CARROLLTON
TEXAS

TRAILS MASTER PLAN

MARCH 2022

DUNAWAY

ACKNOWLEDGMENTS

The City of Carrollton provided ongoing support to the Dunaway Team throughout the Master Planning process. A special thanks to the following individuals who participated:

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Planning Process

Planning Process

Throughout the master planning process, the Team worked closely with City staff and leaders to examine opportunities to expand the vibrant, connected Carrollton trail network. During the planning process, development of this trail network plan was achieved using a three-phase approach, as follows:

Phase 1: **Analysis**

Data Gathering & Inventory

Site Review / Existing Conditions

Opportunities & Considerations

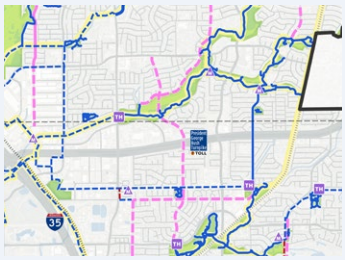
Benchmarking

Phase 2: **Planning**

Concept Diagram

Public Engagement

Preliminary Trail Master Plan



Phase 3: **Recommendations**

Hike & Bike Trail

On-Street Bikeways

Crossings

Sidewalk Connectors

Trailheads

Portals & Branding

Phase 1: Analysis

Phase 1: Analysis

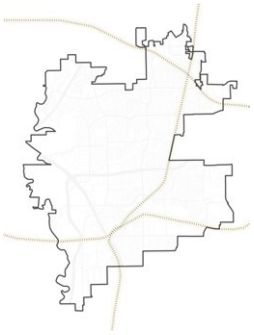
Dunaway's first phase was a critical step in building the foundation for planning the proposed trails plan. In this investigatory phase the Team evaluated the existing system, gathered existing and proposed data, analyzed local and regional planning documents, toured benchmark systems throughout North Texas, and provided initial thoughts on opportunities and constraints impacting future trail development. This section documents the steps taken in the Analysis phase of the planning process.

Data Gathering & Inventory

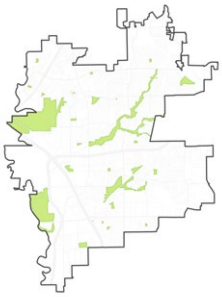
A comprehensive approach to data gathering was implemented to inform the planning efforts. Utilizing Geographic Information Systems (GIS) analysis and AutoCAD software, Dunaway compiled the following layers into the base map: aerial photographs, parks, schools, commercial and residential parcels, roadways, railroads, drainageways and creeks, floodplains, city limits, existing trails, and proposed developments. The DART light rail alignment and NCTCOG Veloweb corridors and Trinity River Paddling Trails are identified to illustrate regional connectivity and context.

Convenient freeway access, DART light rail lines, and trails affect everyday transportation and recreation decisions made by bicyclists, pedestrians, transit riders, and motorists. Dunaway completed a thorough site review of Carrollton's trail and bicycle infrastructure to identify opportunities and challenges for future trail development.

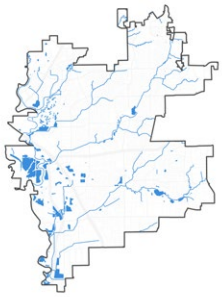
Roadways



Railways



Parks

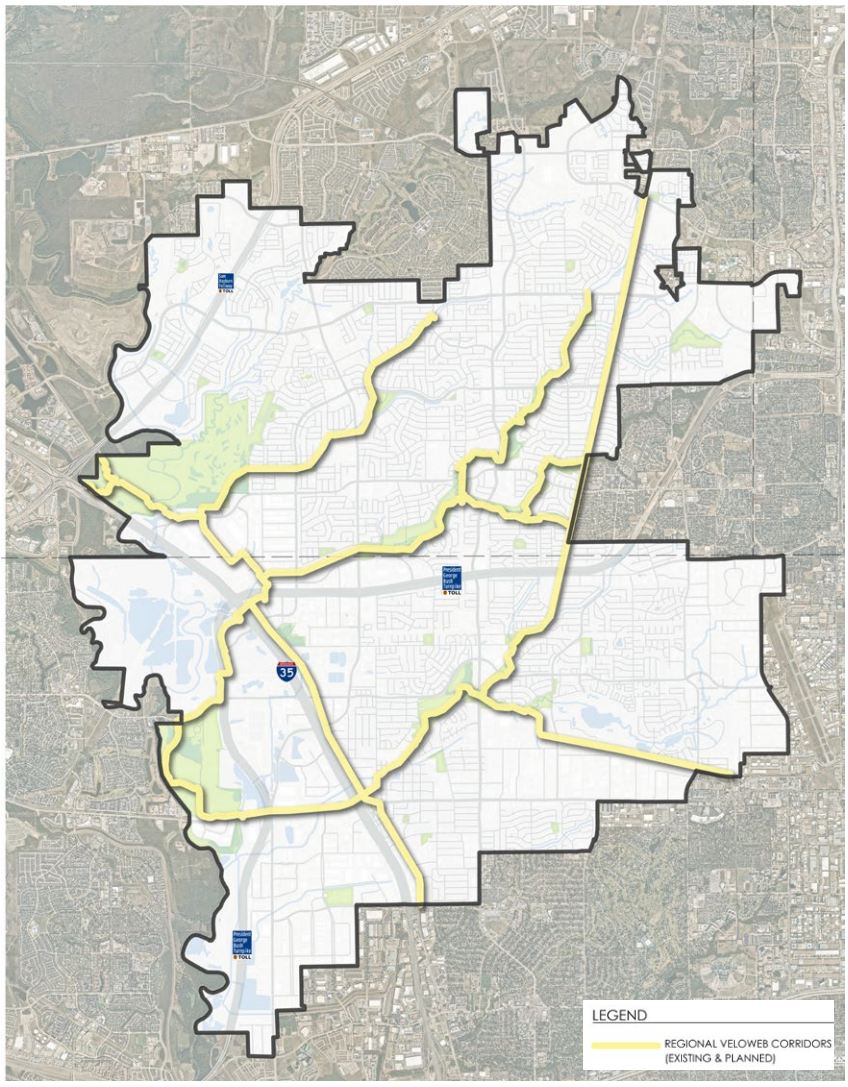


Waterways

Regional Connections

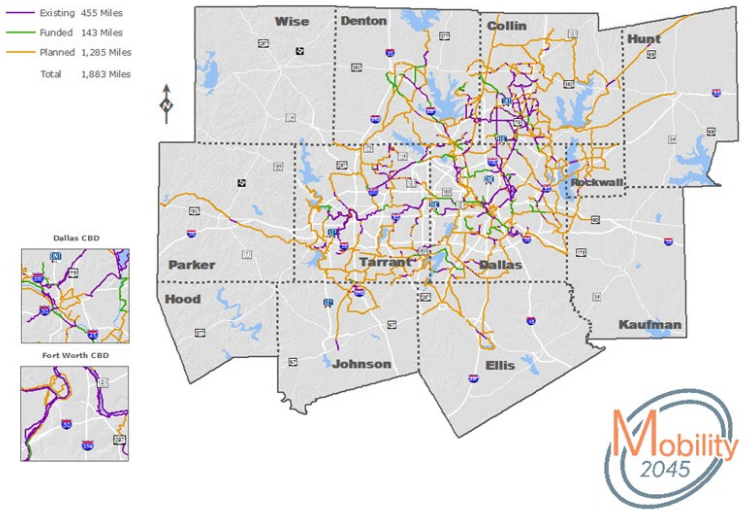
Regional Trails

Carrollton is a member city of the North Central Texas Council of Governments (NCTCOG), the regional planning organization for the DFW metroplex. A complex network of shared-use paths known as the Regional Veloweb that links all 16 NCTCOG member counties. Several Carrollton trails have been designated as Regional Veloweb segments and still other corridors are identified as planned routes. The most prominent proposed segments are the Cottonbelt Trail, Broadway Trails, Trails paralleling the BNSF road, and trails connecting McInnish park to the Trinity Mills DART station. When complete these trails will link Carrollton to Addison, Coppell and Lewisville.



Regional Resources

The north Texas area where Dallas, Collin and Denton Counties intersect has significant natural resources and preserved areas including the Trinity River, Arbor Hills, Lake Lewisville Environmental Learning Area (LLELA), and John Burke Nature Preserve. Close proximity of these features make the Carrollton area a regional draw for visitors seeking to connect with nature.



DFW Regional Veloweb

Cottonbelt Trail

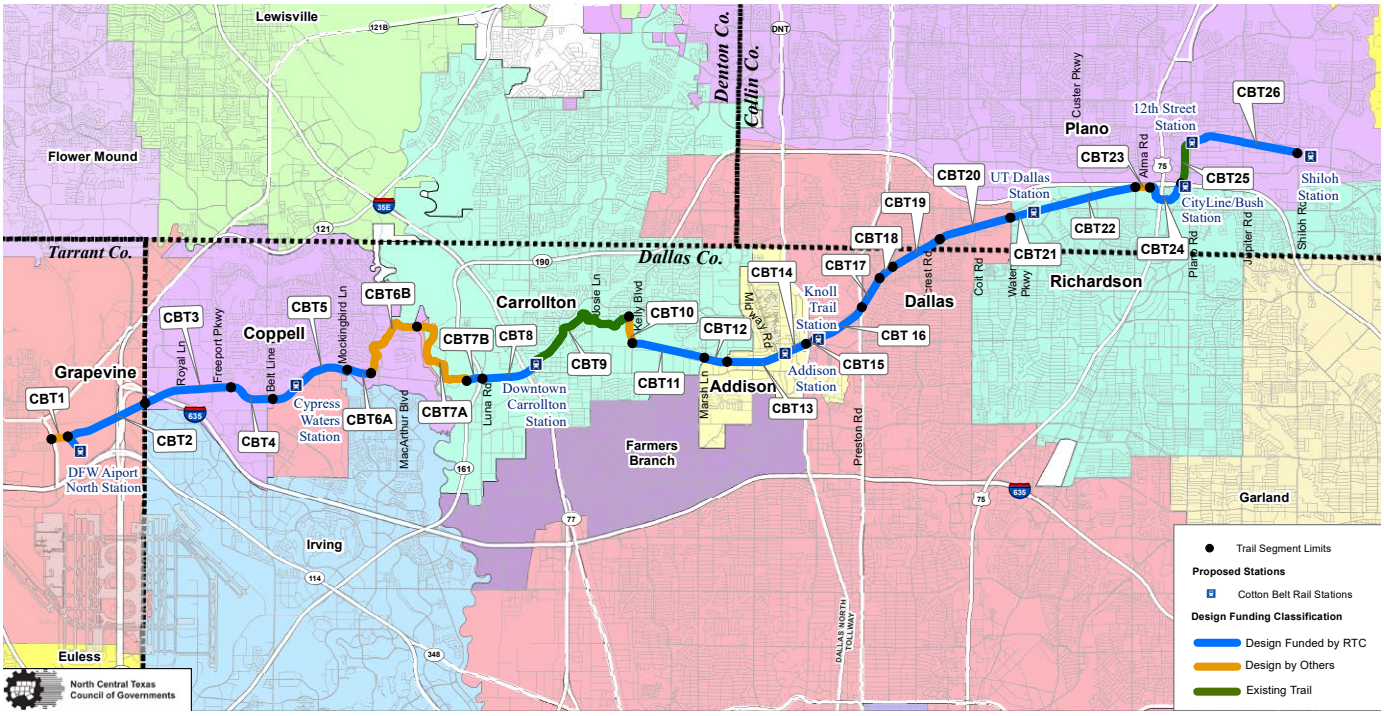
The Cottonbelt trail is a 55.2 mile regional trail corridor that will connect Plano and Fort Worth. Currently 15.4 miles of the trails exist and another 22.4 miles are in design or under construction.

In Carrollton, 11.8 miles of the corridor will cross the City from Addison to Coppell linking the east and west sides of the City and providing connections to downtown and other destinations.

The alignment will generally follow the Cottonbelt rail line and existing trails along Hutton Branch Creek. Near Downtown Carrollton, the alignment will cross I-35 and PGBT, improving bike and pedestrian connectivity and access to Carrollton Square.

Existing Cottonbelt Trail - Hurst

Upon completion, this trail will provide links to several key destinations in North Richland Hills, Downtown Grapevine, Old Town Coppell, Cypress Waters in Dallas, Downtown Carrollton, Addison Town Center, CityLine in Richardson, and Downtown Plano.



Cotton Belt Regional Veloweb Trail: DFW Airport to Plano

Hike & Bike Trails

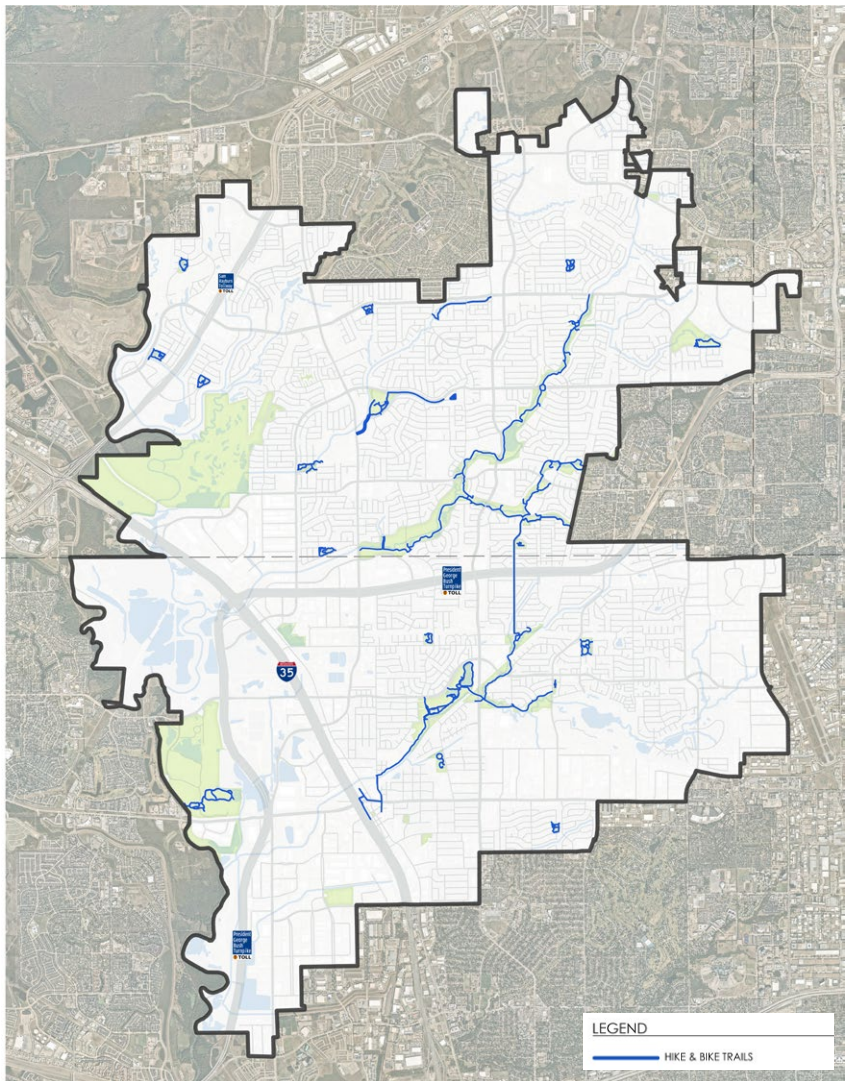
Carrollton's trail system originally developed with linear trails along riparian corridors and park loops in neighborhood parks. This method of development has led to good coverage of trails, but also resulted in gaps in the trails network across the city.

Linear Trails

Signature routes that follow Furneaux Creek, the Hutton Branch and Eisenhower Greenbelt include creek crossings, pond views, and a variety of topography and vegetation are some of the community's most treasured assets. These three natural corridors, cross the city diagonally from SW to NE, creating long trail segments that roughly parallel. Each concrete trail is marked with a color-coded centerline to facilitate navigation throughout the system. Frequent connection to neighborhoods and parks makes these trails easily accessible to most residents.

Loop Trails

Parks across the city include concrete walking trails that provide residents from surrounding neighborhoods with ¼ to ¾ loops, ranging in width between 6' and 12'. Typically, the narrower trails are in stand-alone parks and wider trails are connected to other trails in the network.



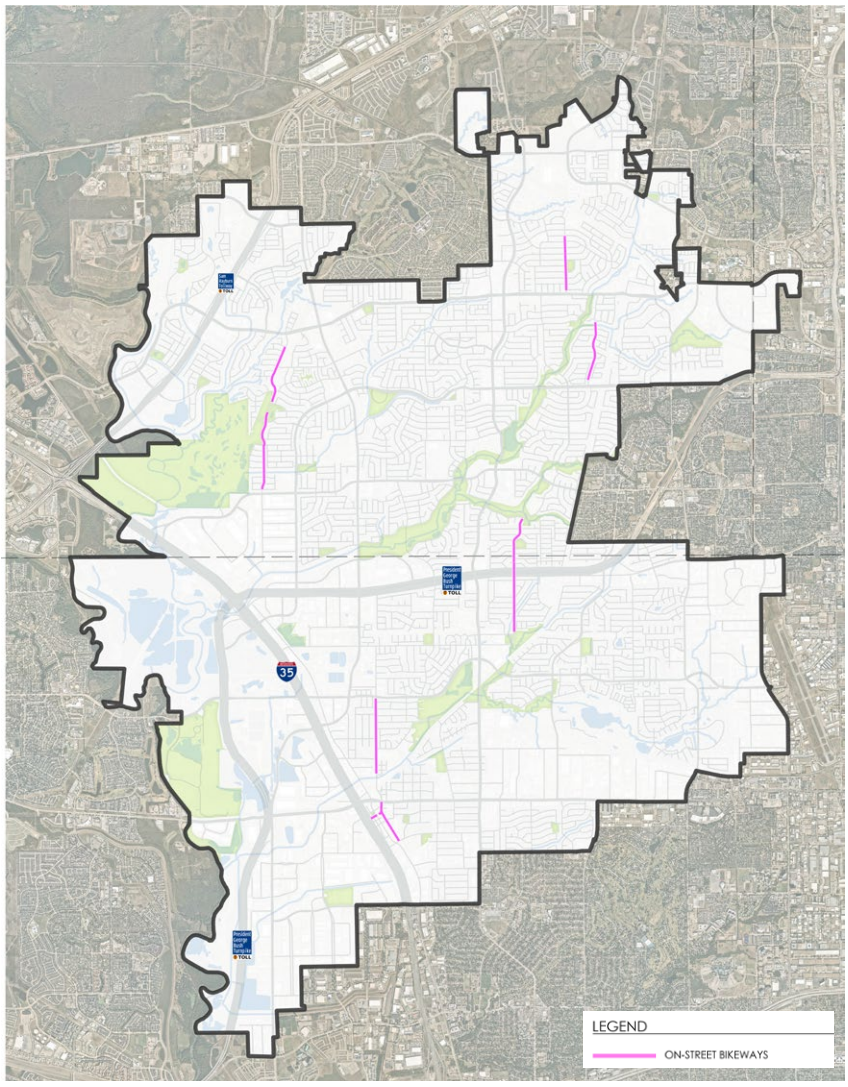
Green Trail

On - Street Bikeways

For decades roads have been designed for cars, but increased bike riding and interest in alternative modes of transportation has increased the need to designate a portion of certain roadway with striping, signage, and pavement markings for preferential or exclusive use of bicyclists. Carrollton's burgeoning network of on-street facilities creates several critical links between destinations and other trail infrastructure using bike lanes and shared lane markings, also known as sharrows.

Current bike lanes are on neighborhood collector streets that parallel arterial roadways, providing direct corridors for efficient bike travel, on streets with a suitable level of vehicular traffic.

Sharrows are currently implemented on streets, to raise awareness of cyclists in areas of high conflict and congestion. Typically seen on two lane, low-speed streets, emanating from the Carrollton Square area.



Spurwood Bike Lanes

Nature Trails & Paddling Trails

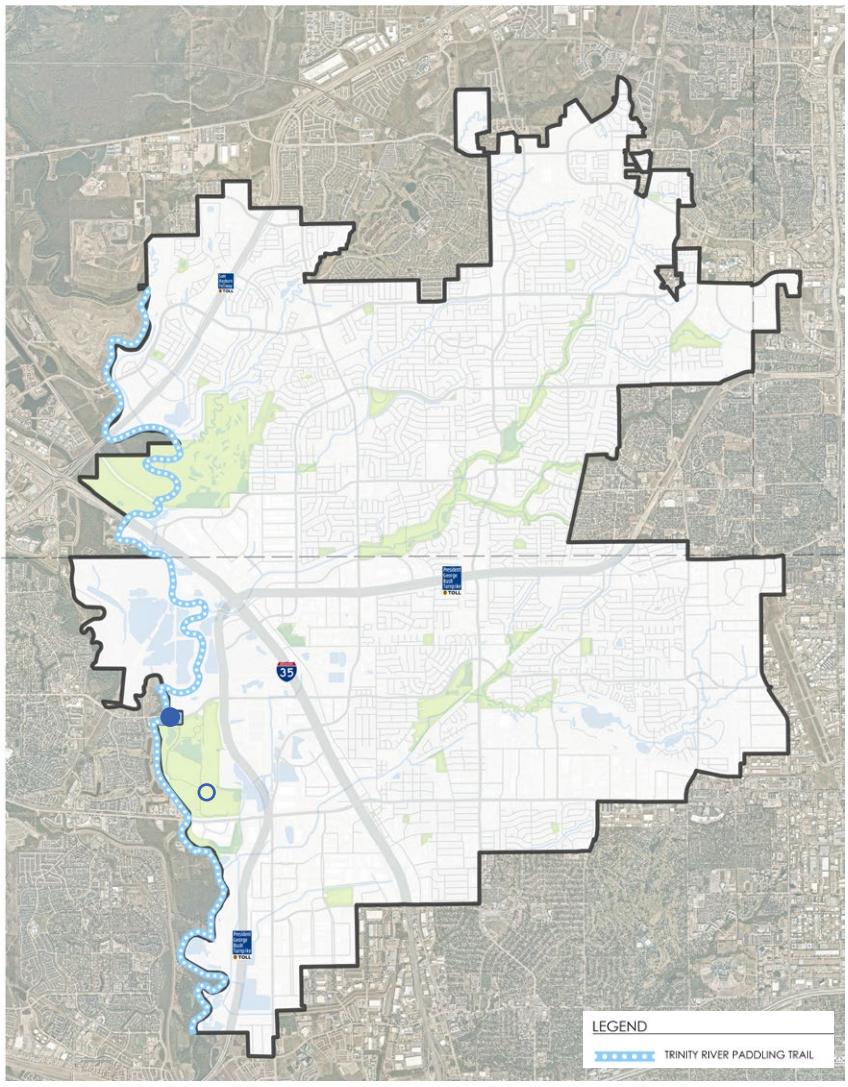
All trails provide outdoor recreation and exercise, but residents and visitors looking for a more immersive natural experience can visit the nature trails and paddling trails near the banks of the of the Trinity River as it passes through Carrollton.

