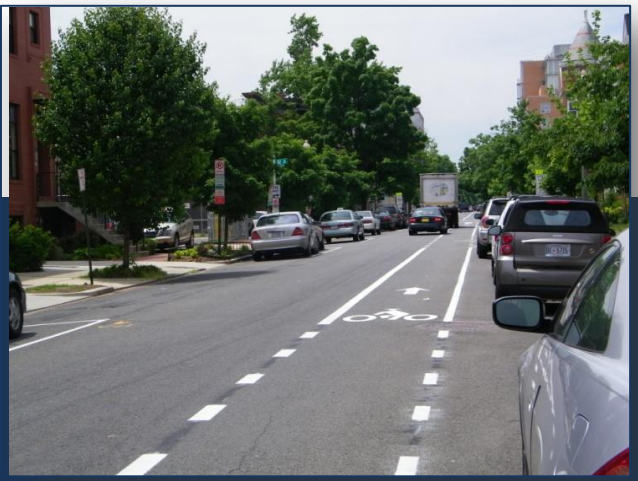
Update to the Pedestrian and Bicycle Linkage Component of the Denton Mobility Plan

With Contributions by:
Bicycle Plan Focus Group
City of Denton Staff
City of Denton Residents

February 21, 2012



ACKNOWLEDGEMENTS

City of Denton staff members, elected and appointed officials, key stakeholders and the Bicycle Plan Focus Group provided knowledge, assistance and insight throughout the process of developing this Bicycle Plan. The contributions and efforts of the following are appreciated and helped to make this Update to the Pedestrian and Bicycle Linkage Component of the Denton Mobility Plan possible.

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PURPOSE AND NEED

States and Metropolitan Planning Organizations across the country are completing plans to address bicycle and pedestrian issues, in part to respond to the requirements of the 1991 Intermodal Surface Transportation Efficiency Act (ISTEA) and its successors, the Transportation Equity Act of the 21st Century (TEA21) and the Safe, Accountable, Efficient Transportation Equity Act: A Legacy of Users (SAFETEA-LU). Many of these plans are echoing the overall goal targets set by the U.S. Department of Transportation in 1994:

(1) To double the percentage of trips made by foot and bicycle in the United States,

(2) To simultaneously reduce the number of injuries and fatalities suffered by bicyclists and pedestrians by ten percent.

As the City of Denton continues to experience population increases in the coming decades, it will be important to address the needs of bicyclists and pedestrians as alternative modes of transportation, focusing on connectivity between education centers, commerce, entertainment, recreation and neighborhoods.

The Update to the Pedestrian and Bicycle Linkage Component of the Denton Mobility Plan builds upon nationwide experience and advancements in bicycling planning and design. The intention of this update is to guide the development of a network within Denton where residents can choose to bicycle or walk to their destinations and to provide recreational opportunities for walking and bicycling to encourage a healthy and active lifestyle. This update seeks to coordinate past and on-going planning efforts, facilitate public involvement and create guidance for the development and implementation of an interconnected network of designated on-street bicycle facilities as well as off-roadway trails and sidepaths.

The ultimate outcome of this planning effort will be to create consensus, to identify bicycle and pedestrian corridors, to classify types of bicycle and pedestrian facilities, to prioritize initial efforts and to ultimately guide decision making by City staff and other community decision makers. This update will be a key component of previous citywide planning efforts which seek to make Denton a unique, attractive, diverse and sustainable community for current and future residents who will call the City home

"With supportive land use and transportation policies, walking and bicycling can be practical alternatives to driving (especially for short trips), contribute greatly to the quality and vitality of the street scene, and help achieve environmental goals. Pedestrian and bike improvements to intersections, sidewalks and other facilities can improve access and safety, and are particularly important for children, senior citizens, people with disabilities, low to moderate income residents, and people who choose to use this mode of transportation. "

-*The Denton Plan. The Comprehensive Planning Section of the Planning & Development Department. P 145. Adopted December 7th, 1999. Ordinance 99-439*

Advantages of Bicycling

Health

Encourages exercise through recreation or by means of daily transportation, providing numerous personal and societal health benefits.

Quality of Life

Creates opportunities for residents to access recreation, parks, open spaces, public facilities and schools.

Mobility

Provides alternative and connected forms of transportation to give residents options for performing their daily needs.

Sustainability

Allows community roadway network to accommodate more intense development.

Economy

Enhances a community's livability and its ability to attract and retain business and commerce.

Environment

Reduces consumption of fossil fuels and provides a non-motorized, clean mode of transportation.

Public Input

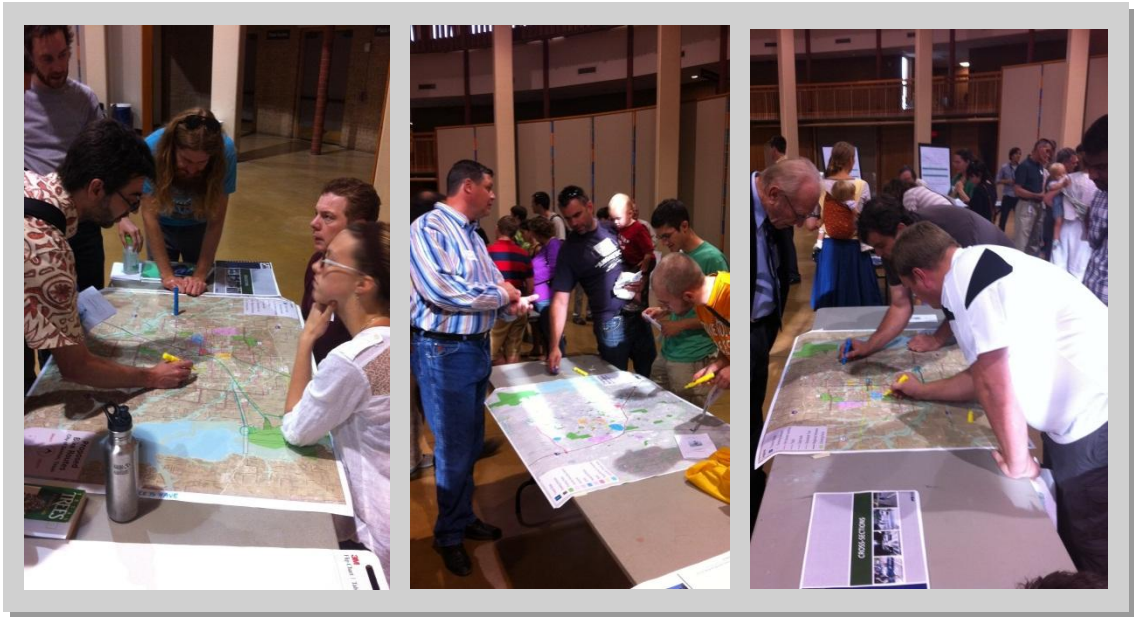
Public input is perhaps the most essential component of creating this bicycle and pedestrian update. This is a plan for the community of Denton which ultimately will contribute to the overall quality of life and community vision for its residents.

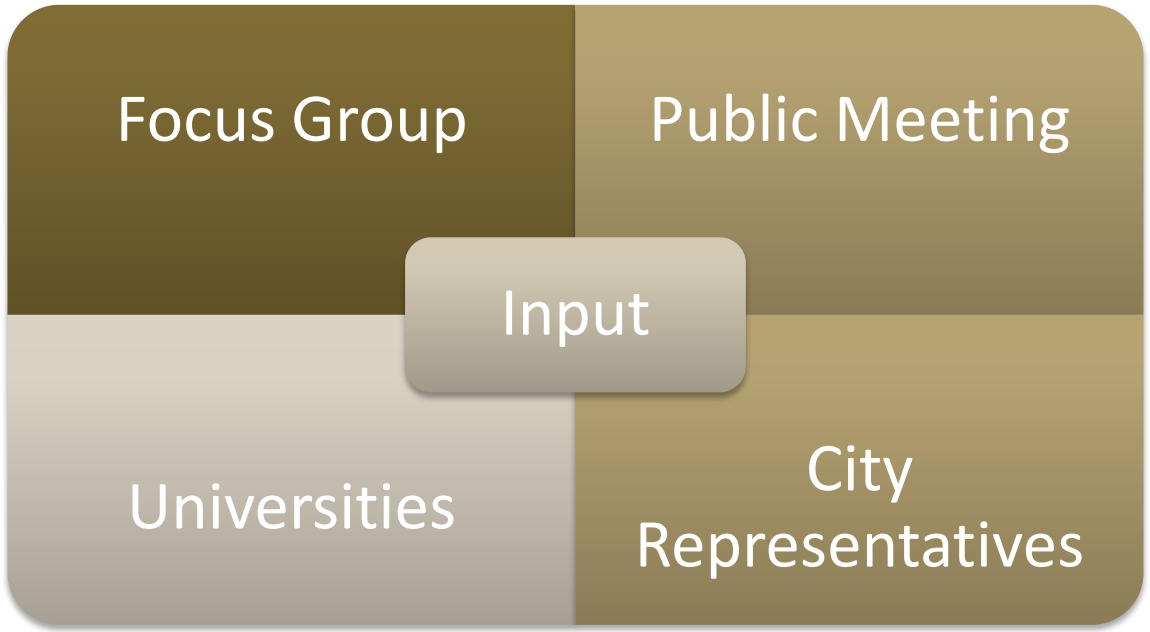
A Focus Group comprised of various residents of the City of Denton was created to guide input and derive feasible and opportunistic locations for bicycle and pedestrian facilities within the community. The Bicycle Focus Group was comprised of representatives from selected stakeholder groups including:

- **Bicycling Advocates**
- **Public Transportation Agency Officials (DCTA, TxDOT)**
- **Parks and Recreation Officials**
- **Public Safety**
- **University of North Texas**
- **Denton County (ITS)**
- **City Staff**

Two Public Meetings were held during the Bike Plan Update process:

- **March 22, 2010**
- **April 13, 2011**





GOALS AND OBJECTIVES

The first step toward advancing bicycle and pedestrian mobility and safety in the City of Denton is to establish a common vision or goal statement for bicyclist and pedestrian mobility, and to define a set of objectives by which progress in achieving desired outcomes can be measured. These goals and objectives guide not only the development of the Update to the Pedestrian and Bicycle Linkage Component of the Denton Mobility Plan, but also its implementation.

