Acknowledgments

Prepared for:
City of Dallas Parks and Recreation Department
Paul Dyer, Director
Willis Winters, Assistant Director
Richard Ritz, Project Manager
The Friends of the Katy Trail
The Friends of the Trinity Strand Trail

Prepared by:
Schrickel, Rollins and Associates, Inc.
Victor Baxter, RLA, Principal-in-Charge
Janna Tidwell, RLA, Project Manager
Joe Bradley, PE, Project Engineer
Spencer Freeman, RLA, Trail Planner
Son Ngo, PE, Structural Engineer
Stephanie Sigler, RLA, Graphics/3D Animation
Kenny House, RLA, 3D Animation

Subconsultants:
Bowman-Melton Associates, Inc., Agency Coordination & Trail Planning
Jaster Quintanilla, Survey & Boundary, Hydraulics & Hydrology
Apex Consultants, Cost Estimating
Yaggi Engineering, Electrical Engineer

Citizen’s Advisory Committee (CAC)
Robin Baldock, Executive Director - Friends of the Katy Trail
Philip Henderson, Chairman of the Board - Friends of the Katy Trail
Shelly White, Executive Director - Friends of the Trinity Strand Trail
Mike Kutner, Former Chair Person - Friends of the Trinity Strand Trail

Technical Advisory Committee (TAC)
Leong Lim, PE, City of Dallas Parks and Recreation
Richard Ritz, RLA, City of Dallas Parks and Recreation
David Garcia, City of Dallas Floodplain Administrator
Eduin Danny Bailey, Trinity Railway Express
Patricia Briere, Dallas Area Rapid Transit
Victor Isewu, Dallas Area Rapid Transit
Mark Bouma, North Texas Tollway Authority
Sue Hounsel, City of Dallas
Richard Mason, Texas Department of Transportation
A ribbon of green unites people to urban, vibrant and emerging places.
It is a place for those who exercise and commute.
It is a place for relaxation.
It restores life back into a river.
It brings whimsy to the once neglected.
It connects.
Table of Contents

Executive Summary

Process
• Site Reconnaissance
• Concept Development
• Cost Estimating

Site Analysis
• Zone 1 - Limestone Escarpment
• Zone 2 - Houston Street to DART Rail
• Zone 3 - Stemmons Park
• Zone 4 - Under IH 35 E to Trinity Strand Trail

Trail Design Guiding Principles

Trail Alignment
• Zone 1 - Limestone Escarpment
• Zone 2 - Houston Street to DART Rail
• Zone 3 - Stemmons Park
• Zone 4 - Under IH 35 E to Trinity Strand Trail

Design Context
• Merging of Two Significant Trails
• Katy Railroad History
• Limestone Escarpment
• Dallas Design District
• Trinity River and the Old Meanders
• Historical Relationship Between the Design District and Railroads
• Cotton Stadium
• Current Trail Design Standards

Design Solutions
• Zone 1 - Limestone Escarpment
• Zone 2 - Houston Street to DART Rail
• Zone 3 - Stemmons Park
• Zone 4 - Under IH 35 E to Trinity Strand Trail

Opinion of Probable Cost

Permitting

Appendix
• Meeting Minutes
• Master Plans of Katy Trail and Trinity Strand

Abbreviations Used Within This Report

' - feet
" - inches
% - percent
mph - miles per hour
sf - square feet
gpm - gallons per minute
MSL - mean sea level
The intent of this master plan is to provide a tool to guide development of a primary trail connection between the 3-1/2 mile Katy Trail and the 2-1/4 mile main spine of the Trinity Strand Trail. It will serve as an accessory connection to a future City park that will function as a landscaped gateway in the area. When complete, “The Connection” will join Uptown, Downtown, the Design District, the Medical District, the Infomart, Stemmons Corridor businesses, and hotels along Interstate 35 E (IH 35 E). This plan analyzes all factors that will impact the development of the connection, provides a comprehensive opinion of probable costs, presents graphics that schematically represent the design and supplies a 3-D animation of the site. All of these elements will be utilized for planning and fundraising efforts conducted by the City of Dallas, Friends of the Katy Trail and Friends of the Trinity Strand Trail.

The Katy Trail is an extremely popular trail that connects people to the City, weaving through a densely populated portion of Dallas, for the purposes of commuting, recreation and exercise. The trail is constructed along the Historic Missouri – Kansas – Texas (MKT) Railroad bed. It is a multi-use system that accommodates runners, walkers, bicyclists and inline skaters. The main portion of the trail is a concrete surface with a minimum width of 12’. Parallel to the main spine of the trail is an 8'-wide soft surface path for runners that is made from recycled tennis shoes. During peak use times, the trail reaches maximum capacity and can become quite congested. North Central Texas Council of Governments (NCTCOG) documented over 3,000 trail-users on a single Saturday in October 2002. To date, Friends of the Katy Trail estimates that 15,000 people use the trail per week. This trail extension and connection will help alleviate congestion.

The Trinity Strand Trail is a developing trail system and is anticipated to be equally popular. Its connection to the Medical District (with its 24,000 employees) and the Dallas Design District with increasing mixed-use construction and numerous hotels (which supply 1,000,000 available room nights per year) will ensure an ongoing demand for a strong pedestrian connection to the core of the City. This trail is planned to follow the remnants of the original Trinity River, referred to as the Old Meanders. This system is master planned to be a 12’-wide concrete surface on one side of the river and an 8’-wide soft surface trail on the opposite side. Refer to the Katy Trail and Trinity Strand Trail Maps in the Appendix for master plan graphics.

The area of land located between the two trail systems is loosely defined by IH 35 E to the west, Harry Hines Boulevard to the east, Oak Lawn Avenue to the north and Victory Overlook to the south, and includes Stemmons Park. Refer to the Existing Conditions Figure on pages 16 and 17 for a graphic illustration of this location.

Since the inception of each trail system, it has been a strategic decision that they connect to provide a continuous main spine that minimizes conflicts with vehicular traffic. To successfully make this connection, the design must respond to a series of challenges, including multi-agency coordination, existing and future highway crossings, drastic grade differences (upwards of 20’), overhead utilities, underground utilities, easements, drainage and backwater from the Trinity River Levee System. To achieve the connection, the trail must:

• Span the Limestone Escarpment (known as Goat Hill)
• Pass below the North Dallas Tollway;
• Cross over Houston Street;
• Spiral down 22’ to the remnant railroad trestle;
• Pass below a Dallas Area Rapid Transit (DART) and Trinity Railway Express (TRE) bridge;
• Cross Stemmons Park;
• Pass under the IH 35 E frontage roads and main lanes;
• Pass under Oak Lawn Avenue;
• Transition up 13’ along Turtle Creek

The trail will travel through four very distinct zones: the Limestone Escarpment, Houston Street to the DART rail line, Stemmons Park and the land below the IH 35 E bridges. Unique constraints and opportunities are associated with each region and will be discussed in this report.
Process

Developing a master plan for the connection of the Katy Trail and Trinity Strand Trail required the involvement of the City of Dallas Parks and Recreation Department, the Friends of the Katy Trail, the Friends of the Trinity Strand Trail, nine jurisdictional agencies, two private property owners and five consultants. To manage the stakeholder participation, two groups were formed: the Citizen’s Advisory Committee (CAC) and the Technical Advisory Committee (TAC). Each group had specific responsibilities.

The CAC consisted of representatives from the City of Dallas Parks and Recreation Department, the Friends of the Katy Trail and the Friends of the Trinity Strand Trail. The purposes of this group were to provide consultants with initial direction and background information and to review the proposed trail alignment, features, design style and amenities.

The TAC involved agency coordination and included representatives from the City of Dallas Parks and Recreation Department, City of Dallas Public Works, City of Dallas Flood Control District, Texas Department of Transportation (TxDOT), North Texas Tollway Authority (NTTA), Dallas Area Rapid Transit (DART), Trinity Railway Express (TRE) and the affected property owners. This group was responsible for providing the team with logistical information regarding development requirements within each jurisdiction. Representatives of the respective Friends’ groups also attended TAC meetings to keep abreast of requirements.

Site Reconnaissance

The first step in the process was to conduct an extensive site reconnaissance. Due to the numerous constraints and barriers associated with this project, all consultants, along with CAC and TAC representatives, walked the proposed trail alignment together. The team of stakeholders and consultants divided the reconnaissance into two segments. The first segment of the investigation began at Stemmons Park, went to the Victory Overlook Plaza and backtracked to Stemmons Park. The second began at Stemmons Park, went below the IH 35 E frontage roads and main lanes to the northwestern side of the project and backtracked to Stemmons Park. Consultants photographed and noted existing utilities, overhead bridge clearances, topography, views, opportunities and constraints. The survey team was instructed on the base map requirements, specifically defining property ownership and providing elevations for the bottom of overhead structures that the proposed trail will pass under. The design team also conducted a site reconnaissance of the existing Katy Trail, the newly constructed Trinity Strand Turtle Creek Plaza and Hi-Line Trailhead, and the adjacent Design District. Existing features of each component were photographed and documented.

As part of the reconnaissance, kick-off meetings were held for the CAC and TAC to gather background information and data. During these meetings, potential problem areas and requirements were gathered from each group.

Concept Development

Due to the complexity of information to be processed, meetings were divided into two manageable topics, function and aesthetics. Initial meetings sought to define functional alignment and placement of the trail.

