

“When I see an adult on a bicycle, I do not despair for the future of the human race.”

– H.G. Wells (1866-1946)



TRAILS & BIKEWAYS

2012 PARKS, RECREATION, TRAILS & OPEN SPACE
VISIONING MASTER PLAN

5.1

INTRODUCTION

“...a world-class system of trails and bikeways to attract and retain residents and businesses alike.”

Every year, more people discover the benefits and excitement of activities like cycling, jogging, and walking. Across the region—and especially in Cedar Hill—trails are the most sought-after recreational amenities. Similarly, the emergence of cycling as not only a popular sport but also a viable mode of transportation has resulted in high demand for on-street bikeways¹. Considering this, it is crucial for Cedar Hill to develop a world-class system of trails and bikeways to attract and retain residents and businesses alike.

To achieve the vision of becoming a City Within a Park, trails and bikeways must be considered “essential infrastructure” (just as are streets, water, sewer, and electricity). In the form of greenbelts and greenways, trails can significantly help Cedar Hill achieve the goal of 20% open space and weave ribbons of natural open space into urbanized areas, which will emphasize the nature/urban interface. This necessitates the development of networks of trails and bikeways along roads, utility corridors, creeks, railroads, and other linear features.

Goals

- Develop a fully-integrated system of trails and bikeways that provide connections to all parts of Cedar Hill for recreation and transportation uses.
- Identify Core trails that create major cross-town routes and loops that serve as the backbone or arterial network of the trail system.
- Plan and design bikeways that provide a high ease of use for B-cyclists² and balance the needs of cars and people.
- As far as possible, connect all existing parks and open spaces to the trail and bikeway system. Locate future parks along greenbelts and major trail corridors, thereby providing connectivity and access to the natural environment.
- Encourage people to walk, jog, and bike to nearby destinations, such as schools, parks, and businesses, by ensuring the safety and security of trails and bikeways.



1 The term “bikeways” is used throughout this chapter in reference to on-street facilities for bicycles. This all-encompassing term includes shared lanes, dedicated bike lanes, sidepaths, and any other type of facility for bicycles on or along roadways.

2 The term “B-cyclists” refers to the average bike rider. See page 5-5.

Purpose

The purpose of this chapter is to identify the needs of different types of trail and bikeway users, analyze opportunities and constraints, and develop a comprehensive network of trails and bikeways across the city. The approach, terminology, and recommendations contained in this chapter have been designed to be compatible with the 2011 Dallas Bike Plan, the Veloweb element of the North Central Texas Council of Governments’ (NCTCOG) Mobility 2035 Plan, and NCTCOG’s Regional

Bicycle and Pedestrian Design Guidelines. The alignments and recommended typologies for trails and bikeways are also compatible with the Transportation element of the Comprehensive Plan and were developed concurrently with the Streetscape Plan (Chapter 6 of this document). In addition to coordinating with established minimum standards for signage² and design geometry³, the National Association of City Transportation Officials' (NACTO) Urban Bikeway Design Guide also greatly influenced the design standards contained in this chapter and in the appendix.



Pertinent Citizen Input

There is a strong level of support for improving bicycle and pedestrian access across Cedar Hill and linking to other communities via trails and bikeways. This support was demonstrated in the comments heard during the focus group meetings and public meetings. Some of the more innovative ideas discussed during the meetings include a multi-use trail encircling Joe Pool Lake and passing through Cedar Hill State Park, as well as the incorporation of cutting-edge, on-street bicycle facilities that appeal to a broad range of people with differing abilities.

The telephone survey also showed a strong level of support for trails and bikeways in Cedar Hill.



- Building multi-use trails was the most supported amenity to construct out of a list of 36 choices (87% support this action).
- People strongly prefer trails in or near scenic areas (88% support) more so than trails along utility rights-of-way (50%), major roads (33%), and railroad corridors (29%).
- Bike routes on roadways are supported by 73% of respondents.
- 60% of respondents would consider using trails instead of driving if they connected throughout the city.
- There is a strong desire to connect trails to Downtown (77%) and Uptown (68%).



² Texas Department of Transportation, “Texas Manual on Uniform Traffic Control Devices”

³ American Association of State Highway and Transportation Officials (AASHTO), “Guide for the Development of Bicycle Facilities, 3rd Edition”

5.2

BICYCLE & PEDESTRIAN PLANNING FRAMEWORK

“The primary goal is to identify meet the common trail and bikeway needs of the community.”

Planning interconnected trail and bikeway systems that are comprehensive in nature and meet the needs of multiple user groups requires identifying common ground. Careful consideration must be given to the diverse needs of various types of users and the challenges associated with each. In addition, analyzing the unique opportunities and constraints reveals the latent (or potential) demand for trails and bikeways.

Trails & Bikeways

There are two categories of infrastructure that constitute the bicycle and pedestrian system: trails and bikeways. While there is variability in each of these categories, they can be broadly defined.

- **Trails** are generally multi-use pathways that follow greenbelts away from roadways, although sidepaths along roadways can be considered trails as well as bikeways. While they can be provided with natural surfaces, trails are typically paved to accommodate the widest range of users, including pedestrians and cyclists.
- **Bikeways** are typically part of the roadway or are within the road right-of-way. Bike lanes and bike routes fall within this category. Sidepaths along the sides of roadways can also be considered bikeways.



User Groups

One of the primary challenges in developing trail and bikeway systems that meet the needs of the entire community is understanding the characteristics, preferences, and challenges presented by the multiple user groups that will utilize the system. In addition to the traditional recreational walking and recreational cycling groups, the spectrum of current and potential trail and bikeway users also includes runners, joggers, and advanced and novice cyclists. The primary goal is to identify the common and specific needs of the groups and develop the trail and bikeway system accordingly.

Pedestrians

Pedestrians (including walkers and runners) utilize trails primarily for the recreational experience that they provide, as well as an alternative mode of transportation. It is important to provide connectivity between neighborhoods and destinations so people can walk instead of drive. However, comfort and accessibility are typically the pedestrian's primary determinants when judging the quality of a trail and desirability for its use. Therefore, shade along trails; well-distributed amenities like benches, mile markers and wayfinding signage; and access points

spaced no more than one mile apart are all essential considerations when designing a trail. It is also important to consider how pedestrian users access trails; some will walk to the trail but many will drive, which requires the provision of adequate parking space at strategically-placed trailheads.

The needs of people with physical disabilities and people pushing strollers should be considered. The maneuverability requirements of these two groups are similar and can be met by designing trails to meet the requirements of the Americans with Disabilities Act and the Texas Accessibility Standards.

Finally, while it is the goal of the Trails Master Plan to develop a continuous network of trails, most pedestrian users are satisfied with trail segments of between one and three miles long, which allow two to six mile “out-and-back” trips. This should be considered when developing trail segments in multiple phases.

Cyclists

Planning for cyclists creates a unique challenge due to the bicycle’s place in American society. On the one hand, bicycles are ridden by people of all ages (including very young children) purely for recreational purposes; on the other hand, bicycles are ridden by skilled adults as a mode of transportation. The bicycle is considered either a toy, sports equipment, or a vehicle¹, depending on the user. Planning for bicycles as part of a City-wide system of trails and bikeways, therefore, requires recognizing differences in abilities and perceptions amongst cyclists and motorists.

Cyclists can be differentiated by skill level. Each group has different preferences and presents unique challenges to the Trails and Bikeways Master Plans.

- **Advanced (Type A)** – These are cyclists that are very experienced in riding as a vehicle with motor traffic and generally prefer riding on streets. These cyclists will often use on-street bikeways (if they are provided), but will usually choose their own routes and feel comfortable riding in many places that do not have any bicycle facilities.
- **Basic (Type B)** – Most people, whether they consider themselves a “cyclist” or not, fall within this group. Basic cyclists might feel comfortable riding on-street in neighborhoods with low traffic or in areas with high ease-of-use bikeways. However, many often prefer grade-separated paths (i.e., trails).
- **Children and Seniors (Type C)** – While many seniors (and some children) fall into one of the two above categories, they gener-



1 Per Sec. 551.101 of the Texas Transportation Code, “A person operating a bicycle has the rights and duties applicable to a driver operating a vehicle...”



ally fall into a third category based on their experience levels and physical abilities. Generally slower and less quick to react, children and seniors often only ride their bikes on grade-separated paths or on very low traffic streets.

Considering the above cyclists types, the majority of current or would-be cyclists are considered Type B, which is historically the least-served group in the United States. In many European countries, which enjoy extensive bicycle infrastructure and implement pro-bicycle policies, cycling is often an integral part of the daily lives of most people and basic cyclists make up the majority of users. This group has the most potential for growth in Cedar Hill and across the country and should be the primary cyclists user group considered in the planning of trails and bikeways. However, developing bikeways, especially in the scenic Escarpment and lake areas, may attract groups from outside the area and play a role in the City's tourism initiatives.

Due to the speeds at which cyclists travel, trail and bikeway facilities for bicycle use must meet state and national design standards (AASHTO and TMUTCD) for sightlines, radii of curves, and detailed regulatory/warning signage.

Other Users

Though far less common than pedestrians and cyclists, there are other types of users that should be considered. Inline skaters constitute one such user group. The characteristics and preferences of inline skaters fall somewhere between those of pedestrians and cyclists and are generally well-served by shared-use trails built with these other two groups in mind. Similarly, skateboarders and BMX riders are becoming increasingly more prevalent as a user group. While most interested in skate parks and BMX tracks, these users will often use trails and sidewalks to access these facilities. Equestrian users constitute yet another group. Equestrians are best-served by natural surface trails that are not utilized by cyclists. Physical and visual separations that minimize potential conflicts between equestrian and other trail users provide the best and safest facilities for all.



Opportunities & Constraints

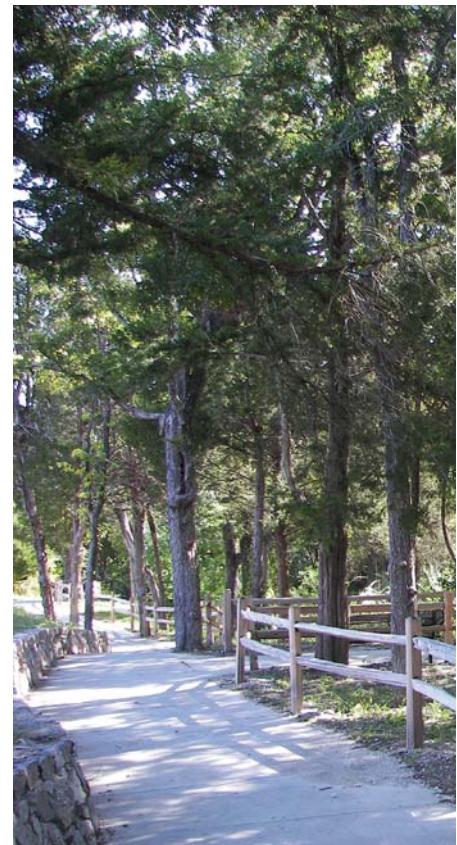
In order for appropriate trail and bikeway corridors to be determined, opportunities and constraints within the City were identified. Key opportunities and constraints were mapped in order to determine hot spots of pedestrian and bicycle activity and potential alignments by which to connect these areas. Figure 5.1 illustrates the various opportunities and constraints identified. The following section examines these features in more detail and explains the impact each has on the development of the Trail and Bikeway Master Plans.