Goal Statement

Based on guidance from the Focus Group, local agencies, staff, suggestions from user groups, and incorporating the goals of the National Bicycling and Walking Study, the following goals were established for the City of Denton to make it a better and safer place to walk and ride bicycles.

Goal #1: *Increase the awareness and acceptance by local policy makers, planners, engineers and motorists in Denton of bicycling and walking as viable modes of transportation and legitimate users of the publically-financed transportation infrastructure.*

Goal #2: *Promote the increased use and safety of bicycling and walking in Denton through the development of a comprehensive yet financially feasible system of bicyclist and pedestrian facilities, support facilities and programs.*

Objectives

To achieve these goals, objectives have been established to set targets and provide measures of the success of the plan towards meeting the stated goals. The objectives are grouped into the following categories:

- **Accessibility**
- **Safety**
- **Interagency Coordination**
- **Education**
- **Funding**

The following sections outline each area of emphasis and specific objectives related to the development and implementation of this plan.

"Today's emphasis on bicycle facilities focuses on providing a combination of ample road space to safely accommodate bicyclists and motorists side-by-side as well as separate multi-use trials exclusively for non-motorized use. "

-*The National Bicycling and Walking Study: Transportation Choices for a Changing America*. United States Department of Transportation. Page XIII.

Accessibility

Accessibility through alternative modes of transportation is an important consideration. Access should be provided at the neighborhood, area, and regional levels to accommodate bicycling and walking to major employment centers and activity centers; recreational facilities; community facilities; transit facilities; and other major destinations.

Objective 1: Implement portions of the Pedestrian and Bicycle Linkages Plan each year as opportunities arise and as budget allows.

- Designate bike routes as soon as they form a functional element of the network.
- Restripe roadways to provide bike facilities as connectivity, resurfacing projects occur and traffic volumes allow.
- Incorporate bicycle facilities into new improvement and maintenance projects.
- Construct trails as bond and grant money become available.

Objective 2: Establish Denton as a bicycle activity and sport destination within the next 10 years.

- Promote the DCTA connection to Downtown Denton, UNT, TWU and ease of access to destinations by bicycle and walking.
- Collaborate with local bicycling advocates and clubs to establish a regional annual bicycling event in Denton.
- Implement a bicyclist and pedestrian way finding system of signs, maps and other information.
- Connect parks, trails and community destinations with bicycle and pedestrian facilities.

Safety

Important safety considerations must be an integral part of the development of a bicycle and pedestrian plan. The provision of safer routes for cyclists and pedestrians is of prime importance.

Objective 3: Promote adherence with traffic laws by bicyclists and pedestrians in Denton.

- Step up ticketing of unsafe bicyclist and pedestrian behaviors.
- Encourage lights and helmets for bicyclists, in accordance with state law.

Objective 4: Reduce the number of bicyclist and pedestrian traffic accidents.

- Establish baseline measures and methodology for assessment.
- Develop a City bicycling website and document the bicycling and pedestrian safety education programs initiated since the baseline year.
- Prepare the accident reduction estimate for the target years.
- Identify and address high volume, unavoidable interchanges.
- Identify and address high crash locations and types.

Interagency coordination

There are numerous governmental jurisdictions and public service entities that have control of public rights-of-way, which may potentially be used to provide bicycle and pedestrian facilities. Public entities as well as organizations in the private sector, such as Bike Denton, can and should become partners in the development and implementation of the bikeway and walkway system.

Objective 5: Promote Coordination among implementing agencies in regards to the Pedestrian and Bicycle Linkage Component.

- Establish clear roles and responsibilities for Key Staff of all participating agencies in development, operations and maintenance of the Pedestrian and Bicycle Linkage Component.
- Designate personnel to serve as liaison between City staff and community bicycling and pedestrian groups.
- Designate City staff to coordinate the City bicycle and pedestrian program with that of adjacent cities and NCTCOG.
- Ensure project coordination between City projects and Denton ISD Safe Routes to School projects.

Education

Bicyclists and pedestrians must be provided information and guidance in regard to proper and safe use of the roadway and trail corridors. Motorists must understand and respect the presence of bicyclists/pedestrians when traveling along roadways, on or off the designated network. Developing and disseminating information is a key component of a successful education and safety program.

Objective 6: Provide a regular program of bicycling proficiency and safety each year.

- Continue to encourage Denton ISD to conduct its "Bike Rodeos" to educate students on bicycle safety.
- Encourage UNT and TWU to provide information as part of the student orientation program.
- Parks and Recreation Department should collaborate with the Police Department to offer "Smart Cycling Program."

Objective 7: Provide a regular program of bicycle and pedestrian safety information to motorists and the general public in Denton each year.

- Compile and evaluate the available motorist and public information materials and best practices each year.
- Prepare and execute an annual public information program on proper response to pedestrians and bicyclists on roadways.
- Develop and execute a public awareness campaign for bicycling and walking each year.

Funding

The ability to fund the implementation of the plan elements is often the largest obstacle towards creation of a bicycle and pedestrian community.

Objective 8: Strategically Pursue funding for facilities and program assistance.

- Identify City funding and resources for implementation of the Plan.
- Identify non-City sources of funding for bicycle and pedestrian facilities and programs.
- Develop strategies which prioritize objectives and set strategies for pursuing funding each year.

Objective 9: Promote public/private partnerships in development, implementation, operation and maintenance of bicycle and pedestrian facilities.

- Provide on-line resources on the City of Denton Website.

EXISTING CONDITIONS

It is important in any planning effort to understand the context for which options are being developed. An examination of existing conditions helps to paint the baseline picture of where bicycle and pedestrian planning currently stands in the City of Denton. For purposes of this Plan, an examination of past planning efforts will be crucial in order to understand what has been accomplished thus far as well as to coordinate and build upon past planning efforts. Examining regulatory controls, such as current design standards within the Denton Development Code, will guide the formulation of policies, programs and improvements. In addition to past planning efforts, it is helpful to examine factors which may impact bicycle and pedestrian usage within the City. These include population growth, land use, transit oriented development, existing bicycle and pedestrian conditions, barriers and origins and destinations within the community.

"Some of the planning and design focus on transportation systems based primarily on motor vehicle movements has begun to shift in the past few years in Denton. With spiking gas prices in 2008, an increased sensitivity and interest in multi-modal and alternative transportation was evidenced."

Payne, Frank G. *Bicycle Connectivity in Denton, Texas, Overview, Options and Opportunities*. City of Denton Water Utilities, 2010, Pg 4
(View full document on City of Denton Website)

Past Planning Efforts

A number of notable planning efforts have taken place prior to the creation of this update. In order to ensure that recommendations within this document both consider and build upon past planning efforts, a crucial component of analysis consisted of analyzing recommendations and goals within past planning efforts related to transportation and mobility conducted at both the local and regional levels.

The Denton Plan

In December of 1999, the City Council adopted The Denton Plan 1999-2000 as the City's guiding Comprehensive Plan. The Comprehensive Plan sets forth goals and recommendations to guide the City forward, both in terms of land use and development decisions, but also in regards to aesthetics, quality of life and mobility.

Chapter seven of the Comprehensive Plan specifically addresses Denton's transportation goals for the year 2020, including pedestrian and bicycle recommendations.

The intention of the Comprehensive Plan is to guide decisions and set the framework for growth and public policy within the community. This update will seek to build upon key existing and future destinations defined within the Plan and will consider and build upon preliminary bicycle and pedestrian efforts outlined within The Denton Plan.

City of Denton Mobility Plan

The City of Denton Mobility Plan is comprised of four separate maps: Roadway Component, Connectivity Component, Pedestrian and Bicycle Linkages Component and Rail and Trucking Component. Together, all of these maps help to provide for transportation planning throughout the City of Denton. Out of the four maps, the Roadway Component and the Pedestrian and Bicycle Linkages Component most heavily influence bicycle and pedestrian facilities in Denton.