Because of the intricate nature of the site, designers felt it was important to digitally model the site and proposed alternative alignments three-dimensionally (3-D). This proved to be an important decision-making tool for the team in determining the final trail alignment.
Three alignment options were presented to the CAC for review and selection. The selected alignment was a blend of the three options presented. Once approved by the CAC, the plan was presented to the TAC for final comments and concerns. The final product was a rendered master plan depicting the trail layout and a 3-D model of the alignment.

After the alignment was chosen, meetings followed to discuss design themes and to create a “sense of place.” Three design themes were presented to the group for review. In order to select a theme, the CAC felt it was important to get preliminary cost information on each theme for the large fly-over bridge structure that would cross over Houston Street. After the opinion of probable cost was presented for each scheme, a design style was selected and modified. During these meetings, a rendered master plan, perspectives, sections and elevations were created and revised to respond to the group’s comments.

**Cost Estimating**

Opinions of probable costs were determined for three fly-over options, and one overall cost estimate was provided once the project had been refined to a final alignment and theme. The detailed cost projections were further broken down into four zones to provide opportunities for phased development, if desired, and are included in this document.
Site Analysis

Limestone Escarpment

Opportunities
- Unique Vegetation
- Highly Visible
- Scenic Limestone Face
- Landmark Billboard
- Goat Hill History
- Existing Katy Railroad Pier

Constraints
- Narrow Trail Easement
- Extreme Grade Changes
- Fault Line
- Overhead Electrical Lines
- Noise

Zone 1 - Limestone Escarpment
The Limestone Escarpment Zone is the portion of trail between the Katy Trail, Victory Overlook Plaza and the overpass crossing of North Houston Street. It parallels the escarpment’s western edge.

Property Ownership
Trail development within this zone fits into the Katy Trail planning efforts. Property on the escarpment is owned by Crow Holdings, which has dedicated a trail easement along the western edge. Access from the Katy Trail to the escarpment property can be achieved at Victory Overlook Plaza. Refer to Zone I Detailed Site Analysis (Sheet 19) for graphic representation of the easement. Due to steep topography, this easement is confined in two spaces. Development of a 16'-wide trail that meets accessibility requirements, without impacting the escarpment, will be costly. The first location is along Houston Street, a City-owned right-of-way that varies in width. The second is due to a significant billboard at the top of the escarpment. The property boundary for the billboard is 30' by 160'.

Infrastructure
Paralleling the escarpment, along Houston Street, is an overhead electrical utility line, which is approximately 16' higher than the street. Near Victory Overlook Plaza is a large overhead electrical transmission line that crosses over Houston Street and connects to an ONCOR utility substation.

Natural Features
The limestone escarpment is a unique geologic formation within the Blackland Prairie. Its 23’ vertical lift represents a fault line between the Eagle Ford Shale and the Austin Chalk formations. The chalky white stone face, visible along the face of the cliff, is scenic. The escarpment is unique to the region and considered environmentally fragile. Development must be sensitive to topography, footings must be designed for movement and vegetation must be preserved. Distinct plant communities are associated with the limestone soils of this topographic feature. A large stand of Mexican Buckeye (Ungnadia speciosa) has been identified on the rocky face of this escarpment. Additional vegetation identified includes Eastern Red Cedar (Juniperus virginiana), Redbud (Cercis canadensis), Hackberry (Celtis occidentalis), Texas Red Oak (Quercus texensis), Cedar Elm (Ulmus crassifolia), Pecan (Carya illionensis) and Bois d’Arc (Maclura pomifera). Illustrated Flora of North Central Texas lists many distinct herbaceous plants as thriving on the rock escarpment soils.

Cultural Features
This escarpment has been known as a Dallas landmark since the 1960s and has been affectionately named “Goat Hill.” Although the geology of the escarpment is prominent, the reason it has become a Dallas landmark is because of cultural
Detailed Site Analysis Zone 1
Limestone Escarpment
factors. For many years it was the home of a well known theme restaurant, Baby Doe’s Matchless Mine, and a unique billboard complete with rock outcropping and waterfall. The billboard was constructed by Pearl Beer in 1962. At 35’ tall, it was thought to be “the biggest beer sign in the U.S.” Baby Doe’s restaurant has been demolished, but the billboard has been renovated and was designated by the City of Dallas as an “Extraordinarily Significant Sign” in 2007. Also found on the escarpment is a remnant concrete support for the Katy Rail that exists on the edge of the escarpment and that appears to be structurally sound.

The top of the escarpment at the southern edge is elevated 23’ above adjacent Houston Street and has some of the best views in the City. Visible is the American Airlines Center to the south, the Design District to the west, the Infomart to the north and the Downtown skyline to the east. At the base of the escarpment, a scenic chalky white stone face is visible amongst the vegetation. As a result, any construction on the escarpment has the potential to be highly visible from surrounding roadways. The adjacent roadways and rail lines create significant noise issues throughout this area.
Zone 2 - Houston Street to DART Rail

This zone is bound by the DART/TRE rail line on the south and west, Harry Hines Boulevard on the north and Houston Street on the east.

Property Ownership
Property in this zone is comprised of numerous property owners. DART/TRE and TXDOT all have existing and planned facilities in this area. There is an existing tract of land dedicated for access from Houston Street to the DART/TRE bridges and an adjacent billboard. Crossing of the DART/TRE facilities will require a dedicated easement and other special considerations. Crossing under the TXDOT facility will require a permit. A split parcel of land, privately owned by Hillwood Development, encompasses the trestle.

Infrastructure
At the western edge of the escarpment are many roadways that the proposed trail must cross over or pass under. Elevated 39’ above Houston Street is the northbound connection ramp to the Dallas North Tollway. In this area, an 8’ elevation difference exists between the escarpment cap and adjacent Houston Street. In the same vicinity will be northbound and southbound future interchange connections between the future expansion of IH 35 E, referred to as Project Pegasus, and the Dallas North Tollway. When these connections are constructed, the existing northbound and southbound connections will be demolished. A staging area for construction of the future highway bridges will be needed. The 12’ clearance over the maintenance road to nearby DART/TRE bridges and adjacent billboard must be preserved. Minimum clearance over Houston Street must be 17’ per city requirements.

In the vicinity, recently renovated DART/TRE rail lines cross over Turtle Creek. A minimum 10’ clearance is required for a trail crossing under the DART/TRE rail lines. The area has been armored in erosion control gabion mats, and all existing vegetation has been cleared. Overhead drainage tubes have the potential to drain water from the rail line onto the trail.

A large drainage culvert under Harry Hines Boulevard flows into Turtle Creek within this zone. Other smaller headwall structures and underground storm drain pipes are also located in the area.

An overhead electrical line runs along the north side of Houston Street, and several power poles and guy wires are in the area.

The abandoned historic wooden railroad trestle has been preserved and dedicated for use by the trail connection.
Natural Features
The topography within this zone is fairly level adjacent to Houston Street, with the slopes averaging 3%. The banks of Turtle Creek, however, have steep slopes that average 40%. Recent construction activities have left much of the site void of vegetation, leaving it susceptible to erosion. The only undisturbed area exists within the banks of Turtle Creek from Harry Hines Boulevard to the Katy Railroad trestle. Within this area, several large trees exist. They include Cottonwood (Populus deltoides), Black Willow (Salix nigra), American Elm (Ulmus sp.), Texas Ash (Fraxinus texensis), Hackberry (Celtis occidentalis), Cedar Elm (Ulmus crassifolia), and Bois d’Arc (Maclura pomifera). Land between the Katy Railroad trestle and the DART/TRE rail line has been cleared and covered with rock gabion mats.

Cultural Features
Within this zone, a historic wooden trestle has been preserved. Numerous structural cross supports for the trestle reduce stormwater flow from an adjacent box culvert that runs under Harry Hines Boulevard into Turtle Creek.

This area is highly visible because of the numerous adjacent roadways. The trail in this area has the potential to make a strong statement that will be seen by many people on a daily basis. On top of the historic trestle is a view of the Infomart, an iconic piece of architecture. While the nearby roadways create high visibility of the trail, they also create a high level of noise, which poses a negative impact.
Stemmons Park

**Opportunities**
- Large Existing Trees
- Highly Visible History of Turtle Creek and Trinity Meanders
- Proximity to Infomart & Design District Cobb Stadium History/Reliefs

**Constraints**
- Backwater/Floodplain
- Channelized Drainage
- Sanitary Sewer Line Below Grade

**Zone 3 - Stemmons Park**

This zone is bound by IH 35 E to the south and southwest, DART/TRE rail lines to the east and Oak Lawn Avenue to the west.

**Property Ownership**

Zone 3 defines the beginning of the Trinity Strand Trail and includes Stemmons Park, which is an undeveloped City park. A 100’ DART/TRE easement (from the centerline of the rail) spans the eastern edge of the site. The northern boundary is defined by Oak Lawn Avenue, and City owned right-of-way of varying widths parallels the street. On the southern side of the park is a property boundary defining the ownership limits for a roadside billboard. Along the west is right-of-way for the IH 35 E northbound frontage road.

**Infrastructure**

Vehicular access to the site is available from a concrete drive approach connected to Oak Lawn Avenue. During the master plan of this project, a signalized left-turn median cut was constructed at the Infomart drive approach, across from the Stemmons Park drive approach. Sidewalks along Oak Lawn Avenue provide pedestrian access, and an asphalt park road lined with bollards also is on the site.

