway Safety Plans (SHSP) and must specifically address a hazardous location or safety concern. HSIP funds are administered within Texas by TxDOT.

TRANSPORTATION ALTERNATIVES SET-ASIDE PROGRAM (TA SET-ASIDE)

The Transportation Alternatives Set-Aside (TA Set-Aside) Program was authorized under Section 1109 of Fixing America's Surface Transportation Act (FAST Act) (the current transportation funding and authorization bill) and provides funding for programs and projects defined as transportation alternatives. The TA Set-Aside Program is similar to the former Transportation Alternatives Program, Transportation Enhancement, and Safe Routes to School programs.

The 12-county NCTCOG Metropolitan Planning Area has been sub-allocated approximately \$23 million in TA Set-Aside Program funds which will be available to award as part of a 2017 Call for Projects in our region. General types of projects eligible under this program include on- and off-road pedestrian and bicycle facilities, infrastructure projects for improving non-driver access to public transportation and enhanced mobility, and pedestrian and bicycle infrastructure associated with Safe Routes to School (SRTS) projects that will substantially improve safety and the ability for students to walk and bicycle to school.

RECREATIONAL TRAILS GRANTS

The Texas Parks and Wildlife Department (TPWD) administers the National Recreational Trails Fund in Texas under the approval of the Federal Highway Administration (FHWA). This federally funded program receives its funding from a portion of federal gas taxes paid on fuel used in non-highway recreational vehicles. The grants can be up to 80% of project cost and have a \$200,000 limit. Funds can be spent on both motorized and non-motorized recreational trail projects, such as the construction of new recreational trails, improvement of existing trails, development of trailheads or traiside facilities and acquisition of trail corridors

The deadline for this program is June 1st of each year. Grant funding for this program is on a cost reimbursement basis. Eligible projects include:

- Construction of new recreation trails on public or private lands
- Trail restoration or rehabilitation
- Americans with Disabilities Act upgrades
- Acquisition of easements, acquisition of property
- Maintenance of existing trails
- Environmental mitigation
- Development of trail-side and trail-head facilities (signs, restrooms, parking areas, water fountains, horse-watering, corrals, hitching posts, tool storage, bike racks, benches, picnic tables and fencing).



LOCAL FUNDING PROGRAMS

A variety of other creative funding options should also be considered for funding trail development. Grant funding can be a component of a larger comprehensive funding strategy that includes:

- Local bond programs referenda
- Annual appropriations through a CIP
- City 4-B sales tax revenue
- Construction of trails as developer requirement
- Impact fees
- Project Improvement Districts (PID)
- Tax Increment Financing District (TIF)
- Creation of a trust fund for and acquisition and facility development
- Private public partnerships - creating relationships that would benefit from trail construction
- Private sponsorship programs (“Adopt-A-Trail”, “Buy-A-Foot”)
- Provide encouragement and support of a “Friends of...” group - such a volunteer organizations could help raise funds from the private sector.

6.3 SAFE AND SECURE TRAILS

A primary safety and security concern is good access to trails for police patrols and emergency vehicles. Trails must accommodate this need by having regularly-spaced access points and being continuous and of sufficient width to accommodate emergency vehicles. Additional public safety measures appropriate for trail facilities include:

Police Patrols – Schedule regular police patrols along each of the City’s trail corridors. Bicycle-mounted officers on patrol at trailheads, access points, and along the trails themselves will provide the most reassuring deterrent to criminal activities.

Emergency Response – Provide the Fire and Police Departments with a map of the trail system that shows access points and mile markers. Provide keys or combinations to locked gates and/or bollards to ensure quick emergency response.

Public Safety Programs – Implement programs that educate and encourage citizens about public safety along the trail system. An example of such programs is a ‘Cells on Trails’ program, which could be provided by the Police Department and would encourage citizens to carry cell phones when they use the trail system



INFRASTRUCTURE & MAINTENANCE

The overall design and condition of trail facilities can inherently preclude many safety and security concerns. The most effective and most visible deterrent to illegal activity in a trail corridor will be the presence of legitimate trail users. As a general pattern, introducing legitimate use into an area through the provision of comfortable, attractive, and easy-to-use facilities tends to drive out illegitimate use.

The following safety and security issues should be considered when developing a trail:

Good Trail Access – Wherever feasible, public access to the trail system should be provided. Access ranges from providing conveniently located trailheads along trails to building sidewalks to accommodate access from private developments adjacent to trails. Access points should be inviting and signed in order to welcome the public onto the trails.

High Level of Maintenance – A well-maintained trail system expresses the community’s pride in its public spaces and encourages the citizens to care about trails in their neighborhoods. Again considering Wilson and Kelling’s “Broken Windows Theory,” a high level of maintenance will discourage undesirable activity along the trails.

Infrastructure for Public Safety – As a general rule, infrastructure (such as emergency call boxes, lighting, and in some cases, remote video monitoring) may be considered as a final line of defense against criminal activity on a trail. Generally, this type of infrastructure is expensive and may involve 24-hour remote monitoring. In addition, these features may represent an additional liability hazard if they are not properly maintained and monitored.

Public Safety Amenities – Provide bicycle racks at key destinations, trailheads, commercial/retail development and public facilities. Bicycle racks should allow for the frame and wheels of a bicycle to be secured. Post “Trail-User Ethics” signs at trailheads and in unobtrusive but visible areas to inform users of trail regulations and customs.

