Chapter 2

Trail Users and Trail Types

"Greenways can draw people together in their communities to provide open spaces for all close to their own homes. They have the potential to be this country's most important land-based effort for conservation and recreation in the next several decades."

President's Commission on Americans Outdoors, 1986

Typical Trail Users

A variety of activities can take place on trails. Trails should accommodate those that want to enjoy being outdoors, those wanting a great view, those that want to run or ride a bicycle, or those that simply want to be with others. Trail users vary from the very young to older residents of the City. Trails can even accommodate horseback riding or residents who want to travel via canoe. Georgetown's trail system should have something for everyone, including the following typical types of trail users.

Walkers seeking exercise and recreation - typically relaxed walking along a pleasant corridor; may include senior citizens, parents with children, or someone walking their dog. May occupy a significant portion of the trail due to walking side by side.

Joggers and runners - typically exercise at a higher speed than other trail users. They often prefer softer trail surfaces such as decomposed granite.

In-line skaters - use trails for fun and fitness. Due to the swinging motion of their arms to increase momentum, skaters occupy a large cross section of the trail.

Recreational and inexperienced cyclists - typically are interested in exercise and activity, as well as scenic appeal. Ease of access to the trail system is important. They prefer more interesting trail alignments rather than trails that favor higher speeds. This group may also include children and youth going to school.

Equestrian riders - these users require a completely separate trail from the other users to ensure the safety of the riders, other users, and horses.

Mountain bikers - travel on more natural trail surfaces, and prefer trails with challenging terrain.

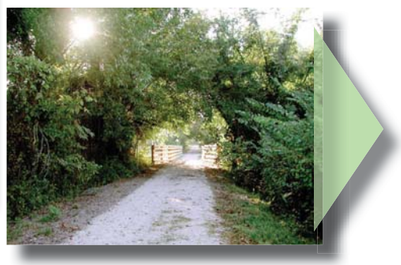
Higher speed cyclists and commuters - these riders favor roadways over off-street trails. For off-street trails, alignments with shallower curves are favored by these users. Because of their higher speeds, increased trail widths are recommended to reduce conflicts with other trail users.

Categories of Trails for Georgetown

Trails in Georgetown will encompass several key types of facilities, each with its own size and character requirements. Where feasible, trails should follow the standards established by the American Association of State Highway Transportation Officials (AASHTO). Recommended trail types are discussed in greater detail below.

- **Regional or Arterial Trails -** Community wide trails should be a high priority, since they provide the connectivity between many different parts of the city. Community wide trails are intended to provide access form one part of the city to another. In essence, these trails become the "spine" system for the city, providing an easy route to travel longer distances. These trails are typically at least 10 feet in width, but in some cases may be up to 12 feet in width where a significant volume of users is anticipated. These trails should be constructed using concrete or asphalt. A suggested option is to provide a soft surface running trail along one side of the concrete trail. Access points to the trail should be located every 1/4 to 1/2 mile with a minimum of 1/2 mile walk or bicycle ride to the access point. Other facilities offered at or along a regional trail include: parking, locator maps, water fountains, shade shelters, bicycle racks, and interpretive / historic signage.

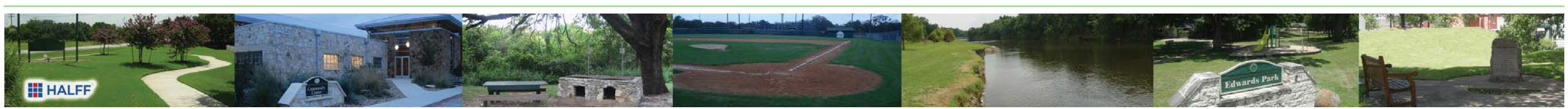
- **Neighborhood Trails -** Neighborhood trails provide access from each neighborhood to the larger arterial trails. Neighborhood trails are typically only 6 feet to 10 feet in width, and are constructed with concrete for long range durability but can be constructed with asphalt or crushed granite. Tighter curves are allowed to introduce interest into the trail segments. As in the case of arterial trails, some neighborhood trails can have a crushed granite component for runners directly adjacent to the concrete trail; if no danger of excessive flooding occurs, neighborhood trails may also be built out of decomposed granite. Access points to the trail are from neighborhoods, streets, parks or schools.



- **Natural Corridor Trails -** natural trail types typically are a compacted earth surface. Nature trails should be at least 6 feet to 10 feet in width, but in some cases may be 12 feet to 15 feet in width to allow for greater visibility within the understory. Normal obstructions such as roots, rocks and understory vegetation should be cleared from the walking pathway. An additional 2 feet to 4 feet shoulder zone is needed on either side of the trail. Bridges and drainage crossings should be constructed using wood and timber materials, and should be rustic in appearance.

- **Greenway Corridor Natural Trails -** potential natural corridors exist along many of the creeks, river and drainage corridors in the city. In some cases these corridors may incorporate walking trails, but with only minimal improvements to address street crossings. Use trail surfaces that create an atmosphere that is compatible with the natural beauty of the corridor and that results in a very pleasant trail environment.