A major design constraint in this zone is Turtle Creek. It is a small tributary of the Trinity River, with its headwaters located in University Park. It generally flows southwest through Highland Park, back into Dallas and through the Oak Lawn Community, through Reverchon Park, and through Stemmons Park (this zone) before passing under IH 35 E and ultimately emptying into the Trinity River Meanders. The Meanders is unique in that it is the original alignment of the Trinity River prior to it being rerouted as part of the Corps of Engineers’ levee/flood control project for Dallas. The Meanders does not empty directly into the Trinity due to the levee. Instead, the Meanders and its tributaries, including Turtle Creek, serve as a detention basin as part of the Trinity River Levee System. Consequently, this entire zone is located within the 100-year floodplain. While it lacks diverse riparian vegetation, it is uniquely situated to be revitalized.

Stormwater is transferred from the back to the front of the levee by a series of pumps, with the closest being at the Baker Station. This pump station handles stormwater from Turtle Creek, which ultimately controls the flood water elevation in Stemmons Park. Baker is comprised of two pump stations, with the original or smaller station having 4 - 54,000 gpm pumps. The newer station has 5 – 80,000 gpm pumps and 1 - 6,000 gpm pump. The 6,000 gpm pump is used to handle frequent small drawdowns in the Turtle Creek sump. This reduces the use of the larger pumps and saves on cost and maintenance. According to the City of Dallas Floodplain Manager, the current Baker Pump Station does not have a 100-year storm capacity, and efforts to upgrade the existing capacity to 3 - 175,000 gpm pumps are being planned. The station currently maintains a
MSL sump elevation between 380’ to 385’ before the main pumps operate. The drainage area of Turtle Creek is unique, as it is not a true backwater area that fills up due to flooding conditions and slowly drains as flood waters go down. The drainage area, instead, continues to flow like a normal creek but begins to back up as it is being pumped over the levee and into the Trinity River.

In addition to backwater being stored in the park, a series of drainage features empty into the park. The largest is a 7’ by 5’ box culvert that runs under Oak Lawn Avenue and drains into Turtle Creek. Other small headwalls and reverse pressure inlets also drain into the site. The location of the existing sanitary sewer line and its aerial crossing over the creek may have an impact on trail improvements in this area, as well.

**Natural Features**
This property is one of the few undeveloped green spaces in the vicinity. A channelized water body, Turtle Creek, bisects Stemmons Park. Topography along the stream bank is very gentle in some places, averaging 8%, and more steep in other places, averaging 35%. The flowline is almost level, fluctuating between a 390 and 389 MSL elevation throughout the channel. Sediment build up has occurred over many years and has contributed to the level flowline. Due to the nature of the site, which collects and stores backwater, sedimentation is an unavoidable dynamic that must be managed.

Large canopy trees inhabit the area, including Bald Cypress (Taxodium distichum), Black Willow (Salix nigra), Live Oak (Quercus virginiana), and American Elm (Ulmus sp.). Ornamental trees, such as Crape Myrtle (Lagerstromia indica) are also located within the property. Park land in this zone is abundant for an area that is surrounded by densely urbanized development.

**Cultural Features**
This portion of the project parallels IH 35 E and will be highly visible from the roadway. It also has great views of the Infomart architecture. The location lends itself to be a lunchtime refuge for people who work in the Infomart, Dallas Medical District and surrounding office spaces. Recently, construction of mixed-use developments in the Design District, west of IH 35 E, has become common. Stemmons Park has the opportunity to become “the park” for Design District residents. Many residents of this area are seen walking with their pets in medians along Hi Line Drive because of the lack of adequate park land accessible from their homes.

In 1957, the land where the Infomart now resides was home to P.C. Cobb Stadium, a 23,000 seat arena for high school sports. After years of use, the stadium was demolished in 1985. A series of concrete sports reliefs have been preserved by the Trammell Crow Family and donated to the City of Dallas Parks and Recreation Department. These reliefs have been reserved for development at Stemmons Park.
Zone 4 - Under IH 35 E to Trinity Strand Trail

This zone includes the portion of the trail from Stemmons Park to the western limit of the project, where it will connect to a proposed portion of the Trinity Strand Trail and the Design District. This area poses the most unique circumstances of all the regions, as it is dark, noisy, mucky and hidden from view.

Property Ownership

Property under IH 35 E is in the TXDOT right-of-way and also falls within the jurisdiction of the City of Dallas Floodplain Manager.

Infrastructure

Leaving Stemmons Park to the southwest, the trail will parallel Turtle Creek. On the northeast side of the IH 35 E main lanes, the trail will encounter two northbound frontage road bridges over Turtle Creek. The first carries right-turn traffic onto Oak Lawn Avenue. The purpose of the turn lane was originally to serve Cobb Stadium traffic during events. Clearance under this bridge will be restrictive, less than 8’, which is below the minimum AASHTO clearance requirements for bicycles. This frontage road is slated to be abandoned by TXDOT during construction of Project Pegasus. The City of Dallas has confirmed that this road could be abandoned if a right-turn lane is constructed with the second IH 35 E frontage road.

The second bridge carries traffic that travels north on the frontage road or turns left onto Oak Lawn Avenue. Clearance under this bridge is less restrictive at 10’, but crossing under the bridge still feels confined. After crossing under the second frontage road bridge, the trail will be under the IH 35 E main lane bridges. The area is very open and clearance is more than ample. The trail will continue southwest, cross over Turtle Creek, and pass under the main lanes as Turtle Creek turns to the northwest. The trail will then turn north and must cross over an existing aerial 30” concrete cylinder water line.

The aerial water line crosses under IH 35 E. Soil reports from the installation of this water line indicate the soil is mucky and that support piers for the line are deeper than 60’. Parallel to the aerial water line is the Oak Lawn Avenue bridge, which passes under the IH 35 E main lanes. The trail will need to clear the aerial water line while passing below the bridge. There is 14’ of clearance between the top of the water line and the bottom of the Oak Lawn Avenue bridge beam.

During rain events, backwater builds up as the Baker Pump Station pumps water into the Trinity River levee system. The function of this system has been described in detail in the Zone 3 Stemmons Park section.

Natural Features

Turtle Creek flows under IH 35 E and maintains a near level flowline, as it does in Stemmons Park, fluctuating between 390 and 389 MSL elevations. The entire area under IH 35 E floods during a storm event, and, with each storm, sediment is deposited.
Detailed Site Analysis Zone 4
Under IH 35 E to Trinity Strand Trail
Due to the presence of constant water, the soil under IH 35 E is described as muck. Shade under the bridge and frequent flooding limit the existence of vegetation, leaving the mucky soil bare.

**Cultural Features**
Because the space is secluded, safety is a major concern. Presence of a homeless population at the northern edge under the bridge also has emerged. These factors, combined with the limited lighting, create a potentially hazardous scenario. Noise from the constant overhead traffic adds to the unappealing nature of this zone.
guiding principles

trail design
**Trail Design Guiding Principles**

A combination of principles were used to define the alignment and function of the proposed trail layout:

- Existing standards for the Katy and Trinity Strand Trails
- American Association of State Highway and Transportation Officials (AASHTO) 1999 Guide for the Development of Bicycle Facilities
- 2009 AASHTO Manual on Uniform Traffic Control Devices (MUTCD) Regulatory Signage and Wayfinding
- Uniform Building Code (UBC)
- Americans with Disabilities Act (ADA)
- Texas Accessibility Standards (TAS)
- City of Dallas Public Works Design Standards
- Practical knowledge of regional factors

During the development of this plan, the AASHTO Guide for the Development of Bicycle Facilities was being updated. Although not formerly adopted and only available in a draft version, some of its proposed guidelines have been included. It is anticipated that The Connection will be constructed after this document has been officially accepted.

Listed below is a compilation of parameters used in developing the trail alignment. Bold points draw attention to more stringent parameters required by the design team or decisions made by the team based on site factors.

**Trail Use Etiquette**

- Travel on right.
- Pass on left.
- Use audible passing warning.
- Integrate MUTCD signage.
- Courtesy trail etiquette reminders on themed signage.

**Trail Width**

- **Average Use Trails** - AASHTO urban minimum width for a two-directional shared use path is 10' with a minimum level 2' shoulder area of recovery.
- **Heavy Use Trails** - AASHTO urban preferred width for a two-directional shared use path is 10'-14' with a minimum level 2' shoulder area of recovery.
- AASHTO suggests a 5’ minimum level shoulder adjacent to parallel water hazards and steep slopes greater than 3:1.
- High user volumes of more than 300 total users per peak hour require a wider trail.
- Average width of the Katy Trail is 12’ with an 8’-soft-surface running/jogging parallel trail.
- Average width of the Trinity Strand Trail is 12’.
- Trail width must accommodate emergency and maintenance vehicles.
- Because of heavy use, the design team determined that the main spine of the proposed trail should be 16’-wide, with accessory paths 10’-wide. If funding is limited, the main spine could be reduced to 14’. This determination was made because, at peak times, the Katy Trail experiences overcrowding. It is anticipated that the Trinity Strand will experience the same usage.

**Vertical Clearance**

- AASHTO desirable above trail vertical clearance is 10’.
- AASHTO minimum above trail vertical clearance is 8’.
- City of Dallas required roadway vertical clearance is 17’.
- DART required maintenance road vertical clearance is 12’.

**Trail Surface**

- A hard, all-weather surface, such as concrete, is desired for the main path.
- Accessory paths can have soft surface material.
- Trail surface of the main Katy Trail is concrete.
- Accessory paths of the Katy Trail are rubberized surface or decomposed granite.
- Trail surface of the main Trinity Strand Trail is concrete.
- Accessory paths for the Trinity Strand Trail are planned to be decomposed granite.