Nature trails

Carrollton's nature trails are limited to the Elm Fork Nature Preserve in McInnish Park. This beautiful mulch trail is routed along the banks of the Trinity River in the shade of mature trees and includes an interpretive center and signage highlighting the unique characteristics of this hidden gem.

Paddling Trails

Recreational paddling continues to grow in popularity, as more people realize that canoes and kayaks provide a unique perspective to experience north Texas' waterways. The kayak launch at McInnish Park is an access point for the Trinity River National Water Trail, a 130 mile paddling trail crosses three counties and nine cities.



Benchmark Tour

To gain insight from other established trail systems in the North Texas region, the Dunaway Team conducted a Benchmark Tour with City staff and key contributors. The team selected peer cities that have implemented trail networks and supporting infrastructure relevant to Carrollton's own opportunities. The tour allowed for the group to view and discuss potential solutions for Carrollton's future trail network. Cities visited and their relevance to development of an expanded trail system in Carrollton are documented below:

City of Plano

Locations:

- Oak Point Park & Nature Preserve
- Bluebonnet Trail

Key Features:

- Complex Trail System in an Established Community
- Maximized Use of Utility Easements, Creek Corridors & Parkways
- Preferred use of Bike Routes and Shared Use Lane
- Historic Downtown with DART Station

City of Richardson

Locations:

- Breckinridge Park
- Duck Creek Linear Greenbelt

Key Features:

- Progressive Network of On and Off-Street Trails with Connections to Neighboring Cities
- Variety of Connections Maximize Community-wide Trail Access
  - Drainageways / Creek Corridors
  - Parkways along Roads
  - Utility Easements
  - Railroad R.O.W. (DART)
  - Between Destinations
  - (Schools / Parks / Neighborhoods / Retail)
- Preferred Use of Dedicated Bike Lanes
- Systemwide Theming
  (stonework, city identity, monuments, etc.)

Benchmark Tour

City of Grand Prairie

Locations:

- Mike Lewis Park
- Good Link Trail

Key Features:

- Trail Network Connections to Trail Loops within Parks
- Bold Trail / Underpass Connections
- Nicely Themed Architectural Elements *(trailhead shelters, decorative railing, signage, etc.)*
- Complex inter-agency coordination *(City of Grand Prairie, NTTA, Trinity River, etc.)*

City of Grapevine

Locations:

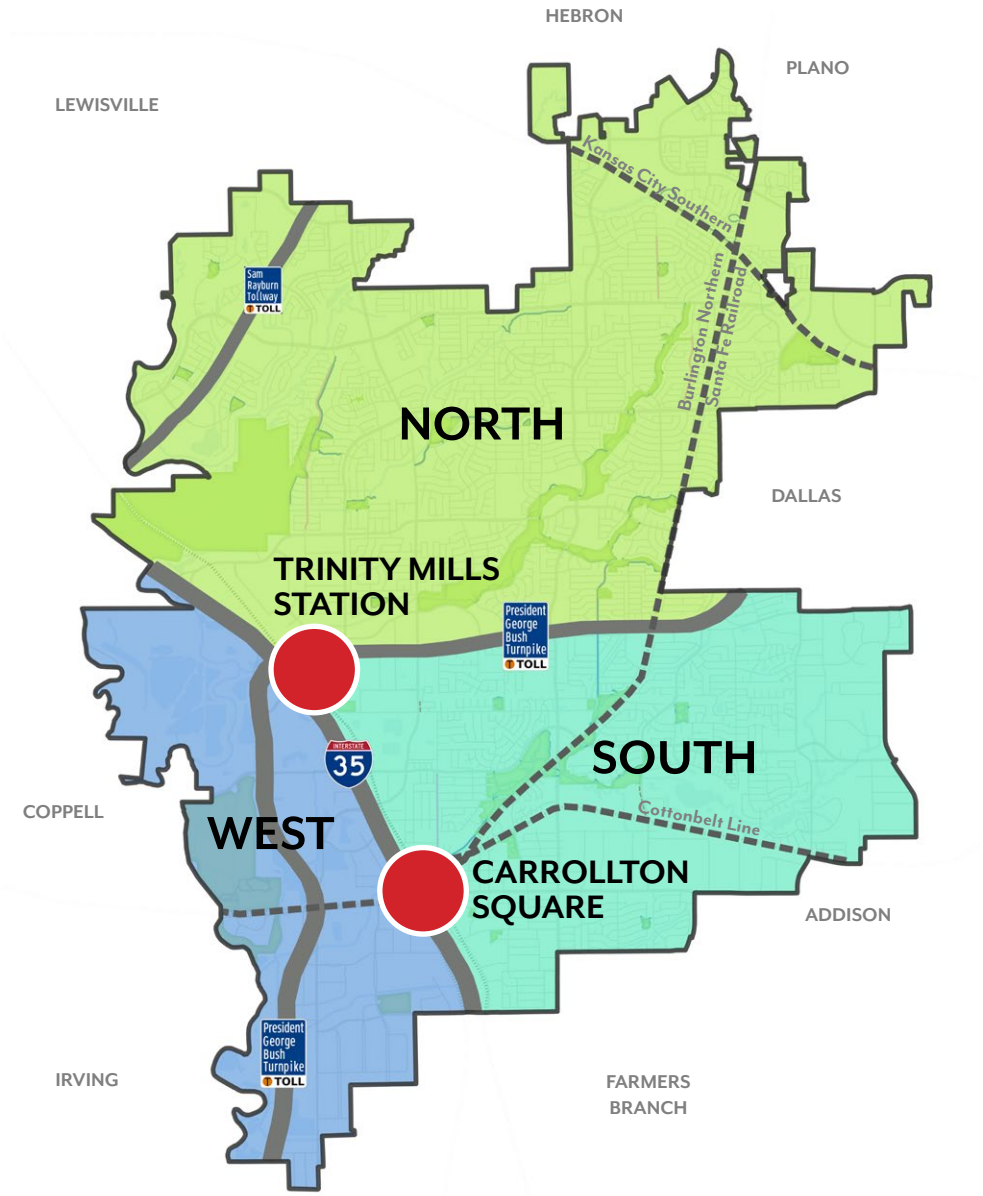
- Oak Grove Park
- North Shore Trailhead

Key Features:

- Destination Mountain Bike and Lakeside Trails
- Historic Main Street Destination with Rail Stop
- Inter-City Railroad Trail Connector *(Cottonbelt Trail)*
- Systemwide Theming *(stonework, city identity, monuments, etc.)*

Character Zones

Dunaway identified four distinct 'Character Zones' to further evaluate the trail network and determine which areas have the greatest need for improvements, which areas can benefit most from strategic investment, and which areas pose the greatest challenges. The context of each zone is defined by development patterns and the infrastructural boundaries and distinct destinations, activities, and natural resources with opportunities to expand mobility and pedestrian connections.



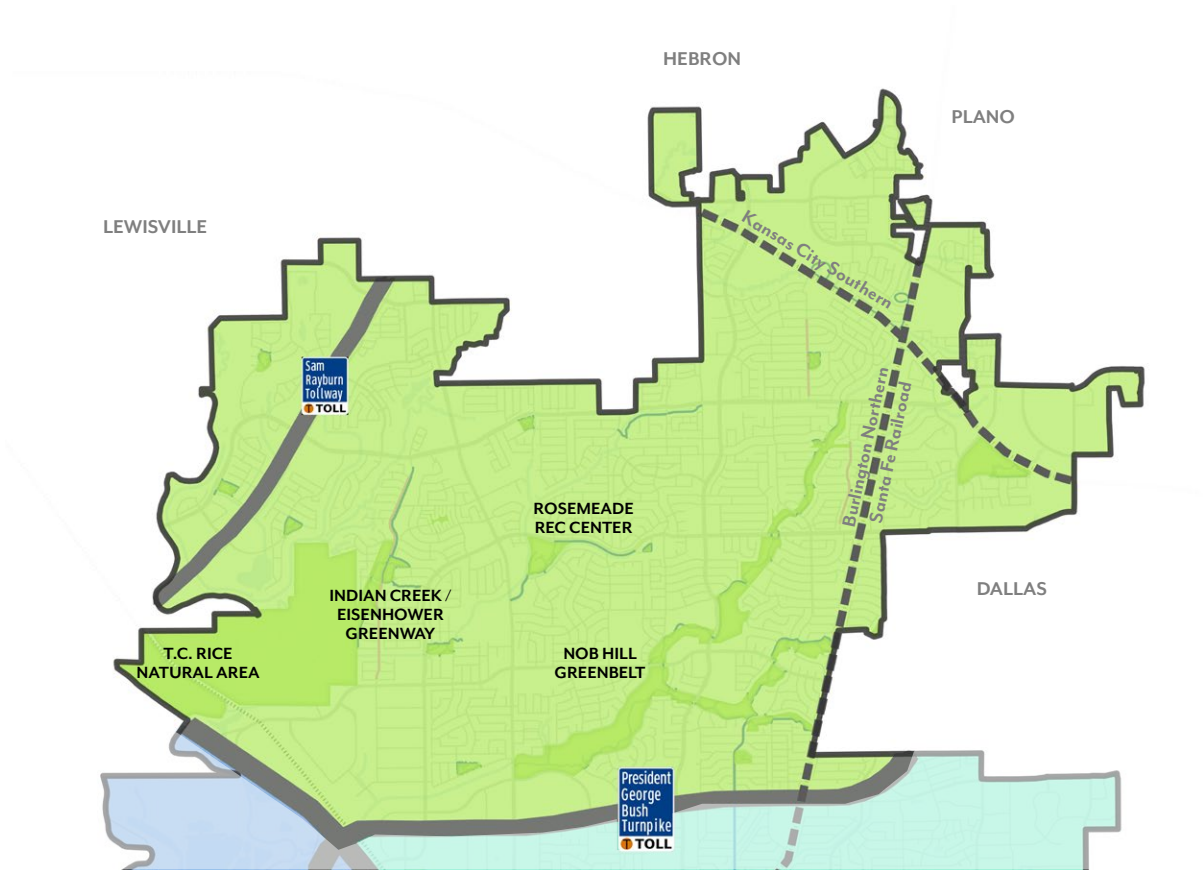
The four (4) Character Zones include: North, South, West & Carrollton Square/Trinity Mills Station.

The following pages are intended to describe key opportunities for trail connection in each "Character Zone" of Carrollton. Existing photos are also included to depict the general character of each zone.

North Character Zone

The North has a predominantly residential land use with a variety of commercial, cultural, and recreational destinations. The boundaries of this sector are defined by I-35 and PGBT, this sector also includes a portion of SH 121 and two railway lines. Each of these infrastructural barriers present a challenge for trail development.

This zone includes natural and recreational assets including multiple neighborhood parks, recreation centers, greenbelts and preserved land. Main trail segments within this zone are the Blue and Orange Trails following Furneaux Creek and the Eisenhower Greenbelt along Indian Creek. Portions of the future Red Trail are in various stages of design and construction. On-Street facilities are limited to several neighborhood streets. Close proximity to regional recreation destinations, LELLA and Arbor Hills, this zone presents an opportunity for trail connections to Lewisville and Plano.



Existing Facilities:

Off-Street

Blue & Orange and Red Trails

Eisenhower Greenbelt Trail

On-Street

Scott Mill Rd Bike Lane

Key Considerations:

Parks & Greenways

Red Trail Extension

T.C. Rice

Rail Corridors

BNSF & Kansas City Southern

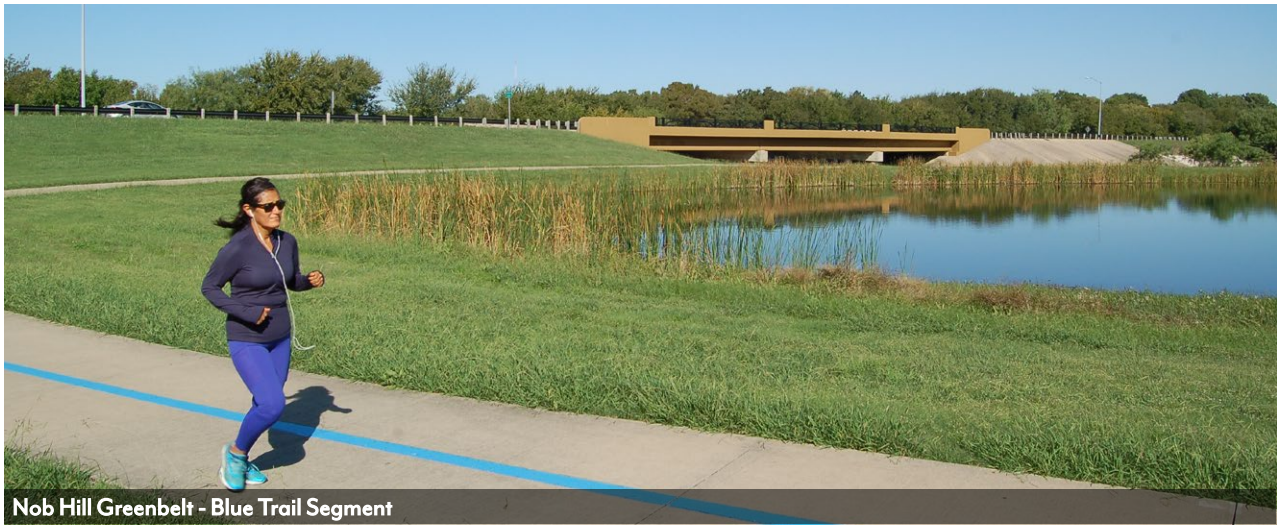
Regional Connections

Lewisville (LLELA)

North Character Zone


Kansas City Railroad - Elevated Track


Bridge at Mustang Park

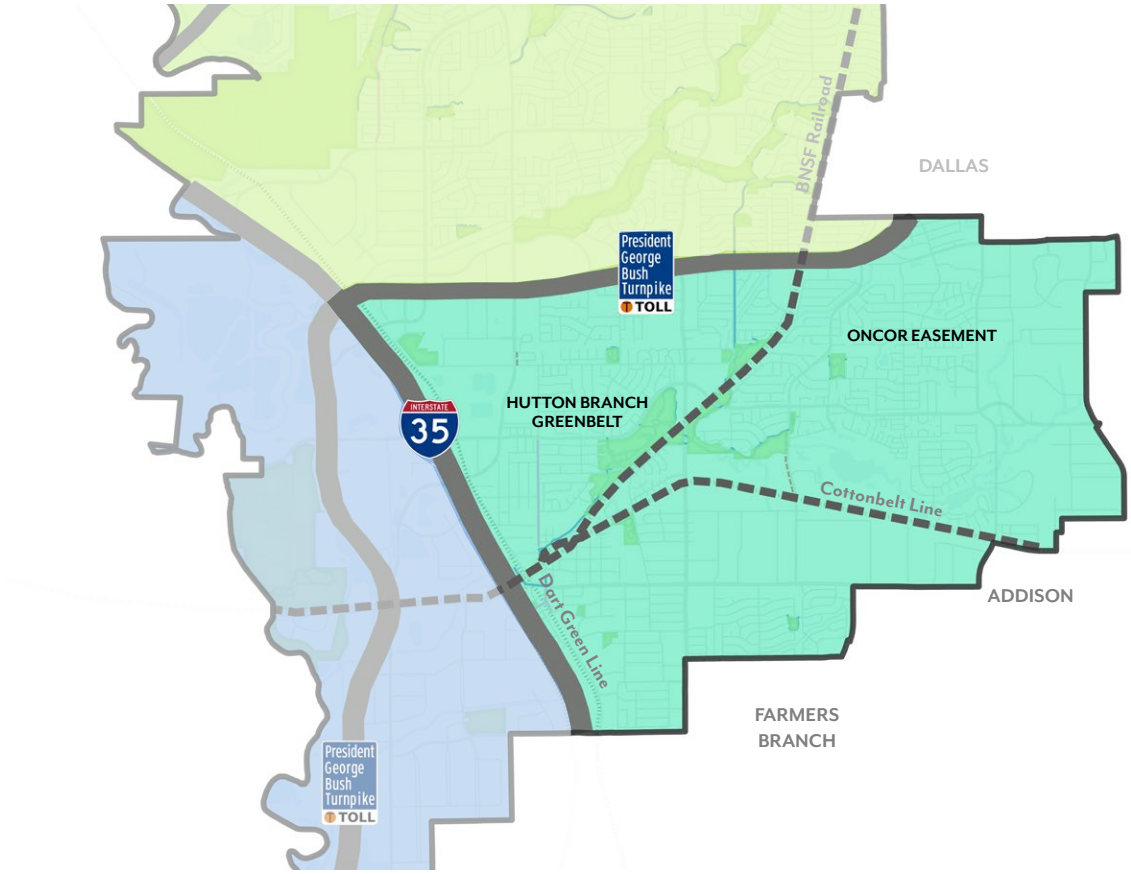

Nob Hill Greenbelt - Blue Trail Segment


At-Grade Crossing

Under Bridge Crossing

South Character Zone

The South character zone includes established residential neighborhoods with areas of commercial and industrial land uses. Electric transmission lines and the rail line cross the zone, posing both obstacles and opportunities for trails. This zone is directly adjacent to both the Trinity Mills and Downtown Carrollton Station and includes highway frontage along I-35 and PGBT. The most notable existing trails in this zone are the Purple and Green segments which follow the Hutton Branch Greenbelt.