- **Parkway Trails and Sidewalks -** often times the best trail corridors are adjacent to major collector or boulevard streets. Unlike sidewalks, these trails are wider, and a minimum width of 6 feet to 8 feet is preferred. A surface of concrete is preferred for durability however crushed granite can also be used. They include amenities such as decorative light fixtures, landscaping and ground cover, and varying surface treatments at intersections and crosswalks. The overall parkway zone should be at least 15 feet to 20 feet, to allow for at least 6 feet of clearance between the street curb and the walkway and another 4 feet +/- between the walkway and the adjacent property line. In many cases additional width may be required to accommodate drainage or other utilities. The picture to the left shows a parkway trail along a roadway. Parkway trails typically include landscaping that beautifies the road corridor such as a row of large, mature trees in this case. Access to the trail should be adjacent to major arterials and collector streets as well as parks.



Other Specialized Types of Trails

- **Water Trails -** water trails could be developed along the edges of Lake Georgetown and in sections of the two forks of the San Gabriel River. Canoes or kayaks could be used for these water trails, and marker poles with information could be added to create interest. Boat launches will be necessary for those water trails.

- **Equestrian Trails -** Lake Georgetown offers great opportunities for lengthy trails for horseback riding and there are planned equestrian trails to be developed at Garey Park. Places to ride horses offer an opportunity for a unique recreational venue in Georgetown. Equestrian trails require additional height clearance and a separate initial quarter mile trail for horse droppings. Parking for trailers is required, and a closed in permanent stabling operation greatly increases the use of these trails.

- **On Street or Striped Bike Lanes -** Off street trails that are intended to accommodate bicycles are referred to as shared use paths. Most trails should be designed to readily accommodate bicycles. On-street bicycle facilities are equally important. Routes should be added to the already existing facilities in Georgetown. Specific facilities for cyclists include striped bicycle lanes that are a minimum 4 feet (5 feet is preferred for inexperienced rider comfort) in width from the street edge of the gutter pan, or in some cases the use of the "sharrow" which indicates a shared use lane (SLM). The sharrow is in the final stages of approval for inclusion in the Manual of Uniform Traffic Control Devices (MUTCD), but municipalities may apply for permission to use this new symbol prior to its formal adoption.

- **Sidewalks -** Sidewalks are an important component of an overall plan to improve walk ability. Sidewalks that are a minimum of 6 feet wide are recommended along collectors and arterial roads. Sidewalks invite walking, and wider sidewalks tell pedestrians that they can walk side by side and that the walkway can accommodate significant volumes of walkers. Similarly, streets with no sidewalks convey the message very clearly "don't walk here." Sidewalks also provide safe routes for children to travel to school.

"Imagine walking out your front door, getting on a bicycle, a horse, or simply donning your backpack and within minutes of your home, setting off along a continuous network of recreation corridors that could lead across the country."

President's Commission on Americans Outdoors, 1987

Trail Amenities

- **Water fountains and Bicycle Parking -** Water fountains provide drinking water for people (and pets in some cases) and bicycle racks allow trail users to safely park their bikes if they wish to stop along the way, particularly at parks and other desirable destinations.

- **Interpretive Installations -** Interpretive installations and signs can enhance the trail experience by providing information about the history of Georgetown. Installations can also discuss local ecology, environmental concerns, and other educational information.

- **Art Installations -** Local artists can be commissioned to provide art for the trail system, making it uniquely distinct. Many trail art installations are functional as well as aesthetic, as they may provide places to sit and play on.

- **Restrooms -** where appropriate at major trailheads or as previously existing in city parks along the trail route.

- **Pedestrian-Scale Lighting and Furniture -** Pedestrian-scale lighting improves safety and enables the trail to be used year-round. It also enhances the aesthetic beauty of the trail. Lighting fixtures should be consistent with other light fixtures in the city, possibly emulating a historic theme. Providing benches at key rest areas and viewpoints encourages people of all ages to use the trail by ensuring that they have a place to rest along the way. Benches can be simple (e.g. wood slats) or more ornate (e.g. stone, wrought iron, concrete).

- **Maps and Directional Signage -** A comprehensive signing system makes a trail system stand out. Information kiosks with maps at trailheads and other pedestrian generators can provide enough information for someone to use the trail system with little introduction - perfect for areas with high out-of-area visitation rates as well as the local citizens. The directional signage should impart a unique theme so trail users know which trail they are following and where it goes. The theme can be conveyed in a variety of ways: engraved stone, medallions, bollards, and mile markers. A central information installation at trailheads and major crossroads also helps users find their way and acknowledge the rules of the trail. They are also useful for interpretive education about plant and animal life, ecosystems, and local history.

- **Information Kiosks -** Trailhead stations should provide trail users with information and the rules and regulations of the trail. Involving school children, university students and civic organizations in the research, design and construction of these kiosks would be an excellent community activity.


