

**OAK CLIFF GREENBELT TRAIL MASTER PLAN  
NARRATIVE**

**PREPARED FOR:**  
**Dallas Park and Recreation Department**

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## INTRODUCTION - MASTER PLAN

### Overview:

This master plan examines the logistical and physical opportunities and constraints for a new trail approximately 4.5 miles (23,760 linear feet) long connecting the Tyler-Vernon DART Station south of the Tyler/West Clarendon intersection, Kiest Park, Briar Gate Park, Pecan Grove Park, and Westmoreland Park at Illinois Avenue. Refer to the Oak Cliff Greenbelt Trail Master Plan (Exhibit 1) for proposed layout of the trail.

This study addresses the proposed trail layout within available city owned right-of-way, city parks, and areas which may require easement agreements with private property owners. The study discusses the following design opportunities and constraints.

- Environmental conditions
- Pedestrian needs including accessibility and options for street crossings, trail heads, and overlooks
- Hydrologic conditions of adjacent streams
- Community input
- Governing city ordinances, especially Article X (City of Dallas Landscape Ordinance) that applies when more than 2000 square feet of non-permeable surface (e.g. concrete trail) are added to a site outside street right-of-way

Proposed phases of construction for the trail follow and are illustrated on Oak Cliff Greenbelt Trail Phasing Plan (Exhibit 2).

- Phase 1 connects the Tyler-Vernon DART Station to Elmwood Parkway.
- Phase 2 is a loop trail around Elmwood Parkway between Elmwood Boulevard and Mountain Lake Road.
- Phase 3 is a trail in the street right-of way along Rugged Road from Mountain Lake Road to Kiest Park.

- Phase 4 is a trail from the southwest corner of Kiest Park to Coombs Creek Drive.
- Phase 5 is a trail along Coombs Creek Drive from Pentagon Parkway north to Westmoreland Park.

Since the proposed trail will run through Briar Gate Park, a master plan was prepared to update the park as illustrated in Exhibit 3: Briar Gate Park Master Plan and Exhibit 4: Briar Gate Park Overlook.

A Probable Cost Estimate (Exhibit 5) addresses trail construction and park renovation costs based on street crossings, trail heads, and overlooks shown on the Master Plans.

A trail connecting Wynnewood Parkway to the Tyler-Vernon DART Station was examined as part of the master plan effort. However, the neighborhood Home Owner's Association requested that no trail be placed in that area. Per this request, a trail through the Wynnewood North neighborhood was removed from the scope of this study at the direction of the Park Board during a scheduled meeting.

## **PROPOSED PHASE I – TYLER-VERNON TO ELMWOOD PARKWAY**

### **Overview:**

The Phase I section of the Oak Cliff Greenbelt Trail is an (8') eight foot wide concrete primary trail located between the Tyler-Vernon DART Station and the Elmwood Boulevard/Rugged Road intersection in Dallas. The trail runs roughly parallel to Elmwood Boulevard traveling in a southerly direction for about 0.7 miles (or 3,700 linear feet).

Roughly 40 percent of the trail is located adjacent to the floodplain with portions that enter into the vegetated area while the remaining 60 percent utilizes sidewalks paralleling either Elmwood Drive or Rugged Road. The trail traverses diverse terrain including a total grade change of 70 feet as one travels from the northeast to the southwest. Per ADA requirements, walks will not exceed 5% slope along the direction of the walk or a 2% cross-slope. Additionally, the trail brings the user along heavily wooded areas, residential areas, a creek, and open grassy fields.

**Description and Hydrologic Considerations:**

The proposed trail begins at the west side of the Tyler-Vernon DART Station, and runs south along Polk Street to Elmwood Boulevard replacing an existing sidewalk (see Image 1 below). The existing trail crosses Cedar Creek at this point and is located out of the 100 year floodplain.