Opportunities

There are many opportunities that will guide the development of trails and bikeways in Cedar Hill. Each of these plays a large role in determining future facility alignments, the location of trailheads and access points, and the prioritization given to each facility segment.

Existing Trails

Existing trails lay the groundwork for the expansion of the City's trail system. The trail network should be based on these existing trails and build upon their successes.



Parks & Public Facilities

Research indicates that the majority of non-motorized trips taken by most Americans are for recreation purposes, so connecting parks and public facilities (such as the Recreation Center and Senior Center) with a system of trails and other pedestrian and bicycle facilities is a sensible priority that will enhance the usability and enjoyment of the City's parks and facilities. Future parks as proposed in Chapter 4 are also included as opportunities.



Schools

The provision of safe, accessible routes between neighborhoods and schools can help to encourage more children to use active transportation, which constitutes modes of travel such as walking and biking, which combine physical activity with transportation. In addition, there are grant programs—such as Safe Routes to School—which provide significant funding assistance for building such facilities near schools. It is important to note that potential actions by the US House of Representatives in the near future may jeopardize the availability of grant funds, including Safe Routes to School, Transportation Enhancements, and Recreational Trail Grants.

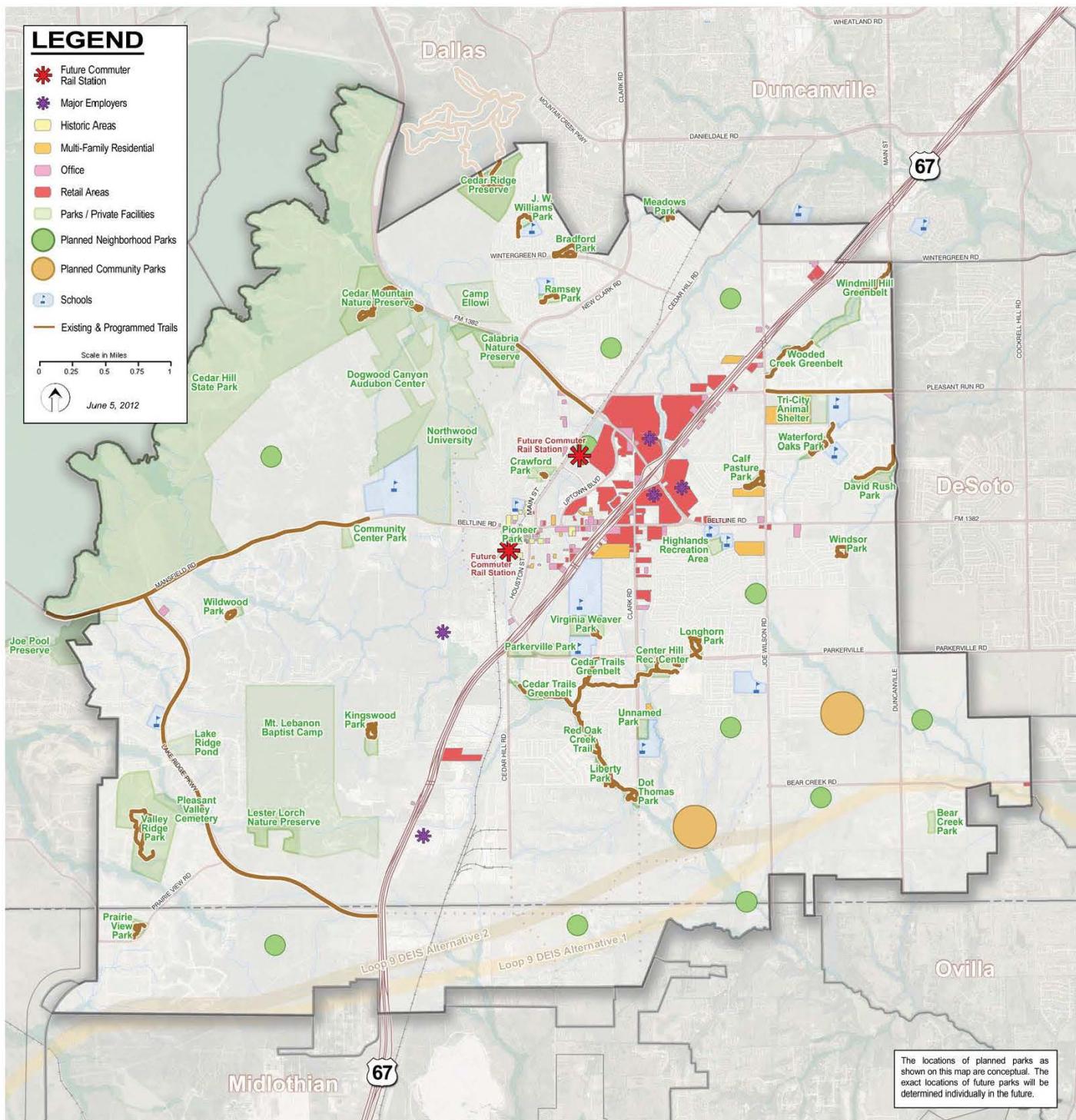


Figure 5.1 – Opportunities & Constraints

This figure illustrates the location and spatial relationship between the various opportunities and constraints that were identified and analyzed for the Trails Master Plan and Bikeways Master Plan.

Employment Centers

Major employment centers (businesses that employ 350 to 1,500 employees) are considered key destinations. While it is likely that a large portion of the employees of these companies do not live in Cedar Hill, the provision of good pedestrian and bicycle facilities linking neighborhoods with employment centers may encourage these employees to relocate here.



Population Density

Population density is an important factor in determining trail alignments since people living in higher-density areas are more likely to walk or cycle as their primary mode of transportation.



Downtown & Uptown

Centered in the heart of the City, Downtown and Uptown are important destinations that will continue to grow in their importance as pedestrian and bike-friendly areas. The small block sizes in the Downtown area naturally encourage bicycle and pedestrian activity. Uptown is a regional shopping destination and is itself very walkable. In addition, a future transit-oriented development that combines dense urban development with a commuter rail station is planned for this area. Providing connections between these districts and other parts of the City is essential.



Retail & Office Land Uses

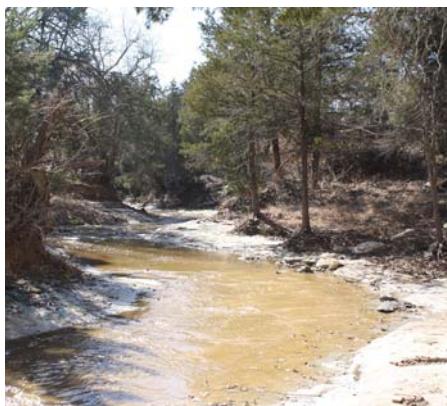
These land uses draw a significant share of trips made by car and may therefore be key destinations for people wishing to avoid driving.

Multi-Family Residential

All trips originate from one's residence. Multi-family residential areas have a higher density of dwelling units and therefore generate more concentrated traffic (pedestrian, bicycle, or otherwise) than other types of residential land use.

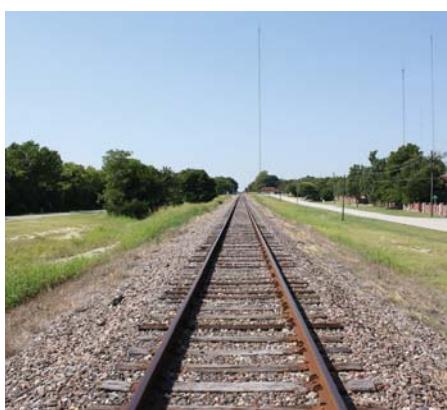
Future Transit Stations

Though not yet in operation, potential station locations for the future commuter rail have been identified. These are key opportunity areas as they will generate significant bicycle and pedestrian traffic once the commuter rail line becomes operational.



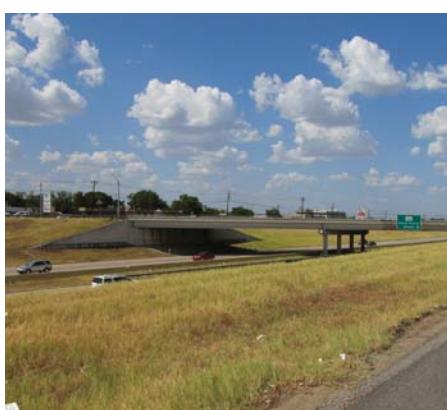
Creek Corridors

Most of Cedar Hill's existing trails are located along creek corridors for a good reason: these are some of the most attractive and most pleasant parts of the City and provide natural routes across the community.



Future Thoroughfares

Especially for bikeways, it is important to look at future thoroughfares and thoroughfare widenings to identify opportunities to provide facilities. It is much more cost-effective to design a facility into a thoroughfare corridor before it is built than to retrofit a facility into an existing thoroughfare. Planning a facility along a future corridor is often a good alternative to retrofitting one that already exists.



Utility & Railroad Corridors

Though often lacking the natural beauty of creek corridors, utility and railroad corridors often provide excellent opportunities for trails. Providing trails along these corridors requires the ability to gain access easements and the cooperation of the railroad or utility company. Electric transmission lines may sometimes be good trail corridors, but often they are in the form of an easement rather than right-of-way and therefore cross private property lines.



Constraints

While there are many opportunities for expanding the trail system in Cedar Hill, there are also many constraints or challenges which must be considered.

US-67

US-67 is a major barrier for trails and bikeways alike. It runs through the middle of the City geographically and separates east from west. This freeway limits several potential trail corridors along creeks as many of its bridges are not sufficiently elevated for a trail to pass under. In addition, several of the roadway crossings are narrow and may not be able to accommodate bikeways.

Limited Right-of-Way

Several of the City's thoroughfares have very limited right-of-way (especially Belt Line Road near Downtown), significantly limiting what improvements are possible. This constraint primarily impacts bikeways but may also impact the City's ability to provide trails.

Topographic Constraints

It is impossible to identify topographic constraints comprehensively when planning on a City-wide basis. Rather, each corridor will need to be analyzed individually as its trails are being designed. In general, practically every creek corridor will present topographic constraints (excessive slopes, cross-slopes, and undulating land). Likewise, any trail passing through the Balcones Escarpment area will most likely be challenged by topography.

Sensitive Environmental Areas

It is often the case that the most desirable places to have trails are also those that are very environmentally sensitive. Creek corridors, which provide the most ecologically diverse landscapes, are especially sensitive to erosion and pollution. Similarly, the Balcones Escarpment may contain sensitive animal habitat and geology.