Drinking Fountains


Bike Racks

Maps and Signage


Interpretive Installations


Lighting and Furniture


Art Installations

Information Kiosks

Trail Design Standards

Trail and sidewalk width matters. Trails should be designed to conform to standards recommended by the American Association of State Highway and Transportation Officials (AASHTO). These standards have been developed and refined over a significant period of time, and offer the most comprehensive safety standards. In some specific cases, variations from AASHTO may be acceptable to respect the character or special conditions of an area. Illustrations that follow indicate typical preferred trail section characteristics and clearances.

Shared Use Path

Figure 2-1 illustrates a typical shared use path design that is appropriate for arterial trails. This trail is designed to accommodate two-way bicycle and pedestrian traffic, typically has its own right-of-way, and can accommodate maintenance and emergency vehicles. This type of trail is typically paved (asphalt or concrete) but can also be a surface that provides a smooth surface, as long as it meets ADA requirements. Wider soft shoulders can be provided for equestrians and runners / joggers if space allows. While vegetation is encouraged to enhance the trail experience, complete blocking out of the trail by vegetation from neighborhood view is discouraged. This results in a "tunnel" effect on the trail, creating the impression of decreased safety.

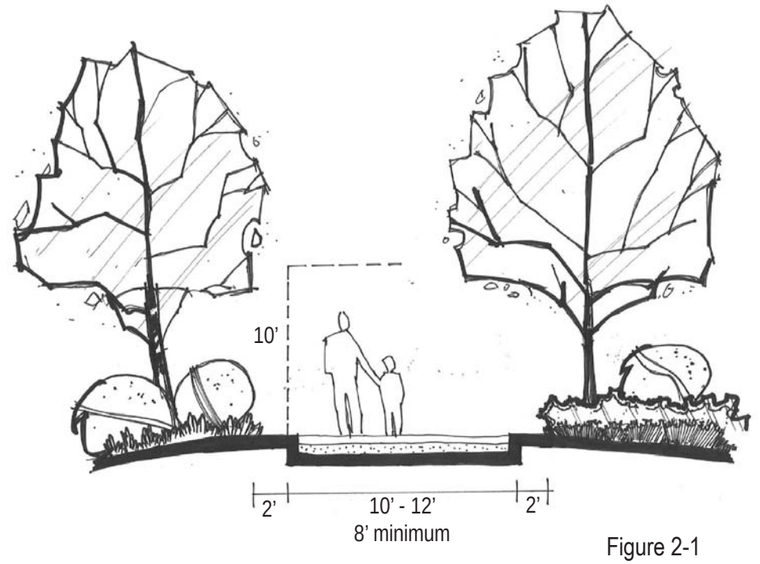


Figure 2-1

"In a time of both great wealth and difficult challenges, trails offer a rare chance to connect the past, present and future. It is possible to envision a system of trails that is as extensive and interconnected as the interstate highways and railroads."

Jeff Olson, *Millennium Trails: Honor the Past, Imagine the Future*, 2000

Community Trails in Sensitive Areas

For community trails that will be located in environmentally sensitive areas, as shown in Figure 2-2 and 2-3, several measures are recommended to lessen the impact of the trail and trail users on the area:

- The riparian setback should be as wide as possible: 30-50' recommended.
- Slope the trail away from the waterway or pre-treat trail run-off with a trailside swale.
- Limit vegetation removal.
- Locate the trail outside the 100-year floodplain wherever possible.
- Remove invasive plant species.
- Use the trail as an opportunity to restore and enhance the waterway or environmentally sensitive area.

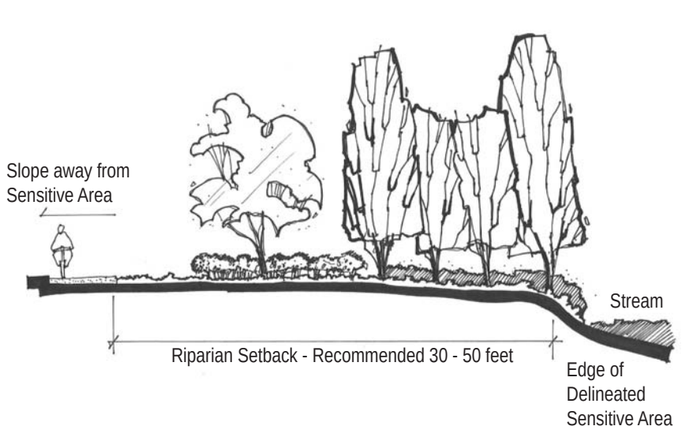


Figure 2-2

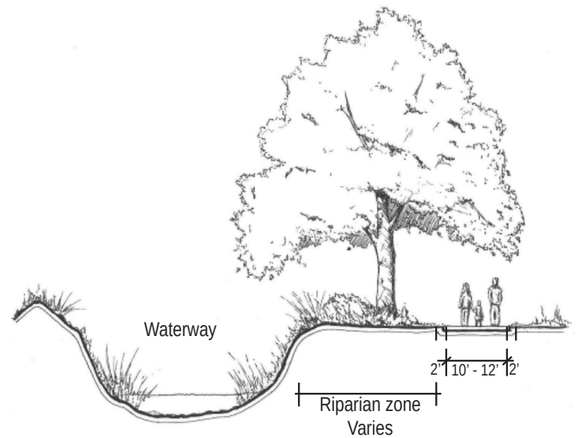


Figure 2-3

Community Trails with Accomodation for Runners

For community trails designed to accommodate runners and joggers, as well as other users, as shown in Figure 2-4, several measures are recommended to ensure a quality trail experience for both runners and other community trail users:

- The hard surface community trail still needs to be designed to the standards of a community trail with no adjacent runner's trail with 10'-12' preferred widths and 10' vertical clearance
- This plan recommends decomposed granite trails along the relatively wide utility easements in order to locate them along – yet, at a distance away, from - the community trails.
- This type of trail is not recommended in sensitive stream corridors.

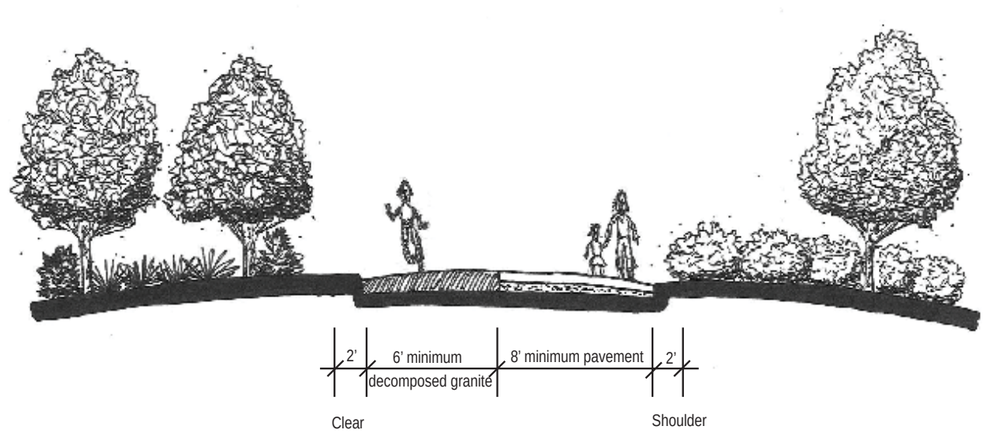


Figure 2-4 Option for combined soft surface and all weather surface

Street Enhancements

Figure 2-5 illustrates a typical enhanced street design that is appropriate for trails along roadways and thoroughfares in Georgetown. These trails are adjacent to the roadway, and the setback from the roadway should be based on the classification of the adjacent roadway, as shown in Table 2-1. This type of trail is recommended along all scenic roads in Georgetown.

Table 2-1 Setback Recommendations	
Roadway Classification	Recommended Minimum Trail Setback
Residential	Minimum 2 feet without trees
Collector	Fifteen feet
Arterials and Highways	Twenty-five feet

Street enhancements should be avoided on roadways with multiple intersections or driveways, as each intersection or driveway creates a conflict point between trail users and motor vehicles. Street enhancements are designed to create connections between foot trails and the community trails, as well as to connect popular destinations throughout Georgetown. Sidewalks less than 6' wide by themselves should be avoided as designated trails wherever possible.

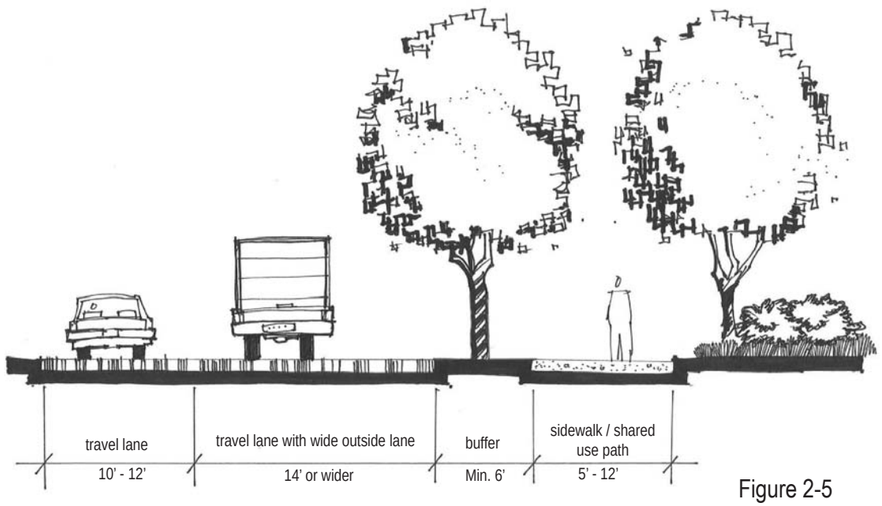


Figure 2-5

"Passion and vision will build future trails, preserve green space, and create other community connections and enhancements in our area."