*Image 1 – Proposed trail using existing walk on Polk St. (view north from Elmwood Blvd)*

From Polk Street the proposed trail continues west along Elmwood Drive in Elmwood Parkway as a new 8' concrete path. Elmwood Parkway is city owned property that is mostly undeveloped. The park extends from Mountain Lake Road (at the southern border) to South Polk Street in the north. The parkway contains Cedar Creek which provides several opportunities for overlooks or rest stops. There are also severe grade changes adjacent to the creek, and where the trail approaches the creek, retaining walls may be required. Since the area has not been surveyed, a retaining wall contingency is included in the cost estimate (see Exhibit 5).



*Image 2 – Potential overlook or rest area along Cedar Creek (view north from Elmwood Blvd)*

At South Clinton Avenue, Elmwood Boulevard splits into Lansford Avenue and Elmwood Boulevard and the two roads enclose part of Elmwood Parkway. The trail could potentially run on either side of the parkway until it reaches South Edgefield Avenue. For either side, the trail would have to cross South Edgefield Avenue to continue in the parkway. After crossing South Edgefield Avenue, the trail would have to run adjacent to Elmwood Boulevard to Rugged Road. The northern side of the parkway is bounded by residential lots.

There is generally ample room in the parkway for new trail development. There are locations where the creek approaches the street, and the grade changes steeply. At these points, retaining walls and guardrails would be necessary (see Image 3 below). The trail would also need to cross numerous drainage structures that feed the creek. At these locations, culverts or other methods will extend the drainage under the new trail in order to maintain the existing drainage patterns.

Phase I has approximately 3,300 linear feet of residential adjacency and will require (66) 3" caliper large canopy trees and (198) small canopy trees. Existing trees within thirty feet of the street curb (the designated street tree zone) may be substituted for required street trees. The exact street tree requirements will be finalized during the design phase. For budgeting purposes, all required street trees will be new 3" caliper trees and are included in the cost estimate (see Exhibit 5).

Article X also requires site trees in all developments where impervious coverage is increased by more than 2,000 square feet at a rate of one (1) 2" caliper large canopy tree per 4,000 square feet. This requirement can be met with existing trees. Final quantities will be determined during the design phase.





*Image 3 – Cedar Creek proximity to Elmwood Boulevard (view looking southwest along Elmwood Blvd)*

## **PROPOSED PHASE II – ELMWOOD PARKWAY LOOP**

### **Overview:**

The Phase II portion of the trail is an 8' loop trail approximately 0.8 mile (4,250 linear feet) around Elmwood Parkway between Mountain Lake Road and Elmwood Boulevard. The trail runs adjacent to Rugged Road and connects to existing park facilities at the south end of the park.

The majority of the trail is located adjacent to the 100 year floodplain for Cedar Creek with portions along Rugged Road that enter into the floodplain. The trail traverses relatively flat terrain that includes a total grade change of 20 feet as one travels from the northeast to the southwest. Some areas are heavily wooded. The route is located in a mostly residential area.

### **Description and Hydrologic Considerations:**

At Rugged Road, the trail will have an 8' wide primary trail on the east side of Elmwood Parkway Park with an 8' wide secondary trail branching off to run along the west side of the park as a loop within the park. Again, the creek location and its proximity to the road will require retaining walls and guard rails in areas to prevent users from falling into the creek and to protect the creek from erosion.

At the south end of the park, the trail will join an existing sidewalk to provide access to existing park facilities (see Images 4, 5 below). There is generally ample room in the parkway for the new trail, although there are locations where drainage culverts empty into the park that the grade changes steeply and does so close to the curb. There is often not enough room between the curb and the start of the slope to place a trail directly on grade and maintain a walkable slope. In these locations, additional measures will need to be taken in order to provide trail access. At these points, retaining walls and guardrails would be necessary. Per ADA requirements, walks will not exceed 5% slope along the direction of the walk or a 2% cross-slope.

This phase has approximately 4,250 linear feet of residential adjacency and will require (85) 3" caliper large canopy street trees and (255) small canopy street trees. For budgeting purposes, all required street trees will be new 3" caliper trees and are included in the cost estimate (see Exhibit 5). Site tree quantities will be determined during the design phase.