Existing Facilities:

Off-Street

Purple & Green Trails

On-Street

Denton Drive Bike Lane

Key Considerations:

Parks & Greenways

Oncor Transmission Easement

Rail Corridors

Cottonbelt, DART & BNSF

Regional Connections

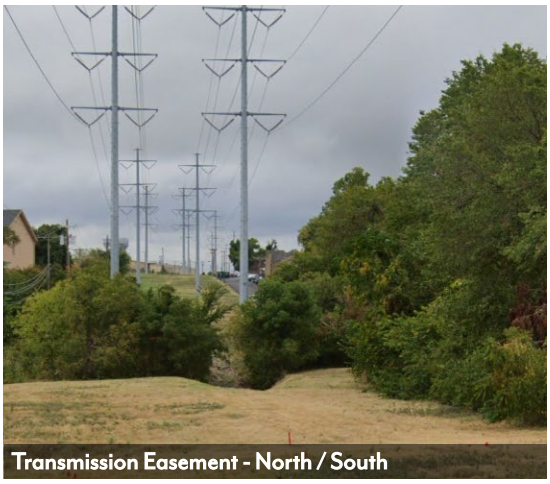
Farmers Branch & Addison

On-Street

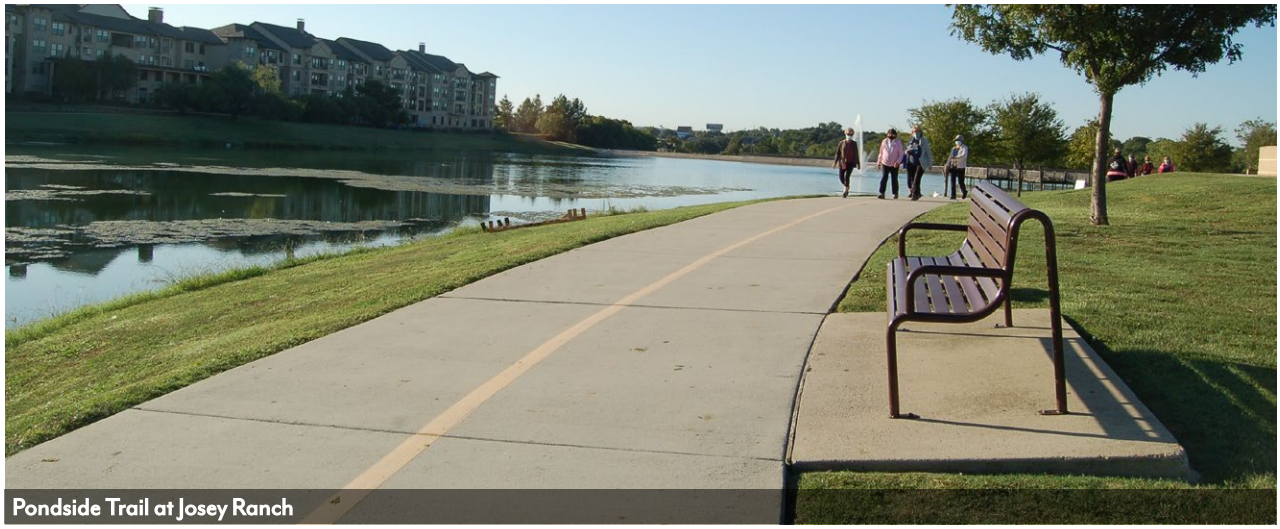
Greenbelt Bike Lanes Connections

South Character Zone

Transmission Easement - East / West



Transmission Easement - North / South



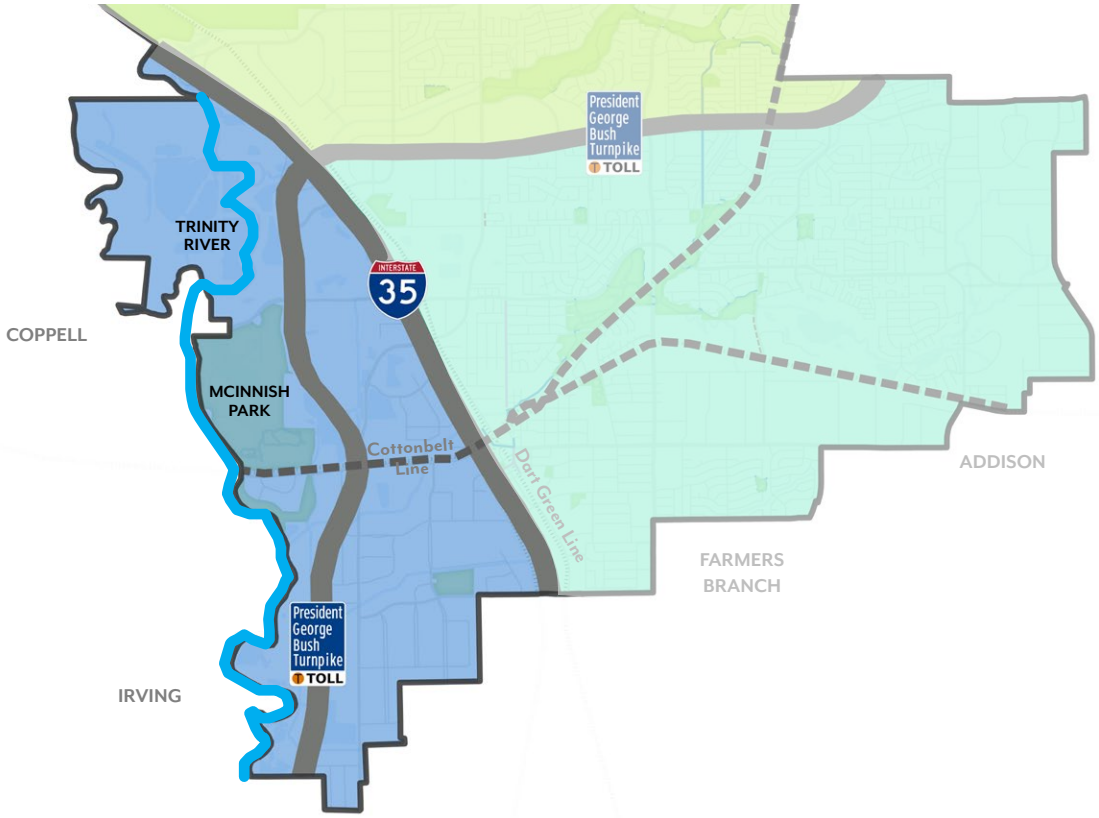
Pondside Trail at Josey Ranch

Denton Drive with Center Turn Lane

Kelly Road Right-of-Way

West Character Zone

The built environment of the West Zone is predominantly industrial and commercial uses in the shadow of elevated freeway columns for PGBT. The Trinity River Corridor is the dominant natural feature with natural riparian vegetation and habitats as well as the popular regional draw McInnish Park, which includes sports fields, soft-surface nature trails and paddling trail launch sites. The planned Veloweb trail alignment will eventually link this amenity to the residents that live east of I-35.



Existing Facilities:

Paddling & Nature Trails

Trinity River National Water Trail

Elm Fork Nature Preserve Trail

Key Considerations:

Parks & Greenways

McInnish Park

Trinity River

Rail Corridors

Cottonbelt Line

Regional Connections

Coppell

West Character Zone

I-35 & President George Bush Tollway

McInnish Park Road

Kiosk at Trinity River Kayak Launch

Elevated Cottonbelt Line at RE Good Sports Complex

Carrollton Square

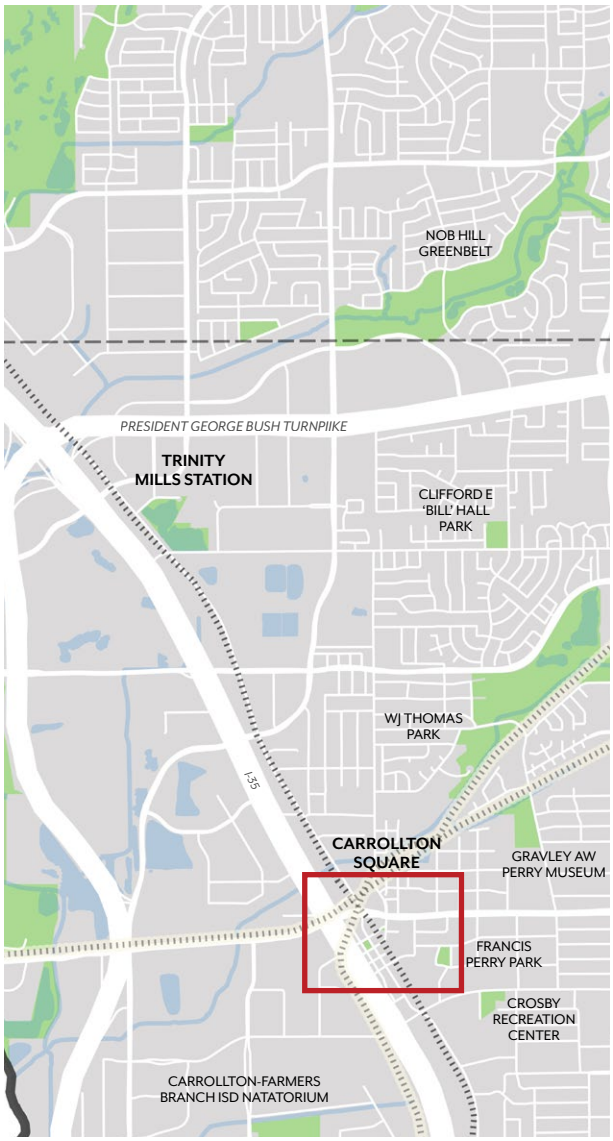
The historic Carrollton Square area is one of the oldest districts in the city. Developed initially as a mix of commercial land-uses with on-street parking, sidewalks, and public spaces in a traditional development pattern. The district has seen continued reinvestment and redevelopment of the area has resulted in a diverse mix of people that live, work and visit the district each day. In 2010, the Downtown Multi-Modal Station was constructed making the district accessible by train. There are currently two platform expansions planned at the station to accommodate DART Silver Line and DCTA trains. The areas popularity and continued growth highlights the need for trail links and active transportation and infrastructure throughout the district.

Existing Facilities:

- » *Downtown Multi-Modal Station*
- » *Broadway Trail*
- » *Civic / Event Spaces*

Key Opportunities:

- » *Station Expansion*
- » *Walkable District*
- » *Multi-Modal District*



Event at Carrollton Square

Elm Street

Carrollton Square

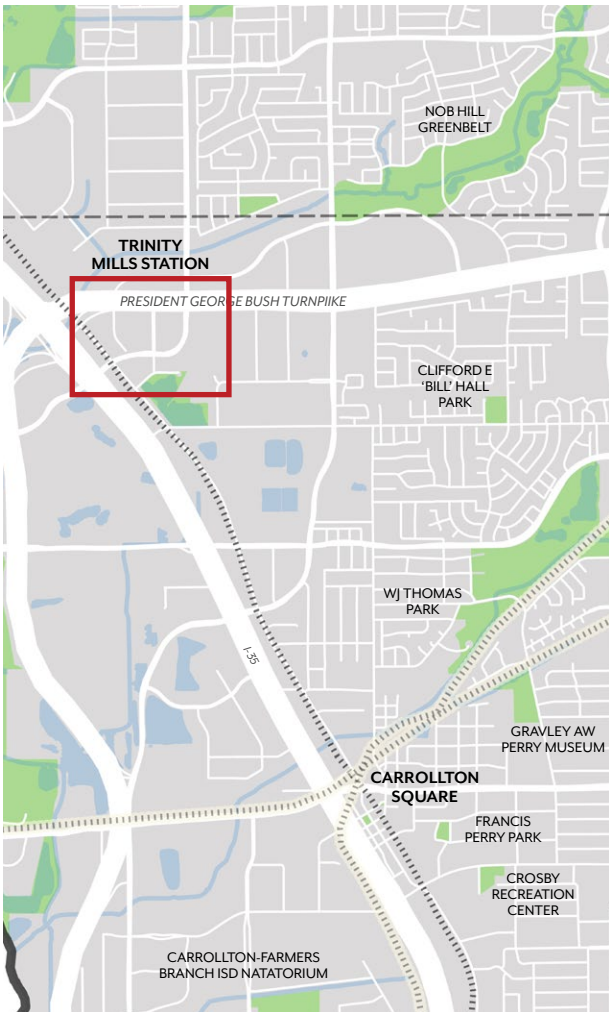
Proposed Veloweb Alignment along DART

Sharrows

Pioneer Park

Trinity Mills Station

The area surrounding the Trinity Mills DART station is being redeveloped into an active mixed-use Transportation Oriented Development (TOD) with office, commercial and multi-family uses centered around public green space. This higher density development increases the need for active transportation infrastructure linking the station, district, and surrounding areas.



Key Opportunities:

- **Planned T.O.D. (Transit Oriented Development)**
  - » *Commercial*
  - » *Residential*
  - » *Hotel*
  - » *Office*
  - » *Entertainment*
- **Public Use**
  - » *Central Park with Esplanade*
  - » *Wide Sidewalks*
  - » *DART Station*
  - » *Special Events*

Proposed Trinity Mills Development

Phase 2: Planning

Phase 2: Planning

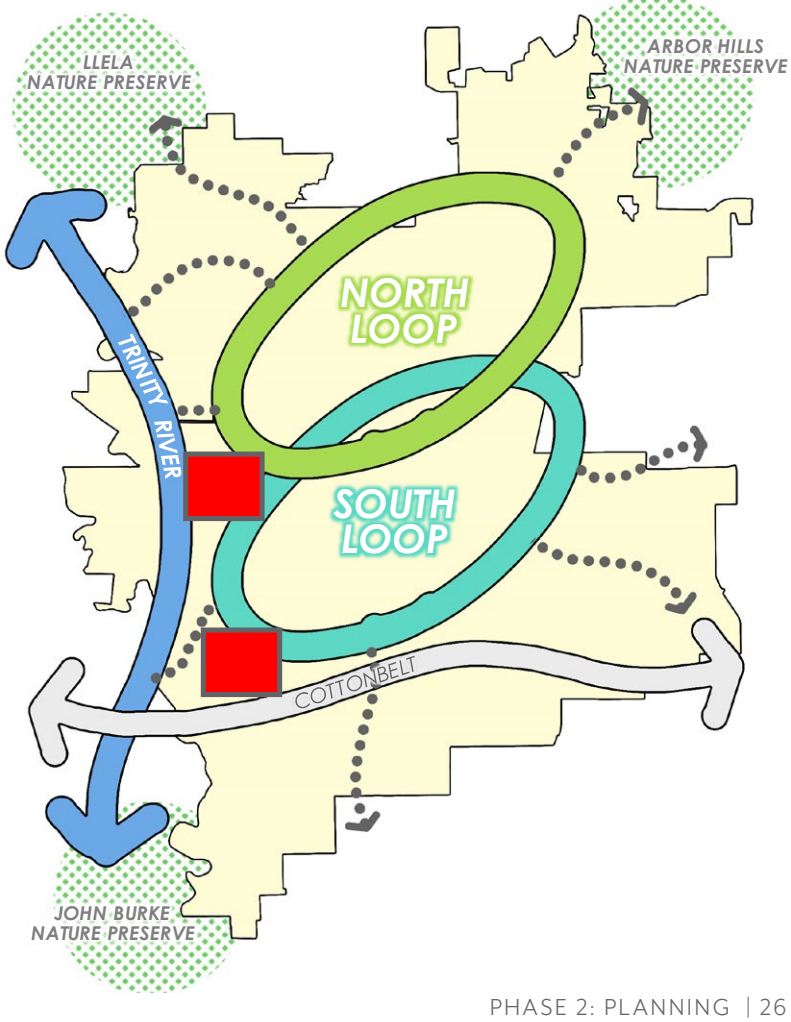
The trails master planning process builds on the information from the analysis phase and establishes an approach for developing a well-connected trail system that serves the needs of current and future Carrollton residents. Input was gathered at a series of meetings with staff, council, board, and community members and incorporated throughout the planning process into the diagrams, maps, guidelines, and implementation strategies that make the Trails Master Plan.

Concept Diagram

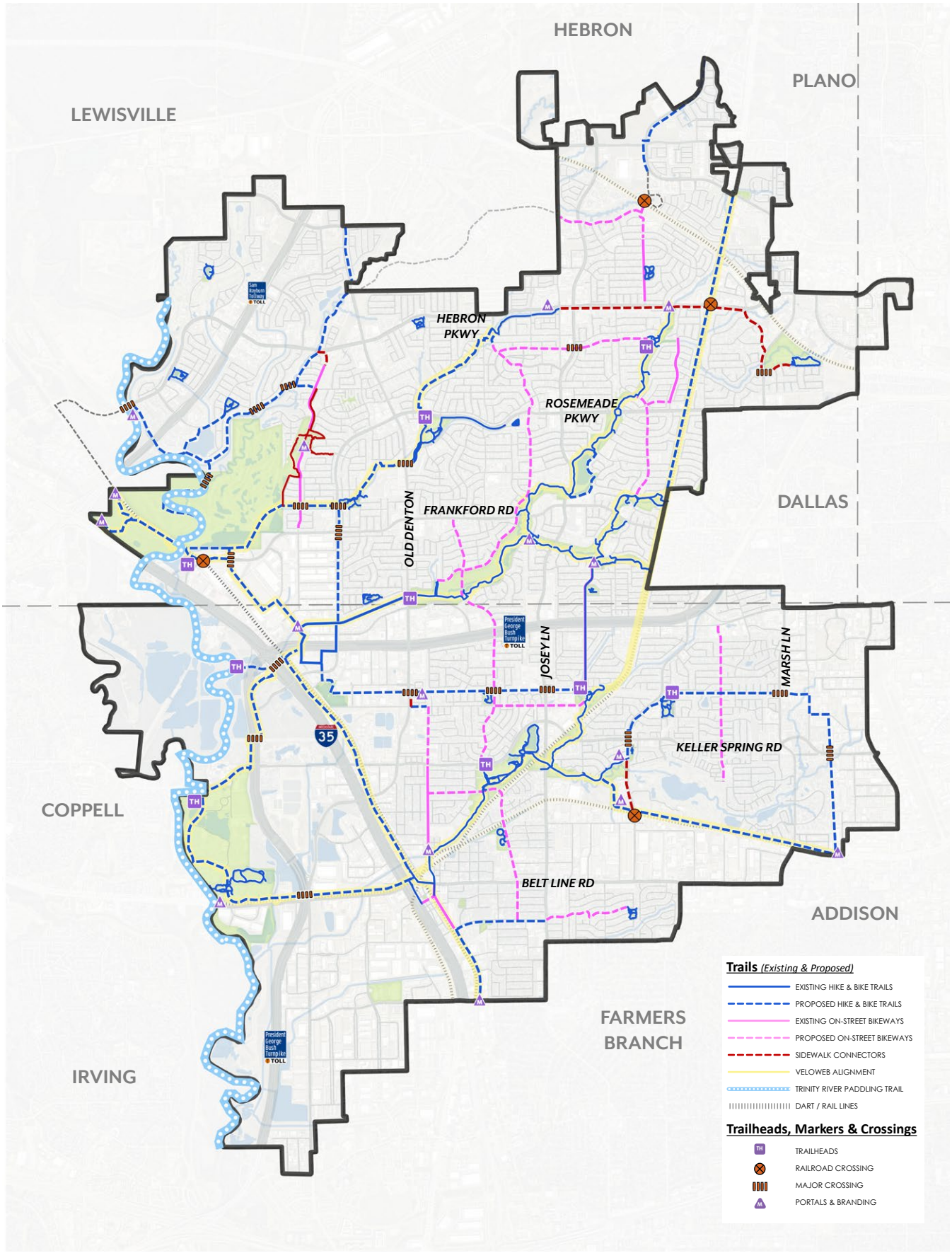
The concept diagram communicates the over-arching design principles of the project in a simplified graphic form, illustrating a well-connected trail network for both pedestrians and bicyclists by linking neighborhoods, schools, parks and transit stations throughout the City. The five defining aspects of the Carrollton Trail Master Plan are (1) trail loops in both the north and south residential areas of the City; (2) active transportation infrastructure around the DART stations; (3) Regional bike network connections; (4) improved access to natural areas (5) and a network of on and off-street trails that link all areas of the City.

Objectives:

- **Loops**
  - » *North Loop*
  - » *South Loop*
- **Links**
  - » *Tributaries & Utility Corridors*
  - » *On-Street Bike Lanes*
  - » *Veloweb*
  - » *Cottonbelt*
- **Green Connections**
  - » *LLELA Nature Preserve*
  - » *Arbor Hills Nature Preserve*
  - » *John Burke Nature Preserve*
  - » *Trinity River*
- **Key Destinations**
  - » *Carrollton Square*
  - » *Trinity Mills Station*

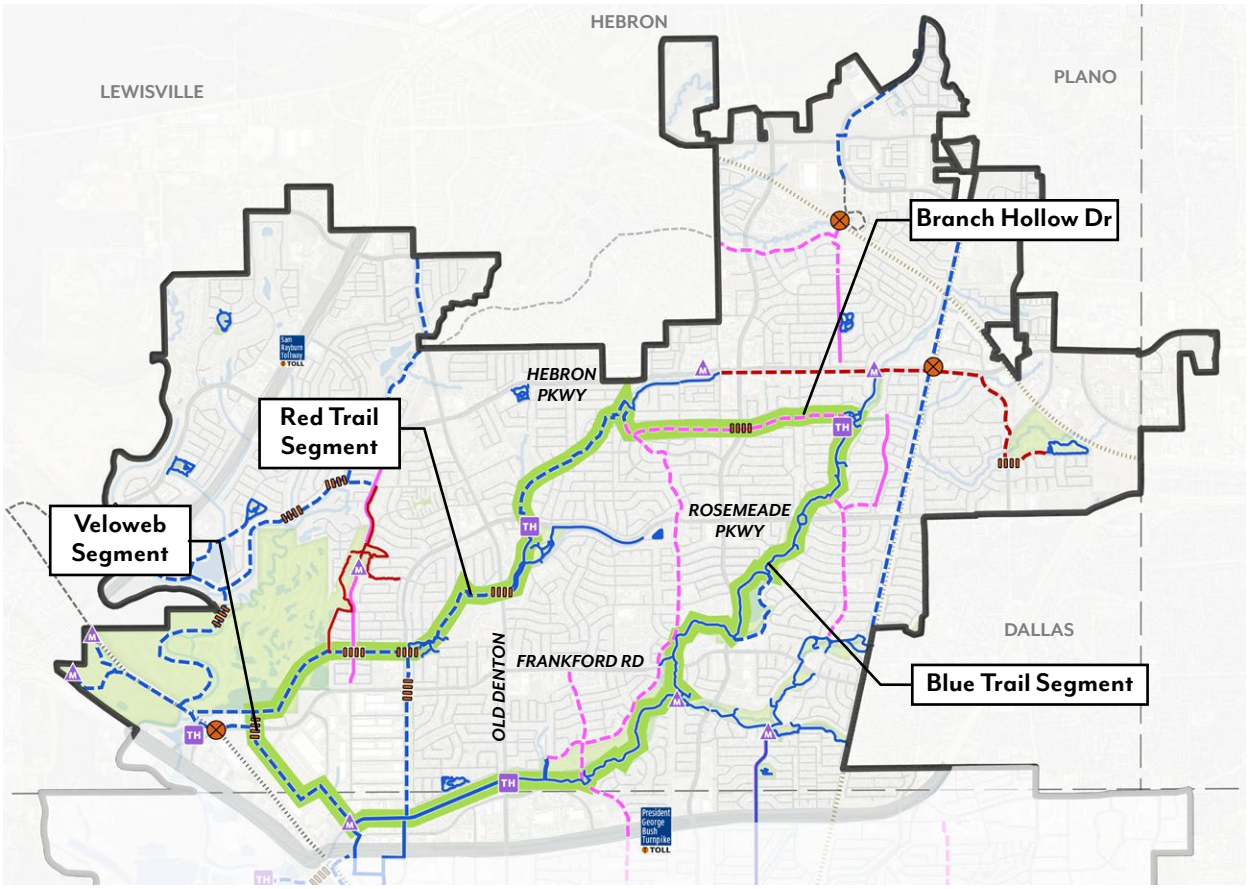


This map illustrates the entire Carrollton Trails System, identifying trail corridors, significant crossings and location of support infrastructure.



North Loop

The defining feature in the North is a continuous 11-mile trail loop that provides direct links to many recreational destinations following greenbelts, creek corridors, and neighborhood streets making it comfortable for recreational and casual riders. Parking areas, trail heads and neighborhood connections provide multiple points of access for the surrounding neighborhoods.