CONCLUSION

Striving to create a premier trail and bikeway system in The Colony that provides “**Healthy / Adventure / Premier / Connections**” for the community is no small task. Achieving this will necessitate the commitment and dedication of City Officials, Staff, and the citizens of The Colony. The purpose of the Trails & Bikeways Master Plan is to provide a “map” that provides direction in accomplishing this task. Specifically, through the Trails Master Plan process, the City of The Colony has achieved the following:

- Established a vision and goals for the future of the City’s trail system;
- Involved the public and gained their input and opinions about various aspects of the trail system;
- Identified and analyzed the unique needs and preferences of various user groups (such as recreational cyclists, pedestrians, paddlers/kayakers) and created a plan for a system that meets each group’s needs;
- Developed a target level of service for trails that is based on regional trends and establishes a series of phased segments for the City to construct in the future in order to foster the implementation of this plan;
- Identified key trail barriers (such as SH 121, limited right-of-way, areas of difficult terrain, etc.), as well as opportunities for the provision of future trails;
- Provided a toolbox of facility types (including off-street shared-use paths, sidepaths, on-street bikeways, and paddle trails) and provided guidance for the implementation and use of each;
- Prioritized and phased key trail facility projects and cost estimate for each;



Having a vision in place, the City and its citizens must now begin the task of implementing the Trails & Bikeways Master Plan. In order to do so effectively, the community must commit to fund and build facilities on a regular basis. The City should use the target level of service established in the Trails & Bikeways Master Plan as a continuous benchmark by which to judge their progress in implementing this plan.

Finally, it is crucial to understand that this plan is not static. Rather, it must be continually updated to reflect the changing needs of the citizens and take advantage of new opportunities. With these tools in hand, the journey toward creating a premier trail system in The Colony can continue and move forward.







APPENDICES

Trails & Bikeways Master Plan

WALKING AND PEDESTRIAN-ORIENTED TERMS

Accessible Pedestrian Signal (APS): A device that communicates information about pedestrian signal timing in non-visual format, through the use of audible tones (or verbal messages) and vibrating surfaces.

Americans with Disabilities Act (ADA): 1990 Federal law establishing the civil rights of people with disabilities. Prohibits discrimination against people with disabilities and requires common places used by the public to provide an equal opportunity for access.

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

Cross-slope: Defined as the slope measured perpendicular to the direction of travel. Cross-slope must be measured at specific points. The average cross-slope is the average of cross-slopes measured at regular intervals along the trail. Running cross-slope is defined as the average cross-slope of a contiguous section of trail. The running cross-slope can be determined by taking periodic measurements throughout a section of trail and then averaging the values.

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

Curb Ramp: A combined ramp and landing to provide access between street level and sidewalk level, usually at intersections or designated crosswalks. ADA accessible ramps must achieve particular design requirements including a running grade no steeper than 1:20. Curb ramps are intended to provide street/sidewalk access to all types of pedestrians, as well as bicyclists who may be legally using the sidewalk or crosswalk.

Detectable Warning: A standardized surface feature built in or applied to walking surfaces or other elements to warn people who are blind or visually impaired of specified hazards.

Median Refuge: An area within an island or median that is intended for pedestrians to wait safely away from travel lanes for an opportunity to continue crossing the roadway.

Midblock Crosswalk: A legally established crosswalk that is not at an intersection.

Passing Space: Passing space is defined as a section of path wide enough to allow two wheelchair users to pass one another or travel abreast. Passing space interval is defined as the distance between passing spaces. Accessible passing spaces allow two wheelchairs to pass one another, or for one wheelchair user to turn in a complete circle. Passing spaces are recommended at regular intervals when the trail is narrow for long distances.

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

Pedestrian Access Route: A corridor of accessible travel through the public right-of-way that has, among other properties, a specified minimum width and cross slope.

Pedestrian Crossing Interval: The combined phases of a traffic signal cycle provided for a pedestrian crossing in a crosswalk, after leaving the top of a curb ramp or flush landing, to travel to the far side of the vehicular way or to a median, usually consisting of the WALK interval plus the pedestrian clearance interval.

Pedestrian Signal Indication: The illuminated WALK/DON'T WALK message (or walking person/hand symbols) that communicates the pedestrian phase of a traffic signal, and their audible and tactile equivalents.

Sidewalk: That portion of a highway, road or street specifically constructed for the use of pedestrians on the outside edge of the vehicular travel way. Sidewalks are typically, but not always, curb-separated from the roadway and made of concrete, brick, asphalt or another hard surface materials.

Rest Area: Defined as level portions of a trail wide enough to provide wheelchair users and others a place to rest and gain relief from prevailing grade and cross-slope demands. Users can benefit from rest stops on steep or very exposed trails to pause from their exertions and enjoy the environment. Rest areas are most effective when placed at intermediate points, scenic lookouts, or near trail amenities. Rest areas located off the trail allow stopped trail users to move out of the way of continuing traffic (Figure 5-4). The most inviting rest areas have a bench, shade, a place to rest bicycles, and a trash receptacle.

BICYCLING AND PATHWAY-ORIENTED TERMS

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

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

Bicycle Network: A system of public bicycle facilities that can be mapped and used by bicyclists for transportation and recreational purposes.

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

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

Shared Roadway: A roadway that is open to both bicycle and motor vehicle travel. Unless bicycle travel is explicitly prohibited, all highways, roads and streets are "Shared Roadways." Some Shared Roadways may have wide curb lanes or paved shoulders, to increase comfort for bicyclists; however in most cases these roads do not have sufficient width to accommodate a Designated Bike Lane.

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

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

Signed Shared Roadway (Signed Bike Route): A shared roadway that has been designated by signs as a preferred route for bicycle use.

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

FUNDING AND IMPLEMENTATION

Annual Appropriation/Leasehold Financing - This is a more complex financing structure which requires use of a third party to act as issuer of the bonds, construct the facility, and retain title until the bonds are retired. The city enters into a lease agreement with the third party, with annual lease payments equal to the debt service requirements. The bonds issued by the third party are considered less secure than general obligation bonds of the city, and therefore more costly. Since a separate corporation issues these bonds, they do not impact the city's debt limitations and do not require a vote. However, they also do not entitle the city to levy property taxes to service the debt. The annual lease payments must be appropriated from existing revenues.

Capital Improvement Fees - These fees are on top of the set user rate for accessing facilities such as golf courses, recreation centers, and pool facilities to support capital improvements that benefit the user of the facility.

Easements - This revenue source is available when the city allows utility companies, businesses or individuals to develop some type of an improvement above or below ground on their property for a set period of time and a set dollar amount to be received by the city on an annual basis.

General Obligation Bonds - Bonded indebtedness issued with the approval of the electorate for capital improvements and general public improvements.