5.3 TRAILS

Trails generally provide places for recreational jogging, walking, cycling, and relaxation. Because they provide enjoyable recreation opportunities, creek corridors, forests, and other scenic areas are prime places for trails. Quite often, trails are also provided along railroad tracks, utility corridors, and streets in order to create connections between greenbelt trails and destinations. There are different types of trails that serve different user groups—a nature trail, for example, might restrict bicycles from its use. Even so, the majority of trails in Cedar Hill’s system will be multi-use, accommodating pedestrians, bicycles, and any other type of non-motorized use other than equestrian.



Inventory & Assessment

Cedar Hill’s trail system is relatively young. Although there are 12.1 miles of trails that exist today, they are generally short loop trails contained within a single park and do not provide connections to other destinations. The new Red Oak Creek Trail (to be completed in 2013) adds an additional three miles to Cedar Hill’s trail system and is the first major segment of a cross-town network of trails. With the completion of four programmed⁴ trails along Mansfield Road, Lake Ridge Parkway, Pleasant Run Road, and FM-1382, the total trail mileage in Cedar Hill will reach 23.2 miles. Table 5.1 summarizes the trails within Cedar Hill and Figure 5.2 shows their locations.

Table 5.1 – Existing Trail Inventory

Segment	Length (miles)	Width	Status
Park Loop Trails (26 segments)	12.1 (0.46 average)	6'-10'	Existing
Red Oak Creek Trail	3.1	12'	Complete in 2013
Pleasant Run Trail	1.0	12'*	Complete in 2013
Lake Ridge Trail	3.6	12'*	Complete in 2013
Mansfield Road Trail	2.6	12'*	Complete in 2014
FM-1382 Trail (New Clark Road to Cedar Hill Road)	0.8	12'**	Complete in 2015
Total Mileage	23.2		

*Includes a 4' sidewalk on the opposite side of the road.

**Includes a 6' sidewalk on the opposite side of the road.

⁴ Programmed trails are those which are under design or for which funding has been secured.

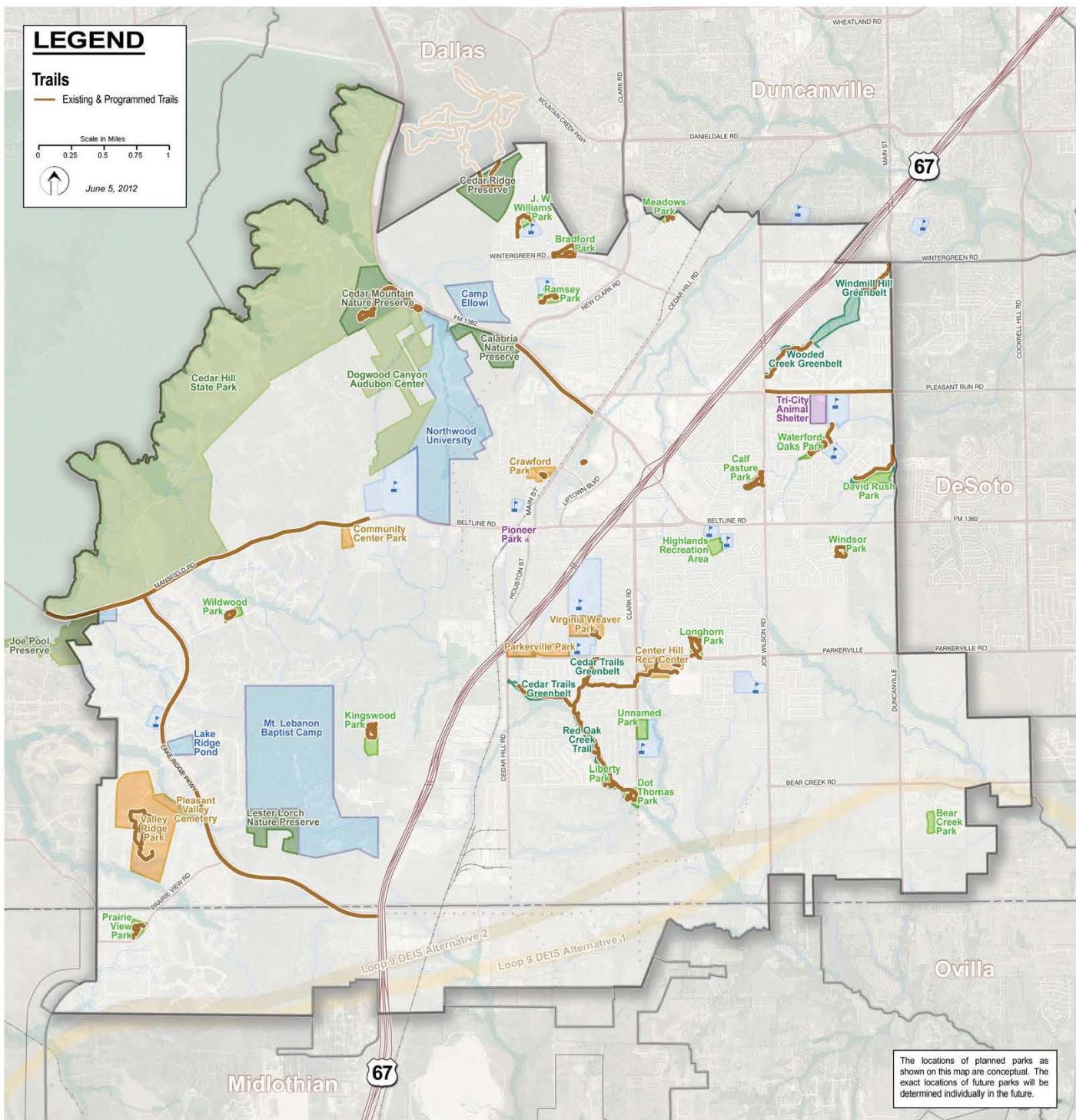


Figure 5.2 – Existing & Programmed Trails

This figure illustrates the location of existing and programmed trails in Cedar Hill. Programmed trails are those which are under design or for which funding has been secured. The trails shown along Mansfield Road, Lake Ridge Parkway, Pleasant Run Road, and FM-1382 are programmed.



Needs

The need for additional trails are based on three factors:

1. Citizen demand as expressed through the public involvement process;
2. A level of service analysis, which expresses trail mileage as a factor population; and
3. An analysis of trail network connectivity, which considers access to destinations and the elimination of gaps between trails.

Citizen Demand

As discussed on page 5-3, there is strong support for the provision of a comprehensive network of trails—especially as they provide connectivity to destinations and nearby cities. In light of the fact that trails are the most desired amenity according to the telephone survey, expanding the trail network is a top priority for Cedar Hill.

Level of Service Analysis

Level of service (LOS) is calculated as a factor of the total population. Table 5.2 provides an assessment of the current LOS and projected 2017 LOS (assuming all currently-programmed trails are constructed). Many cities in North Texas choose a target LOS between 1,000 and 2,000 people per mile of trail (a lower number indicates a higher level of service). Based on this Master Plan’s trail network, which was designed to provide a premier system of trails, the LOS for Cedar Hill at build-out would be 1 mile/750 people. This means that by 2030, Cedar Hill is planned to have 120.2 miles of trail, which includes 97.0 additional miles of trail over and above what is currently programmed.

Table 5.2 – Level of Service Analysis

Period	Total Miles of Trail	Population	Level of Service
2012*	12.6	45,260	1 mile/3,592 people
2017**	23.2	56,000	1 mile/2,414 people
2030***	120.2	88,956	1 mile/750 people (97.0 additional miles)

*Includes the Red Oak Creek Trail.

**Includes currently programmed trails. Population estimate is an average of NCTCOG's 2011 Population Estimate and the 2020 Forecast from the Texas Water Development Board's 2011 Regional and 2012 State Water Plan Population Projections

***Trail mileage based on the planned trails included in this Master Plan. This reflects a need of 97 additional miles of trail over and above what is currently programmed. Level of service is approximate.

Network Connectivity Analysis

The goal of the network connectivity analysis is to identify the lack of connectivity to destinations and within the trail network itself. This analysis is based on the mapping information included in Figure 5.1 (Opportunities & Constraints) and Figure 5.2 (Existing & Programmed Trails).

With many trail projects currently underway, access to destinations in Cedar Hill will greatly improve over the next five years. However, there remain many gaps in the system's overall connectivity. US-67 is the most significant barrier for trails in Cedar Hill and creates many challenges for trail crossings. Figure 5.2 illustrates the gap in connectivity across the freeway. This, in part, results in Uptown and Downtown—the core of Cedar Hill and major destinations for trail users—remaining unconnected to the trail system. Outside of the City core, there are many parks and major employment areas that are also not accessible by trail. Providing connectivity to these destinations is important.

A key priority for the trail system is to bridge the gaps between Red Oak Creek Trail and the programmed trails along FM-1382, Mansfield Road, and Pleasant Run Road. This requires identifying crossing opportunities for US-67, prioritizing the development of trails across this freeway and connecting to Uptown and Downtown.

In addition, the development of trails in and near the State Park and Escarpment provides the greatest opportunities for economic development and tourism initiatives.





Trail Typologies

The majority of trails included in this Trails Master Plan are intended to be multi-use, accommodating pedestrians and bicycles. Multi-use trails are typically two-way, striped concrete⁵ pathways between 10' and 14' wide, depending on the anticipated volume of users.

Core Trail (12-14' wide)

Core trails are multi-use and are the heart of the Trail Master Plan—they are considered the major thoroughfares of the trail system. Core trails will typically be 12' wide. However, in areas where higher volumes of trail users are expected—such as near Downtown and Uptown—widths of 14' may be warranted. In areas with severely constrained rights-of-way, it may be necessary to construct trails 10' wide (with 3' shoulders). If along a roadway with severely constrained right-of-way, 8' sidepaths⁶ on both sides of the road may constitute a core trail, as long as bicycle traffic is constrained to one-way on each side (see the sidepath typology in the Bikeways section of this chapter). However, since one-way traffic can be challenging to enforce, wider sidepaths that accommodate two-way traffic are more desirable.



Secondary Trail (10' wide)

Secondary trails are multi-use trails that connect core trails to destinations and provide additional trail connections along lower-priority corridors. While secondary trails must be 10' wide to accommodate two-way bicycle traffic, there are two alternative configurations: A) they may be as narrow as 8' wide if a parallel bikeway is provided; and B) they may be provided as dual 8' wide sidepaths and signed as one-way for cyclists and two-way for pedestrians.



Park Loop Trail (8' wide)

Loop trails within parks are on average 0.5 miles in length and are typically used by pedestrians. Other than children, these trails do not experience large volumes of bicycle traffic. In smaller neighborhood parks, where no bicycle traffic is expected, trails may be as narrow as 6'.

- 5 While concrete is the preferred material due to its durability, alternative materials such as pervious asphalt, pervious concrete, and decomposed granite may be used in ecologically-sensitive areas.
- 6 A trail along a roadway is called a “sidepath” in the Trails Master Plan and Bikeways Master Plan terminology.