Key Segments & Lengths:

- » **Red Trail Segment** (New Connection) - 3.8 mi
- » **Branch Hollow Drive** (On-Street) - 1.5 mi
- » **Veloweb Segment** (DART Green line) - 1.1 mi
- » **Blue Trail Segment** (Existing) - 5 mi

Trails *(Existing & Proposed)*

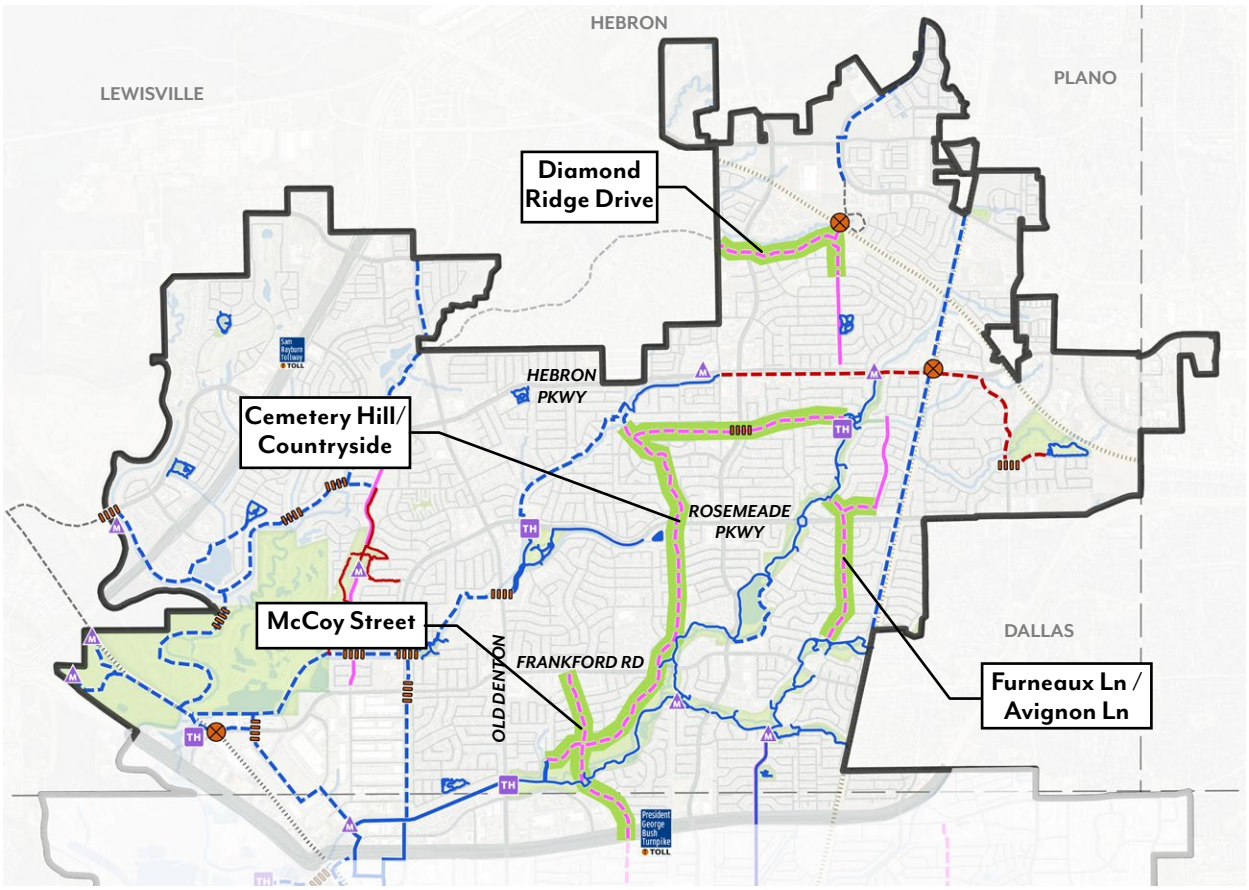
- EXISTING HIKE & BIKE TRAILS
- PROPOSED HIKE & BIKE TRAILS
- EXISTING ON-STREET BIKEWAYS
- PROPOSED ON-STREET BIKEWAYS
- SIDEWALK CONNECTORS
- VELOWEB ALIGNMENT
- TRINITY RIVER PADDLING TRAIL
- DART / RAIL LINES

Trailheads, Markers & Crossings

- TRAILHEADS
- RAILROAD CROSSING
- MAJOR CROSSING
- PORTALS & BRANDING

On-Street Bikeways

On-Street bike routes identified with bike lanes, sharrows or signage provide safe links between main trail corridors and neighborhoods. Selected for light traffic, low vehicle speeds, and appropriate ROW widths these routes mark safe corridors of travel, expanding active transportation options for capable bike riders in North Carrollton.



Key Segments & Lengths:

- » **Cemetery Hill / Countryside** (On-Street) - 2.8 mi
- » **McCoy Street** (Bike Lane) - 1.6 mi
- » **Furneaux Ln / Avignon Ln** (On-Street) - 1.1 mi
- » **Diamond Ridge Drive** (On-Street) - 1 mi

Trails *(Existing & Proposed)*

- EXISTING HIKE & BIKE TRAILS
- PROPOSED HIKE & BIKE TRAILS
- EXISTING ON-STREET BIKEWAYS
- PROPOSED ON-STREET BIKEWAYS
- SIDEWALK CONNECTORS
- VELOWEB ALIGNMENT
- TRINITY RIVER PADDLING TRAIL
- DART / RAIL LINES

Trailheads, Markers & Crossings

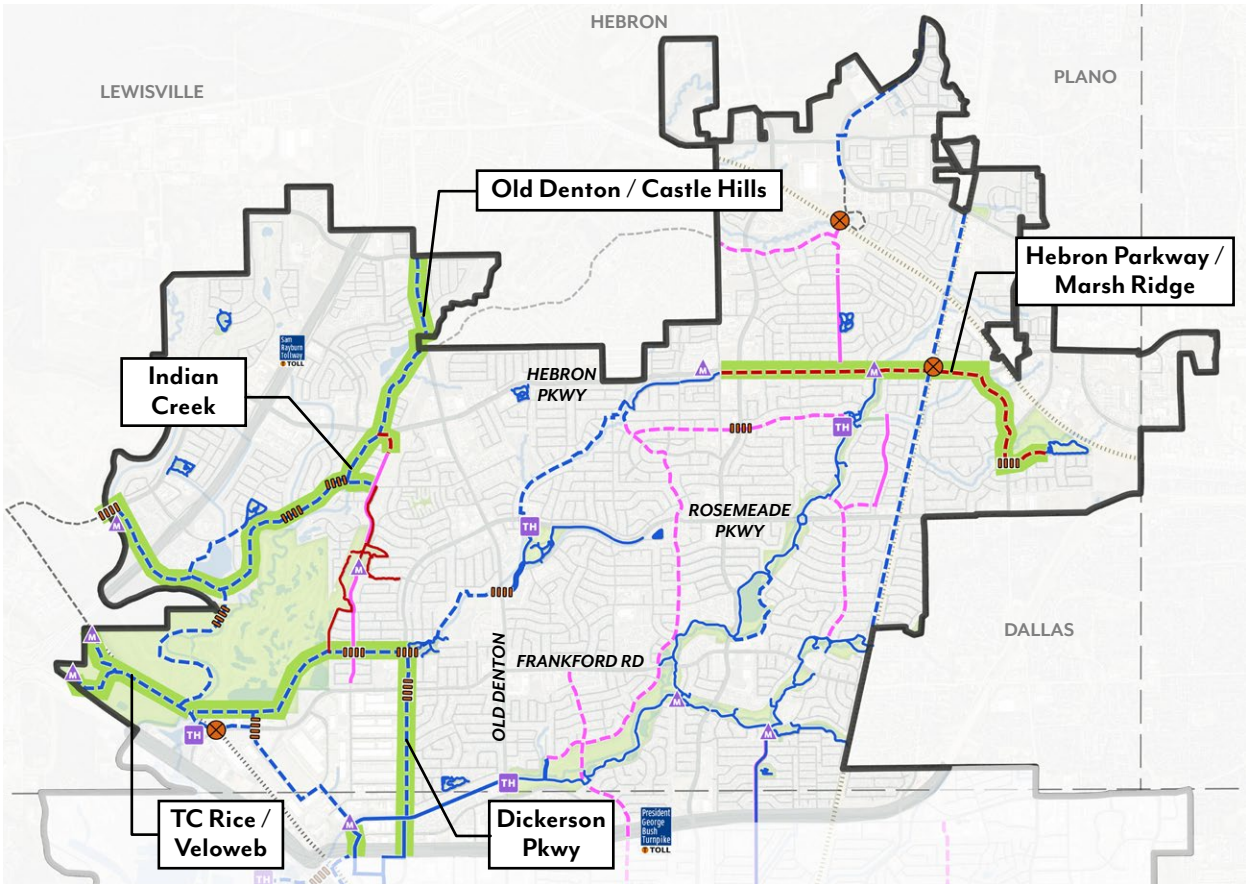
- TRAILHEADS
- RAILROAD CROSSING
- MAJOR CROSSING
- PORTALS & BRANDING

North Network Expansion

Hike and Bike trails following Indian Creek will connect Castle Hills to T.C. Rice nature preserve and Lewisville's kayak launch on the bank of the Trinity River.

A trail connecting the North Loop to Oak Creek Park will follow Hebron Parkway, across the railroad tracks, to Marsh Ridge. This off-street trail alignment will cross the BNSF rail line and utilize existing rights-of-way along roadways.

A trail in the Dickerson Parkway right-of-way will link the Trinity Mills Station to the North Loop.



Key Segments & Lengths:

- » **Old Denton / Castle Hills Segment** (Off-Street) - 1.1 mi
- » **TC Rice / Veloweb** - 2.8 mi
- » **Hebron Parkway / Marsh Ridge** (Off-Street) - 2.5 mi
- » **Dickerson Parkway** (Off-Street) - 1 mi
- » **Indian Creek** (Off-Street) - 2.5 mi

Trails *(Existing & Proposed)*

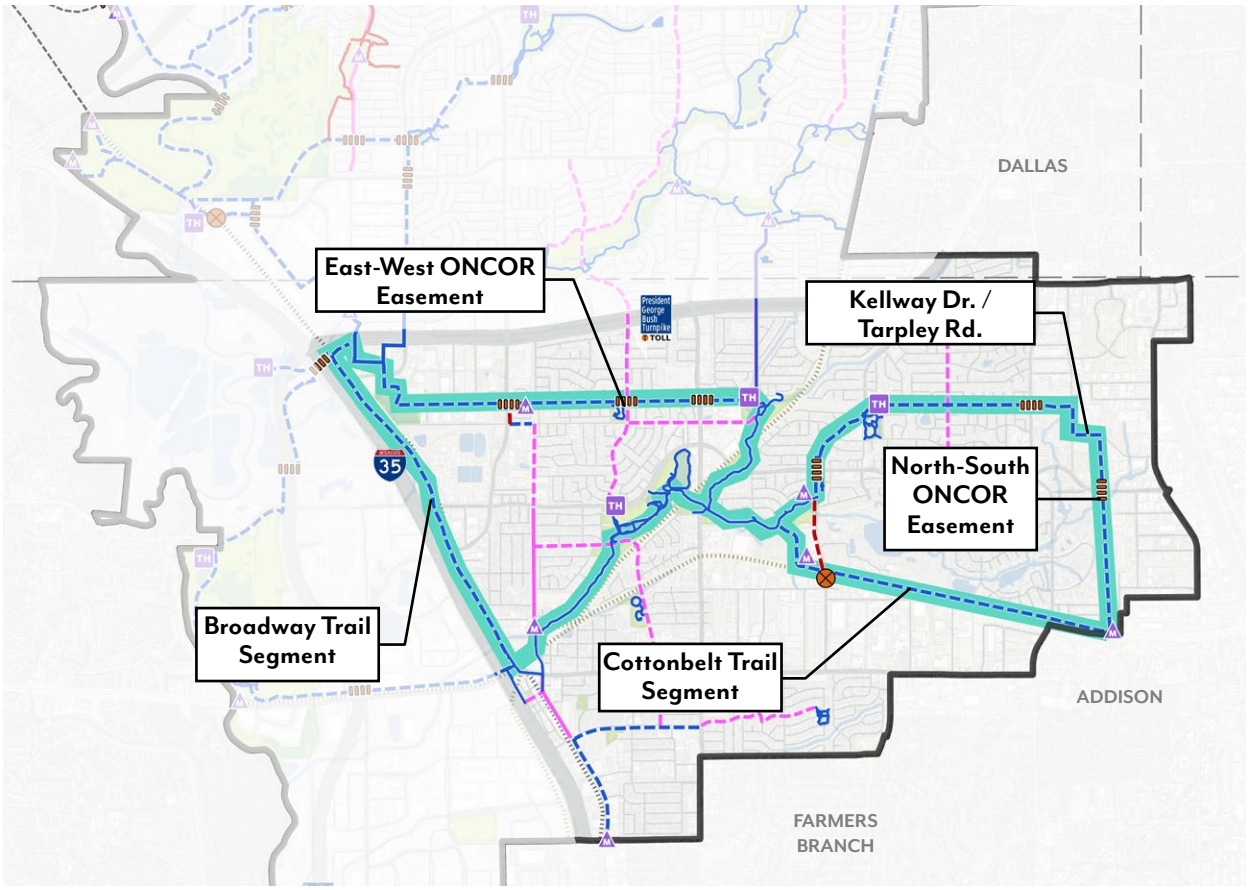
- EXISTING HIKE & BIKE TRAILS
- PROPOSED HIKE & BIKE TRAILS
- EXISTING ON-STREET BIKEWAYS
- PROPOSED ON-STREET BIKEWAYS
- SIDEWALK CONNECTORS
- VELOWEB ALIGNMENT
- TRINITY RIVER PADDLING TRAIL
- DART / RAIL LINES

Trailheads, Markers & Crossings

- TRAILHEADS
- RAILROAD CROSSING
- MAJOR CROSSING
- PORTALS & BRANDING

South Loop

The two trail loops create the framework for all trails and active transportation infrastructure in South Carrollton. The route which follows the Hutton Branch and utility easements to connect regional Veloweb segments, that follow the Cottonbelt and DART corridors, links destinations, neighborhoods and parks throughout Carrollton's southern sector.



Key Segments & Lengths:

- » **East - West ONCOR Easement** - 4.2 mi
- » **Kelley Dr / Running Duke Dr** - 0.4 mi
- » **North - South ONCOR Easement** - 1.2 mi
- » **Broadway Trail Segment** - 2.4 mi
- » **Cottonbelt Trail Segment** - 1.8 mi

Trails *(Existing & Proposed)*

- EXISTING HIKE & BIKE TRAILS
- PROPOSED HIKE & BIKE TRAILS
- EXISTING ON-STREET BIKEWAYS
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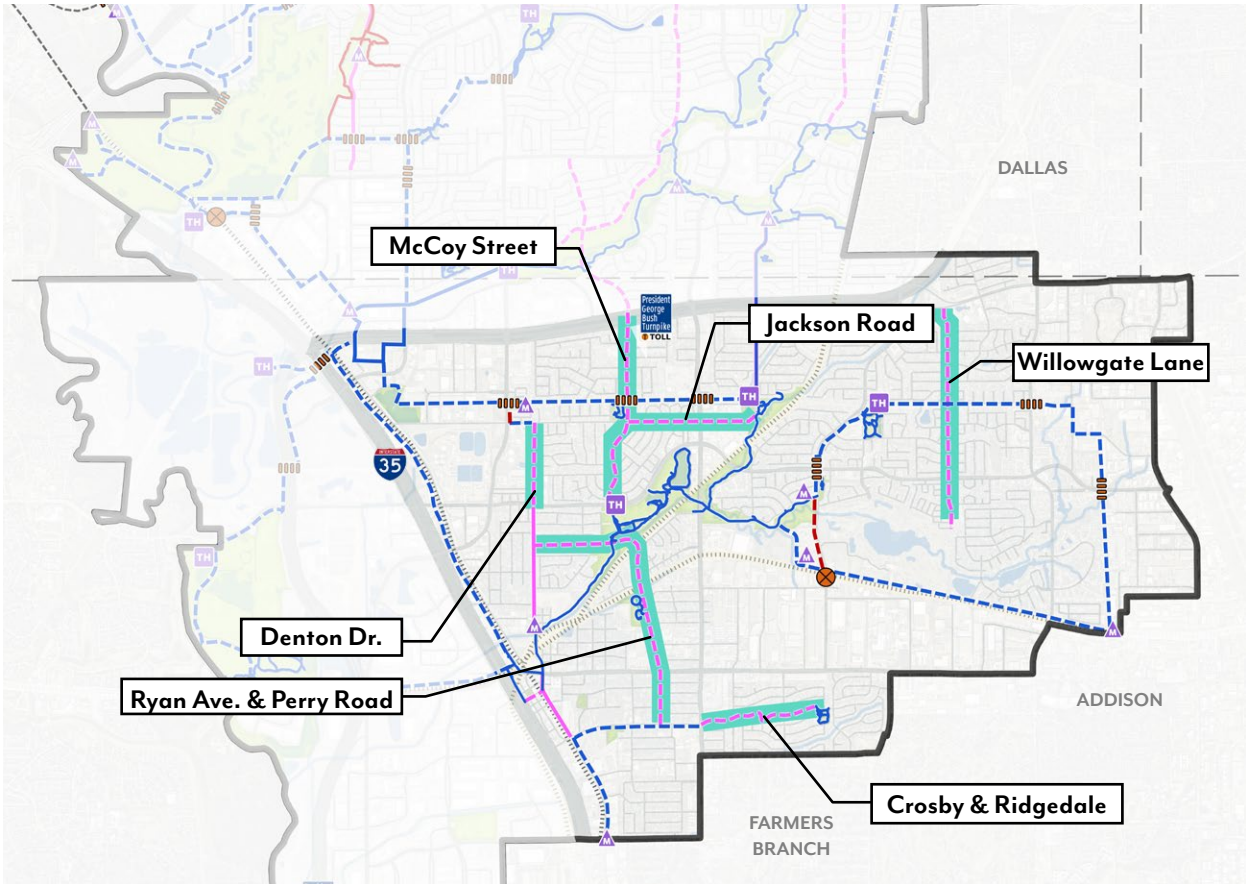
Trailheads, Markers & Crossings

- TRAILHEADS
- RAILROAD CROSSING
- MAJOR CROSSING
- PORTALS & BRANDING

South Neighborhood Connections

Trails and on-street bike lanes extend pedestrian and bicycle connectivity into neighborhoods throughout the district. These routes link the south trail loop, DART stations, and neighborhoods expanding active transportation and recreation options for residents in the southern portion of Carrollton.



Key Segments & Lengths:

- » **Jackson Road** (Bike Lane) - 0.8 mi
- » **McCoy Street** (Bike Lane) - 1.2 mi
- » **Denton Drive** (Bike Lane) - 0.5 mi
- » **Kelly Road** (Bike Lane & Sharrows) - 1.1 mi
- » **Crosby & Ridgedale** (Sharrows) - 0.8 mi
- » **Ryan Avenue & Perry Road** (Sharrows) - 1.7 mi

Trails *(Existing & Proposed)*

- EXISTING HIKE & BIKE TRAILS
- PROPOSED HIKE & BIKE TRAILS
- EXISTING ON-STREET BIKEWAYS
- PROPOSED ON-STREET BIKEWAYS
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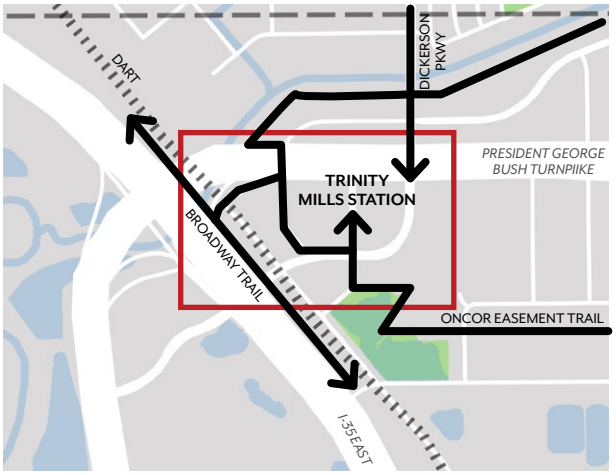
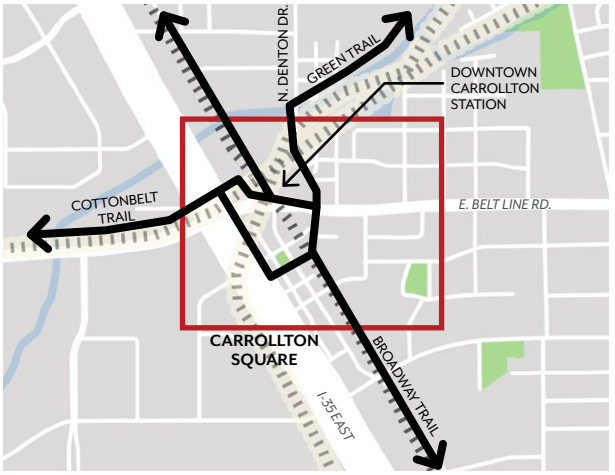
Trinity Mills Station

The district around the Trinity Mills Station is planned to be a Transit Oriented Development. Wide sidewalks within the development will accommodate pedestrian traffic throughout the district. New trail network improvement should be focused on providing on and off-street trail links that extend into the surrounding neighborhoods and districts. These links include a Broadway Trail Connection, a link to the Oncor Trail segment, and on-street bikeway improvements along Dickerson Parkway.