Greenway Utility - Greenway utilities are used to finance acquisition and development of the greenways by selling the development rights underground for the fiber optic types of businesses.

Inter-local Agreements - Contractual relationships entered into between two or more local units of government and/ or between a local unit of government and a non-profit organization for the joint usage/ development of sports fields, regional parks, or other facilities.

Parks, Trails and Developer Dedication and Development Fees - These fees, as currently assessed by The Colony, are for the development of residential properties with the proceeds to be used for parks and recreation purposes, neighborhood park acquisition, and development. Ordinances should be put in place to facilitate and include trail development, right-of-way preservation and/or dedication.

Public Improvement District (PID) - New developments can establish a PID when authorized by the City Council and legally set up according to state law. This taxing district provides funds especially for the operation and maintenance of public amenities such as parks and major boulevards.

Recreation Service Fees - This is a dedicated user fee, which can be established by a local ordinance or other government procedures for the purpose of constructing and maintaining recreation facilities. The fee can apply to all organized activities, which require a reservation of some type or other purposes, as defined by the local government. Examples of such activities include adult basketball, volleyball, tennis, and softball leagues, youth baseball, soccer, football and softball leagues, and special interest classes. The fee allows participants an opportunity to contribute toward the upkeep of the facilities being used.

Revenue Bonds - Bonds used for capital projects that will generate revenue for debt service where fees can be set aside to support repayment of the bond.

Tax Increment Finance (TIF) District - Tax Increment Finance districts (TIF's) are established to provide funds for certain types of public improvements that benefit a defined area of affected properties. Revenue is generated through the incremental increase in property tax revenue above a specified threshold being applied to accounts for use in improvements that may include most public infrastructure improvements including parks and landscaping.

User Fees/Charges - User fees are primarily established to cover operational costs, but can be used for debt service on revenue bonds.

EXTERNAL FUNDING

Community Development Block Grant (CDBG) - Funding received in accordance with the CDBG Programs national objectives as established by the U.S Department of Housing and Urban Development. Funding may be applied to such programs as infrastructure improvements, public facility and park improvements, human service enhancements, lead-based paint education and reduction, housing education assistance, and economic development and anti-poverty strategies.

Grants - Grants for parks and recreation are typically administered through the state and are competed for by municipalities. These grants require some level of local funding. They also generally have a long lead time due to funding cycles and application requirements. Following is a list of those currently funded or anticipated to be funded:

Indoor Recreation Facility Grants - This program provides 50% matching grant funds to municipalities, counties, MUDs, and other local units of government with a population less than 500,000 to construct recreation centers, community centers, nature centers and other facilities (buildings). The grant maximum will increase to \$750,000 per application. The application deadline will be July 31st each year (with master plan submission deadline 60 days prior to application deadline). Award notifications occur the following January.

Outdoor Recreation Grants - This program provides 50% matching grant funds to municipalities, counties, Municipal Utility Districts (MUDs) and other local units of government with a population less than 500,000 to acquire and develop parkland or to renovate existing public recreation areas. There are two funding cycles per year with a maximum award of \$500,000. Projects must be completed within three years of approval. Beginning in 2009, deadlines are January 31st and July 31st each year thereafter (with master plans submission deadline 60 days prior to application deadline).

Shade Structure Program - The American Academy of Dermatology's Shade Structure Program awards funds for the purchase for permanent shade structures to nonprofit organizations in need of shade for outdoor locations. These locations include any areas where children and adults gather and are exposed to the harmful ultraviolet (UV) rays of the sun, such as playgrounds, pools, bleachers, eating areas and other recreation areas. The deadline is typically April of each year and is open to 501(c)(3) organizations.

OTHER FUNDING

Advertising Sales - This revenue source is for the sale of tasteful and appropriate advertising on park and recreation related items such as in the city's program guide, on scoreboards, dasher boards and other visible products or services that are consumable or permanent that exposes the product or service to many people.

Catering Permits and Services - Similar to user fees, this is a license to allow caterers to work in the park system on a permit basis with a set fee or a percentage of food sales returning to the city. Also, many cities have their own catering service and receive a percentage of dollars off the sale of their food. These funds can be used to off-set debt service

Concession Management - Concession management is from retail sales or rentals of soft goods, hard goods, or consumable items. The city either contracts for the service or receives a set amount of the gross percentage or the full revenue dollars that incorporates a profit after expenses. or fund a dedicated capital improvement budget.

Corporate Sponsorships - This revenue funding source allows corporations to invest in the development or enhancement of new or existing facilities in park systems. Sponsorships are also highly used for programs and events.

Friends Associations - These groups are formed to raise money typically for a single focus purpose that could include a park facility or program that will better the community as a whole and their special interest.

Irrevocable Remainder Trusts - These trusts are set up with individuals who typically have more than a million dollars in wealth. They will leave a portion of their wealth to the city in a trust fund that allows the fund to grow over a period of time and then is available for the city to use a portion of the interest to support specific park and recreation facilities or programs that are designated by the trustee.

Naming Rights - Many cities and counties have turned to selling the naming rights for new trails, buildings or renovation of existing buildings and parks for the development cost associated with the improvement.

Pouring Rights - Private soft drink companies that execute agreements with the city for exclusive pouring rights within park facilities. A portion of the gross sales goes back to the city to off-set debt service or fund a dedicated capital improvement budget.

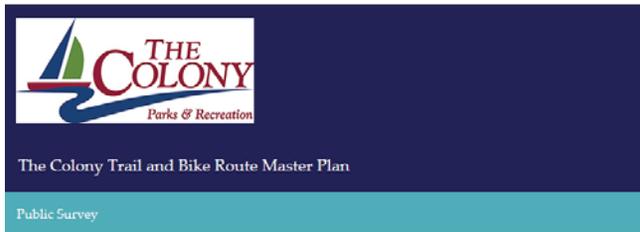
Public/Private Partnerships (PPP) - Partnerships are a very effective method for leveraging The Colony's resources to the greatest extent possible. These partnerships should be based on formal agreements and supported by a policy approved by the Parks and Recreation Board and City Council. Partnerships are joint development funding sources or operational funding sources between two separate agencies, such as two government entities, a non-profit and a city department, or a private business and a city agency. Two partners jointly develop revenue producing park and recreation facilities and share risk, operational costs, responsibilities and asset management, based on the strengths and weaknesses of each partner.