Christian White, *A History of Portland Trails*, 2001

Pedestrian Bridges

Pedestrian bridges are required in locations where typical drainage channel crossings spans anywhere from 50' to 200'. These bridges may be typical pre-fabricated designs, but should always strive to be a step above the customary steel bridge design.

From a user's perspective, bridges should be at least as wide as the trail; preferably one to two feet wider on each side. This is so pedestrians can stop and view the adjacent scenery without obstructing the trail. Any bridge that is specifically designated for bicycle traffic must have appropriate railing for bicyclists. Texas has adopted the AASHTO Bridge Design Specifications requirement that railing of bridges that are designated for bicycle traffic should be a minimum of 54 inches high with the same restrictions on openings as for pedestrian railing. Pedestrian railing openings between horizontal or vertical members must be small enough that a 4-inch sphere cannot pass through them in the lower 27 inches. For the portion of pedestrian railing that is higher than 27 inches, openings may be spaced such that an 8-inch sphere cannot pass through them. Decking material should be firm and stable. Bridge approaches and span should not exceed 5% slope for ADA access.

Bridges should accommodate maintenance vehicles if necessary. Bridge structures should be out of the 100-year floodplain. Footings should be located on the outside of the stream channel at the top of the stream bank. The bridge should not constrict the floodway. All bridges and footings in the stream corridor will need to be designed by a registered geotechnical or structural engineer. Cost, design and environmental compatibility will dictate which structure is best for the trail corridor.


Plano, TX

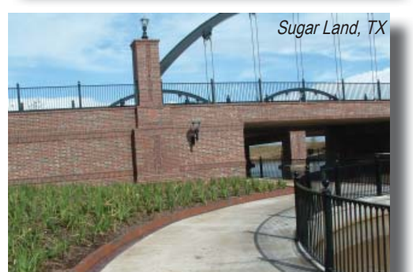

San Francisco, CA

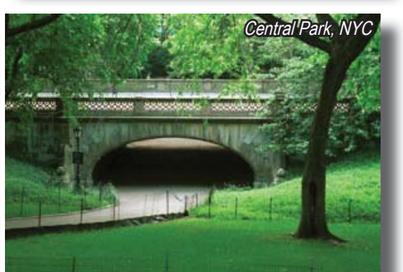

Batavia, IL


Houston, TX


Fort Worth, TX

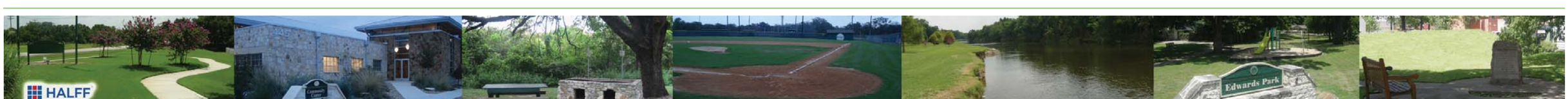

London, England


Sugar Land, TX


Central Park, NYC

Pedestrian Underpasses

Underpasses provide a more direct route to go under a busy street. From the standpoint of a user, underpasses should be well lighted and attractive, and most of all project a sense of security. All vehicular bridges added in Georgetown in the future should be designed to accommodate a "shelf" for a trail.



Trailheads and Access Points

A very high level of accessibility is desired for municipal trail corridors. More access points increase a sense of security, since they encourage ready use of the trail by area residents. A well used trail will most likely be at parks. Access points should be as little as 1/8th of a mile apart for neighborhood trails, and typically no more than a 1/4 mile to a 1/2 mile for all other trail types. Two types of neighborhood trail access points include:

- Access from adjacent neighborhood streets
- Access from specific trailheads in parks

Typical facilities for trailheads include the following:

- parking for 10+/- cars
- Small Shade Pavilion
- Drinking Fountain
- Optional Safety Call Box
- Kiosk with Trail Map and Information
- Bicycle Parking Stand
- Optional Fitness Stations or Warm-Up Stations
- Landscaping and Optional Seasonal Color
- Major Trail Identification Sign
- Optional restrooms (in park locations)

Estimated Costs for Typical Types of Trails

Cost projections for a typical one mile length of trail, using different materials are shown on the following pages. Implementation costs may vary considerably based on the type of material used for the trail, the number of bridges or drainage crossings that are required, and the types of amenities that are included in each trail segment. Each projection also includes a contingency amount, since all trails in this plan are at a pre-design stage. Projections also include an allowance for surveying, design and construction administration associated with the design of each trail.

Table 2 - 2
Summary of Trail Cost per Linear Foot

10’ to 12’ wide community trail concrete	$150 to $175 per linear foot
8’ wide neighborhood trail concrete	$140 to $152 per linear foot
8’ wide parkway trail concrete	$110 to $135 per linear foot
6’ wide sidewalk	$80 to $90 per linear foot
8’ wide decomposed granite trail	$70 to $140 per linear foot
8’ wide nature trail	$65 to $110 per linear foot

“Our common goal is the creation of a nationwide network of multi-use trails - local, regional, and national systems - that allow walkers, bicyclists, people with disabilities, equestrians, runners, skiers, hikers, and others to enjoy the beauty of the American landscape.”