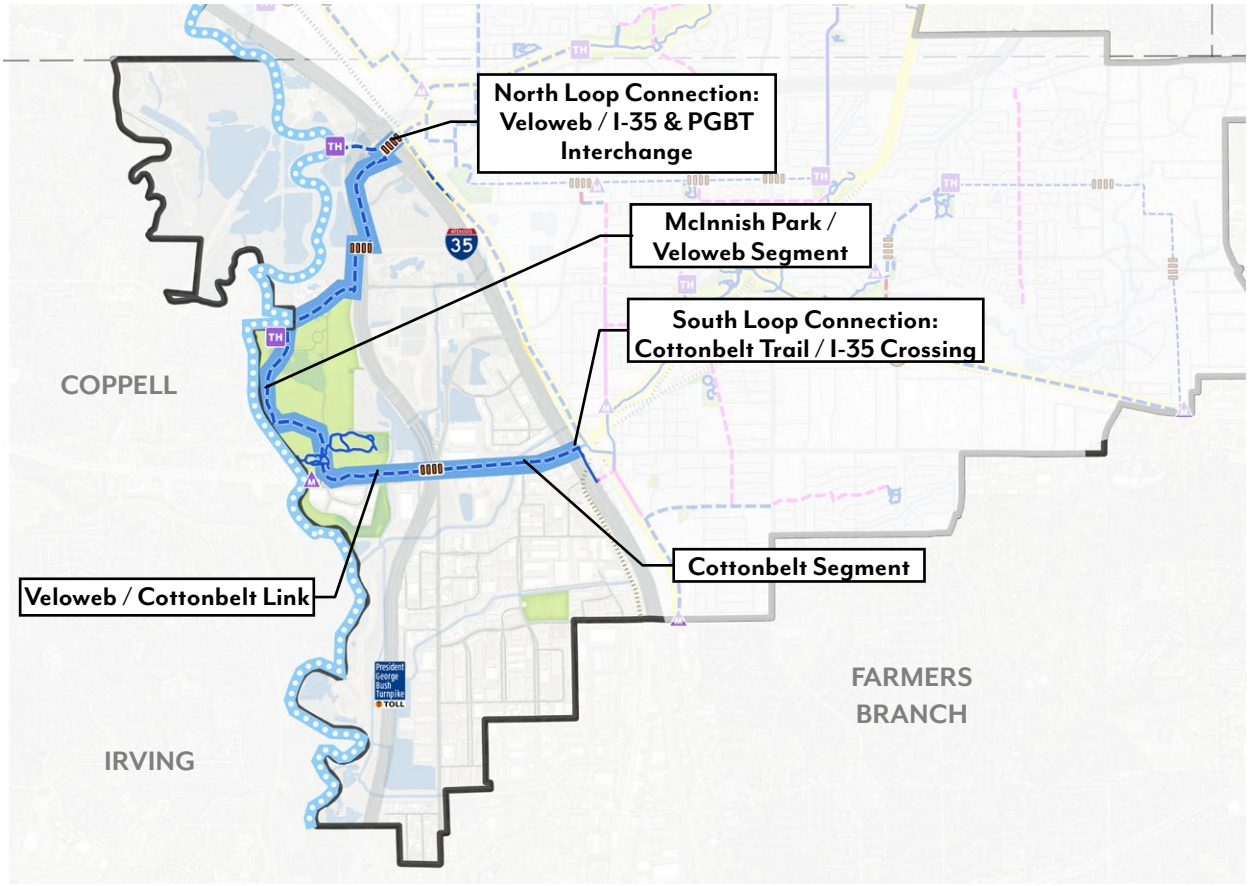
Carrollton Square

Carrollton Square's mix of businesses, multi-family developments, and civic spaces attract a diverse group of visitors each day. The streetscapes created by the traditional development patterns accommodate drivers, parked cars, bicyclist and pedestrians. Special events can attract even larger crowds creating more potential conflicts. Trail improvements to this area should be focused on safe sidewalk connectors for pedestrian, on-street shared lane markings on key roadways, and sidepath connections to nearby trail segments.



West Network Expansion

Paddle trails and the Regional Veloweb in West Carrollton provide recreational opportunities that extend beyond the boundaries of the City. Under-bridge crossings at the PGBT / I-35 interchange, and along the Cottonbelt Trail, link east and west sides of the city making these resources more accessible to residents of the City.



Key Segments & Lengths:

- » **North Loop Connection: Veloweb / I-35 & PGBT Interchange**
- » **South Loop Connection: Cottonbelt Trail / I-35 Crossing**
- » **McInnish Park / Veloweb Segment** - 2.8 mi
- » **Veloweb / Cottonbelt Link** - 1.7 mi

Trails *(Existing & Proposed)*

- EXISTING HIKE & BIKE TRAILS
- PROPOSED HIKE & BIKE TRAILS
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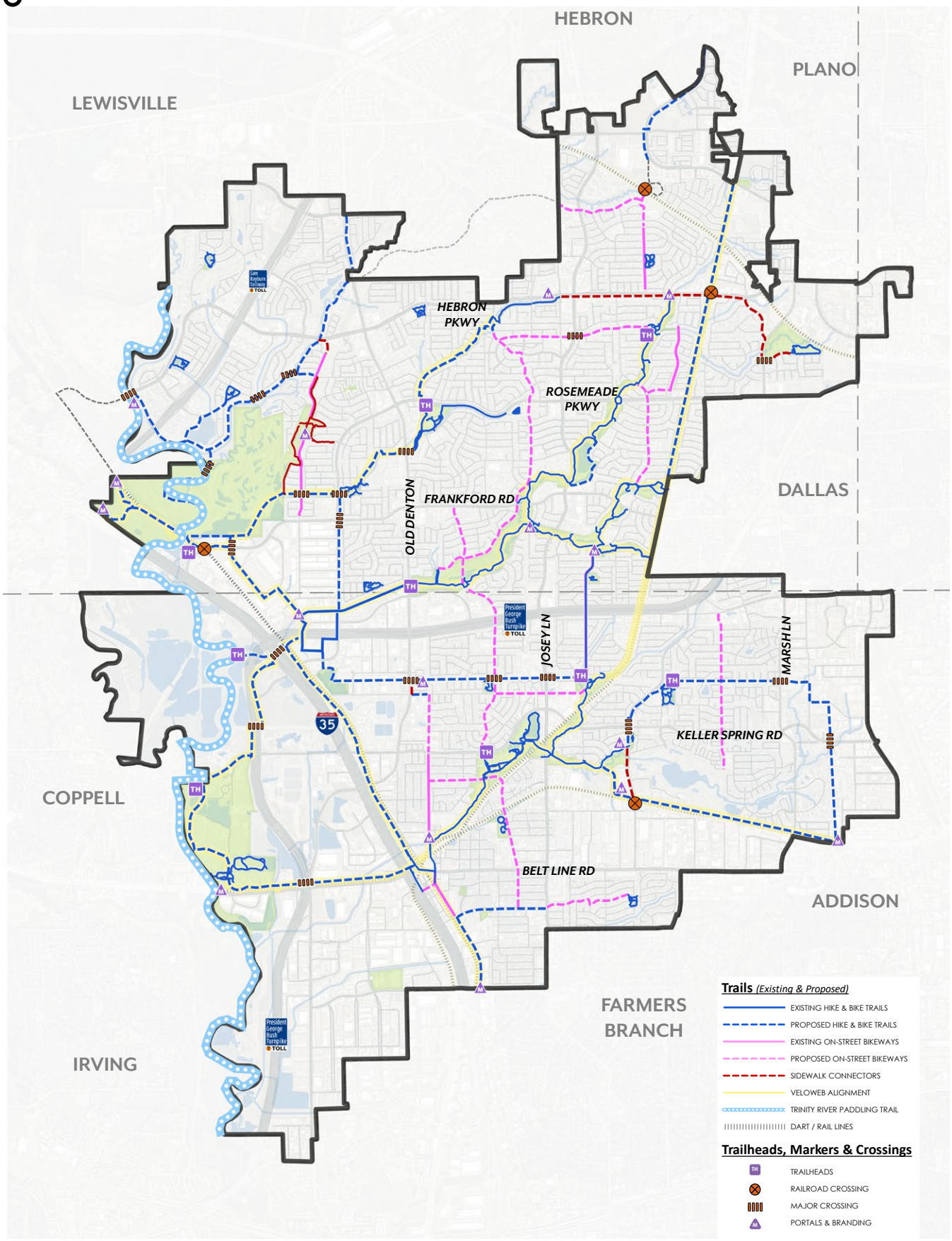
Preliminary Trail Master Plan



Phase 3: Recommendations

Phase 3: Recommendations

Carrollton's trail system is comprised of a hierarchy of trail types and support infrastructure. The following pages outline recommendations for each category including trail location opportunities and general design standards.

Hike & Bike Trails

Shared-use paths that accommodate two-way traffic for both pedestrians and bicyclist. These trails provide separation from vehicular traffic and can be in parks, easements or adjacent to roadways.

On-Street Bikeways

Roadways marked with signs, 'sharrows' or striped bike lanes indicate that cars and bikes are to share the roadway and identify routes that connect neighborhoods and destinations with the rest of the trail network.

Crossings

Locations where trails cross infrastructural barriers like highways, roadways and railroads should be designed to prioritize bicyclist and pedestrian safety.

Sidewalk Connectors

Locations where constraints do not permit full trail construction, sidewalks can be utilized for short links and connections between other off-street hike and bike trails.

Trailheads

Enhanced trail access points that orient users throughout the network. Trail heads are often locations where motorists transition to cyclists. Typically, they include parking, signage, and furnishings, where users can gather or rest along the trail.

Portals & Branding

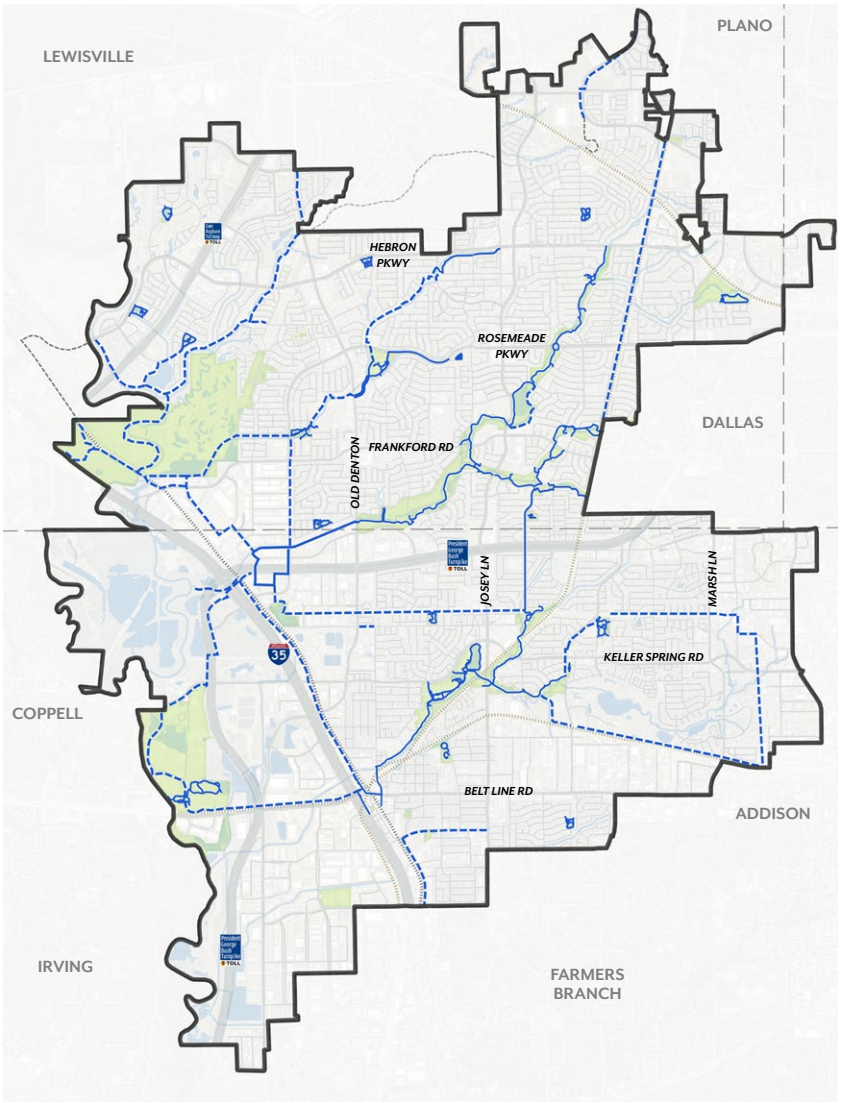
Monuments, markers and signage shall support a constant City identity and image. Promoting trail tourism and recreational opportunities to residents and visitors alike.

Hike & Bike Trails

Trails that follow the Trinity River's tributaries extend deep into Carrollton, these signature hike and bike trails make the backbone of the trail network. Other trails in the city follow roadways or encircle parks providing important links and recreation opportunities to residents.

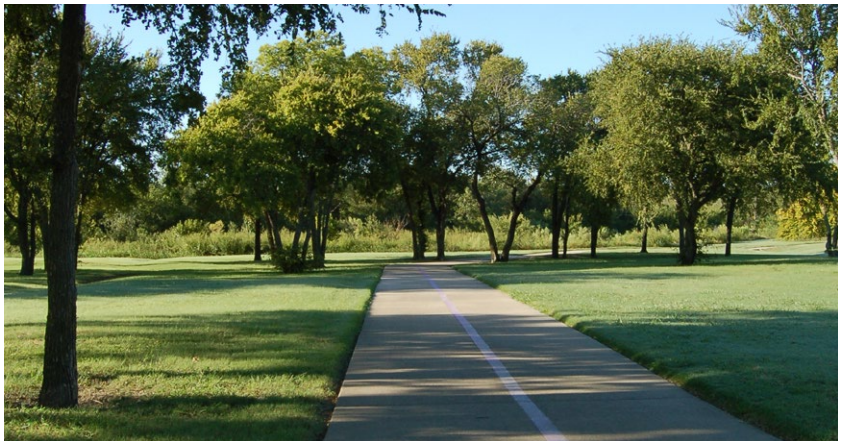
Shared-Use Path is the AASHTO designation for two-way bike and pedestrian trails; often referred to as greenway trails when located in parks, natural areas, easements and drainageways or as sidepaths when they follow along roadways. No vehicle access and limited conflict with motor vehicles make these trails the most comfortable and safe walking and biking experience.

The Red Trail, Cottonbelt, DART, and Veloweb trails are in various stages of implementation, and will follow railway corridors. Other new trails will be in established roadway rights-of-way and utility easements, like the cross-city segment that follows the Oncor transmission lines



Key Hike & Bike Trail Locations:

- The Red Trail
- Oncor Transmission Easement
- Cottonbelt Trail
- Broadway Trail
- Veloweb Trails



Hike & Bike Trail in Park

Design Standards: Hike & Bike Trails

The list below outlines a general set of guidelines that can be used for planning and implementing Hike & Bike trails.

Trails, also referred to as shared use paths, are intended for two-way traffic of bicyclists and pedestrians and should be designed in accordance with AASHTO Guidelines for Pedestrian and Bicycle Facilities.

Construction shall generally follow the Carrollton General Design Standards (GDS). and be constructed of highly durable materials. Highly durable materials that are common in the north Texas region include steel reinforced concrete, glass fiber reinforced concrete, and asphalt paving with prepared aggregate base.

All trails identified to be on the Veloweb or as regional connections shall be 12' wide (minimum).

Hard surface trails should be constructed 12' wide (typical). Neighborhood Park loops and limited trail connections may be 10' or 8' (min) wide due to limitations or site constraints.

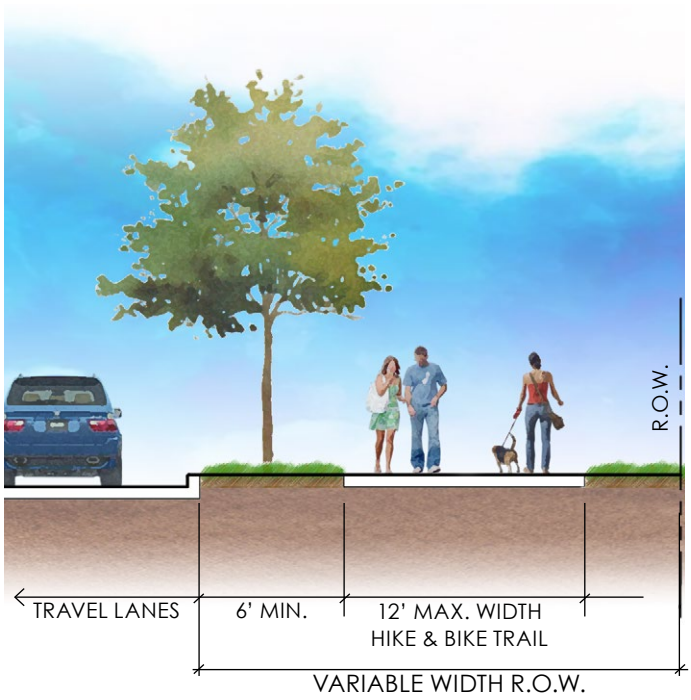
Trails in riparian corridors shall be routed close enough to the creek for an enhanced user experience and visual interaction with the water where appropriate, and away from sharp waterway bends or highly erosive creek bank areas.

In heavily wooded areas, the trail corridor should be wide enough to include the width of the trail surface plus at least 10' to 15' cleated understory brush on each side for visibility / sense of safety. The clear trail corridor should be large enough to allow vehicular access for ease of routine maintenance and emergency access. Accommodations may need to be provided for all-terrain utility vehicles, light duty maintenance trucks, emergency vehicles, brush trucks, etc., as required by the City of Carrollton.

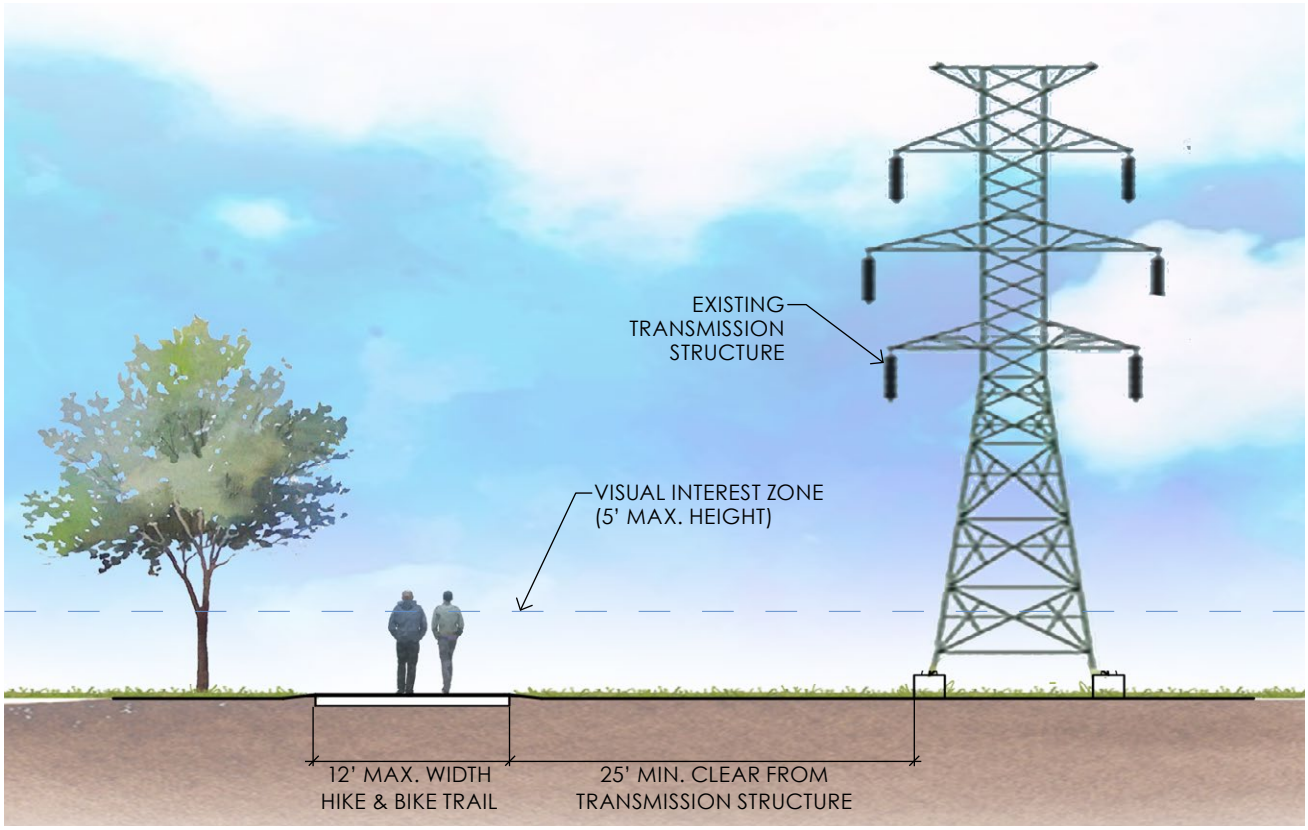
Design Standards: Hike & Bike Trails

The list below outlines a general set of guidelines that can be used for planning and implementing Hike & Bike trails.