Private Concessionaires - Contract with a private business to provide and operate desirable recreational activities financed, constructed, and operated by the private sector, with additional compensation paid to the city.

Private Developers - These developers lease space from city owned land through a subordinate lease that pays out a set dollar amount plus a percentage of gross dollars for recreation enhancements. These could include a golf course, marina, restaurants, driving ranges, sports complexes, equestrian facilities, recreation centers and arenas.

Private Donations - Private Donations may also be received in the form of funds, land, facilities, recreation equipment, art or in-kind services. Donations from local and regional businesses as sponsors for events or facilities should be pursued.

7.0 CITIZEN SURVEY



1 / 1 100%

1. In what city do you live?

The Colony

Other (please specify)

2. In what city do you work?

The Colony

Other (please specify)

3. Do you currently commute by foot or by bicycle?

Yes

No

RESPONSE SUMMARY
SURVEY ALERTS: OFF

331

Total Responses

OPEN

Overall Survey Status

Collectors

| | | | |
|----------------------------|----------------|-----------------|-------------|
| Web Link 1 | Responses: 331 | Since 4/11/2016 | OPEN |
|----------------------------|----------------|-----------------|-------------|

Responses Volume 4/11/2016 - 5/10/2016

Q1:

IN WHAT CITY DO YOU LIVE?

| Answer Choices | Responses | |
|----------------|----------------|------------|
| The Colony | 100.00% | 308 |
| Total | | 308 |

Q02:

| In what city do you work? | | |
|---------------------------|------------------|----------------|
| Answer Options | Response Percent | Response Count |
| The Colony | 100.0% | 110 |
| Other (please specify) | | 221 |
| <i>answered question</i> | | 110 |
| <i>skipped question</i> | | 227 |

Q03:

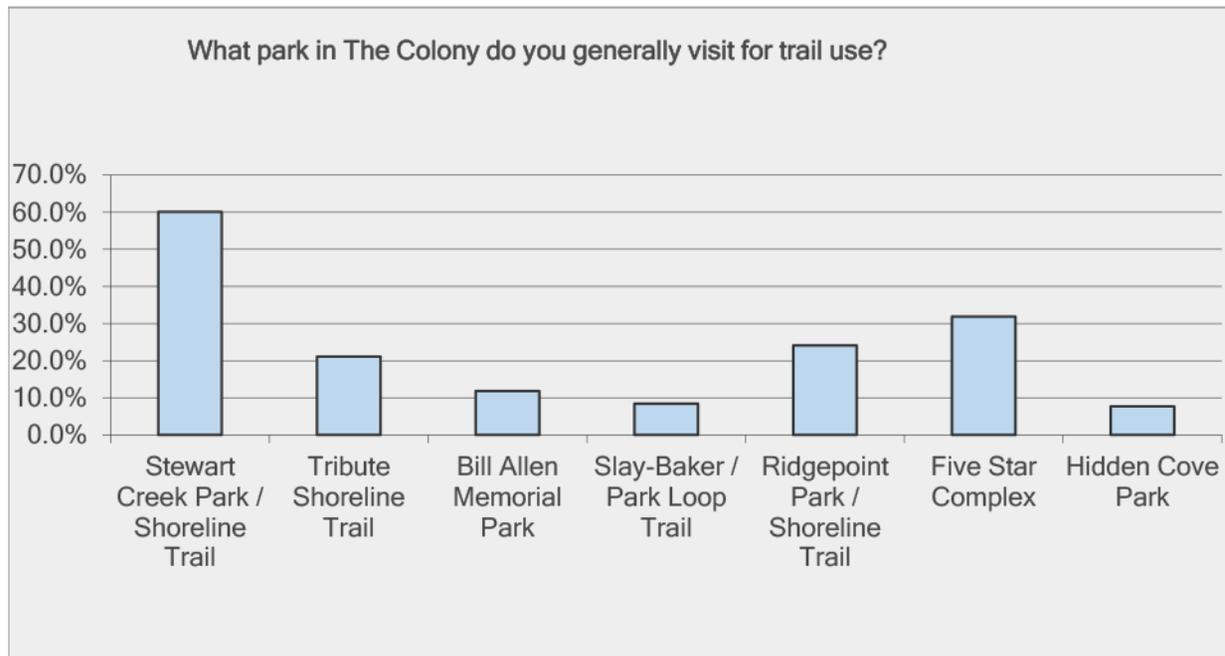
| Do you currently commute by foot or by bicycle? | | |
|---|------------------|----------------|
| Answer Options | Response Percent | Response Count |
| Yes | 12.7% | 42 |
| No | 87.3% | 289 |
| <i>answered question</i> | | 331 |
| <i>skipped question</i> | | 6 |

Q04:

| If yes, how frequently? (Please check one only) | | |
|---|------------------|----------------|
| Answer Options | Response Percent | Response Count |
| Daily | 4.6% | 11 |
| More than once a week | 6.7% | 16 |
| Once a week | 2.9% | 7 |
| Once or twice a month | 3.8% | 9 |
| Infrequently | 5.9% | 14 |
| Never | 76.1% | 181 |
| <i>answered question</i> | | 238 |
| <i>skipped question</i> | | 99 |