William Spitzer, National Park Service, 1993

Major Arterial Trail (Concrete Surface) - 10' Width

Potential Development Cost

Description - Planned as major trail connecting sectors of the city. 10' wide concrete all weather trail, centerline stripe, straight to curvilinear alignment as corridor permits. 4 to 6' thick concrete to allow for some use as maintenance track. Includes some amenities at key intersection or access point nodes. Additional amenities such as shade structures and benches can be added in the future.

	Item	Quantity	Unit	Unit Price		Amount
Base Cost						
1	Grading Allowance (per linear foot)	5,280	LF	$12	$	63,360
2	Concrete Trail, 4 to 6 inch depth, 10' width, includes base material	5,280	LF	$75	$	396,000
3	Trail Striping	5,280	LF	$4	$	21,120
4	Culverts (12" diam. Max. for local drainage only). Allowance for one every 250 linear feet	21	EA	$1,000	$	21,000
5	Major drainage culverts (36" to 48" box culvert, assume two every 2000 linear feet)	3	EA	$20,000	$	60,000
6	Trail directional/safety signs (assume 1 every 500 linear feet)	10	EA	$500	$	5,000
7	Intersection crosswalk striping	4	EA	$1,000	$	4,000
8	Intersection and access point accessible ramps (assumes 8 at every intersection)	8	EA	$1,000	$	8,000
9	Turf re-establishment (allowance for 5' on either side of trail corridor)	52,800	SF	$0.5	$	26,400
Subtotal					**$**	**604,880**
Amenity Cost						
10	Drinking fountain (one per mile)	1	EA	$5,000	$	5,000
11	Information kiosk (assume ratio of one per mile)	1	EA	$5,000	$	5,000
12	Major trail access point sign (1 every 2500 linear feet)	2	EA	$3,000	$	6,000
13	Security lighting at access point (1 pole per access point)	4	EA	$2,500	$	10,000
14	Bench node (2 per every mile, includes bench, trash receptacle, decorative pavement)	2	EA	$15,000	$	30,000
Subtotal					**$**	**56,000**
	Subtotal Construction Cost				$	660,880
	Design, Testing, Administration, Misc. Costs (15%)				$	99,132
	Contingency at Pre-Design Level (20%)				$	152,002
Total					**$**	**912,014**
Estimated Overall Cost per Linear Foot					**$**	**173**
Estimated Base Cost per Linear Foot					**$**	**158**

Note: *Order of Magnitude Estimate only, without detailed design.*
This estimate is intended only to establish a range of potential costs for this construction effort.
Costs shown are in 2008 dollars.

Neighborhood Concrete Trail - 8' width

Potential Development Cost

Description - Planned as neighborhood trail segments connecting to major arterial trails. 8' wide concrete all weather trail, centerline stripe, straight to curvilinear alignment as corridor permits. 4 to 6" thick concrete to allow for some use as maintenance track. Includes some amenities at key intersection or access point nodes. Additional amenities such as shade structures and benches can be added in future.

	Item	Quantity	Unit	Unit Price		Amount
Base Cost						
1	Grading Allowance (per linear foot)	5,280	LF	$9	$	47,520
2	Concrete Trail, 4 to 6 inch depth, 8' width, includes base material	5,280	LF	$65	$	343,200
3	Trail Striping	5,280	LF	$4	$	21,120
4	Culverts (12" diam. Max. for local drainage only). Allowance for one every 250 linear feet	21	EA	$1,000	$	21,000
5	Major drainage culverts (36" to 48" box culvert, assume two every 5000 linear feet)	2	EA	$20,000	$	40,000
6	Trail directional/safety signs (assume 1 every 500 linear feet)	10	EA	$500	$	5,000
7	Intersection crosswalk striping	4	EA	$1,000	$	4,000
8	Intersection and access point accessible ramps (assumes 8 at every intersection)	8	EA	$1,000	$	8,000
9	Turf re-establishment (allowance for 5' on either side of trail corridor)	52800	SF	$0.5	$	26,400
Subtotal					**$**	**516,240**
Amenity Cost						
10	Drinking fountain (one per mile)	1	EA	$5,000	$	5,000
11	Information kiosk (assume ratio of one per mile)	1	EA	$5,000	$	5,000
12	Major trail access point sign (1 every 2500 linear feet)	2	EA	$3,000	$	6,000
13	Security lighting at access point (1 pole per access point)	4	EA	$5,000	$	20,000
14	Bench node (2 per every mile, includes bench, trash receptacle, decorative pavement)	2	EA	$3,000	$	6,000
Subtotal					**$**	**42,000**
Subtotal Construction Cost					$	558,240
Design, Testing, Administration, Misc. Costs (15%)					$	83,736
Contingency at Pre-Design Level (20%)					$	128,395
Total					**$**	**770,371**
Estimated Overall Cost per Linear Foot					**$**	**146**
Estimated Base Cost per Linear Foot					**$**	**135**

Note: *Order of Magnitude Estimate only, without detailed design.*
This estimate is intended only to establish a range of potential costs for this construction effort.
Costs shown are in 2008 dollars.