The roadway component of the City of Denton Mobility Plan is a map that identifies the classification and schematic routing or location of existing and future roadways in the City. Denton roads are classified as residential, collector, secondary arterial, primary arterial or freeway. The map also identifies whether or not existing streets are built to classification standards. Many of Denton roadways are not built to full classification standards, meaning that they currently exist at a capacity or condition less than that designated per Code, as highlighted on the map. Knowing where these existing and future roadways are, their classifications, and whether they meet classification standards is an extremely useful tool for City staff as well as for developers and citizens.

This information is particularly important when discussing where future bicycle and pedestrian facilities may be located. Due to the fact that many of the City's current roadway facilities are not built to capacity, significant opportunities exist to include bicycle and pedestrian facilities in conjunction with roadway expansion or improvement projects.

Denton Development Code

The adoption of The Denton Plan required a comprehensive rewrite of the City of Denton's zoning and development regulations leading to the adoption of a new development code for the City, The Denton Development Code (DDC). Specific mandates for Pedestrian/Bicycle Facility Standards within the DDC include:

"All Developments shall provide for the pedestrian and bicycle facilities necessary to serve pedestrian/bicycle traffic to, from or across the development in accordance with the Transportation Criteria Manual and the Bicycle/Pedestrian component of the Mobility Plan. If a development is proposed within a 1/2 mile of public elementary or secondary school, a pedestrian TIA will be required to determine the appropriate size and location of sidewalks and bicycle facilities to serve those uses." (Section 35.20.4)

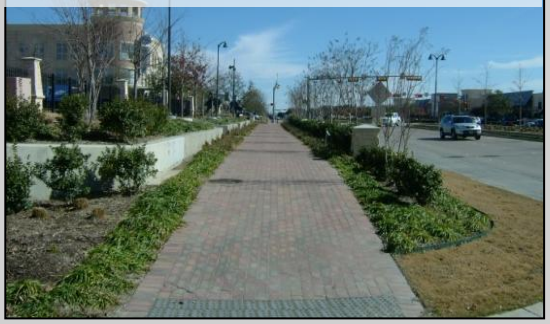
Specific facilities discussed within the DDC include:

Sidewalks are used on residential and arterial roadways and are intended primarily for pedestrian traffic. On residential streets, traffic volume is low and bicyclists can use the roadways to get around. The low volume and speed of motorist traffic on these streets allow for the bicyclists and motorists to avoid and accommodate each other.

On Road Bicycle facilities are to be provided on arterial roadways for those designed and constructed under the current Roadway Design Criteria Manual. This type of facility is a shared wider outside lane. The wider lane is intended to provide enough operating space for advanced bicyclists (See page 26 for bicycle user type definitions) and motorists to navigate the lane. Basic and child bicycle riders are discouraged from using these arterial roadways due to less experienced skillsets. AASHTO states that advanced or experienced bicycle riders are "typically more comfortable riding with motor vehicle traffic; however, they need sufficient operating space on the traveled way or shoulder to eliminate the need for either themselves or a passing motor vehicle to shift position.

Off Road Shared Use Pedestrian and Bicycle Paths are slated to be located alongside collectors. These paths are intended to be eight feet in width and are intended for use by bicycle and pedestrian traffic to primarily move from residential to local activity centers. Currently the City has not placed any of these paths along freeways or arterials.

Example Sidewalk/Sidepath



Example On Road Bicycle Facility

Example Off Road Shared Use Pedestrian and Bicycle Path

Parks, Recreation & Trail System Master Plan

In 2009, the City drafted the Parks, Recreation & Trail System Master Plan coordinating specific recommendations for park expansions, trail linkages and park development to serve the growing population and needs of Denton. Extensive public outreach was conducted to determine top needs within the community. During public outreach, an overwhelming number of respondents indicated that the most needed facility within the City was an increase in connected walking and bicycling trails. Page 121 of the Master Plan identifies "More Hike/Bike/Walk/Jog/Run Trails" as a "High Priority."

Bicycle and pedestrian trips to current and future parks and recreational facilities will be important to consider to help further the development of a cohesive system for bicyclists and pedestrians within the community and to assure that major recreation destination points identified within the Parks Plan can be adequately served and accessible by Denton residents.

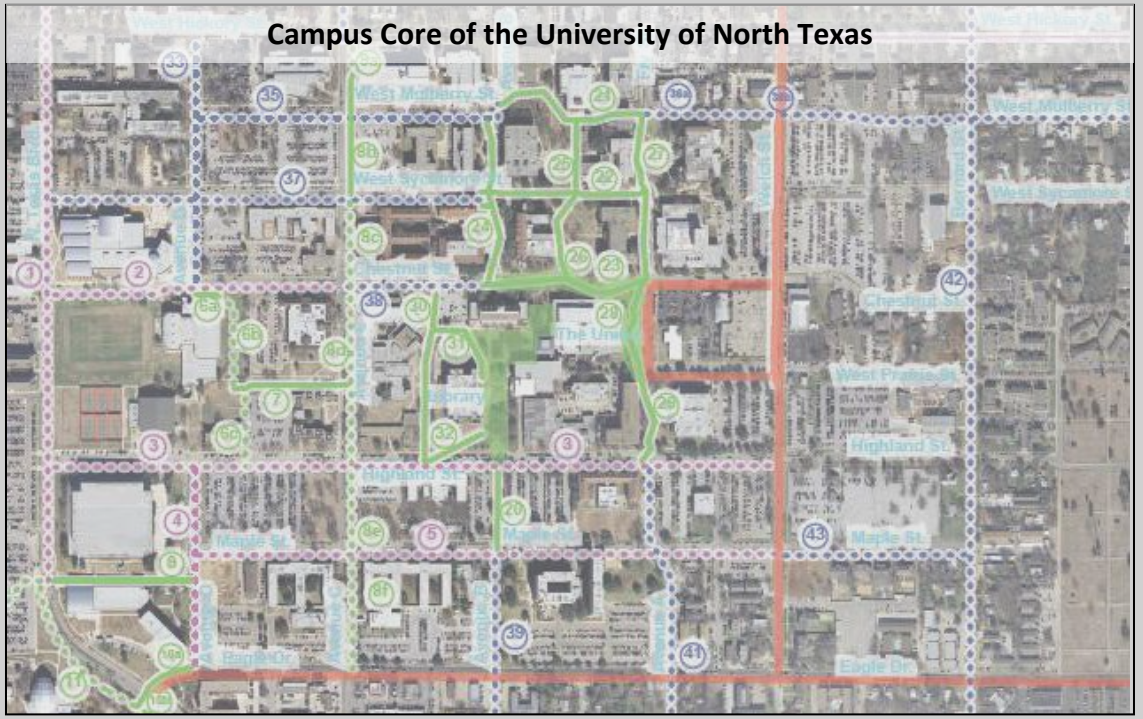
Connect Major Recreational Centers

PARK LAND:	
Mini-Parks	0
Neighborhood Parks	13
Community Parks	4
City Parks	4
Open Space/Linear Parks	10
Trails/Open Space	5
Special Use Areas	1
Cemeteries	2

RECREATION FACILITIES:	
Amphitheater	1
Baseball/Softball Fields (game)	25
Baseball/Softball Fields (practice)	3
Basketball Courts	11
Concession Stands	5
Dog Park	1
Frisbee Golf	18 holes
Fishing Piers	2
Outdoor Learning Center	1
Miles of Trail (soft surface)	11.90 miles
Miles of Trail (concrete)	9.85 miles
Pavilions	13
Playgrounds	22
Rugby Field	1
Skate Park	1
Soccer/Football Fields (game)	17
Soccer/Football Fields (practice)	10
Swimming Pools	3
Tennis Courts	16
Volleyball Courts (sand)	3

University of North Texas Campus Bicycle Master Plan

The University of North Texas is a major activity center within the City of Denton, providing educational and employment opportunities to the citizens of Denton and North Texas. UNT developed the University of North Texas Campus Bicycle Master Plan in 2006 in order to "develop a comprehensive system of bicycle infrastructure that encourages bicycle use at UNT, provides good connections to the surrounding area, and meets the needs of students, faculty, staff, and visitors of UNT." Major components of the Plan focused upon the Campus Core, the Eagle Point Connection, and the Route to Discovery Park. The Plan created by the University of North Texas will be incorporated into the broader goals of the City's Bicycle Network, particularly due to the significant number of bicycle and pedestrian trips generated by the University. Linkages to surrounding neighborhoods, Downtown Denton and DCTA transit facilities will vastly improve the overall use and efficiency of the City's bicycle network.



Campus Core

The campus core or the central area of campus is directly adjacent to neighborhoods and sits in close proximity to the downtown square. The Campus Core can be expected to generate the most bicycle trips.

Eagle Point Connection

Eagle Point is located to the southwest of the campus core and is the site of the new stadium. Interstate 35 serves as a physical barrier; however, a pedestrian bridge and roadway improvements will enhance accessibility.

Discovery Park

Discovery Park is located in north Denton along US 77. A major goal of the Campus Bicycle Master Plan was to connect UNT with Discovery Park.