*Image 4 – Existing bench and walkway in Elmwood Parkway*



*Image 5 – Existing Playground in Elmwood Parkway*

## **PROPOSED PHASE III – MOUNTAIN LAKE ROAD TO KIEST PARK**

### **Overview:**

South of Mountain Lake Road the trail will continue approximately 0.5 mile (2,640 linear feet) in City street right-of-way along Rugged Road to Illinois Avenue, where a sign-designated street crossing will be required. This phase will end with a connection to a perimeter walkway in Kiest Park.

The trail parallels Rugged Road, and none of the trail lies within the 100 year floodplain. The trail traverses relatively flat terrain including a total grade change of 20 feet as one travels from the north to the south.

### **Description and Hydrologic Considerations:**

Rugged Road from Mountain Lake Road to Illinois Avenue is a curb-lined asphalt road with sufficient City right-of way to place an 8' trail between the curb and adjacent residential property lines (see Image 6). The residential properties are side-loaded on Rugged Road. Since the trail will be installed on the west side of Rugged Road, no trail will go through residents' yards. The right-of way is relatively clear of trees, so little tree removal will be necessary. The trail will intersect Illinois Avenue, a 6-lane, divided street with no traffic signals at the Rugged Road intersection (see Image 7). DART bus stops are located on either side of Illinois at Rugged. A signalized pedestrian crossing is recommended due to the level of traffic on Illinois traveling in excess of 35 miles per hour. An intersection feasibility study will have to be conducted during the next phase of design to determine the exact requirements for a pedestrian crossing at this intersection. Elements that may be required include a full traffic signal, overhead traffic signs, video detection system, pedestrian signs, crosswalk and other pavement markings, and a pedestrian refuge in the island in the street.



*Image 6a – Rugged Road R.O.W. (view south along Rugged Road)*



*Image 6b - Rugged Road with new trail in right of way*

South of Illinois Avenue, the trail will continue in the Rugged Road right-of way to Kiest Park, where it will join the existing park trail at the northeast corner of the park. A new trailhead will be installed at this location (see Image 8). The overall grade is generally flat and will require no substantial grading for



the proposed connection to the existing trail. Per ADA requirements, walks will not exceed 5% slope along the direction of the walk or a 2% cross-slope.



*Image 7 – Looking south on Rugged Road at Illinois Intersection*



*Image 8 – Northeast corner of Kiest Park with new trailhead and trail*

Article X requirements for this phase include no street trees because the trail will be installed in existing street right-of-way and is therefore considered part of the city infrastructure and exempt from the requirements.

## **PROPOSED PHASE IV – Kiest Park to COOMBS CREEK DRIVE**

### **Overview:**

The trail is approximately 1.5 miles (7,920 linear feet) and will extend from the southwest corner of Kiest Park along Kiest Boulevard and Pentagon Parkway to Coombs Creek Drive, connecting Kiest Park, Briar Gate Park, and Pecan Grove Park.

Roughly 90 percent of the trail is located adjacent to the 100 year floodplain of Five Mile Creek with portions that enter into the 100 year floodplain while the remaining 10 percent parallels either Kiest Boulevard or West Five Mile Parkway. Approximately 20 percent of the trail lies within the 100 year floodplain. The trail traverses diverse terrain including a total grade change of 70 feet as one travels from the northeast to the southwest. Per ADA requirements, walks will not exceed 5% slope along the direction of the walk or a 2% cross-slope. Additionally, the trail brings the user along residential areas and through existing parks.

### **Description and Hydrologic Considerations:**

The proposed concrete trail will begin again at the southwest corner of Kiest Park, at the intersection of Kiest Boulevard and Hampton Road (see Image 9). There are DART bus stops on the corners of the intersection on both sides of Hampton Road.



*Image 9 – Looking west along Kiest Boulevard at Hampton Road*

The Kiest/Hampton intersection is a fully signalized intersection with crosswalks and pedestrian crossing lights providing a safe crossing for trail users at this busy intersection. The next phase of the design will determine any improvements necessary to the existing intersection such as improved



crosswalks, or pedestrian signage. There is an existing 8' wide concrete walk on the north side of Kiest Boulevard from Hampton Road to Five Mile Parkway, which the trail will utilize. The trail will cross an existing bridge with guardrail over Five Mile Creek (see Image 10). The bridge has an existing 6' wide sidewalk which will be integrated as part of the trail. Bridge construction costs are prohibitive to widen the existing walk to match the 8' standard trail width, so the existing 6' walk will be used as is.