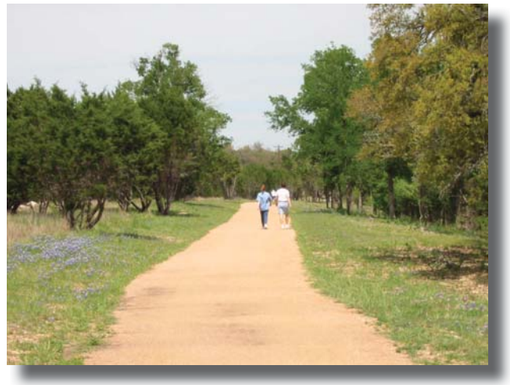
Parkway Trail - 8' Width

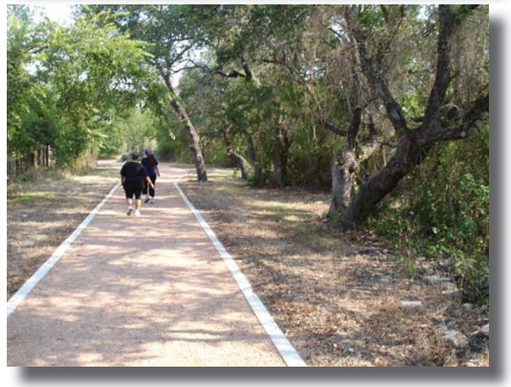
Potential Development Cost

Description - straight to semi-curved alignment where possible, constructed adjacent to major boulevards. 8' width, 4'+ thickness. Because these trails are in highly visible locations, they must include landscaping and decorative features such as benches, groundcover, and signs at key node areas.

	Item	Quantity	Unit	Unit Price		Amount
Base Cost						
1	Grading Allowance (per linear foot - assumes 0.5 ft depth fine grading under trail to generate allowance	5,280	LF	$3	$	15,840
2	Concrete Trail, 4 to 6 inch depth, 10' width, includes base material	5,280	LF	$65	$	343,200
3	Trail Striping (not required for this type of trail)	0	LF	$4	$	-
4	Culverts (12" diam. Max. for local drainage only). Not required for this type of trail	21	EA	$1,000	$	21,000
5	Major drainage culverts (36" to 48" box culvert, assume two every 2000 linear feet)	0	EA	$20,000	$	-
6	Trail directional/safety signs (assume 1 every 500 linear feet)	10	EA	$500	$	5,000
7	Intersection crosswalk striping	4	EA	$3,000	$	12,000
8	Intersection and access point accessible ramps (assumes 8 at every intersection)	8	EA	$1,500	$	12,000
9	Turf re-establishment (allowance for 5' on either side of trail corridor)	40,000	SF	$0.5	$	20,000
Subtotal					**$**	**429,040**
Amenity Cost						
10	Landscape allowance	5,280	LF	$10	$	52,800
11	Benches (8 per mile)	8	LF	$1,200	$	9,600
12	Drinking fountain (one per mile - not provided with this type of trail)	0	EA	$5,000	$	-
13	Information kiosk (assume ratio of one per mile)	1	EA	$5,000	$	5,000
14	Major trail access point sign (1 every 2500 linear feet)	2	EA	$3,000	$	6,000
15	Security lighting at access point (1 pole per access point - assumed to be already in place along streets)	0	EA	$2,500	$	-
Subtotal					**$**	**73,400**
Subtotal Construction Cost					$	502,440
Design, Testing, Administration, Misc. Costs (15%)					$	75,366
Contingency at Pre-Design Level (20%)					$	115,561
Total					**$**	**693,367**
Estimated Overall Cost per Linear Foot					**$**	**131**
Estimated Base Cost per Linear Foot					**$**	**112**

Note: *Order of Magnitude Estimate only, without detailed design.*
This estimate is intended only to establish a range of potential costs for this construction effort.
Costs shown are in 2008 dollars.