North Central Texas Council of Governments Veloweb

Mobility 2030 is a regional plan produced by North Central Texas Council of Governments (NCTCOG). It includes ideals for various modes of transportation for the North Central Texas region and sets goals and strategies for the year 2030, none of which are mandates. Chapter 15 of the Plan addresses pedestrian/bicycle systems for the region, stating that NCTCOG has a regional goal of eight percent combined alternate transportation mode share.

The Veloweb is a 644 mile, designated off-street trail network for the Dallas-Fort Worth metroplex, primarily intended for use by fast-moving bicyclists. Trails in the Veloweb tend to follow rail lines and other non-road corridors (such as major drainage and easement corridors.

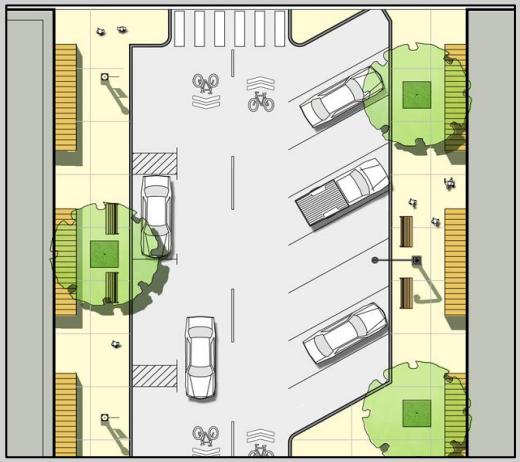
Within Denton, the VELOWEB includes:

- The Greenbelt Trail
- Rail-with-Trails along DCTA
- The Trail connecting the Greenbelt and DCTA trails will utilize Mayhill and US 380 Corridors.
- US 377 BNSF Rail-with-Trail from the end of DCTA trail towards Fort Worth.

Downtown Implementation Plan (DTIP)

Historic downtown Denton provides a major identity and sense of place for the community. Restaurants, cafes, shops offices and residences provide for an increased level of activity within the central core of the community. The DTIP calls for increased density of mixed-use development in the core of downtown east of Carroll and North of Sycamore. The Downtown Implementation Plan included potential cross sections in Chapter 5 which incorporate complete streets, or a variety of modes of transportation within downtown including vehicular, bicycle and pedestrian traffic. The DTIP recommends bike lanes on Elm and Hickory Streets and bike lanes along Sycamore to connect the DCTA Station with UNT. This Update to the Pedestrian and Bicycle Linkage Component of the Denton Mobility Plan will build upon the recommendations established through the Downtown Implementation Plan to ensure consistency and cohesion, ultimately allowing for a coordinated effort.

Downtown Denton is the most characteristically urban area of the community. Bicycle facilities which meet the needs of downtown residents, businesses and visitors must be carefully chosen to blend in with the urban fabric of the downtown square. It will be important to connect bicycle facilities to the DCTA Downtown Denton Commuter Rail Stop.



TxDOT Roadways

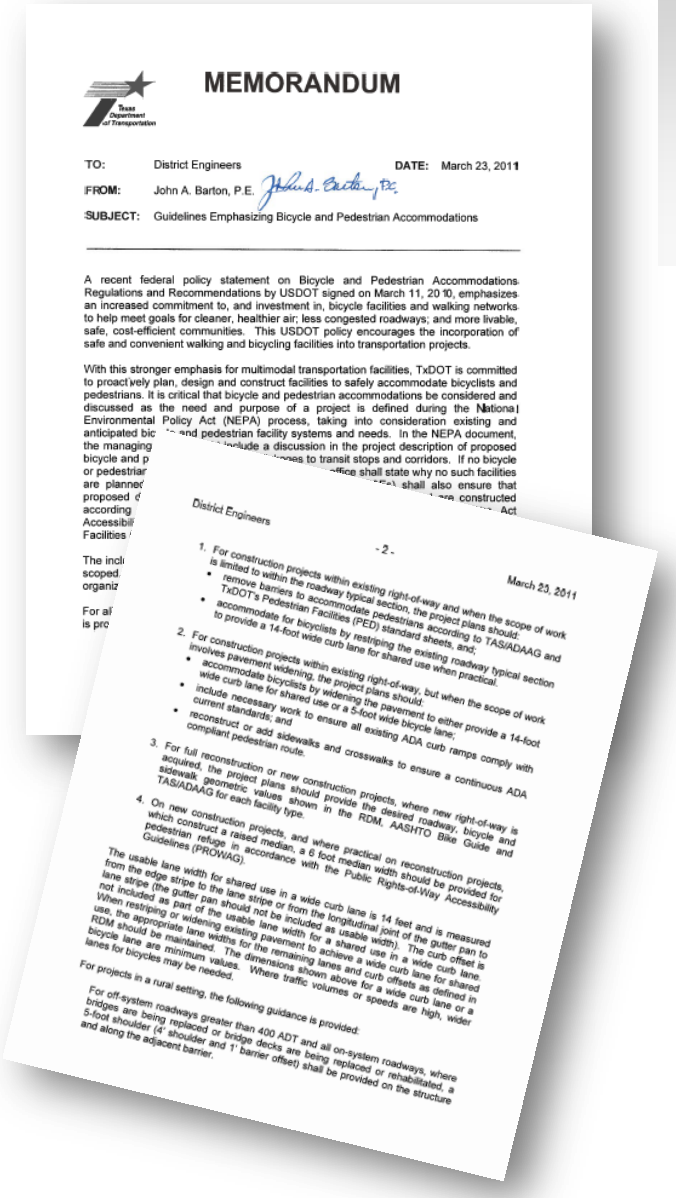
Much of the arterial street network in many communities throughout Texas is built and maintained by the Texas Department of Transportation (TxDOT). Historically, TxDOT's primary focus has been on the movement of vehicles, which fed the development of cities for many decades. Since the inception of ISTEA and ensuing legislation and funding programs, the focus of TxDOT has expanded to include consideration of bicyclists and pedestrians. Recently, TxDOT issued directives to all of its local districts to incorporate sidewalks and bicycle facilities into all of its new roads and improvements to existing roadways. This memorandum, dated March 23, 2011, sets forth certain design parameters for state maintained arterial street networks. Highlights of the memorandum are listed to the right.

"A recent federal policy statement on Bicycle and Pedestrian Accommodations Regulations and Recommendations by USDOT signed on March 11, 2010, emphasizes an increased commitment to, and investment in, bicycle facilities…to help meet goals for cleaner, healthier air; less congested roadways; and more livable, safe, cost-efficient communities."

"For construction projects within existing right-of-way, but when the scope of work involves pavement widening, the project plans should accommodate bicyclists by widening the pavement to either provide a 14-foot wide curb lane for shared use or a 5-foot wide bicycle lane. "

"For full reconstruction or new construction projects, where new right-of-way is acquired, the project plans should provide the desired roadway, bicycle and sidewalk geometric values shown in the RDM, AASHTO Bike Guide and TAS/ADAAG for each facility type."

"These guidelines apply to all projects which are currently in the planning and design stages and projects whose environmental documents are approved after August 31, 2011."



MEMORANDUM

TO: District Engineers DATE: March 23, 2011

FROM: John A. Barton, P.E.

SUBJECT: Guidelines Emphasizing Bicycle and Pedestrian Accommodations

A recent federal policy statement on Bicycle and Pedestrian Accommodations Regulations and Recommendations by USDOT signed on March 11, 2010, emphasizes an increased commitment to, and investment in, bicycle facilities and walking networks to help meet goals for cleaner, healthier air; less congested roadways; and more livable, safe, cost-efficient communities. This USDOT policy encourages the incorporation of safe and convenient walking and bicycling facilities into transportation projects.

With this stronger emphasis for multimodal transportation facilities, TxDOT is committed to proactively plan, design and construct facilities to safely accommodate bicyclists and pedestrians. It is critical that bicycle and pedestrian accommodations be considered and discussed as the need and purpose of a project is defined during the National Environmental Policy Act (NEPA) process, taking into consideration existing and anticipated bic and pedestrian facility systems and needs. In the NEPA document, the managing include a discussion in the project description of proposed bicycle and p nnes to transit stops and corridors. If no bicycle or pedestrian ffice shall state why no such facilities are planned shall also ensure that proposed constructed according Act Accessibil Facilities

The incl scoped organiz

For al is pro

District Engineers

- 2 -

March 23, 2011

1. For construction projects within existing right-of-way and when the scope of work is limited to within the roadway typical section, the project plans should:
   - remove barriers to accommodate pedestrians according to TAS/ADAAG and TxDOT's Pedestrian Facilities (PED) standard sheets, and;
   - accommodate for bicyclists by restriping the existing roadway typical section to provide a 14-foot wide curb lane for shared use when practical.
2. For construction projects within existing right-of-way, but when the scope of work involves pavement widening, the project plans should:
   - accommodate bicyclists by widening the pavement to either provide a 14-foot wide curb lane for shared use or a 5-foot wide bicycle lane;
   - include necessary work to ensure all existing ADA curb ramps comply with current standards; and
   - reconstruct or add sidewalks and crosswalks to ensure a continuous ADA compliant pedestrian route.
3. For full reconstruction or new construction projects, where new right-of-way is acquired, the project plans should provide the desired roadway, bicycle and sidewalk geometric values shown in the RDM, AASHTO Bike Guide and TAS/ADAAG for each facility type.
4. On new construction projects, and where practical on reconstruction projects, which construct a raised median, a 6 foot median width should be provided for pedestrian refuge in accordance with the Public Rights-of-Way Accessibility Guidelines (PROWAG).