*Image 10 – Looking west at bridge walkway along Kiest Boulevard*

At the Five Mile Parkway intersection with Kiest Boulevard, the trail has the option of following Five Mile Parkway north or continuing to follow Kiest Boulevard west to Pierce Street. In the option to follow Five Mile Parkway, an 8' trail would follow existing City right-of-way along the north side of the street until it reaches the end of the street, where the City would have to obtain an agreement with the existing property owner to allow access for the trail to Pierce Street and the western end of Briar Gate Park. This would require an easement about 400 feet long and 50 feet wide to accommodate the trail construction. Also, in this option retaining walls and guardrails will be required in areas where the creek closely approaches the curb and grades are steep (see Image 11).



*Image 11 – Steep Banks along Five Mile Creek north of Five Mile Parkway*

In another option, the trail will follow an existing walk on the north side of Kiest Boulevard. The existing walk narrows to 4' wide, and winds in and out of numerous existing trees. The existing walk is in poor condition, cracked and heaving in places, and will need to be replaced. The new trail will be 6' wide, and will avoid trees wherever possible. Some trees may still be removed due to their proximity to the trail. These trees will need to be mitigated per Article X.

At Pierce Street, the trail will turn north towards Pentagon Parkway. The trail should cross Pierce Street either at Kiest Boulevard or Pentagon Parkway. Pierce Street crosses Five Mile Creek between Kiest and Pentagon, and the bridge has an existing sidewalk on both sides of the street, although it is no more than 5' wide (see Image 12). The existing walk will need to be repaired in places due to cracks and heaving, but it cannot be widened without substantial work to the bridge. A new or improved crosswalk with pedestrian ramps will be required at either crossing point.



At the intersection of Pierce Street and Pentagon Parkway, the 8' trail will turn west and continue through Briar Gate Park. Briar Gate Park has existing improvements including a playground, basketball goals, picnic benches, and open areas overlooking the creek. The Briar Gate Park Master Plan proposes adding a concrete landing, benches, and railing to observe the creek. Refer to the Briar Gate Master Plan (Exhibit 3) for details. The trail will split in the park to offer the trail user the option of visiting the overlook.



*Image 12 – Looking north on Pierce Street bridge and walks*



*Image 13 – Playground at Briar Gate Park*



*Image 14 – Basketball court at Briar Gate Park*





*Image 15 – Potential location for overlook of Five Mile Creek at Briar Gate Park*

At the west end of Briar Gate Park, the trail must cross Westmoreland Road at the Pentagon Parkway intersection. There are north-south and east-west bus stops at this intersection, and a bridge crossing the creek. Westmoreland Road is a 6 lane, divided street and will need a protected pedestrian crossing (see Image 16).



*Image 16 – Looking west on Pentagon Parkway at Westmoreland Avenue intersection*

There are three options for providing a protected pedestrian crossing at the Westmoreland/Pentagon Parkway intersection: a street-grade un-signalized crossing, a street-grade signalized crossing, or a crossing under the bridge. An intersection feasibility study will have to be conducted during the next phase of design to determine the exact requirements for a pedestrian crossing at this intersection. The street-grade signalized crossing option is preferred at this time and reflected in the cost estimate. A street grade un-signalized crossing would set the trail back from the intersection with bollard protected entrances from the street, a protected space in the island, and signage warning pedestrian and vehicular traffic of the intersection (see Image 17).



*Image 17 – Example of “at grade”, protected street crossing*

If a street-grade signalized pedestrian crossing is required here, elements would include a full traffic signal, overhead traffic signs, video detection system, pedestrian signs, crosswalk and other pavement markings, and a pedestrian refuge in the island in the street.