• Trail surface must support loads of emergency and maintenance vehicles.
• Bridge decks must have expansion joints that will not cause unsafe hazards to users.
• Non-slip surface on bridge decks.
• ADA requires the cross slope of accessible pedestrian routes to not exceed 2%. Design team recommends 1.5% maximum cross slope because of high shrink/swell capacity of local clay soils.
• ADA requires the longitudinal slope of pedestrian routes to not exceed 5%. Design team recommends 4.5% maximum longitudinal slopes because of high shrink/swell capacity of local clay soils.
• Achieve positive drainage away from the trail.
• The design team determined that the proposed trail and accessory paths would be 6” thick concrete, reinforced with steel.
**Design Speed**

- Design speed is related to the site and dependent upon condition, location, grade and number of users along the path.
- Current AASHTO guidelines recommend a minimum design speed of 20 mph.
- TXDOT has a policy that, where federal funds are utilized, a minimum design speed of 20 mph is required.
- Where grades 4% or greater exist, a 30 mph design speed is recommended by AASHTO.
- AASHTO requires the minimum path radius be used to determine the design speed.
- Based on limiting site factors, such as a small inside turning radius, the design team determined that the design speed of the trail should be 14 mph.

**Lean Angle**

- AASHTO desirable minimum radius for paved shared-use paths, based on a 15% lean angle and 20 mph design speed, is 100’.
- AASHTO minimum radius for paved shared-use paths with a 20 mph design speed, based on 2% superelevation rates and 20% lean angle, is 90’.
- AASHTO recommends increasing the path width and utilizing centerline striping on the path if the 20% lean angle is utilized.
- AASHTO recommends that MUTCD standard curve warning signs and supplemental pavement markings should be installed when site conditions require a smaller radius.

**Grade**

- TAS requires a maximum 2% cross slope and 5% longitudinal slope
- AASHTO will allow grades steeper than 3% but limits the distance the steeper slopes are allowed.
- Design team recommends 1.5% maximum cross slope and 4.5% maximum longitudinal slope because of high shrink/swell capacity of local clay soils.

**Sight Distance**

- Centerline striping must be used for heavy volume or limited sight distance constraints.
- AASHTO recommends MUTCD warning signage at sharp curves.
- AASHTO suggests a widened path at narrow curves or in locations with limited lines of sight.
- AASHTO requires, based on a maximum grade of 5% and a design speed of 20 mph, the minimum ascending stopping sight distance to be 120’ and to be 140’ where descending.

**Safety**

- AASHTO recommends MUTCD signage at trail/roadway crossings, which include stop signs and stop bars on the path.
- AASHTO suggests curb ramps should be the width of the path.
- AASHTO recommends a 4’ wide yellow line down the center of the path to divide lanes.
- AASHTO recommends lighting along trails for nighttime use and in pathway tunnels and underpasses during all trail use times.
- AASHTO recommends providing connection points to roadways that paths cross over or pass under.
- AASHTO and UBC recommend 42” tall protective railings where grade difference adjacent to trail is 30” or greater.
- AASHTO recommends protective railings where a 5’ shoulder, parallel to hazards and water bodies, is not achievable.
- AASHTO recommends a 6” rub rail located 36” above the trail surface.
- UBC requires that openings should not allow passage of a 4” sphere.
- Where the trail is superelevated over the escarpment and is spanning over highway bridges, the design team recommends a protective railing of 52” versus AASHTO’s 42” requirement.
- Where the trail crosses over highway bridges and roadways and near rail lines, the design team recommends enclosing the trail for short spans to prevent obstacles from being thrown into traffic and debris flying from the road onto the trail.
Trail Alignment

Zone I Limestone Escarpment

Challenge
A narrow trail easement at two points is very restrictive. Development at these restricted points threatens to impact the sensitive escarpment.

Solution
Several limiting factors were identified as key components that would influence the trail alignment. Designers studied three different trail options and analyzed the positives and negatives of each alternative.

Option A took the most sensitive approach to protecting the escarpment. To limit earthwork, this scenario proposed elevating the trail with piers placed at the base of the escarpment. The trail would be elevated enough to cross above and through unique escarpment vegetation. This “treetop” opportunity would provide an experience to the trail user unique to any trail experience in the region. Construction of this option would be the most expensive. For this reason, the CAC opted to designate this option as the second preferred choice.

Option B was dependent upon acquiring additional easement where the trail was restricted. The original trail easement was defined during the planning efforts of the property, formerly home to Baby Doe’s. Limited space was available to meet the requirements of the plan and to provide space for the trail. A new plan for the land is now being developed by the property owners. Although it is anticipated that available space is still limited, only 3,700 sf of additional easement is required to protect 14,300 sf of escarpment. This option will cost the least to construct and will pose the least impact on the escarpment. Although this is the favored option, it is dependent upon additional easement acquisition, which cannot be ensured at this time. Therefore, Option A, the second favored choice, will also be included in the final master plan.

Option C posed the most impact on the escarpment. It honored the existing trail easement and utilized cut and retaining walls to construct the trail. This option was the least favored by the CAC.
Trail Alignment
Zone 1
Zone 2 Houston Street to DART Rail

Challenge
Determining the trail alignment under the future North Dallas Tollway northbound connector ramp (part of Project Pegasus) and Houston Street, while providing the City of Dallas required 17’ clearance over Houston Street, proved to be one of the greatest challenges of this project. To adequately address this challenge, a digital 3-D model of the existing conditions and proposed bridges was created. This allowed designers to visualize the relationship between the topography, roadways and bridges. From the model, designers realized that the proposed North Dallas Tollway northbound connector ramp would be in conflict with any trail crossing over Houston Street, as the proposed ramp would not meet the minimum 17’ clearance requirement.

Solution
TXDOT and the engineering firm working on Project Pegasus were contacted about the conflict. SRA engineers proposed a profile that elevated the future frontage road. This would allow the trail to cross over Houston Street with 17’ of vertical clearance between the top of curb and the bottom of the trail structure and 10’ of vertical clearance between the trail deck and the frontage road. This solution eliminated the conflicts, and all parties agreed to the change as long as there would be no additional right-of-way required.

Challenge
Transitioning from the Houston Street crossing to match the elevation under the DART/TRE rail lines presented a challenge. Approximately 33’ of grade difference between the Historic Katy Railroad Trestle and the crossing under the DART bridge currently exists.

Solution
Designers proposed three scenarios for transitioning the trail from one grade to the other. Scenario A was selected by the CAC as the favored solution and is the alignment illustrated on the following page.

Scenario A proposed a fly-over spiraling down 3.6% from the Houston Street crossing to meet the railroad trestle. A bridge would span the railroad trestle and then a switchback trail would slope 4.5% to meet the grade below the DART/TRE rail line. The advantage of this option was that it utilized the trestle and unused City right-of-way to make the transition. The disadvantage of this option was the limited space available to make the spiral and switchback, which resulted in small inside radii and limited the design speed for the trail. A 40’-radius at the spiral and a 36’-radius at the switchback were the largest radii achievable, which limited the design speed to 14 mph. Ideally, a 20 mph design speed is preferred, which requires a minimum inside radius of 74’ for both features. Unfortunately, the space was not available to increase the radii and the trail design speed. The advantage of this option was the potential it had to make a very strong visual statement about the trail. This was the solution favored by the CAC.

Scenario B utilized the historic trestle as an overlook and not a component of the trail. Instead, this option proposed directing the trail down from the Houston Street crossing (similar to Option A) and utilizing the historic trestle as an overlook (as proposed by Option B). This option spanned the creek in front of the trestle. The main advantage of this option was the increased inside turning radius. However, the increased radius was not enough to increase the trail design speed significantly. It was considered an interesting feature because it gave trail users a strong visual connection to the trestle. However, the lowered trail structure built across the creek would have a significantly negative hydrologic impact. For this reason, Option C was not considered.

Scenario C proposed spiraling down from the Houston Street crossing (similar to Option A) and utilizing the historic trestle as an overlook as proposed by Option B). This option spanned the creek in front of the trestle. The main advantage of this option was the increased inside turning radius. However, the increased radius was not enough to increase the trail design speed significantly. It was considered an interesting feature because it gave trail users a strong visual connection to the trestle. However, the lowered trail structure built across the creek would have a significantly negative hydrologic impact. For this reason, Option C was not considered.

Challenge
The elevated trail will cross over and under numerous highway bridges, roads and rail lines. Trail planners are concerned with safety of the trail users and motorists from accidentally or intentionally thrown, flying or falling objects.

Solution
A steel plate roof is proposed for the fly-over structure. Wire mesh sides are proposed where the trail is adjacent to bridges, roads or railings.
Zone 3 Stemmons Park

This is the most level and spacious area within the boundary of the proposed trail. However, there were a few challenges that were discovered during the planning of the trail.

Challenge

While the numerous mixed-use developments being constructed in the Design District are creating a growing residential community, most do not have yards. As a result, the Friends of the Trinity Strand Trail requested an “off-leash” dog facility in Stemmons Park. Typically, land and parking needs for a dog park exceeds three acres. In this area, however, space is much more limited.

Solution

Designers reconfigured the parking and the trail to create an uninterrupted space along the northeastern edge of Stemmons Park. The result is 1.5 acres of land for an “off-leash” dog park. This space is not adequate for the typical City dog park nor is there room for the parking that is required by such a feature. The City of Dallas Parks and Recreation Department, however, has experienced success with a small dog run located in Main Street Gardens, which serves Downtown residents only. Following this example, this area in Stemmons Park will be designed to serve the Design District residents and will function as an urban dog run.