The usable lane width for shared use in a wide curb lane is 14 feet and is measured from the edge stripe to the lane stripe or from the longitudinal joint of the gutter pan to lane stripe (the gutter pan should not be included as usable width). The curb offset is not included as part of the usable lane width for a shared use in a wide curb lane. When restriping or widening existing pavement to achieve a wide curb lane for shared use, the appropriate lane widths for the remaining lanes and curb offsets as defined in RDM should be maintained. The dimensions shown above for a wide curb lane or a bicycle lane are minimum values. Where traffic volumes or speeds are high, wider lanes for bicycles may be needed.

For projects in a rural setting, the following guidance is provided:

For off-system roadways greater than 400 ADT and all on-system roadways, where bridges are being replaced or bridge decks are being replaced or rehabilitated, a 5-foot shoulder (4' shoulder and 1' barrier offset) shall be provided on the structure and along the adjacent barrier.

Conditions in Denton

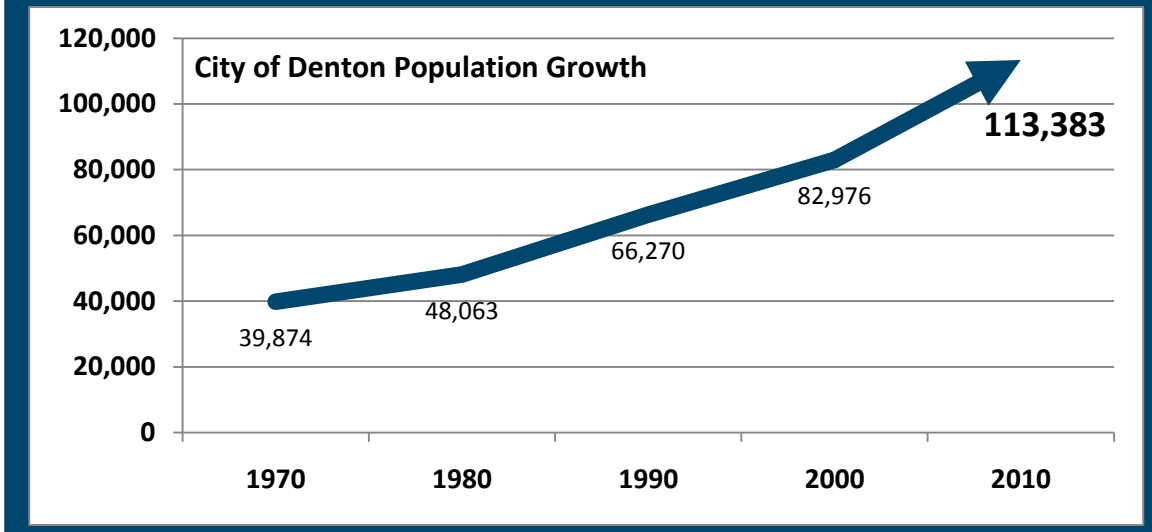
Population

The City of Denton has experienced rapid population growth, in conjunction with the greater metropolitan area as a whole. The Dallas/Fort Worth metropolitan area is the fastest growing metropolitan region in the United States and is expected to add nearly 3 million new residents by 2030.

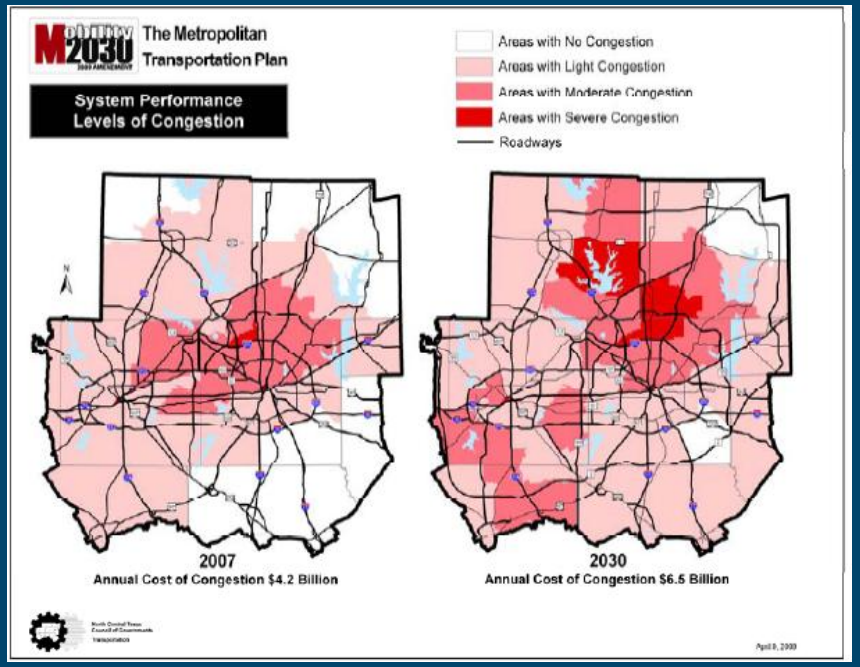
This increase in population will ultimately lead to an increase in overall congestion, indicated by many NCTCOG forecasts. This highlights the need for transportation options, enabling North Texans to have choices in determining how to perform their daily transportation needs.

Land Use

Land use, particularly density, often plays an important role in determining the effectiveness of bicycle and pedestrian facilities. The City of Denton, like most communities in North Texas, is predominately shaped by single-family residential housing and automobile travel. There are, however, opportunities for increasing density in the future, particularly around the downtown area, Rayzor Ranch development and transit oriented development facilities.



NCTCOG projects an increase in congestion between 2007 and 2030. This graphic highlights the dramatic increase in congestion in Denton and Collin Counties even with highway expansions and improvements. Multi-modal options will give residents choices in performing their daily commuting and transportation needs.



Universities

A significant factor impacting bicycle usage within the City is the location of two significant universities near the central core of the community. The University of North Texas and Texas Woman's University each contain thousands of students, many of which live in and around their respective campuses. Many of these students use bicycles to travel to and from their daily studies, leading to the City of Denton having a larger number of non-motorized commuters (7.6% locally compared to 3.7% in Texas, according to the 2000 U.S. Census). Providing safe facilities that connect the universities to neighborhoods, downtown, recreational facilities and to transit oriented developments will be essential. The location of these two universities will contribute a base of ridership for the City of Denton bicycle facilities and, in many ways, can help support the feasibility and need for bicycle facilities within the City.

Downtown

Downtown is the most urban area of the community. Its compact form provides many opportunities for working, living and entertainment. Bicycle and pedestrian connectivity may add to the synergy and revitalization efforts of downtown by connecting various neighborhoods and districts with downtown Denton.

Bike and Pedestrian Connections at Michigan State University Campus

Transit Oriented Development

The Denton County Transit Authority is currently constructing its A-Train commuter rail line which will connect downtown Denton to the DART system. Potential Transit Oriented Developments (TOD) around DCTA transit stops may provide additional development opportunities for residential, retail and office uses. Transit stations should be linked to the overall bicycle and pedestrian network, providing safe and convenient routes for those who desire to bicycle or walk to and from community destination points. Additionally, commuter rail will increase accessibility to Denton from other portions of the metroplex, particularly beneficial for University students.

Fry Street

The Fry Street area currently serves as an entertainment district within the City of Denton with shops, restaurants, nightlife and music venues. This area is a popular destination point for students at UNT and TWU and serves as a gathering location for many locals. The Focus Group indicated that bicycle access to Fry Street should be an important consideration.

Existing Conditions for Bicyclists and Pedestrians

A bicycle is legally recognized by the State of Texas (and many other states) as a vehicle, with all the rights and responsibilities for roadway use that are also provided to motor vehicles. As such, bicyclists can legally ride on any of the streets in Denton (except controlled access highways such as the IH 35 main lanes). However, certain roadways are more attractive to riders than others. Basically, local and collector streets are suitable for use by most adult bicycle riders, as long as traffic volumes are not high and speeds are less than 35 miles per hour. Arterial streets typically carry higher traffic volumes with speeds of 35 to 45 miles per hour, and are more suitable for the more skilled and assertive bicyclists. Rural arterials with shoulders and/or very low traffic volumes attract sports cyclists interested in longer-distance travel with fewer interruptions (stops).

Many of the rural arterials, primarily those with shoulders greater than four feet in width could be designated as bike routes after careful consideration of safe bicycle accommodations at intersections. Many existing local and collector streets could also be designated as bike routes after review of traffic volumes, speeds and parking conditions on those roadways. However, by definition, all of these roadways are already open to bicycle travel now.