Nature Trails

Nature trails provide the closest connection with the natural environment and are often built using decomposed granite or earth. These trails are often not of a constant width and vary from 4' to 6'. Nature trails are not always multi-use; some are designed specifically for mountain bikes while others prohibit bicycles altogether. As such, this typology is typically not used to make major connections within the trail system.

Trail Corridors

If land must be acquired for developing a trail along a creek, utility corridor, or railroad, it is desirable to secure a corridor at least 20' wide but preferably 32' wide. A 32' wide corridor accommodates the trail and its shoulders while providing space for grading, tree protection, trail meandering, overlooks, and rest areas. Wider trail corridors also help to maintain the visual integrity of the trail experience. In many cases, even more width may be required to accommodate drainage or other utilities.

For sidepaths (trails along roadways), a minimum corridor width of 20' is required to accommodate a 12' wide pavement section, two 3' shoulders, and a 2' setback from the roadway (18' is required for 10' sidepaths). If feasible, a 25' wide corridor is preferred to provide a wider setback from the roadway and increased distance from adjacent development.

Trail Network

The planned network of trails builds upon Cedar Hill's existing trails and the previous master plan to provide an interconnected and comprehensive network of various trail typologies. Trail alignments were chosen based on connectivity to destinations, proximity to residential areas, recreational value, ease of implementation, and in consideration of physical constraints. The foundation of the trail network is a series of six core trails, described below. However, the secondary trails shown are essential in ensuring connectivity across all parts of the community.

Core Trails

The core trail network builds upon the North-South Core Trail (shown in yellow on Figure 5.3) that served as the foundation of the previous trails plan. The Trails Master Plan adds two linear corridors across the City (shown in blue and turquoise in Figure 5.3) and three loops (shown in purple, red, and green).

- ***The North-South Core Trail*** will extend the new Red Oak Creek Trail to connect to the City core and pass through the scenic vistas along FM-1382. This will provide connections to Northwood University, Dogwood Canyon, and the Cedar Mountain and Calabria Nature Preserves.
- ***The East-West Core Trail*** connects the western and southeastern portions of the community to the City core. This alignment will provide access to the dramatic environment of the Balcones Escarpment and the rural landscapes of the Blackland Prairies to the east while also allowing linkages to historic Downtown, Uptown, the Government Center, numerous schools, and public parks.
- ***The Railroad Core Trail*** follows the existing railroad corridor that will one day carry commuter rail traffic to Cedar Hill. This alignment will provide a direct connection to Duncanville, as well as ample opportunities for future commuter rail line users to access future stations.
- ***The Inner Loop Core Trail*** will provide circulation within the City core, making connections to Uptown and Downtown while crossing US-67 twice, at Belt Line Road and FM-1382. This will serve as a major connector in Cedar Hill's business corridor.
- ***The Middle Loop Core Trail*** encircles the City core and provides access to and through Northwood University.
- ***The Outer Loop Core Trail*** encircles the entire City, passing through Cedar Hill State Park and along existing and future thoroughfares. This trail allows the greatest opportunity for a world-class trail system for future generations.

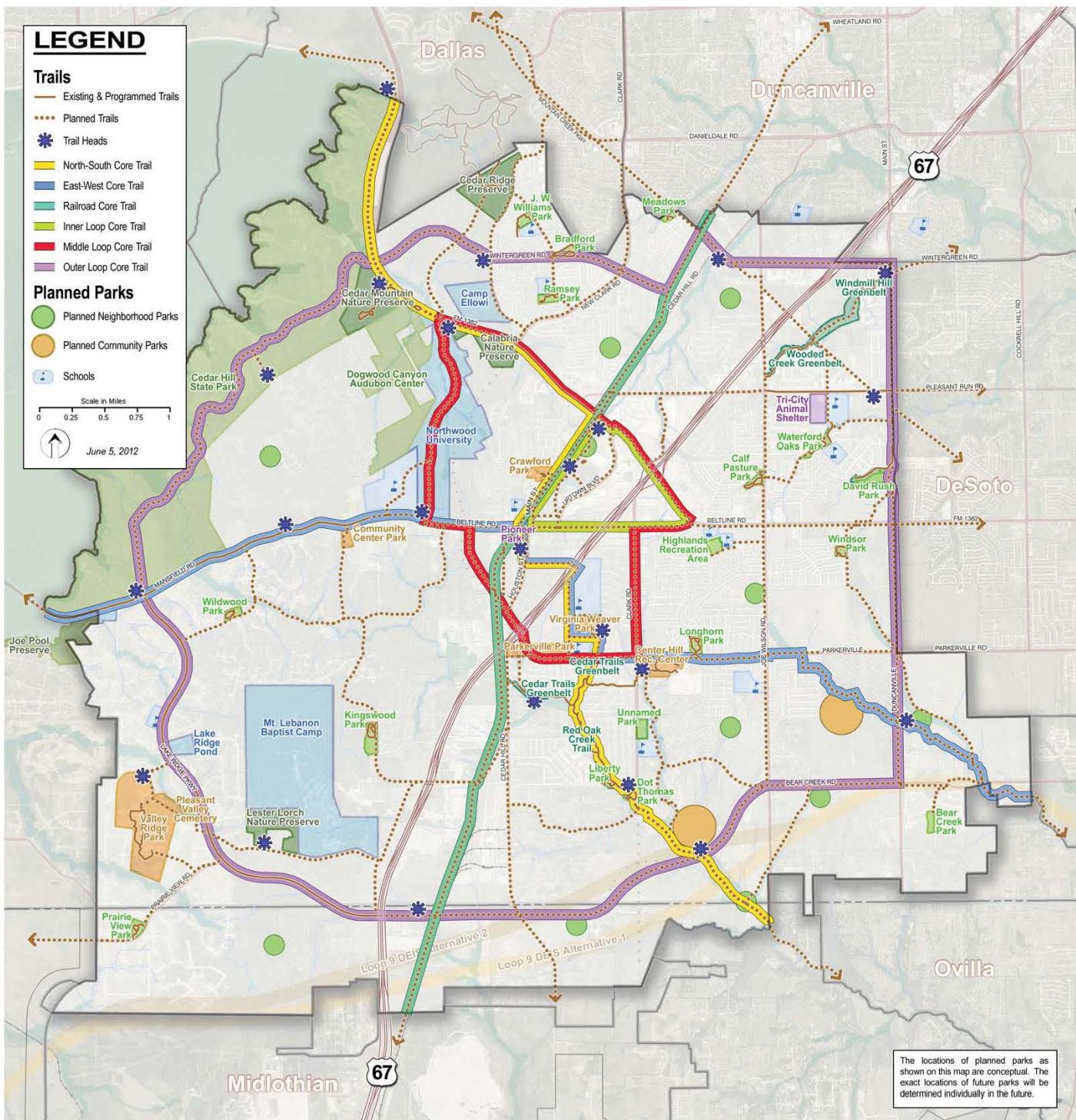


Figure 5.3 – Trails Master Plan

This figure illustrates the location of existing/programmed and planned trails in Cedar Hill. Core Trails (highlighted in yellow, blue, turquoise, green, red, and purple) will serve as the major thoroughfares of the trails system and are the highest-priority segments.

Trail Implementation

Trails Master Plan Cost Estimates

The Trails Master Plan recommends 97.0 miles of new trails in addition to the City's existing and programmed 23.2 miles of trail. Of these recommended trails, 48 miles are Core Trail segments. If fully implemented, Cedar Hill's trail system would total over 120 miles. Implementing the Trails Master Plan independent from other projects would cost an estimated \$80.3 million (see Table 6.3). However, many of these facilities can be implemented in coordination with other capital projects. For example, trails can be constructed along with road improvement projects and drainage projects, thereby reducing the cost per mile of these facilities due to an improved economy of scale resulting from being piggy-backed onto a larger project.

Many of the projects can be funded with Federal, State, and regional transportation, safety, and/or air quality grants. Trails can serve as transportation corridors for commuters, making the projects eligible for funding programs. However, some of the trails are purely recreational in nature, thereby limiting their qualification for federally-designated money and must be supplemented or wholly funded by local or private sources.

Table 5.3 – Trail Master Plan Cost Estimates

Type	Miles/Units	Typical Cost*	Total Cost
Existing & Programmed Trails	23.2	--	--
Planned Trails (all types)	97.0	\$750,000	\$73,725,000
Trailheads	17	\$350,000	\$5,950,000
Overlooks/Viewing Points	4	\$150,000	\$600,000
Total	120.2 Miles		\$80,275,000

*Estimated costs include design, administration, and miscellaneous costs as well as a 20% contingency. The cost for the Core & Loop Trail segments, as reflected in Table 5.4, are included in the totals shown on this table.

While not included as major priorities of this Trails Master Plan, additional park trails and sidewalks along roadways are important elements of the pedestrian and bicycle infrastructure system and should be provided as needed.

Core Trail Segment Prioritization

Implementation priorities have been assigned to various segments of the core trail network. The prioritization criteria chosen to evaluate the trail corridors include:

- ***Connectivity and User Generators*** – Proximity and connectivity to key destinations and generators, specifically those referenced in the previous Opportunities & Constraints section of this chapter constitute a high priority.
- ***Network Completion*** – Segments that fill in a missing gap in the trail system and maximize recreational benefit in the most cost-effective manner receive higher priority.
- ***Existing Partnership or Availability of Rights-Of-Way*** – Segments located within public rights-of-way or land owned by existing partners (e.g., Cedar Hill State Park, Northwood University, etc.) are given priority.
- ***Ease of Implementation*** – Ease of implementation in terms of topography, vegetation density, number of creek and traffic conflicts and crossings, etc. impact the prioritization.