Within the 1.5 acres planned for the dog run, .3 acres are within the DART/TRE easement. During a TAC meeting, designers proposed the idea to DART that an easement use agreement would provide more space for a dog park and relieve the agency of the responsibility of maintaining the land. DART/TRE representatives were receptive to the idea and stated that the request would need to go through the proper review channels to get final approval. Additional agency coordination will be necessary during future phases of the project.

Challenge

At the request of the Friends of the Trinity Strand, trail designers provided park designs with and without parking. Stemmons Park is intended to be a neighborhood park and will serve the population within walking distance of the park. If parking is to be provided, the group would like to explore providing shared parking off-site, which will require additional study. Should parking be located within Stemmons Park, its proposed location will conflict with an existing 7’ x 5’ box culvert that outfalls into Turtle Creek.

Solution

Designers proposed extending the box culvert to the edge of the new parking lot.

Challenge

An existing sanitary sewer line conflicts with the proposed box culvert extension and clearance needed to pass under the IH 35 E Frontage Roads to Oak Lawn Avenue.

Solution

Designers proposed replacing the box culvert with a series of smaller pipes that would outfall into Turtle Creek and allow the sanitary sewer line to remain in place. Not only would this modification allow the trail and road to be constructed over the drainage structure, it would dissipate stormwater.

Challenge

Existing clearance below the IH 35 E/Oak Lawn Avenue right turn lane (8.5’) does not meet the ideal trail clearance requirements and barely meets the minimum requirements. The existing ground elevation (390.5 MSL) in this area nearly matches the adjacent flow line of Turtle Creek (390 MSL). To meet accessibility requirements, the trail elevation will be higher than the existing ground elevation and only have 5.5’ of clearance. Designers analyzed the use of a steeper sloping (8.33%) trail with handrails to meet the accessibility requirements, along with the scenario of removing the right-turn frontage road to Oak Lawn Avenue. Advantages and disadvantages of each scenario were presented to the CAC. The scenario that included the provisions of a steeper slope would reduce connectivity and would also incur flooding and sedimentation problems with each storm.

Solution

Although removal of the IH 35 E right-turn frontage road bridge would necessitate the widening of the existing primary frontage road bridge, the CAC decided to pursue removal of the existing right-turn bridge to facilitate optimal function of the proposed trail alignment.
Trail Alignment
Zone 3

EXISTING NORTH DALLAS TOLLWAY (SOUTHBOUND)

ZONE 4

EDGE OF DART / TRE R.O.W.

ZONE 3

HARRY BLVD.

HARRY HINES BLVD.

ZONE 2

ZONE 1

OAK LAWN AVENUE

INFOHART PROPERTY

DALLAS DESIGN DISTRICT

GOAT HILL

GALVESTON BAY

HARRY BLVD.

HARRY HINES BLVD.

ZONE 3

ZONE 4

ZONE 1

ZONE 2

OAK LAWN AVENUE

INFOHART PROPERTY

DALLAS DESIGN DISTRICT

GOAT HILL

GALVESTON BAY

HARRY BLVD.

HARRY HINES BLVD.
Zone 4 Under IH 35 E to Trinity Strand Trail

This is the most unique zone within the project. Its location below IH 35 E presents a series of challenges.

**Challenge**
IH 35 E is one of the busiest highways in Dallas. The large volume of traffic constantly traveling over the bridge creates a great deal of road noise, which adds to the unappealing nature of this zone.

**Solution**
Designers proposed the installation of an interactive art feature underneath the bridge that would work with the noise to create natural sounds and rhythms.

**Challenge**
The area below IH 35 E was thought to be an unsafe environment because of limited light and visibility. The largest obstacle to overcome was the seclusion of the space. Reduced visibility of the space under the bridge from nearby motorists and pedestrians poses safety concerns.

**Solution**
The solution to this challenge is three-fold. First, it is suggested that lighting is added under the bridge to increase visibility for people using the trail. This will aid in creating a safer environment but will not solve the problem of the secluded nature below the bridge. The only way to ensure that the area is less secluded is to substantially increase the number of people using the space below the bridge. Secondly, making the space more accessible and appealing is another tactic. Designers recommend creating an experience underneath the bridge that will be a destination or draw, encouraging people to go there.

Lastly, designers also recommend accessory trails to allow a user optional points of exit when the trail appears unsafe.

**Challenge**
Land below the highway functions as a detention pond, storing run-off while it is being pumped into the Trinity River Levee System. During every rain event, sediment loads settle in the backwater while it is being stored. As a result, siltation issues will be an ongoing maintenance problem.

**Solution**
Silt build-up on the trail is unavoidable but can be managed. Elevating the trail above smaller storm event levels will help to reduce the amount of maintenance. The impact of flooding at unavoidable low points along the trail could be greatly reduced by constructing coffer walls on each side of the trail. Installation of hose bibs and access for maintenance vehicles will increase trail maintenance manageability.

**Challenge**
Unstable soils in the area could result in trail settling.

**Solution**
Constructing an elevated trail supported by piers that rest on a bearing stratum will limit trail settling. Further geotechnical investigation is needed to determine the exact depth of the piers. For the purpose of this report, 100’-piers were estimated. This corresponds with geotechnical requirements associated with the construction of the existing aerial water line and TXDOT bridge piers.

**Challenge**
During storm events, the land below IH 35 E floods. This could render the connection impassable.

**Solution**
Where possible, the trail has been elevated above anticipated common flood levels. At low crossings, the trail will be lined with concrete flood control barriers on each side. This will allow the trail to function during most typical flood events.

During rare and extreme flood events, the City of Dallas Parks and Recreation Department would temporarily close the trail connection. The master plan provides accessory trails at-grade and street level. This will allow crossings for pedestrians between the Katy Trail and Trinity Strand Trail during these extreme flood events.
Trail Alignment
Zone 4
design context
Design Context

The project site is steeped in natural, cultural and historical features, as well as solid existing design standards to follow. Designers identified the following substantial contextual features to draw on as inspiration for design: merging of two significant trails, Katy Railroad History, Limestone Escarpment, Goat Hill, Dallas Design District, the historical relationship between the Design District and railroads, Trinity River and the Old Meanders and Cobb Stadium. Each of these features are strongly related to the zones that were established during the site analysis portion of this document.

Merging of Two Significant Trails
This project is the merging of two substantial trail systems located within a very densely developed area near Downtown Dallas. The Katy Trail portion extends from Victory Plaza to the DART rail crossing. The Trinity Strand Trail portion extends from the DART rail crossing to just west of the IH 35 E underpass. The significance of uniting these two trail systems is monumental.

Katy Railroad History
The Missouri - Kansas - Texas Railroad was incorporated on May 23, 1870. It was traded on the public stock exchange under the initials KT and became commonly referred to as the "Katy." When construction of the rail line was completed, St. Louis in the north was linked to the Port of Galveston in the south, and all major cities in between were connected. Dallas was one of these cities, with rail service reaching the area in 1886.

The Katy served as both a freight and a commuter line. From 1915 to 1959, the Katy operated a luxury passenger train called the Texas Special. Being a passenger on the Texas Special was prestigious. In fact, several jazz and blues songs were written about the Katy during those years. Towards the end of the period when the Texas Special operated, rail cars were highlighted with bright colors and markings in lieu of the former black and brown colors. From 1947 to 1957, Katy Diesels were bright red with silver side panels and cream yellow on the nose hoods. From 1957 to 1965, the bright red color was replaced with orange-red and embellished with yellow accents and the "Katy Herald." Because red fades in the Texas sun, it was later replaced with dark green in the 1970s. Remnants of the Katy Rail exist within Zones 1 and 2 of this project. Adjacent to Goat Hill is a concrete support for the railroad. Between Harry Hines Boulevard and the DART/TRE line is a wooden trestle crossing Turtle Creek. Pictures from the 1940s show the Katy winding around the escarpment. The horizontal and linear form of the tracks was a significant feature of the area.

Design Inspiration

Materials
- Metal
- Rivets
- Wood

Colors
- Red
- Orange-Red
- Green
- Yellow

Forms
- Rail
- Locomotive

Patterns
- Repetitive
- Linear
- Horizontal
- Movement

Katy Rail Line logo and locomotive color schemes
Limestone Escarpment

The escarpment is an elevated spine that transverses the Blackland Prairie, a predominant vegetational group of North Central Texas. The Blackland Prairie begins in Sherman and extends just south of Austin. The sedimentary limestone cliff was formed millions of years ago from marine algae that were deposited in horizontal bands. The primary component of the algae is calcium carbonate, the main material in limestone, and many fossils are apparent in the chalky deposits. The hard limestone face has been exposed over the years due to erosion of softer surrounding soils. Distinct features of the escarpment are the striking white face which boldly contrasts with surrounding features, steep topography and unique vegetational communities. Many names are given to the geologic formation; “White Rock Escarpment,” “Austin Chalk,” “Limestone Escarpment” and the “Chalk Escarpment” are the most common.

This particular escarpment is a well known landmark in Dallas. Its prominent white limestone face with steep geologic uplift has lent itself to being named “Goat Hill.” It has been home to a well-known theme restaurant, Baby Doe’s Matchless Mine, and a significant billboard. Baby Doe’s industrial architecture on top of Goat Hill was visible for miles. From the restaurant, views of Dallas were phenomenal. The restaurant was closed and demolished in 2005.
Historical Relationship Between the Design District and Railroads
The Dallas Design District has always had roots steeped in railroad history. The District emerged from an area of commerce dependent upon adjacent railroad spurs to import and export merchandise. The spur road beds still exist in many locations within the District and could serve as connecting corridors to the future Trinity Strand Trail System.