Prior bicycle planning efforts are being realized through implementation of dedicated on-street bicycle lanes and provision of non-designated lanes and shoulders on several city and TxDOT street improvement projects. A few notable roadway facilities that include bicycle lanes or shoulders are:

- FM 428 north of Loop 288 is a two-lane rural arterial with 8-foot shoulders and new pavement. It attracts many cyclists for rides, using the Sports Complex as a gathering place.
- Hickory Street (one-way eastbound) has a bike lane from Welch Street to Carroll Street; however, the couplet twin on Oak Street does not have a bicycle Lane.
- Some isolated residential streets have bicycle lanes including Stuart Road.

Safe Passing Separation

Recently, the Denton City Council passed a "Safe Passing" ordinance. Motorists in Denton are required to either change lanes or provide a "safe passing" distance (3 feet for cars, 6 feet for trucks) when passing vulnerable roadway users, including pedestrians and bicyclists.

FM 428

Hickory Street

Stuart Road

Existing Barriers

The crossing of barriers is one of the most important features of a bicycle and pedestrian plan for a community. Freeways, major arterials, railroads, water features, and topography can all impose significant barriers to bicycle and pedestrian access and mobility. The Denton urbanized area poses several significant barriers to safe and convenient bicycle and pedestrian travel. Examples include:

- Interstate 35
- Railroads

Railroads – The railroad companies have allowed a limited number of street crossings of their tracks to minimize the exposure to railroad crossing accidents with motor vehicles. Though crossing points tend to be more frequent for the railroads than Interstate 35, the effect on concentrating traffic at crossings is similar to that of the freeways.

Although rail can often serve as a barrier, commuter or light rail facilities have the opportunity to incorporate adjacent bicycle and pedestrian facilities. This is typically referred to as Rails with Trails. The Denton County Transit Authority's A-Train commuter rail line is an example.

Interstate 35-E Crossing

Existing Heavy Rail

Rails with Trails

Additionally, "bike-n-ride" is a collaborative use of the two modes and extends the range of a bicycle trip.

Heavily Traveled Arterials – In general, arterial streets carrying high volumes of traffic at high speeds are a safety concern for pedestrians and bicyclist traveling along the roadway and for those attempting to cross the roadway. Some type of traffic control (stop signs or traffic signals at intersections) is typically needed for the safe crossing of such roadways. At uncontrolled locations, a pedestrian refuge area such as a raised median of the roadway, can enhance the safety of the crossing. There is a trade-off that must be considered between the needs of bicyclists and pedestrians, e.g. lane conversions to bike lanes) and the delays imposed to significant volumes of motor vehicle traffic.

Arterial roadways in Denton that pose significant barriers for crossing by bicyclists include the following examples:

- University Drive (Highway 380)
- Fort Worth Drive
- Teasley/Lillian Millar/Loop 288
- N. Elm Street
- US 377/Carroll Blvd Corridor

These same roadways provide motorists access throughout Denton, but are a challenge for bicyclists to use for the same purpose.

Origins and Destinations

Historical focus on mobility by the personal automobile and motorized transport has resulted in roadbeds being the predominant feature in the rights-of-way established for the transport of goods and people. However, anywhere a roadway goes is a potential destination for cyclists and in many instances pedestrians. High areas of interest for access by walking and bicycle include schools, libraries, and parks. Pedestrian access should be provided to all destinations that are within walking distance (about one-quarter mile) of where people live and/or work.

In addition, cycling as a form of non-polluting recreation and sport can make advantageous use of the shoulders of many roadways and highways. The development of loop routes in the area can facilitate the activities of the longer-distance cycling activities.

Figure 1 on the following page depicts some of the most significant origins and destinations within the City of Denton as identified by the Focus Group and public meeting attendees.

Major Origins and Destinations within Denton

University of North Texas, Texas Woman's University and DCTA commuter rail stations serve as primary origin and destination points within the community.

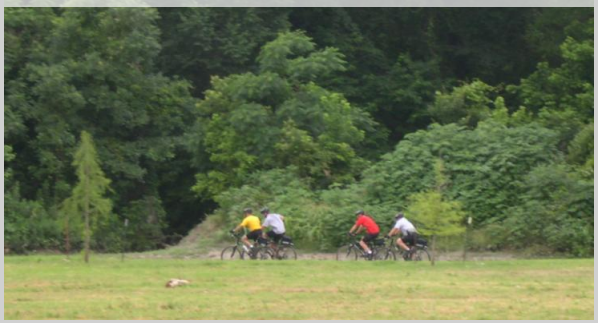
Universities and Transit

Downtown Denton, Fry Street, Rayzor Ranch, Denia Neighborhood, and other distinct neighborhood areas within the central core of the community must be linked and connected.

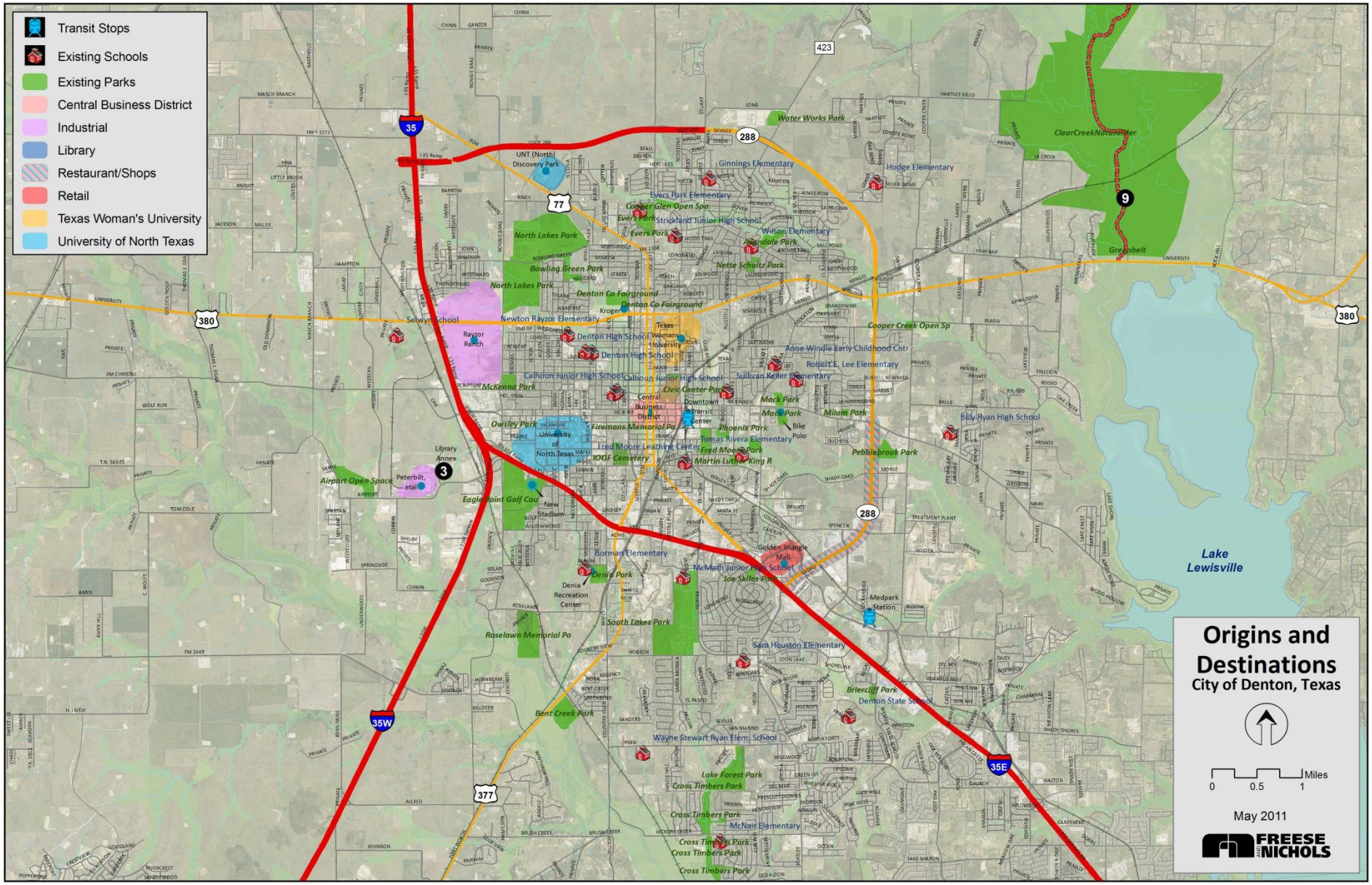
Neighborhoods & Districts

Community parks and trails connecting to open spaces and greenbelts provide recreational opportunities for Denton residents.

Parks & Recreation



Origins and Destinations Map



Bicycle and Pedestrian Crashes

One of the national goals of the U.S. Department of Transportation (DOT) is to reduce the number of bicycle and pedestrian accidents, which the DOT describes as "crashes". ***The National Bicycling and Walking Study- Transportation choices for a Changing America*** presents a plan of action for activities at the Federal, State and local levels for meeting two concurrent goals:

- To double the current percentage of total trips made by bicycling and walking; and,
- To simultaneously reduce by ten percent the number of bicyclist and pedestrians killed or injured in traffic crashes.