The final option would be to lay the trail under the bridge on the Briar Gate Park side of the street, and bring it back up to grade on the other side of the street. There appears to be enough room to grade the trail down to obtain the necessary clearance under the bridge on both sides (see Image 18). This option would require substantial retaining walls, guardrails, and potentially some tree clearing and mitigation, but it would eliminate any potential vehicular and pedestrian conflict. This trail option would also have periodic flooding and would be subject to floodplain building restrictions. Further hydraulic study of this option would be required in the next stage of design.





*Image 18 – Underneath bridge at Westmoreland and Pentagon looking north*

A similar condition occurs at the next intersection as the trail continues west at Spruce Valley Lane (see Image 19). Spruce Valley Lane is a smaller street, and an at-grade pedestrian crossing would probably not need signalization. However, there is potentially room under the bridge to place the trail in order to completely avoid any vehicular/pedestrian conflicts.



*Image 19 – Looking east towards Spruce Valley Lane bridge at Pentagon*

West of Spruce Valley Lane, the trail would continue west in Pecan Grove Park to Coombs Creek Drive.

Article X requirements for this phase include (127) 3” caliper large canopy street trees and (381) small canopy street trees along 6,350 linear feet. For budgeting purposes, all required street trees will be new 3 inch caliper trees and are included in the cost estimate (see Exhibit 5). Final site tree quantities to be determined during the design phase.

## **PROPOSED PHASE V – COOMBS CREEK DRIVE TO WESTMORELAND PARK**

### **Overview:**

The trail will cross Coombs Creek Drive and continue north along Coombs Creek Drive approximately 1 mile (5,300 linear feet) in the street right-of-way or in the Coombs Creek Greenbelt to Westmoreland Park at Illinois Avenue.

Roughly 50 percent of the trail is located adjacent to the 100 yr. floodplain with portions that enter into the floodplain. The remaining 50 percent parallels Coombs Creek Drive. The trail traverses relatively flat terrain including a total grade change of 40 feet as one travels from the northeast to the southwest. Per ADA requirements, walks will not exceed 5% slope along the direction of the walk or a 2% cross-slope. Additionally, the trail brings the user along heavily wooded areas and residential areas of varying density.

### **Description and Hydrologic Considerations:**

After crossing Coombs Creek Drive, the trail will continue north in the street right-of-way on the west side of the street (see Image 20).

The east side of the street is mostly residential, with scattered businesses. The west side of the street has one residence between Pentagon Parkway and the DART right-of-way. There is an abandoned railroad bridge in the DART right-of-way that crosses Coombs Creek (see Image 21). The bridge is scheduled to be removed when DART light rail extends south past Coombs Creek, but if that removal does not occur prior to construction of this portion of the trail, the trail will have to negotiate the remaining bridge structure, or the structure will have to be removed. In either case, the trail can be designed to work with the future DART construction, or re-designed and constructed with the design and construction of the DART rail.





*Image 20 – Looking north along Coombs Creek Drive right-of-way near Pentagon Parkway*

North of the DART right-of way, the trail continues north along the street right-of-way to connect to an existing 4' wide concrete walkway south of Illinois Avenue. This 4' walk will be replaced with an 8' wide trail. The new trail will connect to Westmoreland Park north of Illinois Avenue. Westmoreland is a busy 6 lane, divided street with DART bus stops in the east and west directions. Existing crosswalks will be enhanced with signage indicating a pedestrian crossing, and a trail head will be placed at the southwest corner of the intersection. Slopes in this phase are generally flat.



*Image 21 – Existing railroad bridge on Coombs Creek Drive*



*Image 22 – Existing sidewalk south of Illinois Avenue to be used as is*

Article X requirements for this phase include (67) 3” caliper large canopy street trees and (200) small canopy street trees along 3,350 linear feet of frontage. For budgeting purposes, all required street trees will be new 3” caliper trees and are included in the cost estimate (see Exhibit 5). Site tree quantities to be determined during the design phase.

## **PLAN-WIDE DESIGN CONSIDERATIONS:**

Several existing conditions were reviewed and considered during the design process for the proposed Oak Cliff Greenbelt Trail Master Plan. These conditions are briefly summarized here:

1. Impact of the proposed trail and associated elements on the hydrology and vegetation of Five Mile Creek and Cedar Creek.