Trail in Greenway



Trail in Right of Way



Trail Near Powerline Structure

Design Standards: Hike & Bike Trails

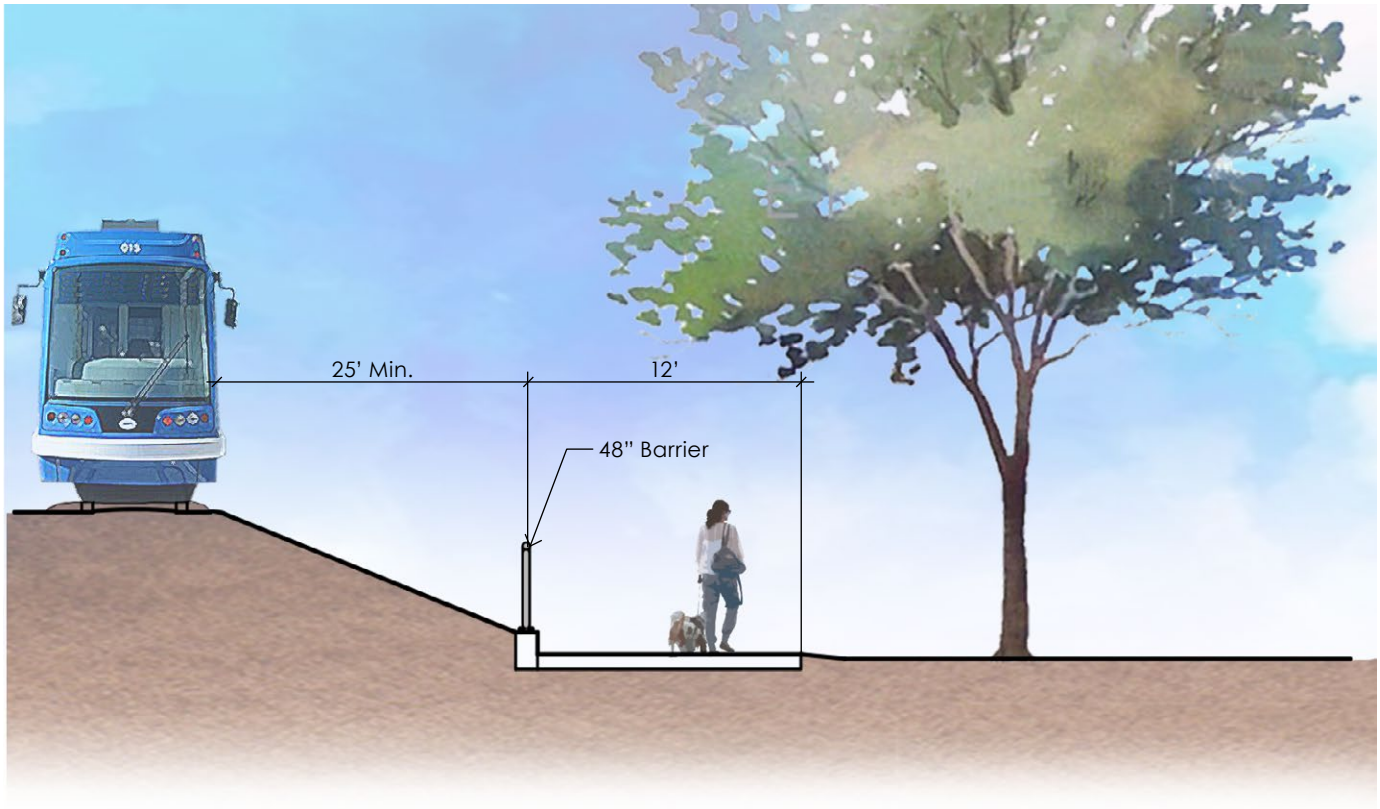
Trails that follow railways are a important for creating regional connectivity. Railway corridors are typically wide enough to accommodate trails and cross infrastructural barriers and governmental boundaries presenting opportunities for regional trail segements.

Trails that follow DART rail lines must be consistent the Hike and Bike Trail Use on DART Right-of-way policy and should should be designed in accordance with Rails with Trails Manual by the US Department of Transportation and all published DART and TexRail guidelines and requirements

Additional design requirements may include.

- *Continuous fence or barrier parallel to tracks.*
- *Positive drainage away from railways*
- *Safety signage and markings*

Shared Use Path in Cottonbelt Line R.O.W.

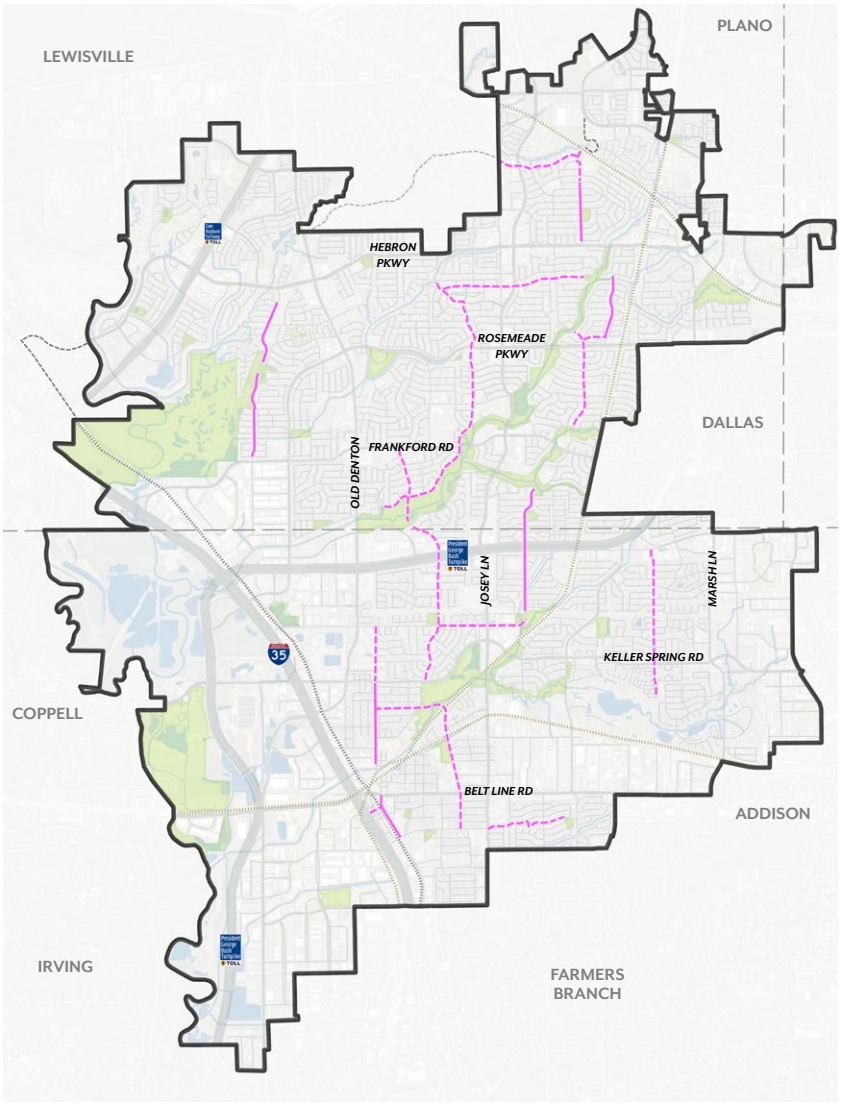


Typical Trail in Rail R.O.W.

On-Street Bikeways

Carrollton's existing on-street bike infrastructure is limited to isolated segments around Carrollton Square and a few streets on the city's east side. Extending these corridors and adding new routes will help to close gaps and improve connectivity between trail and destinations. Many existing roads in Carrollton can be modified to better accommodate bicyclists. Roadway traffic volumes and vehicle speeds will inform bikeway selection and design of bicycle facilities. Roadways with pavement widths exceeding standard requirements, are candidates for restriping and markings to create bicycle facilities with minimal capital commitment.

Typically, roads with faster speeds and greater car volumes require more separation between riders and drivers. The follwing is a list of common bicycle facilities that may be used on Carrollton's bikeways, in order of increased separation between bicyclists and vehicles: Shared Pavement Markings, Bike Lanes, Buffered Bike Lanes & Separated Bike Lanes.



Key On-Street Bikeway Locations:

- Denton Drive Bike Lane
- McCoy Road Bike Lane
- Crosby Road Sharrow
- Kelly Blvd. Bike Lane
- Branch Hollow Dr. Sharrow

Bike Lane on Residential Street

Design Standards: On-Street Bikeways

The following pages outline a general set of guidelines that can be used for planning and implementing On-Street Bikeways.

On-street bike facilities shall be designed in accordance with AASHTO Guidelines for Pedestrian and Bicycle Facilities. Regional trails should follow the published design standards, as well as the TMUTCD.

The configuration of On-Street Bike facilities shall consider existing traffic level and behaviors to adequate safety to protect bicyclists from parked and moving vehicles.

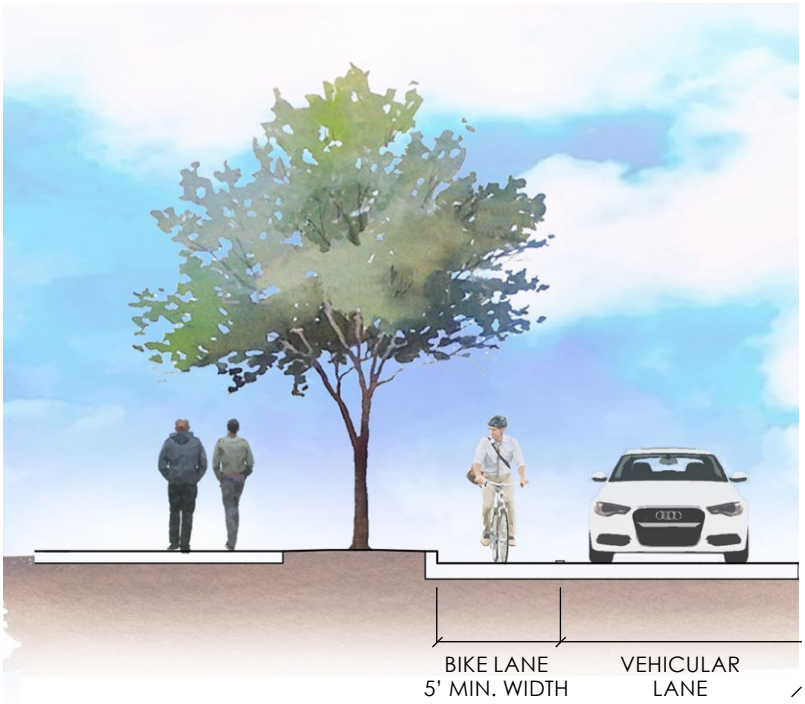
Shared Lane Markings or 'sharrows' are road markings that indicate a shared lane environment for bicycles and automobiles. These markings identify bikeways and indicate proper bicyclist positioning in the roadway. Typically located 4 feet from the curb, or 11' from the curb when on-street parking is allowed.

Bike Lanes are dedicated bicycle space on the roadway between motor vehicle lanes and the curb or shoulder. Bike Lanes shall be a minimum of 5' wide.

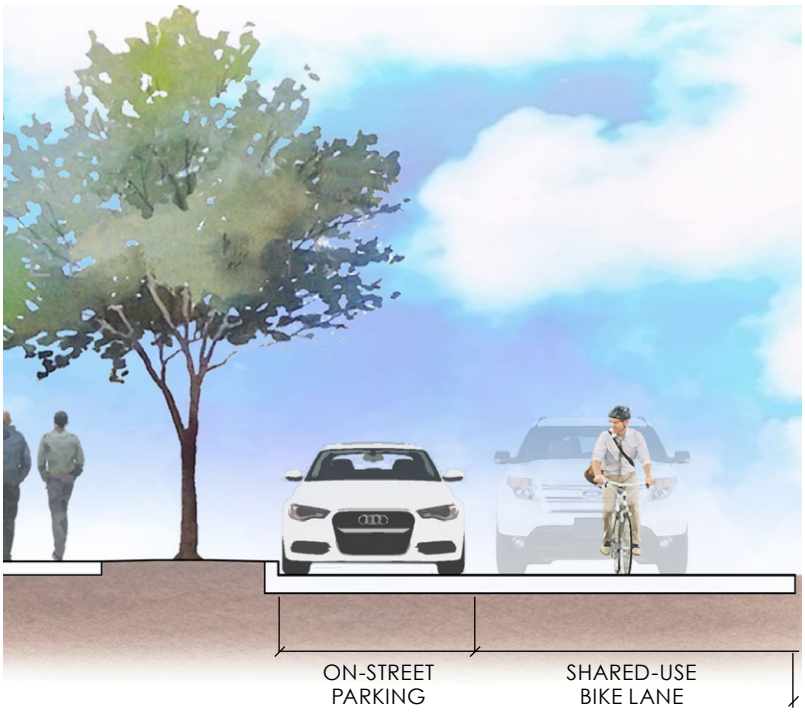
Buffered Bike Lanes are separated from adjacent motor vehicle lane by a stripe buffer area that may include chevrons, diagonal lines or wide pavement marking stripes. Buffered bike lanes shall be a minimum of 7' wide, inclusive of the buffer.

Separated Bike Lanes are physically separated from vehicular traffic with vertical barriers like a continuous median, flexible posts, or intermittent concrete curbing.

For a higher level of visibility color pavement markings (typically bright green) can be utilized either as a corridor treatment along the length of a bike lane or in limited locations such as conflict areas or intersection crossing markings.



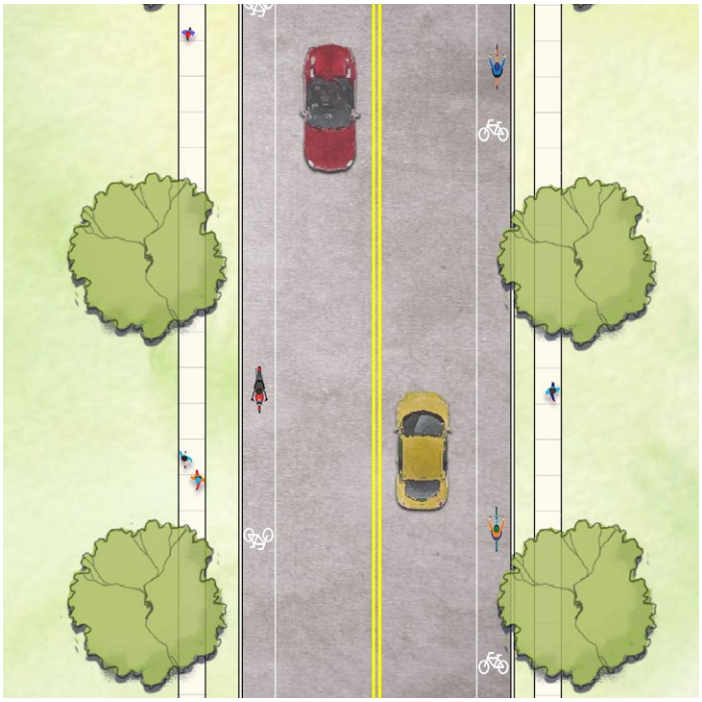
Typical Bike Lane



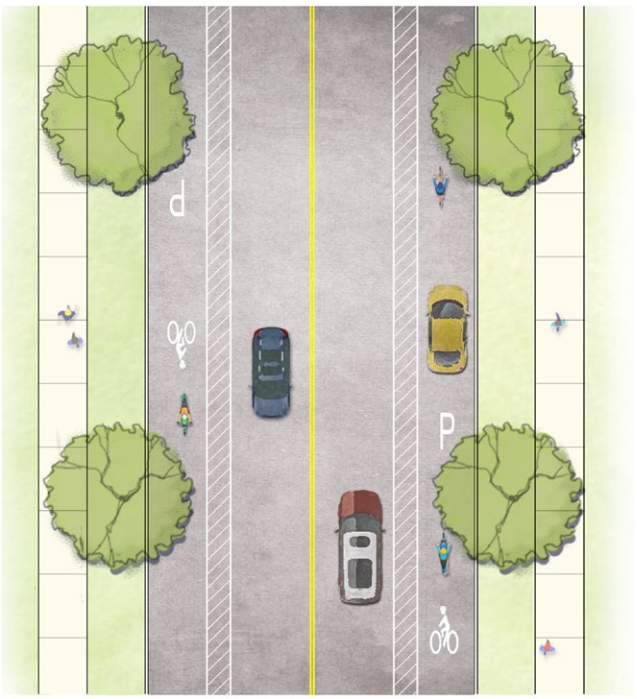
Shared Use Bike Lane

Design Standards: On-Street Bikeways

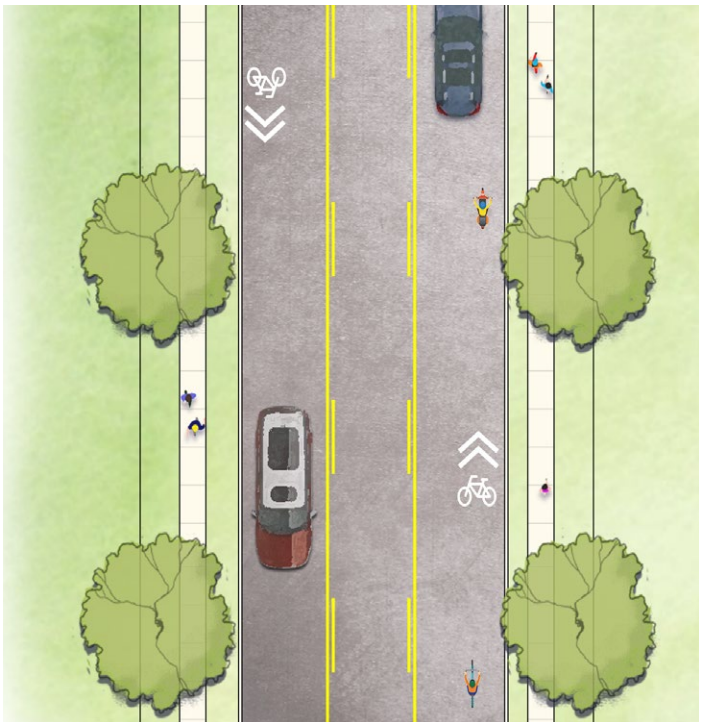
The exhibits below illustrate potential on-street bike facility configurations. All roadway pavement markings that change the traffic capacity, traffic operations, or safety characteristics of street, must be justified through an engineering study.



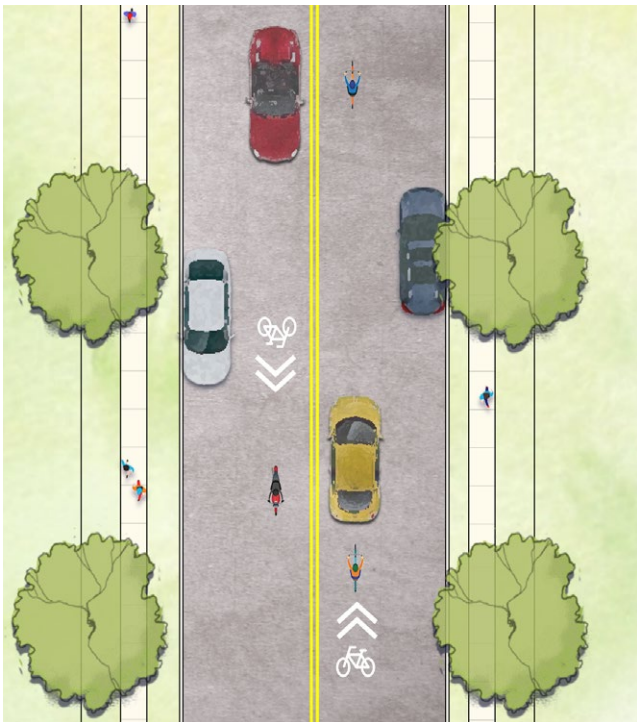
Typical Bike Lane



Buffered Bike Lane with Parking



Shared Use Lane Markings



Sharrow with Parking

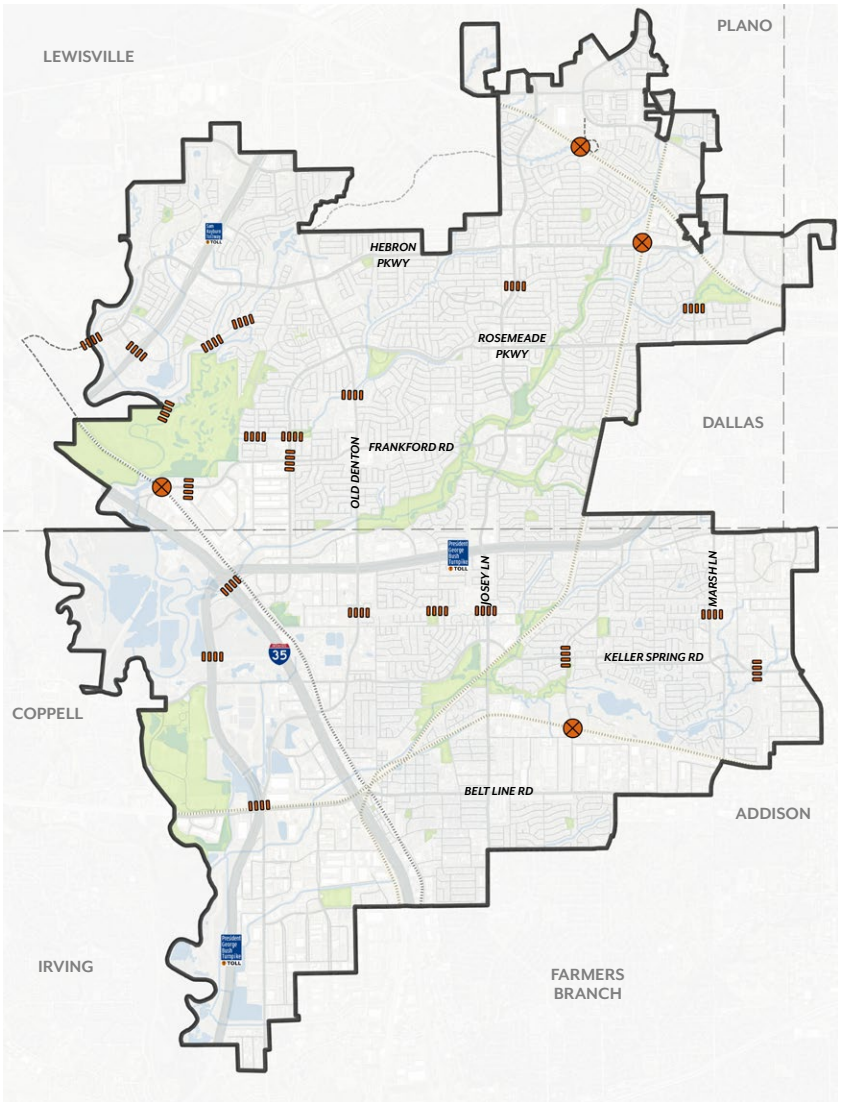
Crossings

Trails are a critical part of Carrollton's multi-modal transportation network that also includes roads, streets and highways, light rail, and train lines. This complex transportation network presents potential conflicts for bicyclist and pedestrians where trails interact with other modes of transportation. The existing system successfully incorporates a combination of grade-separated crossings under bridges and railways, and at-grade crossing with roadways.