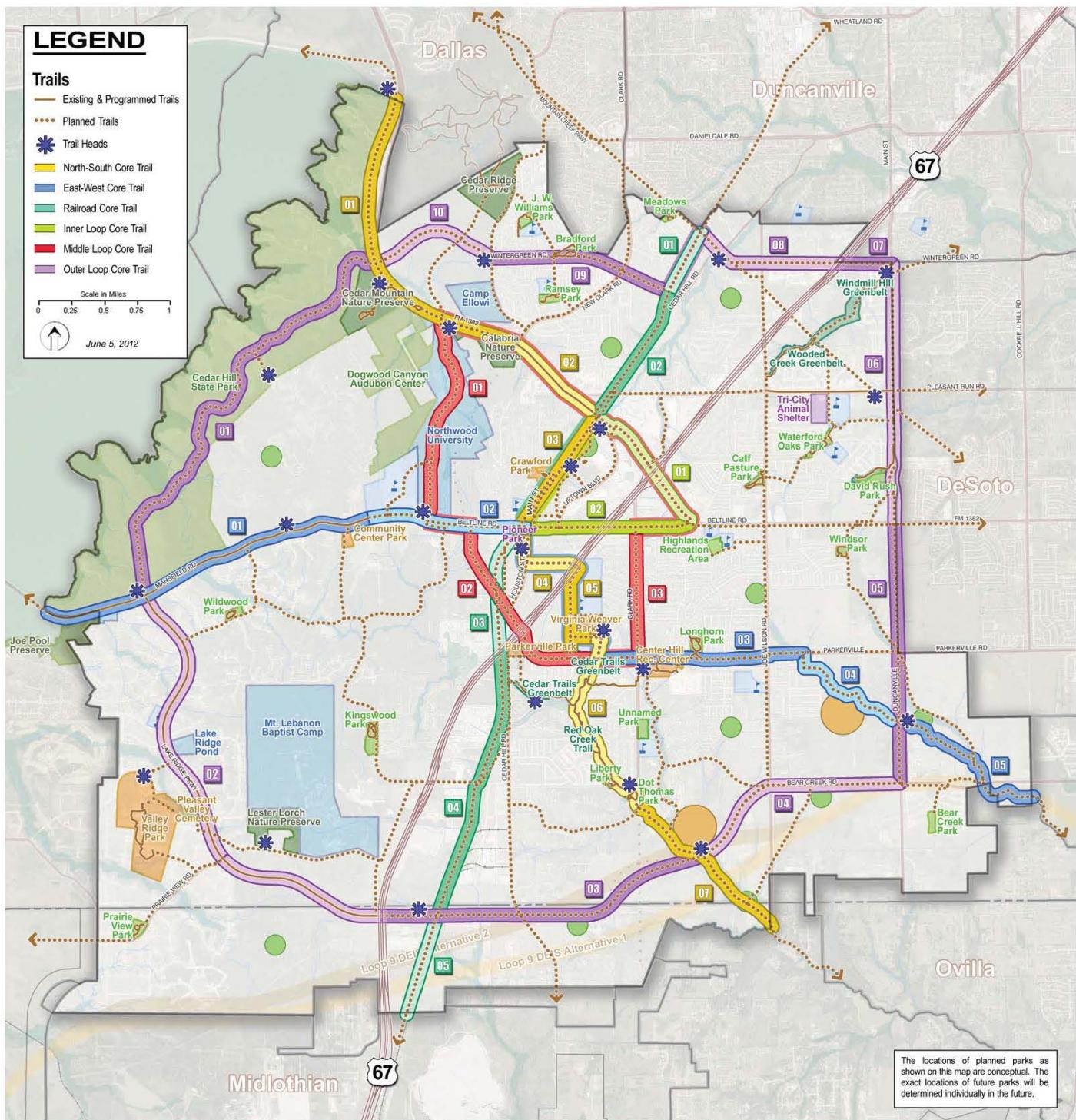


Figure 5.4 – Trails Master Plan Priorities

This figure illustrates the core trail prioritization. Fully implemented, the trail system illustrated on this map would total 120.2 miles. Of this, 21.9 miles exist or are programmed for near-term completion and 98.3 miles are planned. Nearly half of the planned trail mileage (48 miles) constitutes Core Trail segments.

Table 5.4 – Trail Master Plan Priorities

Segment ID	Priority Group	Description	Length (miles)	Width [†] (feet)	Cost [‡] (thousands)	Potential Funding Sources [△]
North-South Core Trail						
01	1	FM-1382 from northern city limits to New Clark Road	2.6	12	\$1,935	TE, RTG
02	In Progress	FM-1382 Sidepath from New Clark Road to Strauss Road	0.8	12	Funded	--
03	1	Cedar Hill Road from FM-1382 to Belt Line Road	1.0	12	\$763	SRTS, TE
04	1	Houston/Main/Cooper Streets from Belt Line Road to US-67	0.6	8/8*	\$471	SRTS, TE
05	1	Longhorn Boulevard from US-67 to Virginia Weaver Park and Parkerville Road	0.7	10-12**	\$504	SRTS, TE
06	In Progress	Red Oak Creek Trail from Virginia Weaver Park to Dot Thomas Park	1.5	12	Funded	--
07	5	Red Oak Creek from Dot Thomas Park to southern city limits	1.4	12	\$1,046	TE, RTG
			<i>Subtotal</i>	8.6		\$4,719
East-West Core Trail						
01	In Progress	Mansfield Road Sidepath from the city limit to Old Belt Line Road	2.7	12	Funded	--
02	1	Belt Line Road from Mansfield Road to Cedar Hill Road	1.2	12	\$906	SRTS, TE, RTG
03	2	Parkerville Park to Lynn Creek	1.6	8/8*	\$1,163	SRTS, TE
04	2	Lynn Creek from Parkerville Road to Duncanville Road	1.0	12	\$760	RTG
05	5	Lynn Creek from Duncanville Road to eastern city limits	1.3	12	\$972	RTG
			<i>Subtotal</i>	7.8		\$3,801
Railroad Core Trail						

[†]If feasible, all Core Trail segments will be 12' wide. This column represents predicted maximum widths based on right-of-way constraints.

[‡]Significant cost savings can be realized if projects are incorporated in other capital projects, such as street construction or rehabilitation.

[△]TE—Transportation Enhancements (TxDOT/NCTCOG); RTG—Recreational Trails Grant (TPWD); SRTS—Safe Routes to School (TxDOT)

*Dual 8 foot wide sidepaths, one on each side of the road.

**Portions of this alignment may be constrained, only allowing a 10 foot wide trail.

Table 5.4 – Trail Master Plan Priorities

Segment ID	Priority Group	Description	Length (miles)	Width [†] (feet)	Cost [‡] (thousands)	Potential Funding Sources [△]
01	2	BNSF Railroad from northern city limit to Wintergreen Road	0.5	12	\$379	TE, RTG
02	2	BNSF Railroad from Wintergreen Road to FM-1382	1.1	12	\$815	TE, RTG
03	5	BNSF Railroad from Belt Line Road to US-67	1.0	12	\$762	SRTS, TE, RTG
04	5	BNSF Railroad from US-67 to future Lake Ridge Parkway extension	2.1	12	\$1,555	TE, RTG
05	5	BNSF Railroad from future Lake Ridge Parkway extension to southern city limits	0.8	12	\$583	TE, RTG
			<i>Subtotal</i>	5.5		\$4,094
Inner Loop Core Trail						
01	3	FM-1382 from Cedar Hill Road to Belt Line Road	1.1	8/8*	\$819	SRTS, TE
02	3	Belt Line Road from FM-1382 to Cedar Hill Road	1.3	8/8*	\$963	SRTS, TE
			<i>Subtotal</i>	2.4		\$1,782
Middle Loop Core Trail						
01	2	Northwood University from FM-1382 to Belt Line Road	1.6	12	\$1,208	RTG, Northwood University
02	4	Northwood University at Belt Line Road to West Parkerville Road	1.6	12	\$1,216	SRTS, TE
03	2	South Clark Road from West Parkerville Road to Belt Line Road	1.0	10-12**	\$749	SRTS, TE
			<i>Subtotal</i>	4.2		\$3,173

[†]If feasible, all Core Trail segments will be 12' wide. This column represents predicted maximum widths based on right-of-way constraints.

[‡]Significant cost savings can be realized if projects are incorporated in other capital projects, such as street construction or rehabilitation.

[△]TE-Transportation Enhancements (TxDOT/NCTCOG); RTG-Recreational Trails Grant (TPWD); SRTS-Safe Routes to School (TxDOT)

*Dual 8 foot wide sidepaths, one on each side of the road.

**Portions of this alignment may be constrained, only allowing a 10 foot wide trail.

Table 5.4 – Trail Master Plan Priorities

Segment ID	Priority Group	Description	Length (miles)	Width [†] (feet)	Cost [‡] (thousands)	Potential Funding Sources [△]
Inner Loop Core Trail						
01	1	Cedar Hill State Park from FM-1382 to Mansfield Road	3.6	12	\$2,700	TPWD
02	In Progress	Lake Ridge Parkway Sidepath from Mansfield Road to US-67	3.6	12	Funded	--
03	5	Future Lake Ridge Parkway extension from US-67 to Red Oak Creek	2.6	12	\$1,925	TE, RTG
04	5	Bear Creek Road and its future extension from Red Oak Creek to Duncanville Road	1.8	12	\$1,378	TE, RTG
05	3	Duncanville Road from Bear Creek Road to Belt Line Road	2.0	12	\$1,496	TE, RTG
06	3	Duncanville Road from Belt Line Road to Wintergreen Road	2.0	12	\$1,525	TE
07	3	Wintergreen Road from Duncanville Road to US-67	0.4	12	\$337	TE
08	3	Utility easement and Wintergreen Road from US-67 to BNSF Railroad	1.1	12	\$822	TE
09	4	Wintergreen Road from BNSF Railroad to Strauss Road	1.4	8/8*	\$1,066	SRTS, TE
10	2	Cedar Ridge Preserve from Strauss Road to FM-1382	1.0	12	\$743	RTG
Subtotal			19.5		\$11,992	
Total – In Progress			8.6			
Total – Future Planned			39.4		\$29,561	
Grand Total			48.0			

[†]If feasible, all Core Trail segments will be 12' wide. This column represents predicted maximum widths based on right-of-way constraints.

[‡]Significant cost savings can be realized if projects are incorporated in other capital projects, such as street construction or rehabilitation.

[△]TE-Transportation Enhancements (TxDOT/NCTCOG); RTG-Recreational Trails Grant (TPWD); SRTS-Safe Routes to School (TxDOT)

*Dual 8 foot wide sidepaths, one on each side of the road.

**Portions of this alignment may be constrained, only allowing a 10 foot wide trail.

Trail Master Plan First Phase Priorities

Table 5.5 lists the top priority projects for completion or initiation in the next five years. These projects are also shown in Table 5.4.

Table 5.5 – Trail Master Plan First Phase Priorities

Segment ID	Priority Group	Description	Length (miles)	Width [†] (feet)	Cost [‡] (thousands)	Potential Funding Sources [▲]
01	1	Cedar Hill State Park from FM-1382 to Mansfield Road	3.6	12	\$2,700	TPWD
02	1	Belt Line Road from Mansfield Road to Cedar Hill Road	1.2	12	\$906	SRTS, TE, RTG
03	1	Cedar Hill Road from FM-1382 to Belt Line Road	1.0	12	\$763	SRTS, TE
04	1	Houston/Main/Cooper Streets from Belt Line Road to US-67	0.6	8/8*	\$471	SRTS, TE
05	1	Longhorn Boulevard from US-67 to Virginia Weaver Park and Parkerville Road	0.7	10-12**	\$504	SRTS, TE
01	1	FM-1382 from northern city limits to New Clark Road	2.6	12	\$1,935	TE, RTG
Total			9.7		\$7,279	

[†]If feasible, all Core Trail segments will be 12' wide. This column represents predicted maximum widths based on right-of-way constraints.

[‡]Significant cost savings can be realized if projects are incorporated in other capital projects, such as street construction or rehabilitation.

[▲]TE—Transportation Enhancements (TxDOT/NCTCOG); RTG—Recreational Trails Grant (TPWD); SRTS—Safe Routes to School (TxDOT)

*Dual 8 foot wide sidewalks, one on each side of the road.