Because detailed topographic information, floodplain information and trail alignment are necessary to determine the final hydrological impact of installing a new trail, the hydrologic impact of the proposed trail within the Five Mile Creek and Cedar Creek floodplains will require further evaluation and study during the next stage of design. Currently, minimal impact is anticipated at potential underpass crossings at Westmoreland Avenue and Spruce Valley Lane. Minimal impact is also anticipated for the rest of the trail alignment, with most of that impact restricted to rebuilding or extending existing drainage culverts and to retaining walls where necessary to protect against erosion.

2. Use / incorporation of existing trails and paths

Based upon a field study of the proposed trail route, it is anticipated that the incorporation of existing concrete walkways could both minimize vegetative clearing and grading, as well as reducing costs associated with tree mitigation. Very few existing walkways exist, however, so cost savings will be minimal.

3. Minimization of conflicts between trail users and vehicles

Areas of potential conflict between anticipated trail users and vehicular traffic on adjacent streets are of interest to the Park and Recreation Department. The proposed trail alignment crosses three (3) major intersections (6 lane divided or more) and approximately twenty (20) minor intersections.

Major intersections include Rugged Road at Illinois Avenue, Hampton Road at Kiest Boulevard, and Coombs Creek Drive at Illinois Avenue. Signalized crossings exist at the Hampton Road/Kiest Boulevard intersection and at the Coombs Creek Drive/Illinois Avenue intersection. Crossing options at Rugged Road/Illinois Avenue include providing a non-signalized crosswalk on Illinois where the proposed trail emerges and providing a signalized crosswalk on Illinois. Final determination for the type of crossing will be set in the next stage of design.

Minor intersections include streets with four lanes or less that are often regulated by stop signs. The potential underpasses at Westmoreland Avenue and Spruce Valley Lane could alleviate conflicts between vehicular traffic and trail users.

#### 4. Minimization of impact on the existing natural habitat

To minimize impact and allow the preservation of existing trees, it is anticipated that the proposed trail width and corresponding clearing would vary but be limited to a maximum of twenty feet. Trail layout would need to be verified in the field to allow minor route modifications to preserve the character of the site and protect existing specimen trees not easily seen in aerial photographs.

Tree protection during the construction process is essential and required by Article X. Trees that are felled can be mulched on-site and used to cover construction access routes and to protect adjacent tree roots.

Appropriate vegetation will provide erosion control and wildlife habitat if native grasses are used. Vegetation in the wooded areas consist of both native and introduced plant species including elm, oak, pecan, poison ivy, Virginia creeper, and privet. Privet should be removed during trail construction.

#### 5. Compliance with City Ordinances

##### Tree Protection:

Some trees may be disturbed during construction, tree requirements will be addressed per Article X and the full analysis regarding tree impacts will be included in the design process. “Protected” trees that are removed due to construction must be mitigated with minimum two-inch caliper trees on an inch per inch mitigation basis.

##### Site Tree Requirements:

One two-inch caliper tree per 4,000 square foot of project area will be met through existing tree credits and new trees planted for mitigation where required.

##### Perimeter Landscape Buffer Strip / Street Trees:

A landscape buffer strip must be provided along the entire length of the portion of the perimeter of the lot where a residential adjacency exists, exclusive of driveways and accessways at points of ingress and egress to and from the lot. It must contain buffer plant materials as defined in Sec. 51A-10.125(b) (7). All landscape buffers required by residential adjacency or chosen as a design standard must contain the following plant groups at a minimum average density of one group for every fifty (50) linear feet of the buffer strip:

- One large canopy tree and one large non-canopy tree.



- One large canopy tree and three small trees.
- One large canopy tree and three large evergreen shrubs.
- One large canopy tree, two small trees, and one large evergreen shrub.
- One large canopy tree, one small tree, and two large evergreen shrubs.
- Two large non-canopy trees.

A “large canopy/non-canopy tree” must have a 3” caliper at planting. For estimating purposes a group of one large canopy tree and three small trees per 50 linear feet of buffer strip was included in the cost estimate. Existing trees within thirty feet of the street curb (the designated street tree zone) may be substituted for required street trees.