Nationally, approximately 630 bicyclists were killed and 51,000 were injured in 2009 as a result of collisions with motor vehicles. Similarly, approximately 4,100 pedestrians were killed and 59,000 pedestrians were injured by motor vehicle collisions in 2009. As a group, bicyclists comprise about two percent of all roadway fatalities each year. Fortunately, Denton has experienced no bicyclist fatalities in the past two years as a result of collisions with motor vehicles.

If bicycling and walking are to be promoted in the community, it is imperative that appropriate facilities that are designed to accepted standards be provided and properly located. To establish a baseline and gauge for future assessment of success of the bicycle and pedestrian program, accident reports for motor vehicle accidents involving bicyclists or pedestrians should be summarized according to a prescribed methodology each year.

Depending on the details of each accident, facility design, unsafe driver behavior, or bicyclist or pedestrian error may be the primary causing factor. A nationwide study on bicycle accidents provides insight into the causal factors of accidents involving bicyclists (see table at right).

In order to address specific localized safety issues, it would be necessary to closely study local crash reports to determine the major crash causes, the involved age groups, and other important factors. The factors would be very useful in developing specific localized design treatments and to prepare targeted education and awareness-building programs

Types of Crashes and Percent of Total Crashes (National Average):

Turning, Merging or Crossing Paths:

Motorist failed to yield to bicyclist	22.3%
Bicyclist failed to yield to motorist at Intersection	16.0%
Motorist turned or merged into the path of bicyclist	12.1%
Bicyclist failed to yield to motorist, Midblock	11.8%
Bicyclist turned or merged into the path of the motorist	7.6%
Crash occurred at intersection	2.7%
Bicyclist did not clear intersection before signal turned green for cross traffic	1.4%
Insufficient Information	1.2%
Bicyclist turning hits crossing motorists	0.8%
Motorist turning hits crossing bicyclist	0.6%

Parallel Paths:

Motorist overtaking vehicle	8.5%
Operator on wrong side of street	2.8%
Bicyclist overtaking a motor vehicle	2.8%
Operator lost control and swerved into the path of the vehicle	1.7%
Unknown if parallel or crossing	0.5%

Hunter, Bill "Pedestrian and Bicyclist Crash Types in the 1990s," Pro Bike/Pro Walk 94 Resource Book (1994)

The "Design Bicyclist"

Nearly 100 million people in the United States own bicycles. Fewer than five percent would likely qualify as experienced or highly skilled cyclists. Since the federal policy goal is to accommodate existing cyclists and encourage increased bicycle use, there will be more novice riders than advanced cyclists using the roadway system. Ideally, roadway treatments intended to accommodate bicycle use should try to address the needs of both experienced and less experienced riders. Practicality and funding must be considered. As appropriate facilities within Denton are examined, it is important to understand the types of riders using each type of facility.

"One of the most frequently cited reasons for not bicycling or walking is fear for safety in traffic. Given the prevailing traffic conditions found in many urban and suburban areas—narrow travel lanes, high motor vehicle speeds, congestion, lack of sidewalks, pollution, etc—many individuals who could meet their transportation needs by bicycling or walking do not, simply because they perceive too great a risk to their safety or health."

The National Bicycling and Walking Study: Transportation Choices for America. United States Department of Transportation

Type of Rider




Bicycling Experience Continuum

Type of Facility




Advanced Bicyclists: These are experienced riders who can operate under most traffic conditions. They comprise the majority of the current users of collector and arterial streets, and are best served by the following:

- Direct access to destinations usually via the existing street and highway system;
- The opportunity to operate at maximum speed with minimum delays; and
- Sufficient operating space on the roadway or shoulder to reduce the need for either the bicyclist or the motor vehicle operator to change position when passing.

Basic Bicyclists: These are casual or new adult and teenage riders who are less confident of their ability to operate in traffic without special provisions for bicycles. Some will develop greater skills and progress to the advanced level, but there will always be many millions of basic bicyclists. They prefer:

- Comfortable access to destinations preferably by a direct route, using either low-speed, low traffic volume streets or designated bicycle and pedestrian facilities; and
- Well-defined separation of bicycles, pedestrians and motor vehicles on arterial and collector streets (bike lanes shoulders) or separate bike and pedestrian paths.

Children: These are pre-teen riders whose roadway use is initially monitored by parents. Eventually they are accorded independent access to the system. They and their parents prefer the following:

- Access to key destinations surrounding residential areas, including schools, recreation facilities, shopping, or other residential areas;
- Residential streets with low motor vehicle speed limits and volumes; and
- Hike and bike trails or other off-street pedestrian and bicycle facilities.

As illustrated in the Bicycling Experience Continuum diagram, there are a wide variety of individual bicyclists that span the definitions of advanced and basic bicyclists and the facilities they prefer. A bicyclist that would ride the shoulder of FM 428 on the weekend may prefer a different type of facility on the weekday when riding solo or when riding with his/her children. Further, some children mature physically at slower or faster rates than others, or may receive more or less exposure or training than others.

Current Facility Design Practice

When investing in multi-modal accessible public infrastructure for transportation, consideration should be given to all modes, not just cars, trucks, and buses. The need for sidewalks on each side of a roadway and accommodations for bicyclists should be considered. This consideration is the national policy as envisioned under ISTEA, and reinforced under TEA 21 and SAFTEA-LU, and is promoted by the National Complete Streets Coalition.

Historically, the Texas Department of Transportation (TxDOT) has not required participated financially in the construction of sidewalks along roadways that are part of the State Highway System and use of these roads by cyclists has not previously been considered a serious design factor. ISTEA mandated that a bicycle coordinator be designated by each state DOT. TxDOT, in turn, established a bicycle/pedestrian coordinator at the State level and has, in addition, designated a person with bicycle coordinator responsibilities at each of its district offices as well. TxDOT is increasingly considering bicycle and pedestrian accommodations on its existing facilities and new projects, and has recently taken a proactive stand towards this end by including 14' wide curb lanes.

The City of Denton has taken progressive steps towards including bicycle facilities in future roadway expansions or roadway rehabilitation plans. The City of Denton Transportation Design Criteria Manual, a component of the Denton Development Code, specifies appropriate cross-sections to which roadways must be constructed. Currently all new streets are required to have a sidewalk and new collector roadways are encouraged to incorporate an 8 foot shared pedestrian and bicycle sidepath. Arterial roadway cross sections include a 16 foot wide outside lane which ideally is sufficient width to accommodate vehicular and advanced bicyclists in a safe manner. Residential streets are generally designed for motorists to operate at lower volumes and slower speeds, typically allowing for safe accommodation of bicyclists within traffic lanes, though young children are encouraged to ride on sidewalks.

The standard design sections are currently under review. Pending modifications include the consideration of a striped shoulder along arterial roadways.

Current Trends in Bicycle and Pedestrian Facility Design Practice

Current quality of life considerations in communities today have expanded the range of planning for our roadway corridors to consider all potential users of the corridor and to make the built roadway consistent with the land use surroundings as well and the functional classification of the roadway. Context Sensitive Solutions to the planning and design of roadways allow a street to transition in its cross section and edge treatment to respond to its surroundings. Complete Streets consider the various users of the roadway corridor - cars, trucks/deliveries, transit vehicles and riders, bicyclists and pedestrians - in allocation of space within the public right of way and adjacent easements.

PEDESTRIAN & BICYCLE FACILITIES DESIGN

There is a wide range of facility improvements which can be considered to enhance bicycle transportation. Improvements can be simple and involve minimal design consideration (such as changing drainage grate inlets) or they can involve a detailed design (such as constructing a hike and bike trail). The major design feature for a bicycle or pedestrian facility is its location (i.e., whether it is on a roadway or follows its own independent alignment). Roadway improvements for on-street facilities depend on the roadway's design and the amount of available right-of-way. On the other hand, bicycle paths are located on independent alignments; consequently, their design depends on many factors, including dedication of ROW and the interaction of the user groups.

With proper planning and design, roadway improvements for motor vehicles can also enhance bicycle and pedestrian travel, and, in any event, should avoid causing adverse impacts on bicycling and walking. A community's overall goals for transportation improvements should, whenever possible, include the needs for pedestrian movement and considering enhancements for bicycling in order to advance these alternative modes of transportation.