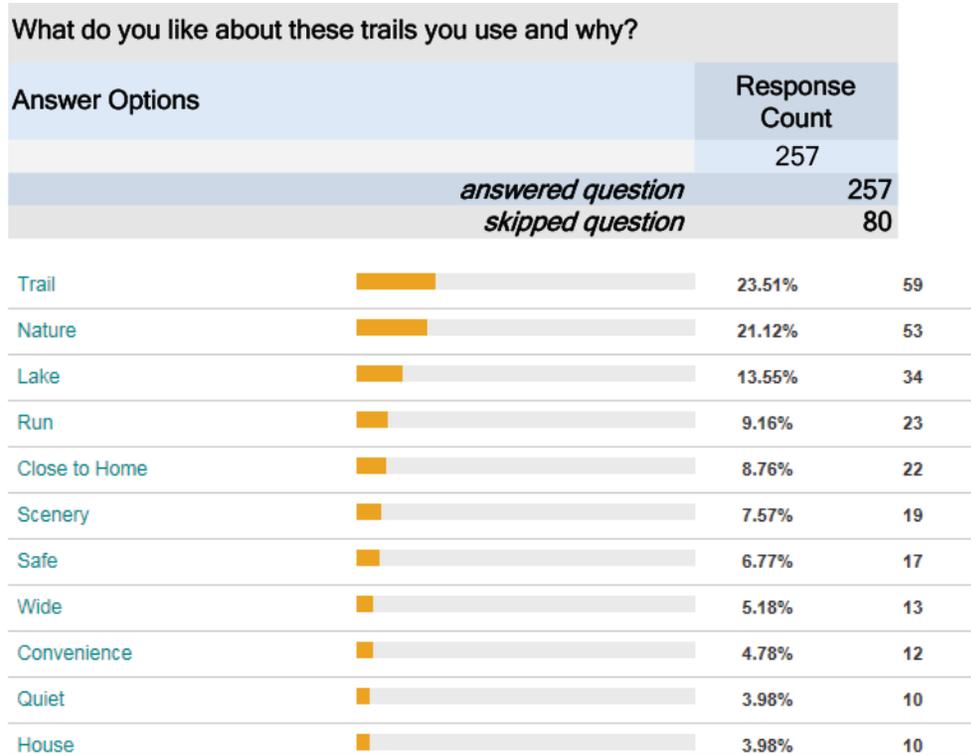
Q05:

| What park in The Colony do you generally visit for trail use? | | |
|---|------------------|----------------|
| Answer Options | Response Percent | Response Count |
| Stewart Creek Park / Shoreline Trail | 60.1% | 194 |
| Tribute Shoreline Trail | 21.1% | 68 |
| Bill Allen Memorial Park | 11.8% | 38 |
| Slay-Baker / Park Loop Trail | 8.4% | 27 |
| Ridgepoint Park / Shoreline Trail | 24.1% | 78 |
| Five Star Complex | 31.9% | 103 |
| Hidden Cove Park | 7.7% | 25 |
| Other (please specify) | | 17 |
| answered question | | 323 |
| skipped question | | 14 |



Q6:

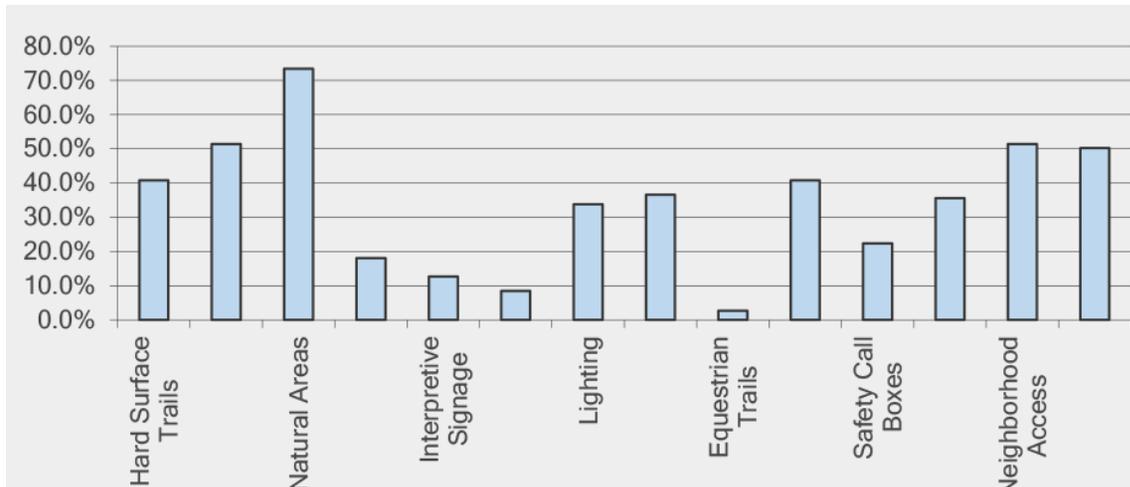
WHAT DO YOU LIKE ABOUT THESE TRAILS YOU USE AND WHY?



Q07:

Please mark the five (5) Recreational Trail Amenities that are most important to you and your family.

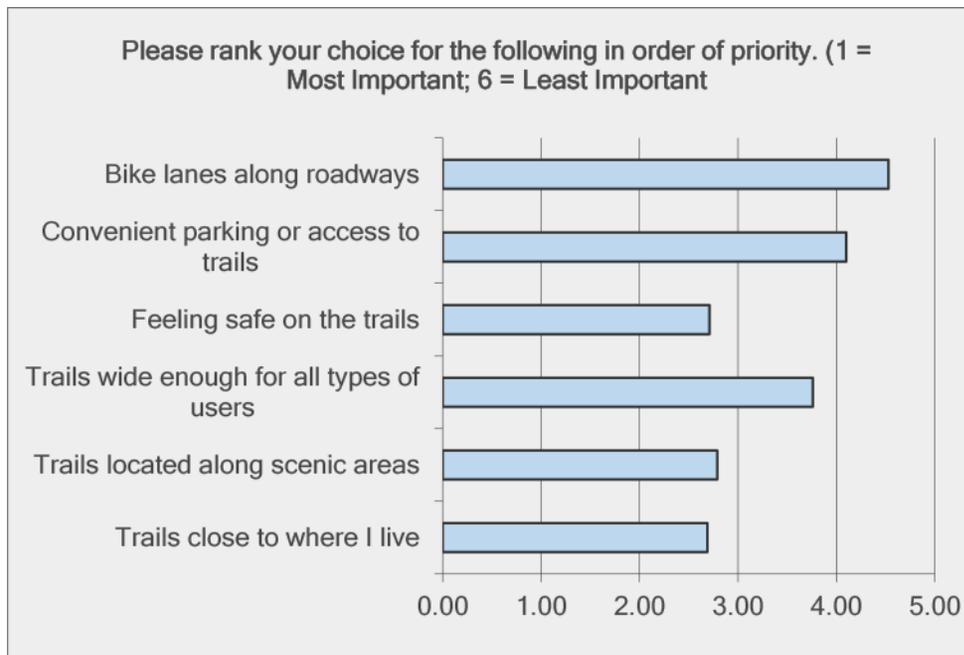
| Answer Options | Response Percent | Response Count |
|----------------------------|------------------|----------------|
| Hard Surface Trails | 40.8% | 135 |
| Soft Surface Trails | 51.4% | 170 |
| Natural Areas | 73.4% | 243 |
| BMX / Mountain Bike Course | 18.1% | 60 |
| Interpretive Signage | 12.7% | 42 |
| Bird Watching Blinds | 8.5% | 28 |
| Lighting | 33.8% | 112 |
| Drinking Fountain | 36.6% | 121 |
| Equestrian Trails | 2.7% | 9 |
| Benches | 40.8% | 135 |
| Safety Call Boxes | 22.4% | 74 |
| Trail Head Parking | 35.6% | 118 |
| Neighborhood Access | 51.4% | 170 |
| Shade | 50.2% | 166 |
| Other (please specify) | | 40 |
| answered question | | 331 |
| skipped question | | 6 |