Grade separated crossings are the safest and most comfortable crossings for trail users and should be implemented wherever possible along new trail routes. When at-grade crossings are required, they should be designed with care and prioritize bicycle and pedestrian safety.

Key Crossing Locations:

- At-Grade Roadway Crossings - Josey Lane, Marsh Lane, Hebron Parkway
- At-Grade Railroad Crossings - Kelly Blvd, Perry Road, Hebron Pkwy
- Grade Separated Crossings - PGBT, I-35, Kansas City Southern (Railroad)



Trail / Rail Crossing

Signalized Pedestrian Crossing

The list below outlines a general set of guidelines that can be used for planning and implementing Crossings. All Trail-Street crossings that change the traffic capacity, traffic operations, or safety characteristics of street, must be justified through an engineering study.

Under-bridge Crossings

These crossings are located where appropriate clearances, visibility and coordination with owning agencies (TxDOT, railroads, etc.) appear feasible. Where height clearance of 10' can be achieved, under-bridge crossings should be considered before at-grade crossings. Typical safety measures to be incorporated when designing under bridge crossings include:

- *Security lighting*
- *Overhead clearance height signage*
- *Speed limit signage*
- *Guardrails (where edge drop-off exceeds 30 inches)*

Under-bridge Crossing

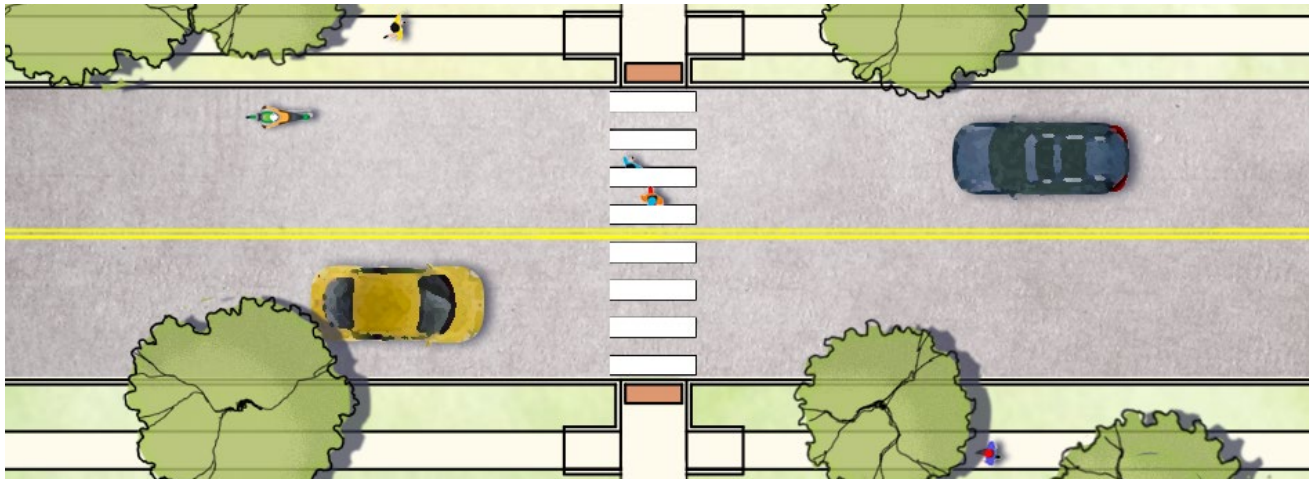
Unsignalized At-Grade Crossings

These crossings occur at lower traffic volume crossings of trail and roadway. At minimum, these crossings should include the following safety measures:

- *Painted crosswalk striping in the roadway*
- *Barrier-free ramps with detectable warning strips*
- *Traffic signage alerting vehicles to presence of pedestrians*

Where feasible, enhance paving should be included in a "Z" configuration that encourages pedestrians to look both ways before crossing the street.

At-Grade Crossing



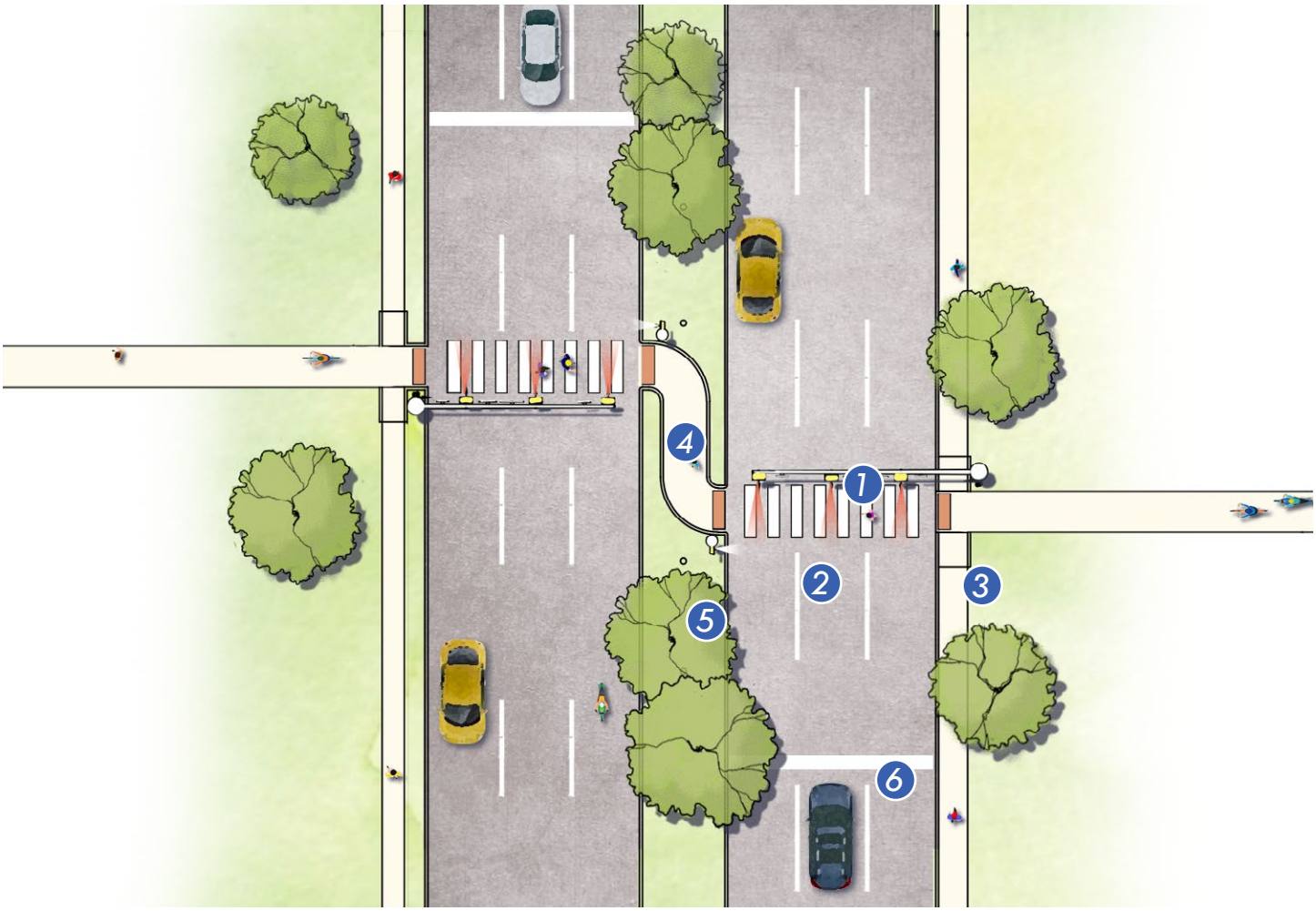
Unsignalized At-Grade Crossing

Pedestrian Hybrid Beacon

Pedestrian Hybrid Beacon crossings are recommended where trails cross high-traffic volume roadways. Often referred to as High-Intensity Activated Crosswalks or HAWK signal, this pedestrian operated traffic signal is used to stop traffic at pedestrian crossings only when needed. Other common signalized crossing types include lighted traffic signage and crosswalks with lighted traffic buttons. Implementation of all crossings should be in accordance with TMUTCD. Additional safety measures include:

- *Painted crosswalk markings*
- *Barrier-free ramps with detectable warning strips*
- *'Z' Crossing Configuration*
- *Stop Bar Markings,*
- *Various Traffic Signage*

Typical Signage



Typical HAWK Crossing Configuration

1. HAWK Signal
2. Crosswalk Markings
3. Accessible Ramps
4. "Z" Crossings
5. Pedestrian Signal
6. Stop Bar Marking

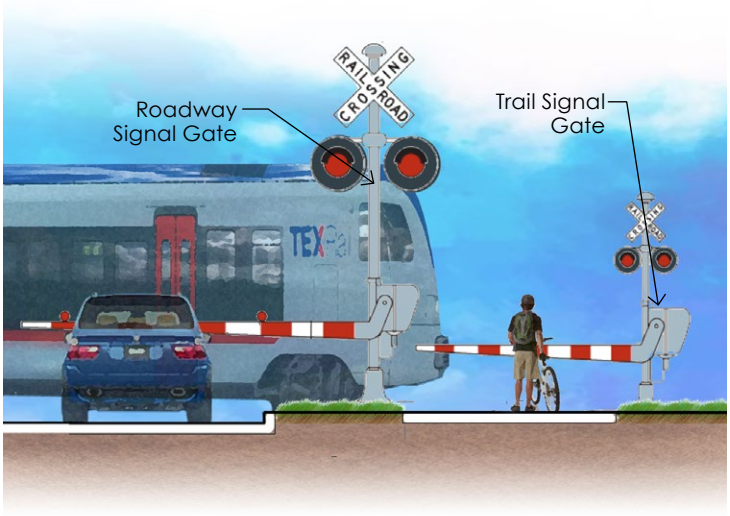
At-Grade Track Crossings

At-grade track crossings are potentially dangerous for trail users and should be used only when necessary. Each crossing should be designed to reduce illegal track crossing by funneling users to the intended crossing location. Wherever possible, trail crossings should be designed in conjunction with existing roadway crossings.

Typical Signage

Additional design considerations may include:

- *Application of automatic pedestrian gates at crossings must be consistent with TMUTCD.*
- *Advance Notice of crossing and properly located traffic control devices*
- *Trails should cross tracks at a right angle*
- *TMUTCD approved signage and markings*
- *Dedicated Trail / Pedestrian Signal Gates*

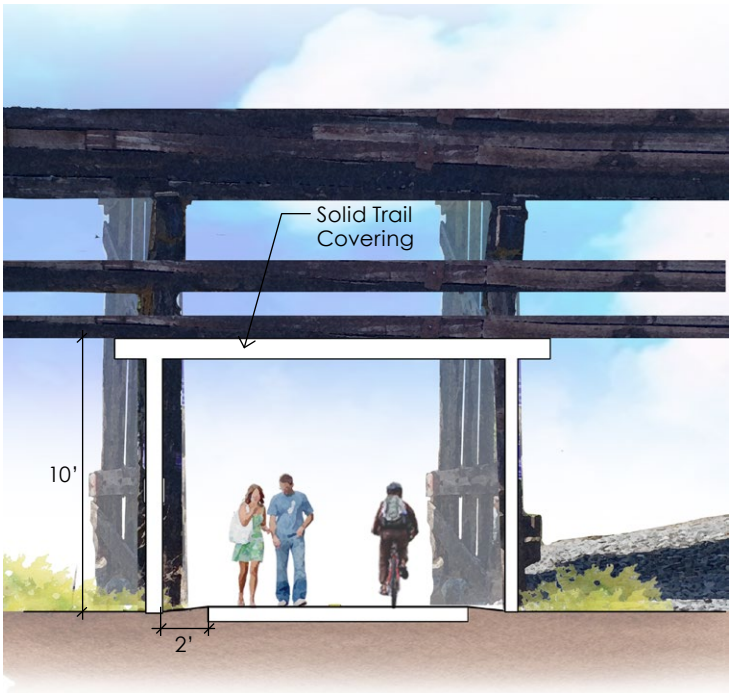


Dedicated Trail / Pedestrian Signal Gate

Grade Separated Track-Rail Crossings

Grade Separated Trail-Rail Crossings can eliminate conflicts by completely separating the trail user from the active rail line. Dedicated bridges, tunnels or overpasses are rarely constructed due to there considerable expense. However, grade separated crossings are often implemented, by routing trail alignments under existing elevated tracks where space allows. Additional safety measures and design considerations include.

- *Minimum 10' vertical clearance*
- *Trail Covering to protect from falling debris*



Grade-Separated Crossing

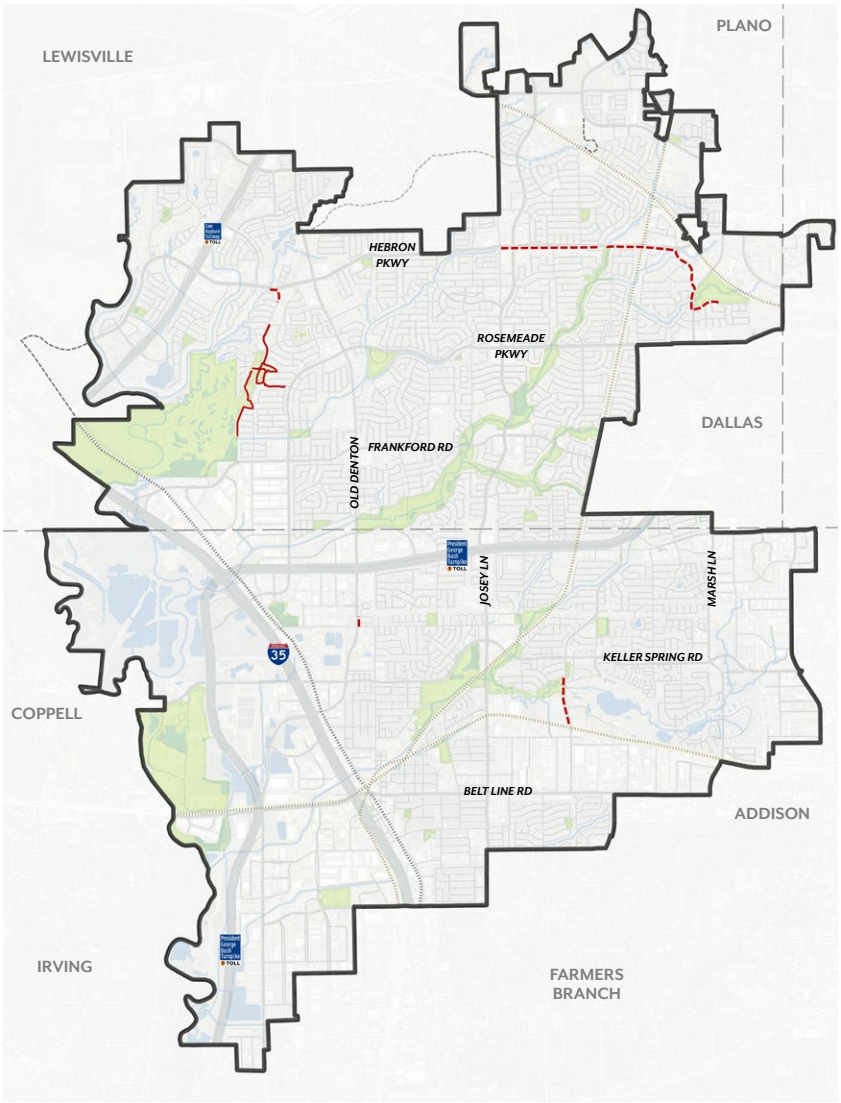
Sidewalk Connectors

Gaps in the trail network can occur where right-of-way constraints limit the ability to construct trails, or vehicle speeds make on-street bike travel unsafe. In these conditions trail users may need to utilize sidewalk connectors for short segments.

Many streets in Carrollton have parallel sidewalks supporting pedestrian circulation. When utilized as a sidewalk connector in the trail system these sidewalks also need to accomodate bicyclists. They should be maintained or constructed with limited obstructions,and provide a visual or physical seperation from the roadway where possible.

Key Sidewalk Connectors Locations:

- Kelly Road
- Hebron Parkway
- Carrollton Square District
- Trinity Mills Station District



Sidewalks in Residential Areas

Connections along Roadways

Design Standards: Sidewalk Connectors

This sheet outlines a general set of guidelines that can be used for planning and implementing Sidewalk Connectors.

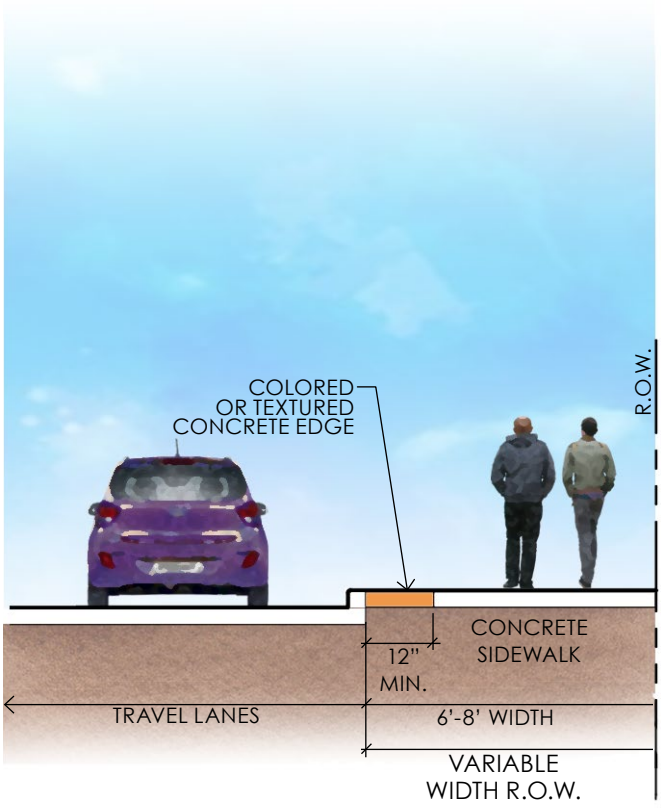
Sidewalk Connections should be 6' minimum width.

Where possible sidewalks should be widened to 8 or 10' wide.

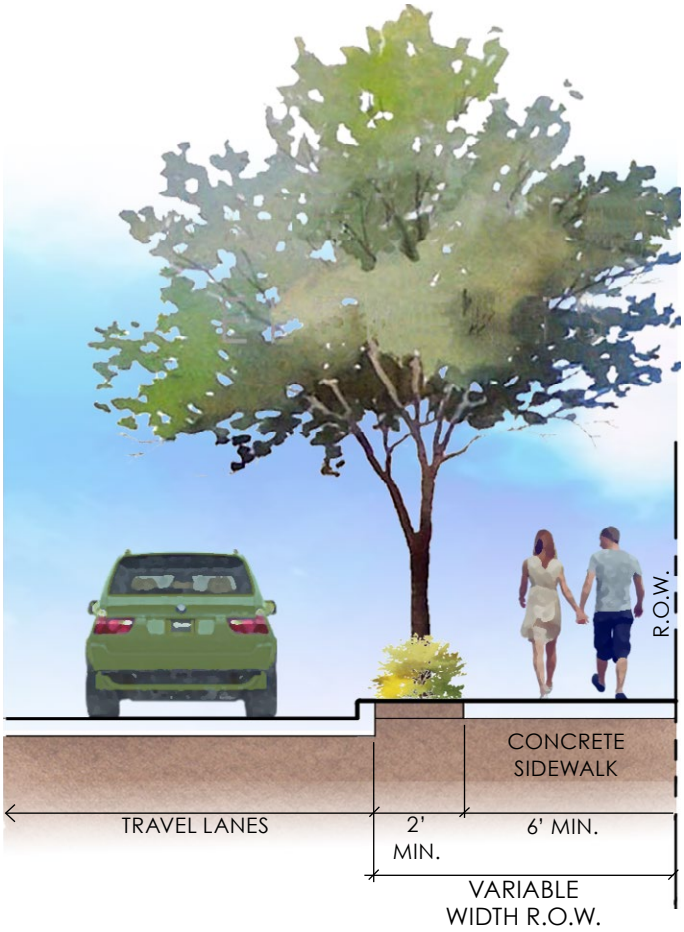
A minimum 2 foot planted buffer should be maintained adjacent to the back of curb, where possible.

If a planted buffer cannot be maintained a contrasting colored and textured concrete paving band shall be installed along the back of curb.

All sidewalk connections shall be designed in accordance with AASHTO Guidelines for Pedestrian and Bicycle Facilities.