Design Inspiration

Materials
- Metal
- Industrial
- Quality

Colors
- Bold Splashes
- Neutral Backgrounds

Forms
- Stylized

Patterns
- Stylized

Dallas Design District
The eclectic Dallas Design District is west of IH 35 E. Historically, the area was a conglomeration of warehouse buildings constructed in the 1950s by Trammell Crow and other developers. The Trinity River levee, inexpensive rent and proximity to freight lines spurred the original development. Over time, it has evolved into a collection of galleries, antique shops and showrooms. The Design District is internationally known as a reliable resource for interior designers. In the beginning, shops and galleries were known as “Strictly To The Trade Only” (STTO). Recent changes in the area have persuaded many owners to open their doors to the public. A growing assortment of mixed-use developments is also breathing residential life into the Design District. A colorful gateway of leaning I-beams demarcated with Le Corbusier’s preferred font designates the entrance to the area.
Trinity River and the Old Meanders

The Trinity River is the longest self-contained river in Texas. It begins in North Central Texas and flows south into Galveston Bay. It is a large river that has four branches: the West Fork, Clear Fork, Elm Fork and East Fork. The West Fork and Elm Fork merge as the river enters Dallas. Throughout time, the Trinity River has sustained life and settlement along its banks. It has also been known for ravaging floods that have impacted life and settlement. One of the most noteworthy floods was in 1908, when the upper basin experienced a 10’ – 15’ flood over a three-day period. This rain event flooded most of downtown and left the City without power, telephone or transportation.

The Trinity became known as a divider between West and East Dallas, and its potential for future devastating flood events was feared. In 1911, the City of Dallas hired George Kessler, a landscape architect, to develop a plan that would include a levee system to control the Trinity floodwaters. William Parsons, a hydraulic engineer, collaborated with Kessler. After some modifications, the final result was a 13-mile long, 30’-tall, 2,000’-wide levee system near downtown Dallas. Along with straightening and relocating the river, the plan called for seven gravity flow sluiceways, four pumping plants, and five pressure sewer lines. The Baker pump station manages the backwater within the project site.

Construction of the giant levees disconnected West Dallas from Downtown even more. Relocation of the river abandoned the original river bed, now referred to as the “Old Meanders.” Natural habitat and wildlife in the “Old Meanders” is not nearly as abundant or diverse as it was prior to the relocating of the Trinity River because of flood prevention maintenance measures and reduced flow. A component of the Trinity Strand Trail master plan is to revitalize and restore the natural habitat to the original Trinity River Channel.

<table>
<thead>
<tr>
<th>Design Inspiration</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Materials</strong></td>
</tr>
<tr>
<td>- Riparian Vegetation</td>
</tr>
<tr>
<td>- Flowing Grasses</td>
</tr>
<tr>
<td><strong>Colors</strong></td>
</tr>
<tr>
<td>- Green</td>
</tr>
<tr>
<td>- Earth</td>
</tr>
<tr>
<td><strong>Forms</strong></td>
</tr>
<tr>
<td>- Meandering</td>
</tr>
<tr>
<td>- Flowing</td>
</tr>
<tr>
<td>- Curvilinear</td>
</tr>
<tr>
<td><strong>Patterns</strong></td>
</tr>
<tr>
<td>- Alluvial</td>
</tr>
</tbody>
</table>

Pickerel Weed photo courtesy of: Sally Wasowski, Lady Bird Johnson Wildflower Center

Button Bush photo courtesy of: Joseph Marcus Lady Bird Johnson Wildflower Center

Bushy Bluesem photo courtesy of: Joseph Marcus Lady Bird Johnson Wildflower Center

Pickerel Weed photo courtesy of: Sally Wasowski, Lady Bird Johnson Wildflower Center

Rilluvial Pattern
Cobb Stadium

P.C. Cobb Stadium was a 23,000 seat facility utilized for high school sporting events. It was built under the Works Progress Administration (WPA) in 1939. Thirty years after its construction, it became the home of the Dallas Tornadoes, a professional soccer team. In 1985, it was demolished to make way for the Dallas Infomart, an iron and glass building modeled after the Crystal Palace in Britain. The Infomart serves the information technology business sector.

The Trammell Crow family has donated several concrete reliefs salvaged from Cobb Stadium to the Dallas Parks and Recreation Department. The re-use of these reliefs is intended for Stemmons Park.

Design Inspiration

Materials
- Concrete
- Metal
- Glass
- Cobb Stadium Reliefs
Current Katy Trail Standards
The Katy Trail is well established and has a palette of design standards to follow. These standards include:

- Minimum 14'-wide Concrete Trail.
- Galvanized Steel Railings.
- Limestone Retaining Walls.
- Limestone Signage.
- Granite 1/4-Mile Markers.
- Decomposed Granite Mulch.
- Native Grass/Perennial Plantings.
- Signage with Katy Logo Shape.
- Art/Interactive Art at Key Locations.
- Lighting.

Trinity Strand Trail Standards
The Trinity Strand Trail is an emerging trail system. The first trailheads at Turtle Creek Plaza and Hi Line Drive have been constructed. Because of master planning efforts, design standards have been developed, which include:

- Minimum 12'-wide Concrete Trail.
- Signage with Trinity Strand Trail Logo.
- Riparian Plantings.
- Complementary Design District Signage.
- Metal Benches.
- Brick Masonry.
- Galvanized Metal.
- Brightly Colored Metal.
Design Solutions

The connection trail design will funnel design context into trailheads, architectural elements, gateways, plazas and points of interest.

Zone I Limestone Escarpment

Victory Overlook

The beginning of the project lends itself into being developed as a trailhead for the connection. Victory Overlook is located in this zone. From the trail users’ perspective, the plaza consists of concrete paving, two circular cut-outs for trees, an overlook, galvanized metal railing, native grasses and seating. From the City, the view of the plaza is of a bold quarried limestone block wall with the lettering “Victory Overlook.” The limestone wall fades into the limestone escarpment face and gives the illusion that it was chiseled from the escarpment.

The proposed development will expand Victory Overlook into a larger plaza that also functions as a trailhead. The planned design will build from the circular plantings within the concrete paving by incorporating larger circular patterns in the existing design. The patterns will help separate the trail zone from the plaza space. Some of the circular forms will be flat and others will be three-dimensional. Flush patterns will be created by sandblasting and staining circular forms into the new and proposed paving. Raised planting mounds encompassed by limestone block seatwalls will create the three-dimensional forms. The raised planters will direct trail traffic and provide areas of refuge for people to take a break. Stained concrete bands in the paving will help define the edges of the trail connection. A limestone trail marker will function as way-finding signage to the connection. This marker will tie into existing Katy Trail signage.

Because of the visual prominence of Victory Overlook, it is a key location to add artistic displays that will identify the space as a trail. Numerous people drive by the area daily and take note of Victory Overlook; however, many do not realize that the Katy Trail reaches this area. Incorporating large sculptural features, such as people running, will be a way to specify the activity associated with the space behind the white limestone walls. Commissioning a metal sculptor, such as regional artist Jerry Daniel, to create a focal piece for this significant area would be ideal. The weathered patina of self-weathering steel would allude to the railroad materials once present in the area and should artfully express and represent people running.

Dancers
Photo courtesy of Jerry Daniel

Mexican Feathergrass photo courtesy of: Joseph Marcus, Lady Bird Johnson Wildflower Center

Limestone block
Master Plan Enlargement

- Highway Bridge Support, (Typ)
- 17” of clearance over Houston
- 12” of clearance below NTTA Ramp
- Retaining Wall Trail raised 7”
- Connection to proposed development
- Goat Hill CROW Holdings
- billboard property
- Escarpment Face
- Right - of - Way
- Trail Easement
- Trail Elevated 27”
- Future - NTTA Tollway Ramp (Northbound)
- Re-routed overhead electrical lines
Trail Cross Section

Stated in the alignment description, two options for the trail are being considered. Option A involves constructing an elevated trail that parallels the escarpment. This option could pose the least amount of environmental impact to the escarpment but would pose considerable visual change to the escarpment. Option B requires the acquisition of additional land. This option would be the more cost effective solution. Each option necessitates a unique cross section.

Option A, the elevated alternative, will be the most visible from IH 35 E and Houston Street. This option will have a treetop effect and wind through the escarpment vegetation. Designers propose incorporating a dramatic splash of green underneath the trail that extends up the side to distinguish it from surrounding highway bridges. It will serve as a symbolic depiction of the “ribbon of green” that the Friends of the Katy Trail advertise. It is very important that the shade of green selected be bold and distinguish itself from the surrounding vegetation. Designers and CAC members narrowed down a color range but agreed that, prior to construction, location mock-ups should be erected in order to select the exact color.

Designers propose letting the trail function as a “platform” for the experience. The views, elevation and canopy vegetation should be protected and emphasized. The framework of the trail is a simple, but elegant railing. Trail lighting will be incorporated into the railing to minimize the number of vertical elements that might compete with the views.

In this option, the remnant Katy Railroad concrete support would be utilized to support the trail. A marker on the trail would designate the significance of the location.

Option B will be partially screened from IH 35 E and Houston Street by escarpment vegetation. Where retaining walls are required, designers propose utilizing quarried limestone block where visible and concrete where hidden. The same philosophy developed for Option A, letting the trail function as a platform for the experience, is applied to this option. View and canopy vegetation is framed. Where elevation differences exceed 30’, a protective guardrail, matching the railing in Option A, will be incorporated.