**Portions of this alignment may be constrained, only allowing a 10 foot wide trail.

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5.4 **BIKEWAYS**

Bikeways serve both recreation and transportation functions. Every week, dozens—if not hundreds—of avid recreational cyclists take to Cedar Hill’s beautiful roadways, especially FM-1382, Mansfield Road, and Lake Ridge Parkway. The popularity of Cedar Hill for recreational road cyclists is what led to the formation of the Head for the Hills Bike Rally. In addition to recreational cyclists, there are transportation cyclists in Cedar Hill, including adult commuters and school children.

Inventory & Assessment

Cedar Hill does not currently have any formalized bikeways, though cyclists are legally allowed to ride on any roadway other than freeways. The avid recreational cyclists that ride along FM-1382, Mansfield Road, and Lake Ridge Parkway do so either on the roadways’ shoulders (where present) or in a regular travel lane.

Needs

The need for additional bikeways are based on three factors:

1. Citizen demand as expressed through the public involvement process;
2. An analysis of connectivity for cyclists using roadways; and
3. Federal and regional government initiatives.

Unlike trails, level of service is not analyzed for bikeways. The reason being that the key measure of a bikeway system’s performance is its connectivity, appropriateness to target users, and quality of design, not the miles of bikeways per capita.

Citizen Demand

As with trails, there is strong support for the provision of bikeways, especially when they are designed to provide a high level of comfort and sense of safety for novice or B-cyclists¹.

¹ The term “B-cyclists” refers to the average bike rider. See page 5-5.

Network Connectivity Analysis

The goal of the network connectivity analysis for bikeways is the same as it is for trails: to identify lack of connectivity to destinations and within the network itself. This analysis is based on the mapping information included in Figure 5.1 (Opportunities & Constraints) on page 5-8.

Considering the current lack of formal bikeways, there is not an adequate level of connectivity for general cyclists at this time. Avid cyclists that are comfortable riding with traffic enjoy a relatively adequate level of connectivity. However, novices that are not comfortable riding with traffic are forced to remain on neighborhood streets (or use trails), which limits their access to potential destinations.

The priority for the bikeways system, therefore, is to begin establishing bikeways along streets that provide the highest level of connectivity and/or would require relatively inexpensive levels of investment. Collector roads through neighborhoods and streets in Downtown and Uptown are prime for initial projects. In addition, any roadway project involving resurfacing, restriping, or pavement modifications should incorporate planned bikeway elements to the extent possible.

Special consideration should be given to intersections, which should be laid out in a way that makes motorists aware of the cyclists' intentions well in advance. Intersection improvements to consider include:

- Specific pavement markings such as "bike boxes" (also referred to as "blue boxes" or "green boxes") at intersections and solid-color bike lanes (where the entire bike lane is painted with a noticeable color, such as green, in order to be more visible);
- Warning signs wherever motorists will have to cross over an on-street bike lane (such as to enter a right-turn lane); and
- Bicycle-oriented traffic signals (which give cyclists a head-start through the intersection).

There are many nuances and details associated with providing bike lanes that can only be addressed during the design process.

Federal & Regional Government Initiatives

Recent Federal initiatives and mandates, which affect how TxDOT and NCTCOG's funding is allocated, require that new roadway projects include facilities for bicycles and pedestrians. This includes bike lanes or wide outside shared lanes (minimum of 14 feet in width¹), as well as sidewalks for pedestrians.

¹ This Master Plan recommends 14.5' minimum for shared lanes, with 16' preferred.

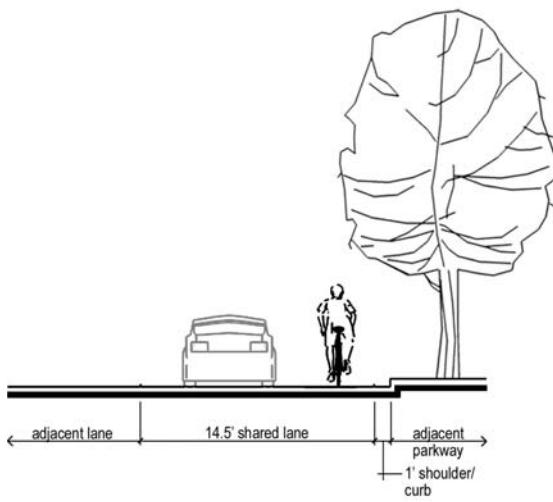
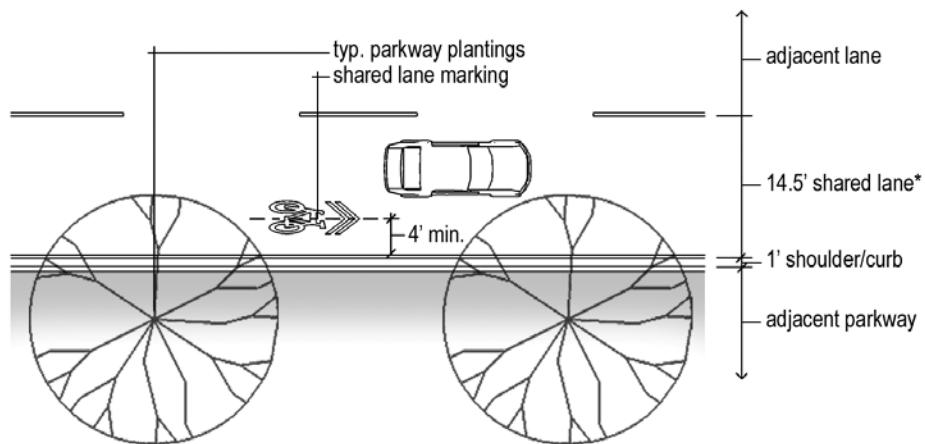
Bikeway Typologies

There are several different types of facilities that fall within the bikeways category—these include shared lanes, bike lanes, and buffered bike lanes/cycle tracks. In addition, “sidepaths” (shared-use paths along roadways) can be used where traffic volumes and speeds are extremely high. Each of these facility types are described in more detail below.



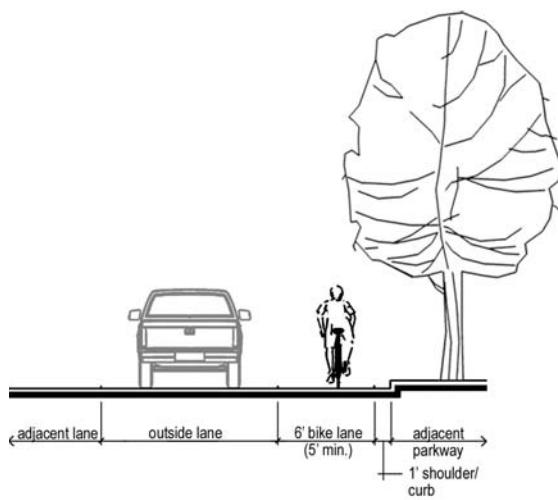
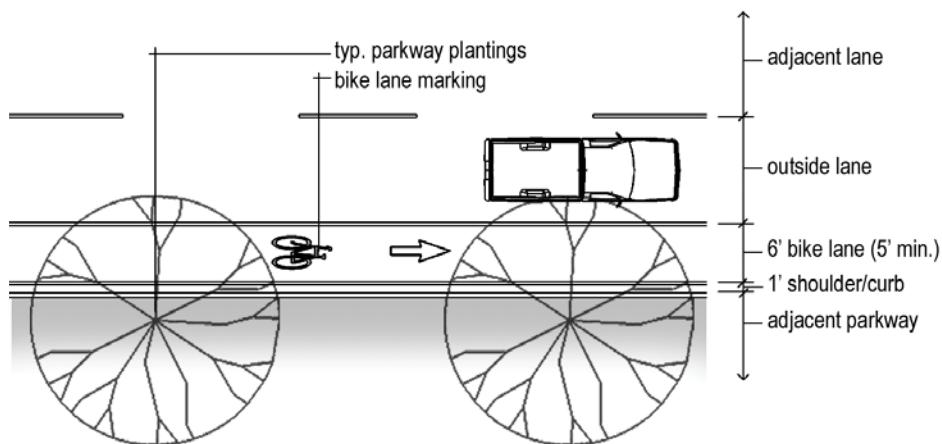
Shared Lanes

This type of facility does not include striping to delineate space for bicycles from space for automobiles. However shared lane bikeways include wider lanes (14.5' minimum [16' preferred] if on-street parking is not allowed, which gives room for a normal-sized automobile to safely pass a bicycle), pavement markings, and are most appropriate along lower-traffic streets. On four lane roads, only the outside lanes should be marked as shared lanes.



Bike Lanes

The benefits of bike lanes, which are most appropriate along moderate-traffic streets, include the clear delineation between space for bicycles and space for automobiles and their high visibility to cyclists and motorists alike (which can improve safety as well as wayfinding). Bike lanes should be a minimum 5' wide from the edge of pavement (not including the gutter) and ideally 6' wide whenever possible. Parking alongside a bike lane is strongly discouraged; however, if parking must be provided, it should stand separately from the bike lane. That is, the parking aisle should not encroach upon and should be in addition to the 5' to 6' wide bike lane. On one-way streets where a bike lane is only provided on one side of the road, parking should be located on the opposite side to minimize potential conflicts between cars and bicycles.



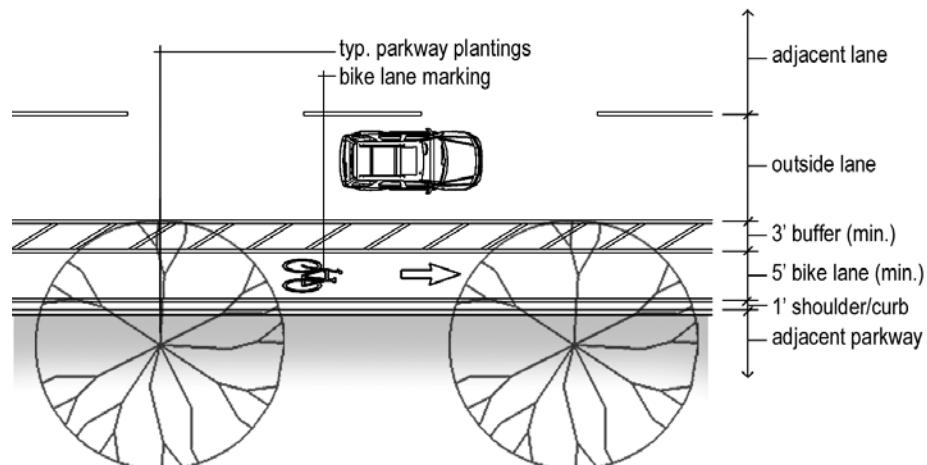
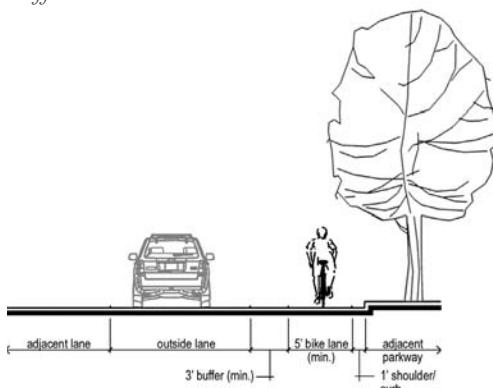