The buffer strip must be at least 10 feet wide, except that:

- any portion of the buffer strip adjacent to public street frontage need not exceed 10 percent of the lot depth; and
- any portion of the buffer strip in the front yard and adjacent to the side lot line need not exceed 10 percent of the lot width.

All off-street loading spaces on a lot with residential adjacency must be screened from that residential adjacency.

#### Street right-of-way:

Any improvements within the street right-of-ways (e.g. new trail along Kiest Boulevard and Rugged Road) are considered city-based infrastructure improvements thereby negating street tree requirements of Article X. However, if the enlarged trail encroaches upon private property, then street tree requirements (1 three inch caliper tree per 50 feet of street frontage) would apply in that area.

#### Parking Lot Trees:

No phases of the trail include new parking and therefore, no parking trees will be required.

#### Design Standards:

Article X also requires the use of two Design Standards. For this project, the following design standards will be included:

- Understory Preservation: Preserve existing healthy understory which is a grouping of natural low-level woody, herbaceous or ground cover species. Must occupy at least 5% of the lot area.
- Pedestrian Facilities: Publicly accessible special pedestrian facilities such as plazas, covered walkways, fountains, lakes, ponds, seating areas, and outdoor recreation facilities. These facilities and features must occupy at least 5% of the lot area (benches, signage, overlook).

Newly planted trees will be watered for one-year for establishment purposes.

#### 6. Miscellaneous

The majority of the proposed trail construction will easily meet the maximum accessible with a slope of five (5%) percent or less with minor grade modifications. Minor modifications are anticipated at existing swales such as the installation of culverts where the proposed concrete trail passes over those swales. Consideration should be given to allowing water to continue flow downhill toward the creek without obstructions.

The extent to which the existing utilities will require relocation cannot be evaluated without further study which should be completed in the next stage of the project.



## **PLAN-WIDE HYDROLOGIC CONSIDERATIONS:**

Phase IV consists of two (2) potential underpass crossings at Westmoreland Avenue and Spruce Valley Lane. Existing conditions appear to accommodate an 8 foot wide concrete trail without the placement of fill. Guard rails may have to be constructed next to the trail as a safety precaution under the overpasses and in areas of steep banks adjacent to the trail. Proposed construction will need further consideration to determine the impact to the stream flow and to meet City requirements.

Providing full-width trails along existing bridges will necessitate a detailed review of the bridges and hydraulic study to see if modifications to the channel geometry and bridge are feasible and cost effective. Transportation and structural engineers would be involved in the design of new bridge structures and abutments. Any changes to the existing channel will call for a FEMA submittal along with environmental permitting to document channel changes.

## **COST ESTIMATE:**

An estimated cost for all five phases of the Oak Cliff Greenbelt Trail from the Tyler-Vernon DART Station to Westmoreland Park is approximately \$5,000,000 (per June 2008 estimated construction costs).

Estimated costs include tree protection, silt fencing, and on-site mulching of removed trees for re-use as road-boardings during construction, concrete trail, trail heads, benches, trash receptacles, retaining walls, drainage elements and structures, guardrails, and additional planting.

Items that will affect the project cost and should be verified during the next stage of the project include:

- Hydrologic implications of adding walkways and reconstructing creek abutments and embankments as well as adding guardrails within the flood plain.
- Quantity of culverts at low water crossings. For preliminary estimation purposes, three low-water crossings are anticipated which may require drainage culverts and rip-rap on either side of the crossing.
- Precise trail location. Several alternate trail locations have been provided during this stage of the project. Final alignment will be decided upon further study including possible land acquisition and costs of under bridge crossings.
- Exact grading modifications required to provide an accessible route with five percent (5%) maximum slope and two percent (2%) maximum cross slope on selected trail location. Specific locations where these requirements cannot be met will need to be identified as will cost implications for ramps or switchbacks in these locations. A topographic survey will facilitate design decisions in these areas.
- Caliper inches of protected trees that will be removed during the construction process and that will require mitigation.
- Economic forces such as inflation, fuel and supply costs, and contractor availability.

## **EXHIBITS:**