In this option, the remnant Katy Railroad concrete support will support a trail overlook. It will include benches, interpretive signage and railing similar to the trail protective railing.
Zone 2 Houston Street to DART Rail

**Fly-over**
This zone is very visible from IH 35 E, Houston Street and the DART rail line. The area is visually cluttered with numerous highway bridges and overhead utility lines. The proposed trail connection will compound the visual clutter by incorporating an additional bridge. A pedestrian “fly-over” will cross over Houston Street and spiral down until it matches the proposed grade at the historic railroad trestle.

Color will be utilized to set the trail apart from transportation bridges and send a message that this is a “people place.” A splash of green color underneath the bridge will be highly visible to motorists. The color will extend up the side of the fly-over for 2’ and will be visible to people traveling on IH 35 E and the DART rail line. To protect trail users from occasional flying debris and to protect motorists from objects potentially thrown from the trail, a covering over and around the sides of the fly-over is proposed. The roof structure will be a steel canopy, powder-coated green. The canopy will also offer much needed relief from the Texas sun. Natural daylight and solar powered lighting will be incorporated in the center of the roof. Nighttime illumination will also be an integral component of the railing. For safety reasons, the structure must be enclosed in some locations with a very open mesh screen. This caused some concerns amongst the design team and CAC members. The concerns and solutions addressed by the design team are:

**Concerns**
- Visibility on the trail is important for safety.
- If users were to encounter dangerous situations, they could become trapped.
- Positive airflow is important.
- Visibility from the trail to surrounding features is important.

**Solutions**
- A very open wire mesh was selected to enclose the fly-over.
- In most cases, the fly-over would not be enclosed on both sides. The mesh would only be located:
  - Where the potential to throw something from the trail into traffic existed.
  - After a sharp curve, to protect out of control bicyclists from being ejected from the fly-over.
**Trestle Overlook**

A bridge will be built over the historic railroad trestle. The wooden structural columns and cross bracing will be preserved. Trail users traveling south on the connection towards the Katy Trail will enjoy a close-up view of the wooden structure.

The east side of the trestle bridge will function as the trail and the west side will function as an overlook. The trail and the overlook will be separated by a “ribbon” of green fiberglass barriers, which will also serve as seating. Stainless steel edges on the barriers will provide protection from skateboard damage. Shade canopies at the overlook will add a splash of color and provide dappled shade while serving as a vertical landmark. This location will be designated as a point of interest.

A steep grade transition between the railroad trestle and the DART rail line must be constructed. Limestone retaining walls will support the grade differences.
Zone 3 Stemmons Park

Portals
Upon entering Stemmons Park, the trail will transition to the Trinity Strand Trail. Surrounding characteristics also change from being confined with steep topography to being largely open with subtle topographic changes. At this point, a series of entry portals are proposed to designate the entrance to Stemmons Park. The portals are symbolic of the convergence of the two trail systems. Two contrasting materials make up the portals: limestone block, reminiscent of the escarpment, and brightly colored steel I-beams, referencing the ones at Turtle Creek Plaza and the gateway to the Design District.

Stemmons Plaza
Turtle Creek meanders through Stemmons Park and, in one location, wraps around a portion of land that lends itself to be a plaza. This location has great views of the Infomart and the creek. It is anticipated that this plaza will not only be utilized by trail users, but also by residents and employees in the Design District, Infomart and surrounding businesses. Layers of seating can be offered to individuals and small groups on a daily basis as well as accommodating small events and gatherings. Mounds of flowing native grasses are encompassed by raised brick seat walls. People can select more isolated seating for privacy or very open seating, which is ideal for people watching. Seating terraces proposed along Turtle Creek will allow users to appreciate the beauty of the restored riparian vegetation. The east wall of the plaza will be bound by a retaining wall that features restored concrete reliefs salvaged from the demolition of Cobb Stadium and donated to the park by Crow Holdings.

This location is a perfect place to portray a series of events that have led to the dynamics of both trail systems. A unique approach would be to create a vertical timeline of features, symbolized by what designers refer to as “Urban Totem Poles,” like Native American Totem poles. Each vertical element will tell the story of a significant event in time. The materials of these totem poles will be very urban and include elements like concrete, steel and bold splashes of color. Proposed events to be covered by the timeline are: the Trinity Strand Trail, Cobb Stadium, construction of the Trinity River Levee System, the influence of the rail industry to the area, and the Dallas Design District.

This space is envisioned as a place of refuge. Berming and evergreen screening are planned to mitigate the traffic noise along IH 35 E.

Turtle Creek
A major objective of the Friends of the Trinity Strand Trail is to breathe life back into the “Old Meanders” portion of the Trinity River. Designers propose that the span of Turtle Creek that flows through Stemmons Park symbolize the revival of the river. A backwater drainage garden is proposed that glorifies the dynamic, ever-changing, riparian ecosystem. Vegetation in this area will not only flourish during drought and flood conditions, but also create an aesthetic interest. Grades will be adjusted to lay the banks of the river back in places and encourage ponding of water. Stone weirs will help pond water and provide pedestrian bridge access across Turtle Creek.

Discovery Meadow
The area to the west of Turtle Creek will be a more intimate natural space. It will be a place of discovery, including smaller paths, selected riparian plantings, quarried stone block seating and public art. This area will be a meadow garden, featuring both lowland and upland meadow plants. Within this space, interpretive elements showcasing the dynamic ecosystem of the Old Meanders and the meadow will be strategically placed so users can explore and discover the biological history.

Example of natural stone outcropping proposed for Turtle Creek
Master Plan Enlargement
**Dog Run**

Because space is in high demand along the east side of Stemmons Park, the construction of a full-size dog park is not feasible. As a result, the CAC and design team determined the best course of action is to provide an urban dog run for Design District residents, which utilizes less property. Design elements within this space include brick retaining walls, metal fencing, screening trees and sculptural turf areas.

**Stemmons Trailhead**

Metal and brick entry signage will identify the park and trail connection. If the parking lot is constructed, lit metal bollards and textured, colored concrete paving will separate the trail from trail readiness zones. Finishes in this space will be similar to materials used on the Trinity Strand Trail.
Zone 4 Under IH 35 E to Trinity Strand Trail
The area beneath the main lanes of IH 35 E is uniquely challenged because it is dark, secluded, noisy and mucky. Designers propose overcoming most of these challenges by creating a destination that will substantially increase the number of people who travel in this zone.

Froggy Bottoms
This proposed destination along the trail has been named Froggy Bottoms. It is a place proposed to have sound, animated colorful lighting, art, whimsy and interaction.

Initially inspired by the potential to mask overhead road noise, designers explored the possibility to turn the noise into music. When standing underneath the Interstate for any amount of time, it becomes evident that there is a constant rhythm from automobile tires hitting the road. The constant drone of cars can even be perceived as fast-running water. To soften the experience, an interactive sound feature is proposed. This feature will activate at the presence of trail users and play sounds, which build from the road noise while mimicking nature. It is anticipated that the sounds produced will be similar to those of frogs and crickets, typical noises heard in a Texas riparian environment at dusk.

LED down lighting is proposed at each of the bridge support columns to wash the area in neon shades of blues and greens. From Stemmons Park, the color will beckon people into the space. Animated light that slowly fades in and out to colors could capture a different experience each time a trail user passes through the space. Accessory lighting of the trail will safely illuminate inhabited spaces.

The proposed nature sounds and mucky soils inspired a playful collection of frogs as interactive art features. The proposed frogs will vary in size. The largest of the frogs will be perched upon a mound of decorative rock and be visible from Stemmons Park. He will be playfully wrapping his tongue under the elevated trail to capture a taunting moth. This could make a subtle connection with a new restaurant in the Design District, the Meddlesome Moth. The medium-sized form will be partially immersed in decorative rock piles. The smallest frog’s eyes will only be visible from the rock. The trail will wrap around the large and medium frogs and each will have an interactive feature. The largest frog will make croaking noises when people run their hands along the ridges of its back. The medium frog will have a thin metal membrane material on its head that will allow trail users to make drum noises with their hands.

Although little to no vegetation exists under the highway bridge, a specific palette of shade-loving, flood-tolerant plants could thrive if properly placed where dappled light filters into the space. Inland Sea Oats (Chasmanthium latifolium), Eastern Gamagrass (Tripsacum dactyloides), Buttonbush (Cephalanthus occidentalis), Palmetto (Sabal minor), Cardinal Flower (Lobelia cardinalis) and Water Clover (Marsilea vestita) are some suggested plants native to North Central Texas that would meet the planting requirements.
Master Plan Enlargement
opinion of probable cost
The Friends of the Katy Trail and Friends of the Trinity Strand Trail will utilize this document and other support materials to conduct a strategic fundraising campaign. Private donations, sponsorships and grants will be targeted. If fundraising efforts are successful, the City of Dallas may contribute funds through a City bond election. A realistic opinion of probable cost is an essential tool to aid them with their fundraising efforts.

A broad cost breakdown has been provided in this section and is followed by a more detailed opinion of probable cost for each of the four zones and their respective options:

- **Zone 1** - Limestone Escarpment, Alignment A and Alignment B.
- **Zone 2** - Houston Street to DART rail line.
- **Zone 3** - Stemmons Park, Option A and Option B.
- **Zone 4** - Under IH 35 E to Trinity Strand Trail.

The overall opinion of probable cost includes a 20% contingency, a 15% (three-year) inflation factor and 12% for professional services. It is anticipated that permitting will be extensive and time consuming, thus increasing the cost of professional services.
ZONE 1
$2,677,978.00 (A)
$1,730,230.00 (B)

ZONE 2
$3,734,580

ZONE 3
$1,600,819 (A)
$1,762,518 (B)

ZONE 4
$4,217,021

OAK LAWN AVE.