Q08:

Please rank your choice for the following in order of priority. (1 = Most Important; 6 = Least Important)

| Answer Options | 1 | 2 | 3 | 4 | 5 | 6 | Rating Average | Response Count |
|---|----|----|----|----|-----|-----|----------------|----------------|
| Trails close to where I live | 96 | 61 | 46 | 40 | 29 | 21 | 2.69 | 293 |
| Trails located along scenic areas | 63 | 79 | 67 | 44 | 24 | 17 | 2.79 | 294 |
| Trails wide enough for all types of users | 15 | 48 | 67 | 74 | 64 | 35 | 3.76 | 303 |
| Feeling safe on the trails | 94 | 58 | 63 | 48 | 30 | 16 | 2.71 | 309 |
| Convenient parking or access to trails | 21 | 31 | 44 | 65 | 103 | 48 | 4.10 | 312 |
| Bike lanes along roadways | 35 | 33 | 25 | 28 | 44 | 162 | 4.53 | 327 |
| <i>answered question</i> | | | | | | | | 331 |
| <i>skipped question</i> | | | | | | | | 6 |



Q09:

Do you agree or disagree with developing additional trails in the following areas?(A = Agree; D = Disagree; N = Neutral)

A

| Answer Options | Agree | Response Count |
|--|-------|----------------|
| Along greenbelts, creeks, and drainage ways | 296 | 296 |
| Along utility right of way corridors (Electric, Water, Through neighborhoods | 186 | 186 |
| Along railroad corridors | 221 | 221 |
| Along major roads | 148 | 148 |
| | 114 | 114 |

D

| Answer Options | Disagree | Response Count |
|--|----------|----------------|
| Along greenbelts, creeks, and drainage ways | 14 | 14 |
| Along utility right of way corridors (Electric, Water, Through neighborhoods | 58 | 58 |
| Along railroad corridors | 41 | 41 |
| Along major roads | 102 | 102 |
| | 149 | 149 |

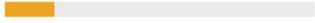
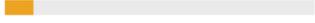
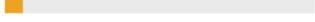
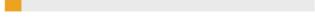
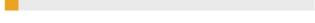
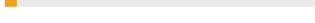
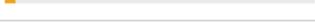
N

| Answer Options | Neutral | Response Count |
|--|---------|----------------|
| Along greenbelts, creeks, and drainage ways | 19 | 19 |
| Along utility right of way corridors (Electric, Water, Through neighborhoods | 85 | 85 |
| Along railroad corridors | 69 | 69 |
| Along major roads | 78 | 78 |
| | 62 | 62 |

| | Question Totals |
|--------------------------|-----------------|
| <i>answered question</i> | 330 |
| <i>skipped question</i> | 7 |

Q10:

| In what one part of the city, or specific area, would you like to see the City develop a trail? | |
|---|----------------|
| Answer Options | Response Count |
| | 184 |
| <i>answered question</i> | 184 |
| <i>skipped question</i> | 153 |

| | | | |
|----------------------|---|--------|----|
| Trail |  | 25.84% | 46 |
| Connect |  | 16.29% | 29 |
| Lake |  | 9.55% | 17 |
| Legends |  | 6.18% | 11 |
| North Colony |  | 5.62% | 10 |
| Easement |  | 4.49% | 8 |
| Austin Ranch |  | 3.93% | 7 |
| South Colony |  | 3.93% | 7 |
| Ridgepoint |  | 3.93% | 7 |
| Main Street |  | 3.37% | 6 |
| East Side |  | 2.81% | 5 |
| Railroad |  | 2.81% | 5 |
| North Side |  | 2.25% | 4 |
| Stewart Peninsula |  | 1.69% | 3 |
| Community |  | 1.69% | 3 |
| Fields |  | 1.69% | 3 |
| Power Line Greenbelt |  | 1.12% | 2 |
| Wooded Area |  | 1.12% | 2 |
| Bike Path |  | 1.12% | 2 |
| Five Star |  | 1.12% | 2 |
| S. Colony |  | 1.12% | 2 |

Q11:

| If The Colony had safe off-street pedestrian/bicycle trails connecting neighborhoods, schools, recreation and civic uses, would you use them instead of driving? | | |
|--|------------------|----------------|
| Answer Options | Response Percent | Response Count |
| Yes | 80.6% | 266 |
| No | 19.4% | 64 |
| <i>answered question</i> | | 330 |
| <i>skipped question</i> | | 7 |

Q12:

| If The Colony had safe on-street pedestrian/bicycle trails connecting neighborhoods, schools, recreation and civic uses, would you use them instead of driving? | | |
|---|------------------|----------------|
| Answer Options | Response Percent | Response Count |
| Yes | 57.1% | 189 |
| No | 42.9% | 142 |
| <i>answered question</i> | | 331 |
| <i>skipped question</i> | | 6 |