Buffered Bike Lanes / Cycle Tracks

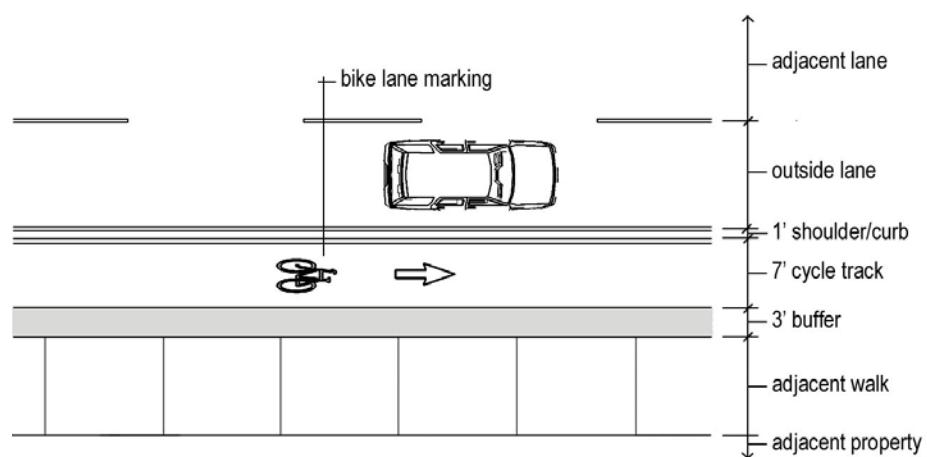
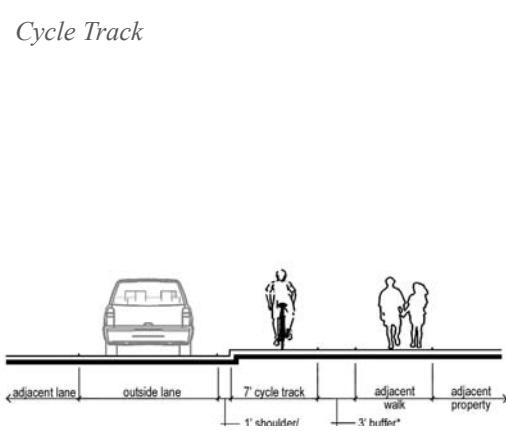
These are relatively new bikeway types in the United States (though very common in European cities such as Copenhagen, Amsterdam, and Muenster as well as Vancouver, Canada). These types of facilities are preferred for higher-traffic roadways and along major bikeway corridors that are anticipated to have a very high volume of bicycle traffic as they provide additional space between bicycles and cars.

Buffered bike lanes are simply bike lanes with an additional 3' or more of striped area between the bike lane and the regular traffic lanes. Cycle tracks, on the other hand are separated from automobiles through a curb, parking aisle, median, bollard, or similar and are separated from pedestrians through a painted stripe, grade separation, or landscaped area. Cycle tracks can be one-way or two-way; however, two-way versions are much more difficult to design and require more signage and traffic control measures than one-way versions. A typical cycle track will be 7' wide, which allows for one bicycle travel lane and one bicycle passing lane. Determining between the application of a buffered bike lane and a cycle track must be done on a case-by-case basis during the design process.

Buffered Bike Lane

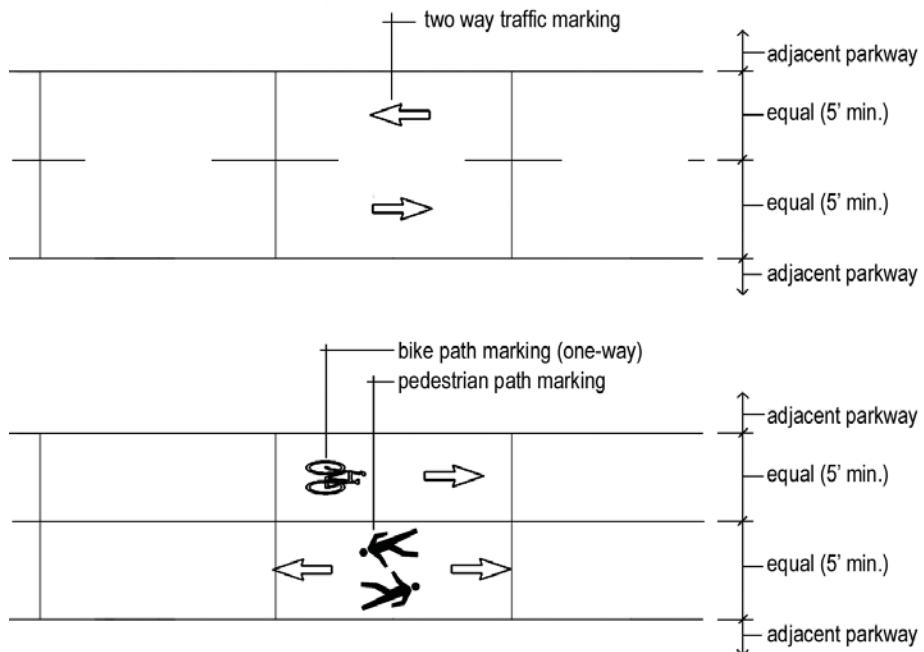


Cycle Track



Sidepaths

In some cases—either along very high-traffic roadways or where large volumes of Type B cyclists are expected—it may be preferable to provide a sidepath (a multi-use path or trail for cyclists and pedestrians along one or both sides of a roadway). Sidepaths are generally the preferred bikeway type for Greenway Arterials (see Chapter 7). Sidepaths should be designed to meet all AASHTO standards for shared use paths, including signage and trail-specific traffic control/signage. Sidepaths indicated on Figure 6.4 should be a minimum of 10' in width when provided on both sides of the roadway or 12' in width when provided on only one side. Note that the Trails Master Plan (Figure 6.2) includes trails along roadways that are not part of the Bikeways Master Plan. Those trails should be a minimum of 8' in width when provided on both sides of the roadway or 10' when provided on only one side. In instances where a sidepath is provided on only one side of the roadway, a sidewalk with a width of 6' or greater should be provided on the other side.



Bikeway Network

The purpose of the bikeways master plan is to provide a city-wide network of bicycle facilities that provide access across the entire city, connect all major destinations—including parks, shopping areas, transit stations, and major employment centers—and provide links to neighboring cities and regional trail systems. The objective is for bikeways to provide safe, quick, and direct travel along corridors with high bicycle demand and to connect discontinuous segments of multi-use trails.

The planned bikeway network has been designed to connect and support the trail system, while also serving as a stand-alone system for cyclists that wish to utilize roadways. The network is built to reflect forecasted future traffic volumes so vehicular traffic is not unduly effected by the bikeways. Another effect of this approach is that bikeway facilities are appropriate for the amount of adjacent traffic and are comfortable for users. While avid, high-speed cyclists will be able to comfortably utilize the network, it is primarily designed to appeal to average bike riders (B-cyclists), which constitute the majority of current or potential cyclists.

Alignment Selection

Bikeway alignments were chosen to provide direct routes with minimal turns. Fewer turns along a route minimize confusion and the effort required to navigate the system. An easier-to-use system will encourage greater use by a variety of cyclists. These alignments also provide route options with varying facility types, so that people with different skill levels can select a route that they are comfortable using. The bikeway system primarily utilizes existing and future arterial and collector thoroughfares for these reasons:

- They provide better cross-town connectivity than minor neighborhood streets.
- They typically have more available right-of-way than neighborhood streets.
- They are the streets with which most citizens are already familiar.
- They typically connect to neighboring cities and transit systems.

Bikeways and Trails

Where bikeways overlap the Core Trail networks (which only occurs along streets, not along greenways), a higher ease-of-use on-street facility is planned. In other words, sidepaths, buffered bike lanes, and cycle tracks are typically provided rather than shared lanes or traditional bike lanes. Examples of these situations are FM-1382, Mansfield Road, and Duncanville Road. Planned bikeways will connect to existing and planned trails to allow users to access those trails by bike, minimizing their dependency on their car.

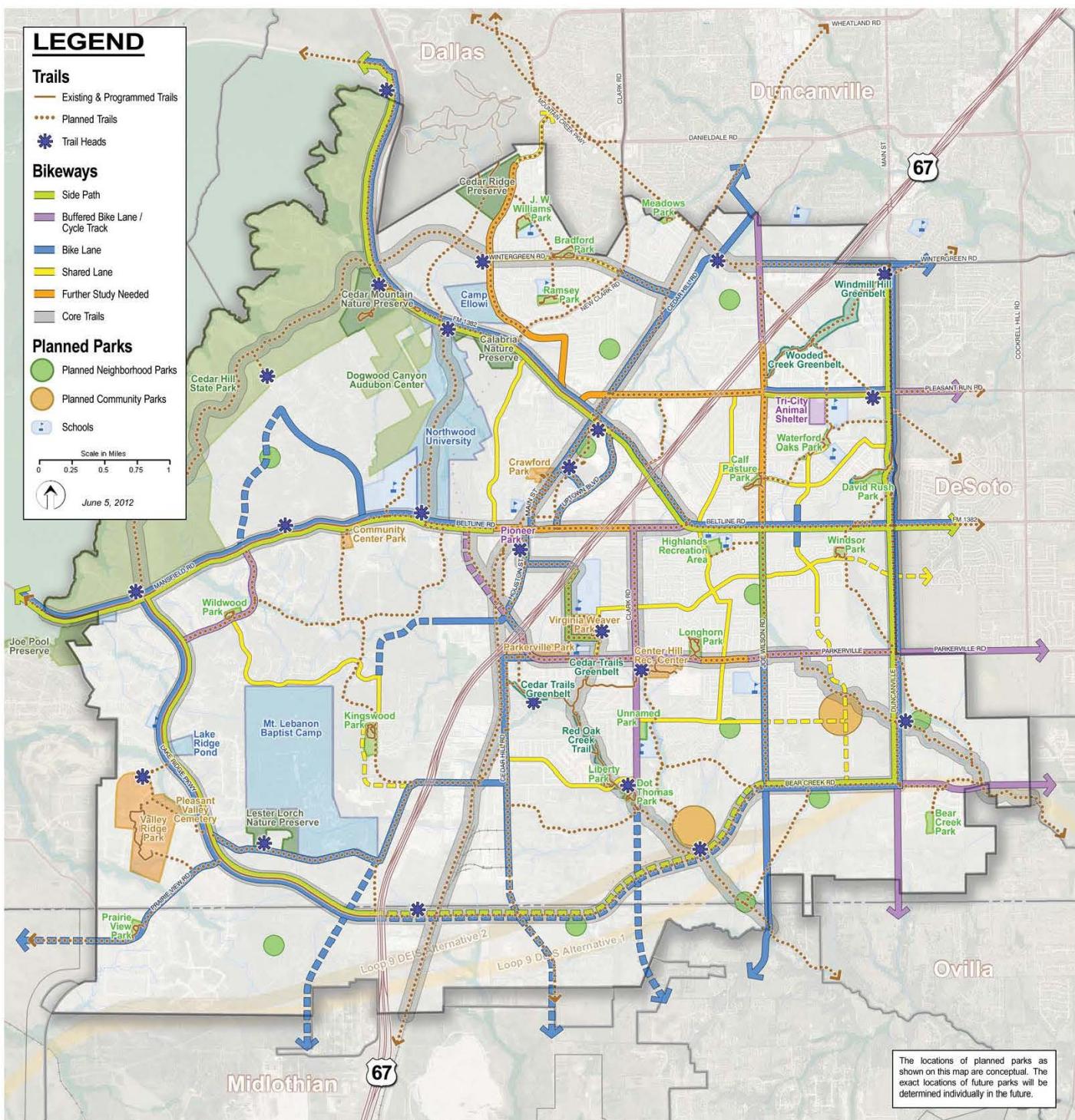


Figure 5.5 – Bikeways Master Plan

This figure illustrates the location of planned bikeways in Cedar Hill. The core trail network is shown in light grey for reference.