Widened Sidewalk with Contrasting Band



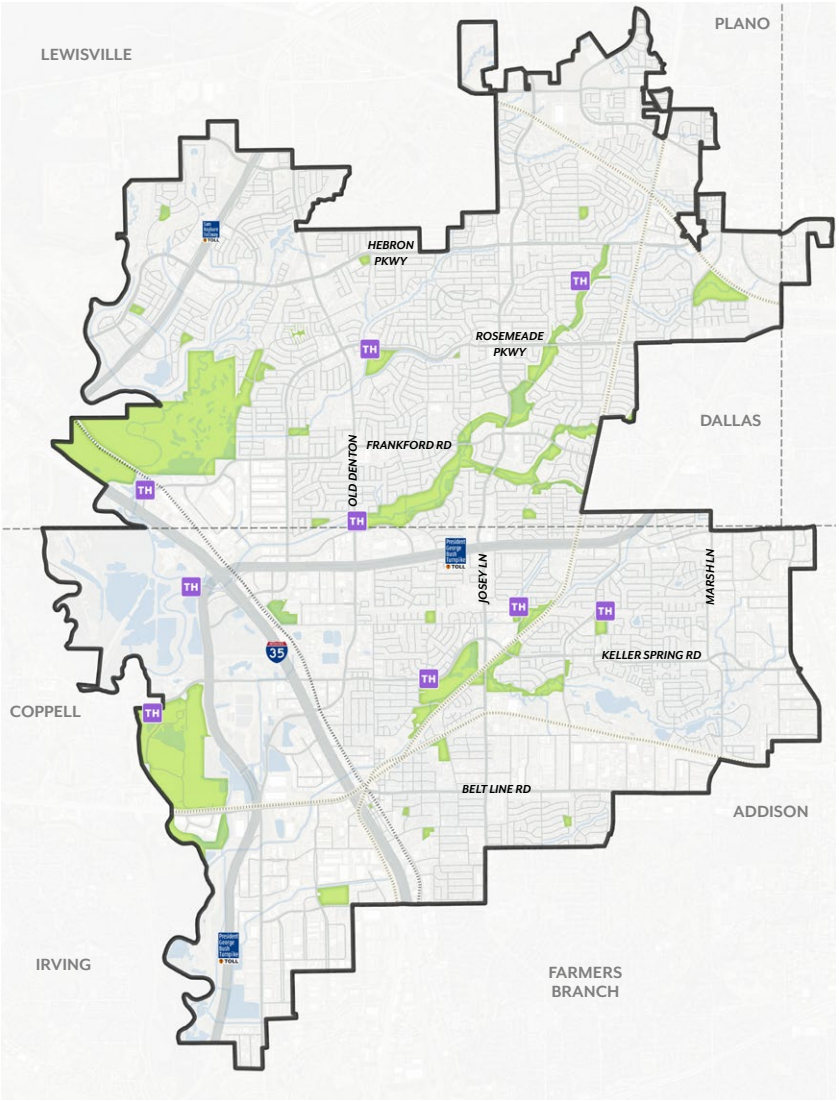
Sidewalk with Planted Buffer

Trailheads

Trailheads are formal points of entry to the trail system. They serve the function of providing access, orientation and rest areas for trail users and may provide certain public support facilities such as parking, drinking fountains, shaded seating etc. Rest stops provide periodic respite for users along the trail, often located to take advantage of natural features and desirable views.

Key Trailhead Locations:

- TC Rice
- McInnish Park
- Rosemeade Rec Center
- Branch Hallow Park
- McCoy Road
- Ward Steenson Park
- Mary Heads Carter Park
- Josey Ranch Park



Trailhead with Seating

Design Standards: Trailhead

The list below outlines a general set of guidelines that can be used for planning and implementing Trailheads.

Primary Trailheads

Located along popular segments where people often drive to access specific trails segments and designed to provide a sense of arrival, access, and orientation for single users and groups these trailheads should include a parking lot, pavilion, map, and site furnishings. Highly visible and signature locations present opportunities to include public art or architectural enhancements.

Primary Trailhead with Public Art

Secondary Trailheads

Designed to reinforce the trail systems identity and assist in wayfinding, Secondary Trailheads provide rest stops for users. Trail maps, shade trees, ornamental plantings, low walls, site furnishings and enhanced paving should be utilized to define these locations.

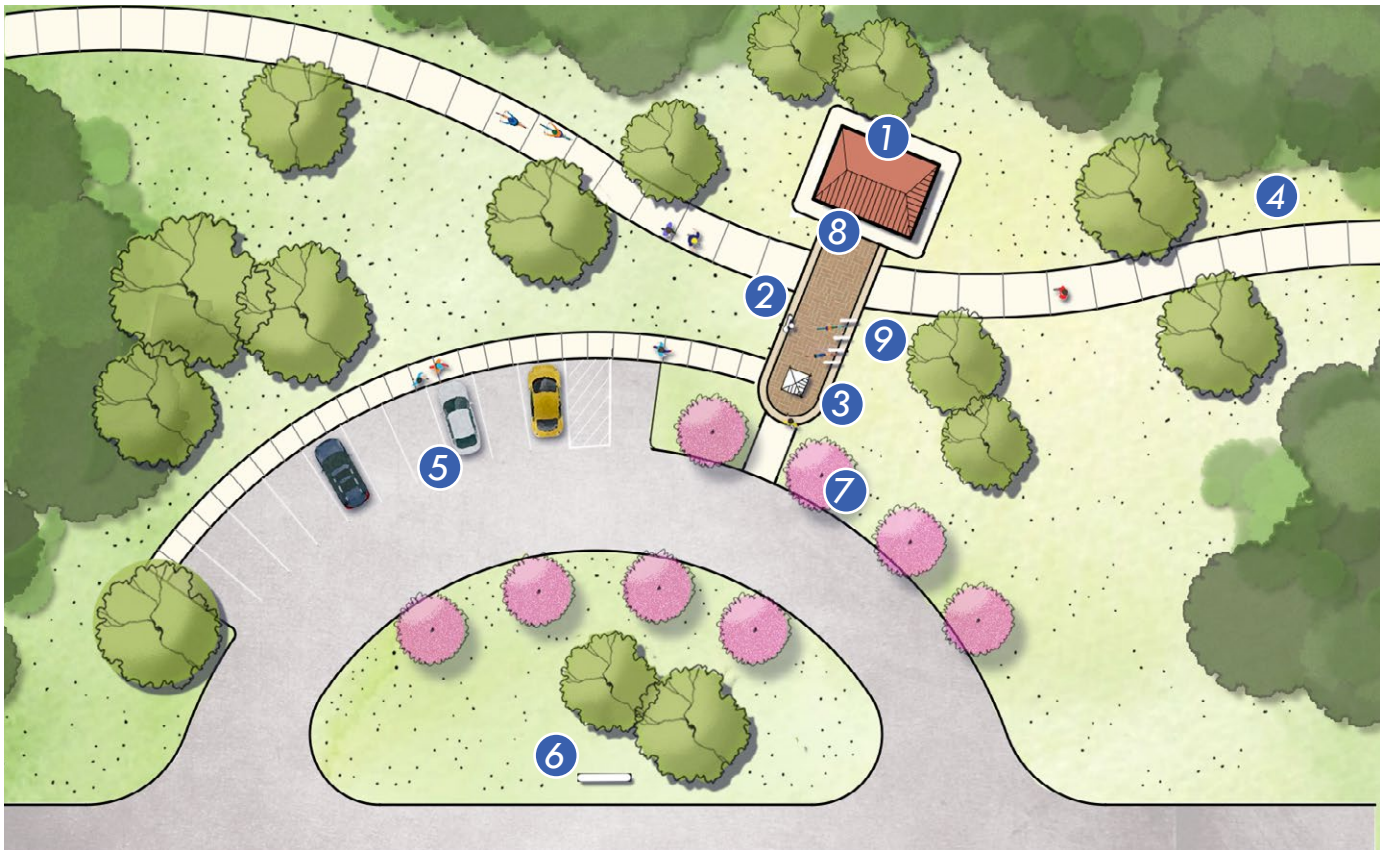
Primary Trailhead with Parking & Seating

Trail Rest Stops

On high traffic trails, rest stops should be placed at intervals of 1/2 mile to 1 mile. On trails with potentially lower volumes of use and more remote sections, rest stops may be placed at intervals of 1 mile to 2 mile.

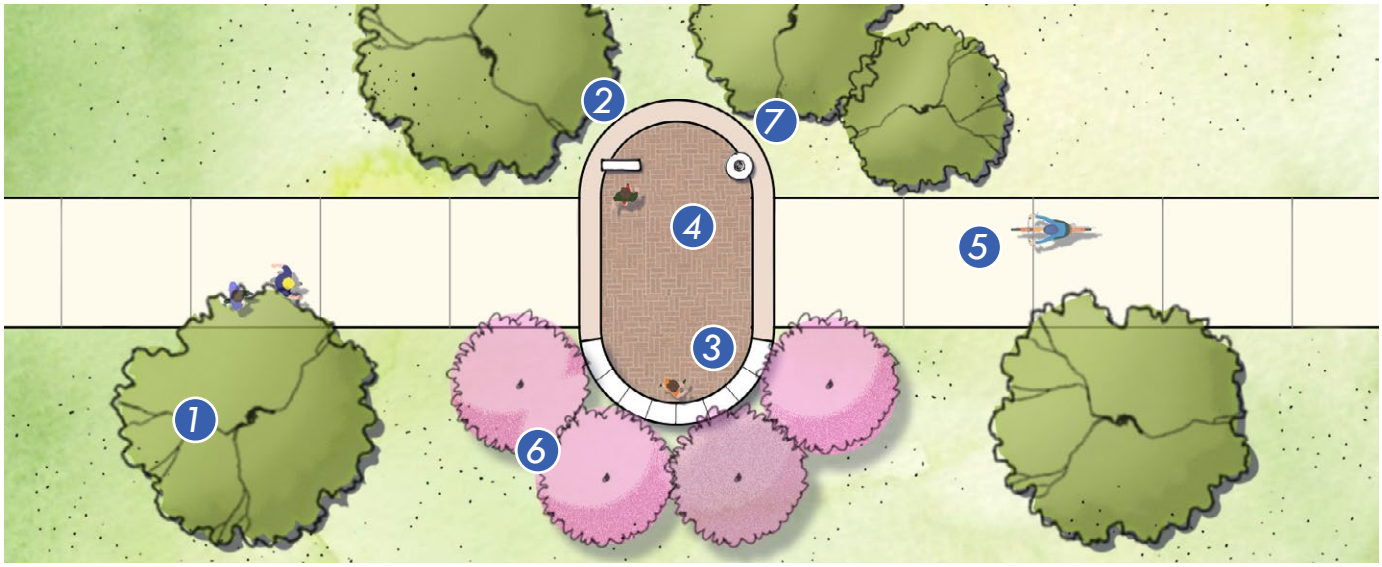
These stopping points may be comprised of a variety of amenities for the trail user. Each stop may include seating only (for example, 1 to 2 benches or a picnic table). They may also include a drinking fountain, trash receptacle, and/or interpretive and wayfinding signage, as appropriate to the character of each area.

Secondary Trailhead with Wayfinding & Seating



Sample Primary Trailhead Configuration

1. Shade Pavilion with Seating
2. Drinking Fountain
3. Wayfinding Signage / Kiosk
4. Trail Access
5. Parking
6. Trail System Signage
7. Ornamental Plantings
8. Enhanced Paving
9. Bike Rack



Sample Secondary Trailhead Configuration

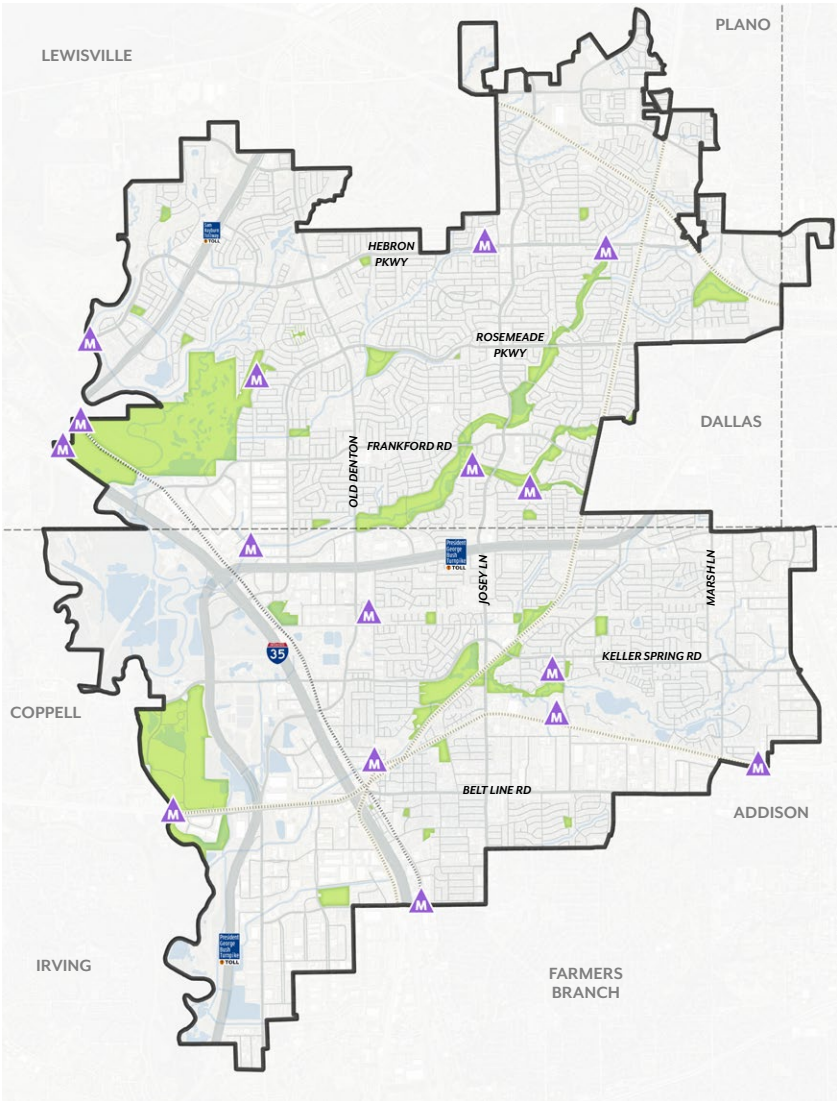
1. Shade Trees
2. Wayfinding Signage
3. Seating
4. Enhanced Paving
5. Trail Access
6. Ornamental Trees
7. Litter Receptacle

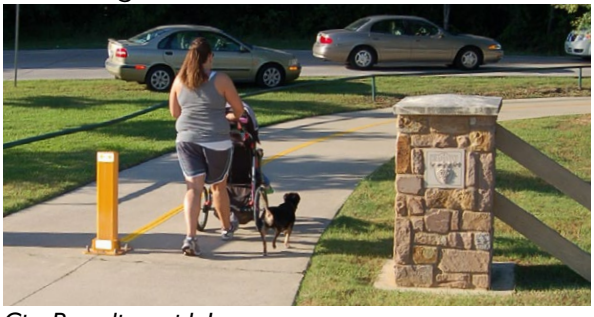
Portals & Branding

Architectural elements, like kiosks, signs, structures, and bridges, combine with natural features and plantings to create the identity of a trail system. This brand is established by implementing a consistent pallet of materials, compatible design styles, and consistent signage to create visual continuity throughout the system. Thoughtful repetition of features and variation of scale can create a distinctive brand for districts or segments. Specific zones may include areas of historic significance, natural importance, tourism opportunities, signature recreational routes, or cultural landmarks.

Portals announce the beginning of a trail segment or the transition from one zone or district to the next. Portals with uniquely designed elements, like monuments, columns, or gateways establish the character of a district.

Trail Identity Markers placed periodically throughout the system, improve wayfinding and reinforce the system brand, enhancing the riders experience. These trail markers are smaller than portals and can include, small columns, fences, branded bollards, signs. Material used for all markers should be stone, metal or other robust material that can withstand weather and potential flooding.





City Branding with Logos

Portal Entryway into Park Trails

Signage is a critical component for creating a safe and convenient trail network. Proper signage reduces conflicts between users, aides with wayfinding, and can even improve emergency response times.

Carrollton's existing network of recreational trail include several routes identified by color. The Blue, Orange, Purple and Green Trails are identified with color coordinated trail markers and centerlines to distinguish the routes. Color coded markers placed at ¼ mile intervals provide riders with distance information, includes a unique number and letter combination that provide exact location of each marker to assist emergency responders in the event of a medical emergency, crime, or other conflict on trails. As new segments are added, and routes are extended this naming convention should be continued.

If an additional measure of security is warranted, devices like lighting, emergency call boxes or surveillance cameras can be added at trailheads or other high-volume areas.

Trail Identification Sign

Trail Location & Distance Markers

Nob Hill Greenbelt - Wood Monument

Hutton Branch Trail - Stone Monument

Signage can also reduce potential conflicts between different users by posting trail etiquette signage at trailheads and strategic locations along the trail system to help curtail some of these conflicts before they occur. It will be important for the city to post an adapted list of trail rules that address issues custom to the Carrollton Trail Network.

Some examples of trail etiquette / rules include:

- Be courteous to other trail users at all times;
- Keep to the right, except when passing;
- Always pass on the left, and give clear audible warning when passing slower traffic;
- Avoid congregating on the trail or walking more than two abreast;
- Bicyclists should keep speed under 15 mph at all times, and should slow down in congested conditions, reduced visibility, or other hazardous conditions; and
- Pet owners should keep dogs on a leash at all times and remove pet waste from the trail.

Wayfinding, warning, and regulatory signs are critical components to any trail system. Trail maps should be incorporated at trailheads and key intersections throughout the trail system to provide users information and length of route segment. Warning signs should be used only where special regulations apply, at specific times only, or where hazards are not self-evident. The use of warning signs should be kept to a minimum so to not lose effectiveness of the message.

Signature Trail Marker

Implementation

Implementation

This document presents a plan for well-connected trail network that will increase trail access and connectivity throughout Carrollton, it can be integrated into other planning efforts and developments. City leaders should use the recommendations outlined in the plan, to devise an intentional implementation strategy for immediate, short-term and long-term priorities.

Immediate priority projects, can be implemented in one to three years, provide strategic connections increasing the impact of the trail network, or address a direct mobility or safety need.

Short-Term Priorities address current needs but may require additional time for design, coordination, and execution, typically between 3 and 9 years. Example short term projects include signature trail extensions, trails associated with new developments that are currently in planning or construction, regional connections.

Future Priorities, are projects that have longer time horizons requiring 10 or more years for implementation. The future projects will depend on an assortment of variables related to overall development in the city including community growth and redevelopment patterns, availability of unforeseen funding sources such as grants, partnerships, donations etc.

Cost of Implementation

Trail projects include similar elements such as pavement, signage and markings, moderate grading that can be used estimate cost for a basic 12' trail at $800,000 to $1M per mile.

Often trail projects include roadway intersections improvements and crossings, or recreational elements such as trailheads, rest areas and exercise stations. Trails commonly traverse undulating topography, with drainage issues, with dense vegetation or other obstacles that and may require features such as bridges, boardwalks, walls, or structures. Complete trail projects incorporating these elements can exceed $1.5 million per mile.

On-Street bicycle facilities can be implemented on existing streets with minimal roadway modifications improving connectivity where trails are not feasible. New bike lane markings and signage improvements range in cost between $75,000 and $100,000 per mile.

Shared Lane markings and signage are approximately $25,000 per mile. When budgeting for individual projects, it is recommended that certain soft costs be included in addition to estimated construction costs. They may include, but are not limited to:

a) *Construction Contingency* - Provides a budgetary allowance for incidental or unexpected costs that can arise during the course of construction. A typical allowance for contingency is in the range of 10% to 20% of construction cost.

b) *Owner's Costs* - These costs describe items incidental to construction that are typically the responsibility of the Owner, and can include but are not limited to land costs, geotechnical engineering, accessibility reviews, permitting, inspections, and others. A typical project allowance for Owner's Costs falls in the range of 1.5% to 2% of the total construction cost.

c) *Market Escalation Allowance* - This line item enables the Owner to prepare for potential inflation when developing an overall budget for a project that may not be constructed for a number of years. In recent years, the COVID pandemic has resulted in global supply chain and labor disruptions leading to increased volatility in construction pricing. Current inflation is trending upward and costs are continuing to rise. A typical placeholder of 3% to 5% of construction costs is widely accepted as a reasonable allowance. However, this allowance fluctuates directly with current market conditions and is difficult to predict.

Potential Funding Sources

Once a budget number is reached, it is important for City leaders to consider what strategic funding sources might be available to help the city supplement the cost of trail network expansion. Some of the following sources could be part of the overall implementation plan.

Dallas, Denton & Collin County

- Open Space / Trail / Preserve Programs

North Central Texas Council of Governments (NCTCOG)

- Transportation Alternatives Set-Aside Program
- Regional Toll Revenue Program

State of Texas

- Texas Parks & Wildlife
  - *Outdoor Recreation Grants*
  - *Recreational Trails Grants*
- Texas Department of Transportation (TxDOT)
  - *Safe Routes to School Program*
  - *Transportation Alternatives Program*

Federal Transportation Funding Sources

- Highway Bridge Replacement and Rehabilitation Program (via TxDOT)
- Highway Safety Improvement Program (via TxDOT)
- National Highway System (via TxDOT)
- Surface Transportation Program (via TxDOT)
- Federal Transit Administration Programs
- Interstate Maintenance (through TxDOT)

Other Federally Funded Programs including Bicycle and Pedestrian Opportunities

- FWHA Pedestrian and Bicycle Funding Opportunities
- U.S. Department of Housing & Urban Development (CDBG)
- U.S. Army Corps of Engineers (USACE)
- U.S. Department of Interior (USDOI)
- National Park Service's Rivers, Trails & Conservation Assistance
- National Fish & Wildlife Resilient Communities