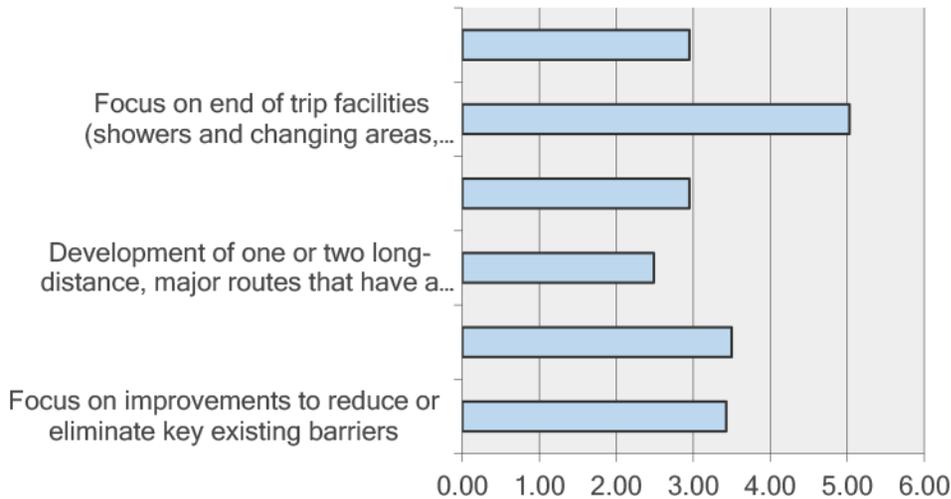
Q13:

| What is your main purpose for cycling? | | |
|--|------------------|----------------|
| Answer Options | Response Percent | Response Count |
| To commute to work | 0.0% | 0 |
| For recreation | 48.2% | 40 |
| For fitness | 45.8% | 38 |
| To commute to school | 3.6% | 3 |
| For trips in your neighborhood | 2.4% | 2 |
| Other (please specify) | | 8 |
| <i>answered question</i> | | 83 |
| <i>skipped question</i> | | 254 |

Q14:

| What should The Colony's bicycle system priorities be over the next five to ten years? | | | | | | | | |
|--|----|----|----|----|----|-----|----------------|----------------|
| Answer Options | 1 | 2 | 3 | 4 | 5 | 6 | Rating Average | Response Count |
| Focus on improvements to reduce or eliminate key | 27 | 34 | 38 | 43 | 30 | 23 | 3.43 | 195 |
| Provide bicycle facilities throughout the city | 25 | 33 | 40 | 38 | 40 | 21 | 3.50 | 197 |
| Development of one or two long-distance, major routes | 71 | 50 | 39 | 25 | 19 | 7 | 2.49 | 211 |
| Add to current standards so that new development has | 41 | 43 | 44 | 40 | 28 | 6 | 2.95 | 202 |
| Focus on end of trip facilities (showers and changing | 9 | 10 | 12 | 17 | 47 | 113 | 5.03 | 208 |
| Focus on improvement of existing streets (provide route | 68 | 37 | 35 | 28 | 24 | 29 | 2.95 | 221 |
| <i>answered question</i> | | | | | | | | 250 |
| <i>skipped question</i> | | | | | | | | 87 |

What should The Colony's bicycle system priorities be over the next five to ten years?





Answered: 93 Skipped: 238

Q15:

PLEASE TELL US WHAT SPECIFIC OFF-STREET PEDESTRIAN/BICYCLE TRAILS, AREAS OF THE CITY OR DESTINATIONS SHOULD BE ADDED TO THE COLONY'S BICYCLE SYSTEM OR REQUIRE IMPROVEMENTS?

| | | | |
|-----------------|--|--------|----|
| Shoreline Trail | | 12.80% | 16 |
| Connect | | 9.60% | 12 |
| Colony | | 8.80% | 11 |
| Park | | 8% | 10 |
| Access | | 7.20% | 9 |
| Bill Allen | | 4.80% | 6 |
| Main Street | | 4.80% | 6 |
| Bike | | 4.80% | 6 |
| Austin Ranch | | 4% | 5 |
| Walk | | 3.20% | 4 |
| Safe | | 3.20% | 4 |

Q16:

PLEASE TELL US WHAT SPECIFIC ON-STREET BICYCLE ROUTES, AREAS OF THE CITY OR DESTINATIONS SHOULD BE ADDED TO THE COLONY'S BICYCLE SYSTEM OR REQUIRE IMPROVEMENTS?

- N. Colony (the complete route) S. Colony (the complete route); crossing 121 needs to be safe/Paige; Main; Spring Creek); N. Colony to Tribute exit.
- North Colony and Main, South Colony and Main
- South colony , Main Street, west portion of north colony
- Main Street north colony south colony and maybe Paige. Side walks along all major roads of the city.
- Widening the sidewalks for both runners and bicyclists along N. Colony , Morningstar, and along Memorial to S. Colony
- North Colony and South Colony , Lake to Frisco and a good North/South connector.
- North Colony Blvd resurfacing, two lanes on memorial from Paige to South Colony Blvd., resurface intersection by top golf and five star on memorial, two directional bike "only" lane on the big hill at Windhaven to have a safe place for hill repeats... this is a huge desire for cyclists.
- North Colony to Blair Oaks to South Colony to Paige Road with branching off to shopping centers.
- Routes to Five Star from both ends of The Colony ; Ways to cross Main St from both ends of The Colony .
- Paige all the way down North Colony . Memorial into Frisco.
- North Colony Bike/ped lanes- add on
- Roads in The Colony can barely handle the everyday traffic during so we're not in favor of disrupting traffic for cyclists. If there are areas where additional land is available at the side of the road to create a separate lane for cyclists, that might be acceptable.