Bikeway Implementation

The Bikeways Master Plan recommends 85.4 miles of new shared lanes, bike lanes, buffered bike lanes / cycle tracks, and sidepaths. Sidepaths constitute 24.6 of these miles, which are also accounted for in the Trails Master Plan Cost Estimates. Table 5.6 depicts the various bikeway facility types and includes cost estimates. However, there is a great amount of variability within the cost of this type of facility. For example, striping a bike lane on a roadway with excess pavement width requires little more than the cost of the paint itself. At the other extreme, adding a bike lane to a roadway without adequate pavement width could require demolishing and reconstructing curbs, modifying drainage, potentially relocating utilities, modifying sidewalks and driveways, etc.

As with trails, many of these facilities can be implemented in coordination with road reconstruction/improvement projects. In reality, this may be the only time that the provision of bikeways is feasible from a cost point of view.

Table 5.6 – Bikeways Master Plan Cost Estimates

Type	Miles	Typical Cost per Mile (retrofit)*	Typical Cost per Mile (new construction)**
Shared Lanes	19.0	\$10,000	\$50,000
Bike Lanes	25.7	\$20,000	\$100,000
Buffered Bike Lanes / Cycle Tracks	9.7	\$30,000	\$150,000 / \$600,000
Side Paths	24.6	\$750,000	\$750,000
Further Study Needed	6.4		
Total	85.4 Miles		

*Costs for facilities retrofitted onto streets. Includes pavement markings and signage. Assumes adequate existing pavement width. Projects requiring pavement section modifications, utility relocations, right-of-way acquisition, etc. would be significantly more expensive.

** Costs for facilities constructed with other roadway projects. Includes additional pavement width, striping, and signage. Does not include additional right-of-way.

Priority Bikeway Projects

Table 5.7 lists upcoming roadway projects which will include bikeway facilities, as well as additional bikeway projects that will provide increased connectivity.

Table 5.7 – Priority Bikeway Projects

Upcoming Roadway Projects

Project	Planned Facility Type	Miles
Mansfield Road from City Limit to Belt Line Road	Bike Lanes & 12' Sidepath	3.9
Lake Ridge Parkway from Mansfield Road to US-67	Bike Lanes & 12' Sidepath	3.6
Pleasant Run Road from Joe Wilson Road to Duncanville Road	Bike Lanes & 12' Sidepath	1.0
FM-1382 from New Clark Road to Strauss Road	Bike Lanes & 12' Sidepath	0.8
South Clark Road from Belt Line Road to Parkerville Road	Buffered Bike Lane or Cycle Track	1.0
Additional Projects for Increased Connectivity		
Belt Line Road from Mansfield Road to Cedar Hill Road	Bike Lanes & 12' Sidepath	1.2
Cedar Hill Road from Belt Line Road to North City Limit	Bike Lanes	2.6
FM-1382 from North City Limit to New Clark Road	Bike Lanes & 12' Sidepath	2.6
Pleasant Run from FM-1382 to Joe Wilson Road	Bike Lanes	1.5
Parkerville Road from Houston Street to Joe Wilson Road	Buffered Bike Lane or Cycle Track	2.1
Meandering Drive/Cannaday Drive/Stone-wood Drive from Pleasant Run Road to Little Creek Road	Shared Lane	2.7
Houston Street from Belt Line Road to Parkerville Road and Cooper Street from Houston Street to US-67	Bike Lanes	0.9

5.5 **POTENTIAL**

FUNDING SOURCES

Trails and bikeways share many funding sources, including several grant programs. Many of the following funding sources can be applied to both trail projects and bikeway projects.

Municipal Bonds

Debt financing through the issuance of municipal bonds is the most common way in which to fund trail projects. This type of funding is a strategy wherein a city issues a bond, receives an immediate cash payment to finance projects, and must repay the bond with interest over a set period of time ranging from a few years to several decades. General obligation bonds—the most common form of municipal bond—is the primary bond type for trail projects.

Impact Fees & Developer Requirements

This tool can be used to require new development to provide trail rights-of-way or easements to offset the City's costs. Allowing or requiring developers to construct trails in accordance with City standards is an alternative implementation method. For bikeways, the Roadway Impact Fee will provide funding for new facilities as development occurs.

Tax Increment Financing/Public Improvement Districts

These related tools allow a development district to divert a portion of its property taxes to fund infrastructure improvements within its area. This can include trails and trailheads.

Recreational Trail Grants (Trails Only)

The Texas Parks & Wildlife Department (TPWD) administers the National Recreational Trails Fund in Texas under the approval of the Federal Highway Administration (FHWA). The grants can be up to 80% of project costs with a maximum of \$200,000 for non-motorized trail grants. Funds can be spent on both motorized and non-motorized recreational trail projects such as the construction of new recreational trails, to improve existing trails, to develop trailheads or trailside facilities, and to acquire trail corridors. The application deadline is May 1st each year.

Texas Department of Transportation Statewide Transportation Enhancement Program

Through the Statewide Transportation Enhancement Program (STEP), the Texas Department of Transportation (TxDOT) periodically makes funds available for the construction of bicycle routes, trails, pedestrian

safety enhancements, and landscaping of transportation facilities. To date, there have been seven program calls (1993, 1994, 1996, 1999, 2001, 2005-cancelled, and 2009) totaling \$533.4 million worth of grant dollars awarded. Grant selection and administration goes through the North Central Texas Council of Governments (NCTCOG), which reviews the projects within the Metropolitan Planning Area for eligibility, ranks the projects, and provides the State-required Letter of Transportation Improvement Program Placement.

STEP provides monetary support for transportation activities designed to strengthen the cultural, aesthetic, and environmental aspects of the transportation system. Funding is on a cost reimbursement basis and projects selected are eligible for reimbursement of up to 80%. This is one of the most important grants for trail projects.

North Central Texas Council of Governments (NCTCOG)

Sustainable Development Funding Program

The North Central Texas Council of Governments Sustainable Development Funding Program was created by its policy body, the Regional Transportation Council, to encourage public/private partnerships that positively address existing transportation system capacity, rail access, air quality concerns, and/or mixed land uses. By allocating transportation funds to land use projects promoting alternative transportation modes or reduced automobile use, NCTCOG and its regional partners are working to address mounting air quality, congestion, and quality of life issues.

The program is designed to foster growth and development in and around historic downtowns and “Main Streets,” infill areas, and passenger rail lines and stations. To support this effort, the Regional Transportation Council designated \$41 million in 2009 for sustainable infrastructure and planning projects throughout the region. Types of projects include:

- **Infrastructure:** A construction project that provides public infrastructure in the public right-of-way and can be used to support private vertical development (i.e., buildings). Examples include pedestrian amenities, landscaping, intersection improvements, lighting, street construction, traffic signalization, etc.
- **Planning:** Projects that include market, housing, and economic analyses, transit station planning; Transit Oriented Development (TOD) planning; general planning (subdivision regulations, creation of new code/zoning regulations, master planning, updates to pedestrian and/or bicycle plans, etc.); and others.

Regional Transportation Council Partnership Program

Through the Local Air Quality Program, NCTCOG's Regional Transportation Council funds transportation projects that address the new air quality standards, including traffic signal timing, trip reduction, air quality outreach and marketing programs, vanpool programs, bicycle/ pedestrian regional connections, high-emitting-vehicle programs, diesel freight programs, off-road construction vehicle emissions reduction programs, park-and-ride facilities, and other air quality strategies.

Congestion Mitigation and Air Quality (CMAQ) Improvement Program / Regional Surface Transportation Program

The CMAQ Improvement Program directs funds to transportation projects in Clean Air Act non-attainment areas for ozone and carbon monoxide. These projects should contribute to meeting the attainment of national ambient air quality standards (NAAQS). CMAQ funds may be used for construction of pedestrian walkways and bicycle transportation facilities or non-construction projects such as brochures and route maps related to safe bicycle use. Bicycle projects must be primarily for transportation rather than recreation and must be included in a plan developed by each Metropolitan Planning Organization and the State. Projects that bring sidewalks into compliance with the Americans with Disabilities Act Accessibilities Guidelines (ADAAG) are eligible for these funds. Because CMAQ funds are managed by NCTCOG, their availability is subject to that organization's current funding initiatives.

Safe Routes to School Program

The Safe Routes to School (SRTS) Program in Texas is based upon Federal funding and is administered by TxDOT. The overall purpose of this program is to improve safety in and around school areas. Projects eligible for SRTS funding are those that reflect one or more of the “5 Es” (engineering, education, encouragement, enforcement, and evaluation). Funds are available for use around schools that enroll kindergarten through eighth grade students. The amount of funding each State receives from the Federal government is based on percentage of student enrollment. This grant program is a 100% Federally-funded cost reimbursement program, which means there is no required match from the local government.

The following guidelines determine what projects can be submitted:

- Projects may be located on or off the State highway system, but must be located on public property
- Projects must be located within a two mile radius of a school
- Projects can cover multiple school sites if similar work is performed at each site
- Infrastructure projects can be awarded a maximum of \$500,000 per application
- Non-infrastructure projects can be awarded a maximum of \$100,000 per application

Non-infrastructure project types eligible for funding include:

- Education on bicycle and pedestrian safety, health, and the environment
- Traffic education and enforcement in the vicinity of identified school(s)
- Creation and reproduction of promotional and educational materials
- Public awareness campaigns and outreach efforts to the news media and community leaders
- Modest incentives for SRTS contests and incentives that encourage more walking and bicycling over time
- Safety and educational tokens that also advertise the program
- Cost for additional law enforcement or equipment needed for enforcement activities

Infrastructure projects must fall within one of six categories to be eligible for funding:

- Sidewalk improvements
- Pedestrian and bicycle crossing improvements
- On-street bicycle facilities
- Off-Street bicycle and pedestrian facilities
- Traffic diversion improvements
- Traffic calming measures for off-system roads
- Secure bicycle parking facilities

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