Decomposed Granite Trail - 8' Width

Potential Development Cost

	Item	Quantity	Unit	Unit Price		Amount
Base Cost						
1	Grading Allowance (per linear foot)	5,280	LF	$9	$	47,520
2	Decomposed granite trail, 4 inch depth, 8' width, includes base material	5,280	LF	$30	$	158,400
3	Optional concrete restraining curb, both sides (not included in this estimate, shown for reference only)	10,500	LF	$16	$	168,000
4	Trail Striping (not required for this type of trail)	0	LF	$4	$	-
5	Culverts (12" diam. Max. for local drainage only). Allowance for one every 250 linear feet	21	EA	$1,000	$	21,000
6	Major drainage culverts (36" to 48" box culvert, assume two every 2000 linear feet)	2.5	EA	$20,000	$	50,000
7	Trail directional/safety signs (assume 1 every 500 linear feet)	10	EA	$500	$	5,000
8	Drinking fountain (one per mile)	1	EA	$5,000	$	5,000
9	Information kiosk (assume ratio of one per mile)	1	EA	$5,000	$	5,000
10	Major trail access point sign (1 every 2500 linear feet)	2	EA	$3,000	$	6,000
11	Security lighting at access point (1 pole per access point)	4	EA	$2,500	$	10,000
12	Intersection crosswalk striping	4	EA	$1,000	$	4,000
13	Concrete intersection and access point accessible ramps (assumes 4 at every intersection)	8	EA	$1,000	$	8,000
Subtotal Construction Cost					$	319,920
Design, Testing, Administration, Misc. Costs (15%)					$	47,988
Contingency at Pre-Design Level (20%)					$	73,582
Total					**$**	**441,490**
Estimated Overall Cost per Linear Foot					**$**	**84**
Estimated Base Cost per Linear Foot					**$**	**118**

Note: *Order of Magnitude Estimate only, without detailed design.*
This estimate is intended only to establish a range of potential costs for this construction effort.
Costs shown are in 2008 dollars.

Nature Trail - 8' Width

Potential Development Cost

Description - natural surface trail through river corridor and along some levee corridors. Includes concrete landings and allowance for some fully accessible areas. Includes small bridges to cross drainage swales, and one major bridge every three miles.

	Item	Quantity	Unit	Unit Price		Amount
Base Cost						
1	Grading Allowance (per linear foot - assumes 0.5 ft depth fine grading under trail to generate allowance	5,280	LF	$3	$	15,840
2	Concrete Trail, 4 to 6 inch depth, 8' width, includes base material	520	LF	$65	$	33,800
3	Natural trail - includes clearing of 15 to 20' wide corridor, fine grading, construction of some steps to improve access	5,000	LF	$15	$	75,000
4	Trail Striping (not required for this type of trail)	0	LF	$4	$	-
5	Culverts (12" diam. Max. for local drainage only). Maximum of 10 per mile assumed	10	EA	$1,500	$	15,000
6	Major drainage culverts or small bridges (36" to 48" box culvert, assume two every 2000 linear feet)	2.5	EA	$25,000	$	62,500
7	Major pedestrian bridge - assumes one every three miles	0.33	EA	$150,000	$	49,500
8	Trail directional/safety signs (assume 1 every 500 linear feet)	5	EA	$500	$	2,500
9	Intersection and access point accessible ramps (assumes 8 at every intersection)	2	EA	$1,500	$	3,000
Subtotal					**$**	**257,140**
Amenity Cost						
10	Landscape allowance at entrances	5,280	LF	$8	$	42,240
11	Bench nodes (4 per mile, includes stone benches, table flagstones set in concrete, seating wall	4	LF	$15,000	$	60,000
12	Drinking fountain (one per entrance area)	1	EA	$5,000	$	5,000
13	Information kiosk (assume ratio of one per mile)	1	EA	$10,000	$	10,000
14	Major trail access point sign (1 every 5000 linear feet)	1	EA	$5,000	$	5,000
15	Emergency call box - solar powered, one per 1/2 mile	2	EA	$15,000	$	30,000
16	Security lighting at access point (1 pole per access point)	1	EA	$5,000	$	5,000
Subtotal					**$**	**157,240**
Subtotal Construction Cost					$	414,380
Design, Testing, Administration, Misc. Costs (15%)					$	62,157
Contingency at Pre-Design Level (20%)					$	95,307
Total					**$**	**571,844**
Estimated Overall Cost per Linear Foot					**$**	**108**
Estimated Base Cost per Linear Foot					**$**	**67**

Note: *Order of Magnitude Estimate only, without detailed design.*
This estimate is intended only to establish a range of potential costs for this construction effort.
Costs shown are in 2008 dollars.

Other Trail Related Costs

General costs are included for use in planning for trail corridors. However, general costs are always subject to change and will vary as more detailed design occurs. General estimated construction costs, for use in preliminary project feasibility determinations are as follows:

- At-grade crossing — About $2,500 each
  (a description of crossing types is to the right)
- Below grade crossing — Will vary greatly based on design specifications.
- Bridge crossing — About $2,000 per linear foot
- On-street trails, striping and signage — $15,000 per mile
- On-street trails, striping only — $3,500 per mile
- Widening of ROW / shoulder — $220,000 per mile

Major Highway or Barrier Crossings

Safe and easily accessed crossings at major highways, drainage channels or the San Gabriel River should be included in the overall plan for Georgetown. All major crossings will require partnerships and coordination with TxDOT or property owners.

At Grade crossings - utilizes crosswalk markings, crosswalk signals and timers, special paving, accessible ramps, and decorative lighting to designate crossing locations.

Below grade crossings - typically will go under existing bridges to create a safe crossing. Connections to street level are required to allow access to and from the trail corridor.

Bridge crossings - location for signature pedestrian bridge to facilitate crossing the San Gabriel River and major arterials as well as creeks when necessary. Bridges should be one of a kind and create a significant statement about Georgetown.