IH 35 E

GOAT HILL

OPTION A

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONSTRUCTION</td>
<td>$12,290,396.00</td>
</tr>
<tr>
<td>MOBILIZATION</td>
<td>$300,000.00</td>
</tr>
<tr>
<td>CONTINGENCY</td>
<td>$2,458,079.00</td>
</tr>
<tr>
<td>INFLATION FACTOR</td>
<td>$1,843,559.00</td>
</tr>
<tr>
<td>PROFESSIONAL FEES</td>
<td>$1,474,848.00</td>
</tr>
<tr>
<td><strong>GRAND TOTAL</strong></td>
<td><strong>$18,366,882.00</strong></td>
</tr>
</tbody>
</table>
## OPINION OF PROBABLE CONSTRUCTION COST

**The Connection**  
March 1, 2011

<table>
<thead>
<tr>
<th>Zone 1 Option A</th>
<th>Item</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Removal and earthwork</td>
<td>$24,357</td>
</tr>
<tr>
<td>1.2</td>
<td>Concrete trail elevated on piers</td>
<td>$1,719,440</td>
</tr>
<tr>
<td>1.3</td>
<td>Main trail on grade</td>
<td>$237,801</td>
</tr>
<tr>
<td>1.4</td>
<td>Amenities</td>
<td>$62,175</td>
</tr>
<tr>
<td>1.5</td>
<td>Landscaping</td>
<td>$64,205</td>
</tr>
<tr>
<td><strong>Zone 1 Option A Subtotal</strong></td>
<td></td>
<td><strong>$2,677,978</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Zone 2 Option A</th>
<th>Item</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>Removal and earthwork</td>
<td>$87,878</td>
</tr>
<tr>
<td>2.2</td>
<td>Concrete trail elevated on piers</td>
<td>$2,699,732</td>
</tr>
<tr>
<td>2.3</td>
<td>Main trail on grade</td>
<td>$561,130</td>
</tr>
<tr>
<td>2.4</td>
<td>Amenities</td>
<td>$351,590</td>
</tr>
<tr>
<td>2.5</td>
<td>Landscaping</td>
<td>$34,250</td>
</tr>
<tr>
<td><strong>Zone 2 Subtotal</strong></td>
<td></td>
<td><strong>$3,734,580</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Zone 3 Option A</th>
<th>Item</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1</td>
<td>Removal, traffic control and earthwork</td>
<td>$186,503</td>
</tr>
<tr>
<td>3.2</td>
<td>Concrete trail elevated on piers</td>
<td>0</td>
</tr>
<tr>
<td>3.3</td>
<td>Main trail on grade</td>
<td>$114,975</td>
</tr>
<tr>
<td>3.4</td>
<td>Amenities</td>
<td>$498,248</td>
</tr>
<tr>
<td>3.5</td>
<td>Landscaping</td>
<td>$861,093</td>
</tr>
<tr>
<td><strong>Zone 3 Subtotal</strong></td>
<td></td>
<td><strong>$1,660,819</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Zone 4 Option A</th>
<th>Item</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1</td>
<td>Removal, traffic control and earthwork</td>
<td>$148,225</td>
</tr>
<tr>
<td>4.2</td>
<td>Widen existing bridge to add right turn lane</td>
<td>$481,680</td>
</tr>
<tr>
<td>4.3</td>
<td>Concrete trail elevated on piers</td>
<td>$1,619,906</td>
</tr>
<tr>
<td>4.4</td>
<td>Main trail on grade</td>
<td>$313,190</td>
</tr>
<tr>
<td>4.5</td>
<td>Accessory trail</td>
<td>$267,020</td>
</tr>
<tr>
<td>4.6</td>
<td>Amenities</td>
<td>$1,021,000</td>
</tr>
<tr>
<td>4.7</td>
<td>Landscaping</td>
<td>$366,000</td>
</tr>
<tr>
<td><strong>Zone 4 Subtotal</strong></td>
<td></td>
<td><strong>$4,217,021</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Zone 1 Option B</th>
<th>Item</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Removal and earthwork</td>
<td>$24,357</td>
<td></td>
</tr>
<tr>
<td>Concrete trail elevated on piers</td>
<td>$546,690</td>
<td></td>
</tr>
<tr>
<td>Main trail on grade</td>
<td>$462,803</td>
<td></td>
</tr>
<tr>
<td>Amenities</td>
<td>$632,175</td>
<td></td>
</tr>
<tr>
<td>Landscaping</td>
<td>$64,205</td>
<td></td>
</tr>
<tr>
<td><strong>Zone 1 Option B Subtotal</strong></td>
<td></td>
<td><strong>$1,730,230</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Zone 3 Option B</th>
<th>Item</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traffic control, removal and earthwork</td>
<td>$279,703</td>
<td></td>
</tr>
<tr>
<td>Main trail on grade</td>
<td>$123,475</td>
<td></td>
</tr>
<tr>
<td>Amenities</td>
<td>$498,248</td>
<td></td>
</tr>
<tr>
<td>Landscaping</td>
<td>$861,092</td>
<td></td>
</tr>
<tr>
<td><strong>Zone 3 Option B Subtotal</strong></td>
<td></td>
<td><strong>$1,762,518</strong></td>
</tr>
</tbody>
</table>

### Additional Costs

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subtotal Zones 1, 2, 3 and 4</td>
<td>$12,290,396</td>
</tr>
<tr>
<td>Mobilization</td>
<td>$300,000</td>
</tr>
<tr>
<td>Design Contingency</td>
<td>$2,458,079</td>
</tr>
<tr>
<td><strong>Subtotal Projected Construction Costs</strong></td>
<td><strong>$15,048,475</strong></td>
</tr>
<tr>
<td>Inflation Factor (3-years at 5%)</td>
<td>$1,843,559</td>
</tr>
<tr>
<td>Professional Services</td>
<td>$1,474,848</td>
</tr>
<tr>
<td><strong>GRAND TOTAL</strong></td>
<td><strong>$18,366,882</strong></td>
</tr>
</tbody>
</table>

---

OPINION OF PROBABLE CONSTRUCTION COST

The Connection  
March 1, 2011
Permitting

Due to the numerous jurisdictional agencies associated with this project, permitting will be an extensive part of constructing this project.

Texas Antiquities Code
To ensure the protection of archeological sites as land is developed for public construction, a Texas Cultural Resources permit will be required. The Antiquities Code requires state agencies and political subdivisions of the state, including cities, counties, river authorities, municipal utility districts and school districts to notify the Texas Historical Commission (THC) of any action on public land involving five or more acres of ground disturbance; 5,000 or more cubic yards of earth moving; or any project that has the potential to disturb recorded historic or archeological sites. During this permitting process, coordination with the Texas Historical Commission/State Historic Preservation Officer will be required. Because of the location of the project in the Historic Trinity River floodplain, an archeological study of certain areas may be required during the permitting process.

U.S. Army Corps of Engineers (USACE) Section 208 or Section 408 process.
If the USACE has improved Turtle Creek at some point for the Dallas Floodway, either a 208 or 408 process would have been required. A previous Trinity Strand Trail project was not required to fulfill the requirements of the USACE 208 or 408 process; however, it was determined that previous federal funding had not been utilized within the project site. Due to this precedent, this proposed project may not be subject to these requirements. However, further investigation is required.

Waters of the United States and Section 404 Permitting.
Recognizing the potential for continued or accelerated degradation of the Nation’s waters, the US Congress enacted the Clean Water Act. The objective of the Act is to maintain and restore the chemical, physical, and biological integrity of the waters of the United States. Section 404 of the Act authorizes the Secretary of the Army, acting through the Chief of Engineers, to issue permits for the discharge of dredged or fill material into the waters of the United States, including wetlands. A permit will be required because this master plan proposes four channel crossings of Turtle Creek and potential modification to an outfall structure. To apply for this permit as a wetland delineation, the boundary between wetlands and uplands in Stemmons Park will need to be determined to accurately define the wetlands.

Several scenarios for 404 permitting exist. The applicable scenario is dependant upon site factors and wetland delineation findings.

TXDOT
Any construction within TXDOT right-of-way will be subjected to TXDOT review and will require a TXDOT permit.

City of Dallas Floodplain Management
A Hydrologic Engineering Centers River Analysis System (HEC-RAS) Study to model the hydraulics of water flow through the channel will be required by the City of Dallas Floodplain Administrator. Calculations will also be necessary to verify that the proposed fill within the floodplain does not exceed net materials proposed to be cut from the floodplain.

If the loss of “Waters of the United States” exceeds 0.5 acre, then an Individual Section 404 Permit will be required.

If the loss of “Waters of the United States” exceeds 0.5 acre, then an Individual Section 404 Permit will be required.

If the project site is not deemed a “Water of the United States,” the proposed crossings of Turtle Creek would be permitted under Nationwide Permit (NWP) 14 – Linear Transportation Crossings. If the loss of Waters of the United States is greater than 0.1 acre, but less than 0.5 acre, and/or the loss includes permanent discharge into wetland, a Pre-Construction Notification (PCN) application for NWP 14 must be submitted to the USACE.

If the outfall is a “Water of the United States” and the total loss of “Waters of the United States” from the project is less than 0.5 acre, then a PCN for NWP 42 – Recreational Facilities could be used.
Katy Trail Master Plan
Trinity Strand Trail Master Plan