Showing 19 words and phrases

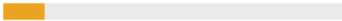
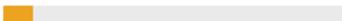
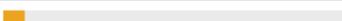
| Word/Phrase | Percentage | Count |
|-------------|------------|-------|
| Trails | 35.48% | 33 |
| Bike | 21.51% | 20 |
| Colony | 10.75% | 10 |
| Safe | 10.75% | 10 |
| Routes | 7.53% | 7 |
| Crossing | 6.45% | 6 |
| Connect | 6.45% | 6 |

- Add trails in the neighborhood north of n Colony blvd
- North Colony and down Blair Oaks
- Link paths along North and South Colony Blvd and Memorial by way of Paige Rd, Blair Oaks and Morning Star. Additionally links Austin Ranch via Paige and Plano Pkwy.
- I believe it is being done, but there needs to be a safe way to travel up/down Main Street. We also need a safe way to cross over Main on North Colony , out of Stewart Creek Park.
- Connect north colony to Nebraska furniture mart area
- Paige Rd area, South Colony Blvd and any area that has scenic parks around lake, etc. to give riders a "tourist view of the city"
- Grandscape area. Morning Star from North Colony to Memorial. All of Memorial
- South Colony area
- PAIGE ST, BLAIR OAKS, AROUND THE COLONY SCHOOLS
- N Colony Blvd. Main Street.
- South colony near 121. Paige near 121.
- Figure out main thoroughfare such as north colony to connect lake trails safely
- The design of the route along North Colony is not especially safe due to the fact that the route crosses over several lanes of traffic. I've come close to being hit by a car and have seen close accidents happen on several occasions.
- Bike lanes on N & S Colony with light indicators to assist in crossing of the street

Q17:

DO YOU HAVE ANY ADDITIONAL COMMENTS TO BE CONSIDERED IN THE TRAIL AND BICYCLE ROUTE MASTER PLAN?

- I believe a comprehensive, integrated, safe and Citywide trail system composed of hard and soft surfaces would be a major upgrade to the quality of life for The Colony citizens as well as a huge drawing card for potential residents. Property values would increase. Perception would improve. Just the addition of the shoreline trails have had a huge impact. If a person could safely access a shoreline trail via a connector trail from anywhere in the City, that would be a game changer. When people look for options of where to live, today one of the important factors is how close am I to a trail .
- I used to live in Plano and they were proud of having bike routes that spanned the entire city but in reality very little of these routes were bike only trails. Most were regular busy streets designated as a bike route with no exclusive bike lane and some exclusive bike trails required frequent crossing of busy streets I would most like to see and use bike trails that are bike only even if it meant there were fewer miles of trails . Having to deal with car traffic even if they are courteous to bikes adds a new level of stress.
- We would enjoy a hike and bike trail system that would connect the city as a whole. We ride the Shoreline Trail and Tribute Trail regularly (weather permitting). We have to bike to Frisco using the sidewalk near B. B. Owens to get to Lebanon. We then head to the Tribute from there. Thanks for sending the survey.
- Make a looping trail that is at least 15+ miles and includes the shoreline trail along with the existing trails by 5 star and through the neighborhoods
- Main concern is with increasing multi use trail system as opposed to cycling only routes to benefit all types of users. Would be nice to add more shade to existing trails for more comfortable summer use. Would like to see trails with lighting for more night time use.

| | | | |
|-------------|---|--------|----|
| Colony |  | 24.39% | 30 |
| Routes |  | 12.20% | 15 |
| Bike Lanes |  | 8.94% | 11 |
| Main Street |  | 8.13% | 10 |
| Blair Oaks |  | 6.50% | 8 |
| Trails |  | 6.50% | 8 |
| Needs |  | 5.69% | 7 |

- Avoid routing large numbers of people via trails through housing developments & do not make housing areas a trail 's destination. Should be feeder trails only.
- Trails need handicap access. Should allow Handicap Golf carts on nature trails during off peak times
- I have understood that some have wanted a permanent restroom by the shoreline trail 's, that would be nice. I also would like you to consider adding larger port-a-potties that would allow us to bring our pets inside with us so that we don't have to try and hold on to the leaches. I would also like to ask if a permanent unit could be built at the lake and other areas- they could be called "family restrooms". Often times I am walking my dog(s) and I need to go, and I know my pets will not hurt anyone, but I know others might be scared and I have to take them in with me... so will you all please consider adding these single large bathrooms? And the larger Port-a-potties on the trails - on the ends
- I realize it's difficult to retrofit, but more open-space trails providing access across town, providing access to on-street trails providing access to begin and end points.
- I THINK THIS IS A GREAT IDEA TO IMPLEMENT INTO THE CITY. HAVING A TRAIL SYSTEM TO ACTUALLY MAKE IT WORTHWHILE TO DRIVE TO THE TRAIL AND TAKE A WALK WITHOUT GOING IN CIRCLES WOULD BE GREAT!
- Thank you for your diligence in creating and maintaining the trails . It has been an asset and an enjoyment to get out and explore the area.
- We are super excited about this expansion. We always ride from The Colony to Frisco and it would be great to have safer, more functional trails . And it's my tax dollars well spent!!!
- Enough with the damn trails !
- I love the trails and am excited about the new additions.

- Connect to Frisco and Carrollton trails
- The city should partner with the Dallas off-road Bike Association to build and maintain a mountain bike trail around the lake.
- Trails should allow for hikers and bikers.
- Please--- All paved Shoreline Trails !!!
- Landscaping should be appropriate. We should be attracting people to our trails from around the area.
- Please startup the easement city trail
- When building a sidewalk, I notice it is always about budget restrictions in Council meetings. City Council needs to not just want and then not have money for their own wants. Set aside a budget upfront that will guarantee to build sidewalk/ trails fully in City with the budget to do so.
- Provide more trash cans and dog poop bags available along trails. 5-Star is good as/is.
- having safe trails and places to run and bike are important to the community
- I would prefer more of a nature trail than a bike route. The cyclist who ride on the street don't follow the laws and regulations as is.
- I am new to north the colony. Looking for Bike trails for nightly exercise and enjoyment
- More focus on trail and mountain biking instead of road biking would be appreciated.
- I would LOVE to see more hike/bike trails . My biggest concern is that we don't take away lanes from our already crowded roads or expect cars to "share the road" with bikes as Plano has done.
- I love the Shoreline Trail !

THE COLONY

TRAILS & BIKEWAYS MASTER PLAN

FEBRUARY 2017