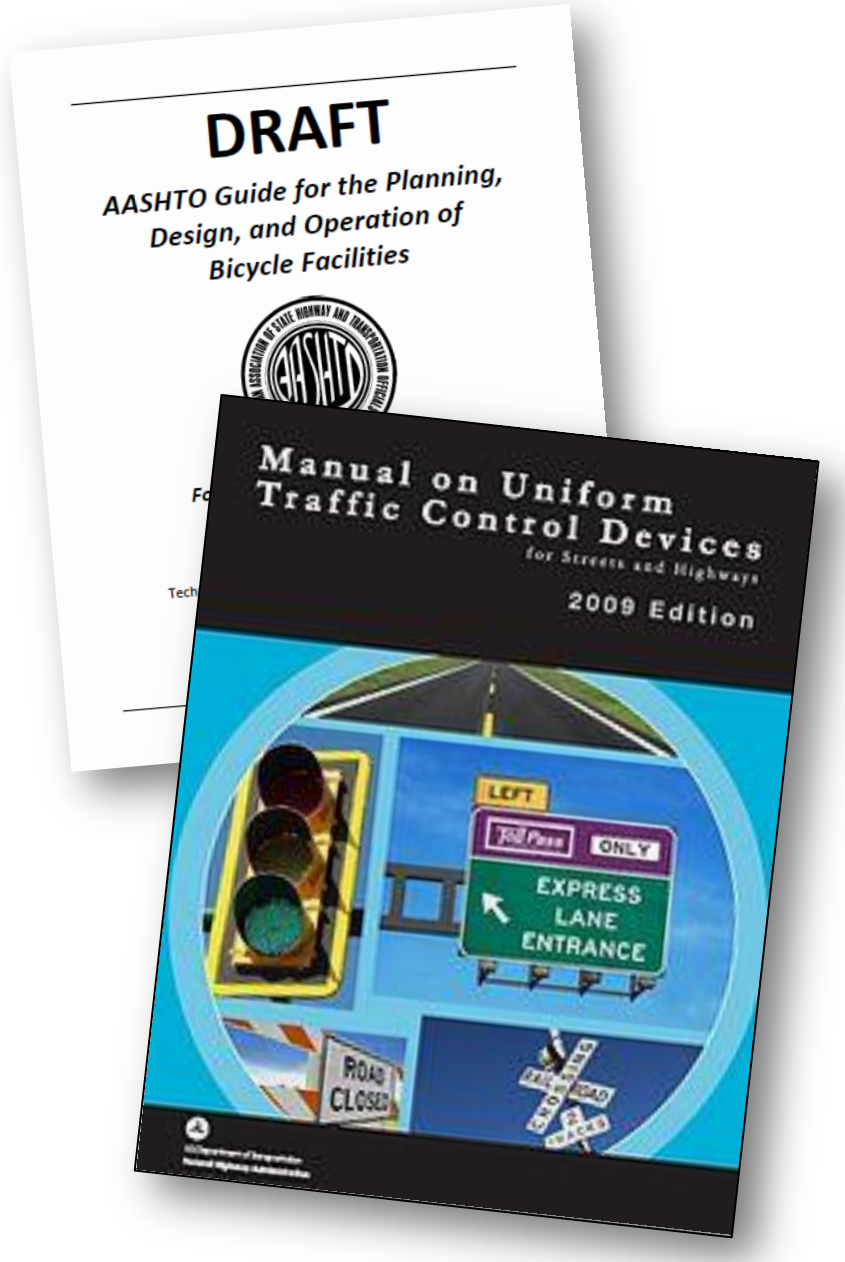
"Local zoning ordinances that separate business and shopping areas from living areas and the 'urban sprawl' that characterizes many American cities strongly favor automobile travel over bicycling or walking. Increasing the density of development of existing areas by providing a more compact mixture of residential, commercial and employment centers can attract more use of bicycling and walking transportation."

The National Bicycling and Walking Study, U.S. Department of Transportation.

Design Standards

All bicycle and pedestrian facilities should meet the minimum standards required by the Denton Development Code and Transportation Criteria Manual, as well as the recommendations of the American Association of State Highway and Transportation Officials (AASHTO) in their two publications publication *Guide for the Planning, Design and Operation of Bicycle (Pedestrian)Facilities*, or its most current edition. Pavement striping, signage, and signals should be in accordance with the Denton Development Code and the most current Texas version of the *Manual on Uniform Traffic Control Devices* (MUTCD). Hike and bike trails and sidepaths should be accessible and traversable by physically disabled persons and should comply with the guidelines set forth by the American with Disabilities Act of 1990 (ADA), as enforced in Texas by the Architectural Barriers Section of the Texas Department of Licensing and Regulations.

The City of Denton design standards are in accord with national and state guidelines, but should be enhanced to consider a wider range of bicycle facility types. The current design standards call for bicyclist accommodations along collector streets by providing an 8-foot wide sidepath and on arterial streets by providing a 16-foot wide curb lane. Pedestrians are accommodated by either a sidewalk on local and arterial streets or a sidepath on collector streets. These sections are presented in Appendix C, along with notations on possible alternative configurations of the sections to accommodate



Bicycle Facility Types

There are many different bicycle facility types which must be understood from the perspective of those whom they serve. Differing bicycle experience levels and usage purposes require different facility types to accommodate and encourage use as well as to ensure the safety of bicyclists. In addition to considering bicycle experience levels, the existing environment may provide physical barriers with regard to the types of bicycle facilities used or desired. This section is intended to provide an introduction into the types of bicycle facilities that may be considered for use in Denton as well as general design characteristics associated with each facility.

The types of facilities that may be provided for bicycle mobility include:

- **Shared Roadways**
- **Wide Curb Lanes**
- **Shoulder Bikeways or Urban Shoulders**
- **Bicycle Lanes**
- **Paths, Sidepaths and Trails**

These facilities are described in detail in the AASHTO Guide for Development of Bicycle Facilities, and are briefly described on the following pages.

Shared Roadway

Because a bicycle is a vehicle, any roadway (except limited access highways, freeways and others specifically prohibiting bicycle traffic) may be considered part of the on-road bicycle network. Because existing roads typically offer the most direct route to many destinations, they tend to be favored by cyclists.

The network of local streets, by their nature, do not extend long distances or across arterials. A bicycle boulevard is a series of local and collector streets that provide for longer connectivity for bicycling but discontinuous conveyance for motor vehicles, providing a larger local street atmosphere for bicycling.

Collector streets often provide longer continuity and signalized crossings of arterial streets. But continuity and signalized crossings attract higher traffic volumes and often higher speeds than local streets. Though lanes can be shared, wide lanes allow better coexistence of bicyclists and vehicles.

Arterial roadways can be shared but should be considered for additional accommodations, such as shoulder lanes, bike lanes or wide curb lanes, as described in the following sections.

On-street parking along local streets in residential areas is compatible with bicycle use, although parking may be a conflict with bicyclist provisions along streets in commercial areas.

Wide Outside Lane

The national standard width considered desirable for an outside traffic lane to safely accommodate bicycle and motor vehicle traffic is 14 feet. This distance is measured from the edge of the gutter (or if no gutter from the curb face) to the lane stripe, but the lane should be wide enough to allow safe passage for cyclists around obstacles such as drainage grates, parked cars and longitudinal ridges between the pavement and curb and gutter. Lanes wider than 15 feet may encourage use by two motor vehicles and are not conducive to safe cycling. The City of Denton has chosen to go with a 16' standard with a 4" white striped urban shoulder and a minimum 3' clear (gutter seam) to edgeline.

Urban Shoulder

The draft 2010 AASHTO Guide for the Planning, Design and Operation of Bicycle Facilities contains guidance that when retrofitting roads for bicycle facilities on constrained roadways, where the width guidelines for bike lanes and paved shoulders are not possible, undesignated paved shoulders can improve conditions for bicyclists more so than providing no designated shoulder at all. In these situations, a minimum of 3 feet (0.9 m) of operating space should be provided between the edge line and the edge of pavement (where there is no curb), the gutter joint (where curb and gutter is used), or the curb face (where curb is used without a gutter). For example, in a retrofit situation where the total width of the outside lane is 14 feet, it would be preferable to instead provide a 10-11 foot wide travel lane and a 3-4 foot wide shoulder.

Shoulder Bikeway

Advanced and recreational/intermediate bicycle riders who commute long distances or ride for sport or recreation can safely make use of smooth, paved roadway shoulders, where available. Shoulders should be a minimum of 4 feet wide in constrained situations and pereferably wider, up to 10 feet adding one foot of width for every 5 MPH for speed limits over 35 miles per hour. Shoulders should be paved, all-weather surfaces with no ridges, seams or other obstructions, and should be generally smooth as opposed to rough in surface texture. Rumble strips, if provided on the shoulder, should occur within the first two feet from the edge line, in keeping with guidelines prepared by the Federal Highway Administration (FHWA). Rumble stripes, an edgeline strip with raised bumps, have been used on Texas roads and provides the desired "rumble" effect without reducing the usable shoulder width.

Bicycle Lanes

Bike lanes are marked portions of the roadway that are designated for exclusive use by bicycles. Typically, bike lanes may be established on arterials and other major streets where a bike lane would enhance the safety and encouragement of bicycling.

The standard width for a bike lane is 5 feet and the minimum is 4 feet. If the curb and gutter is separate from the roadway, the 4' to 5' standard is measured out from the joint between the roadway and the curb and gutter. A bike lane between on-street parking and a motor vehicle travel lane should be 5 feet wide, minimum. Bike lanes wider than 6 feet may encourage parking or other inappropriate uses.

Bike lanes should be signed and marked with a 6-inch wide stripe and appropriate bike symbols and arrow markings in accordance with the Texas MUTCD and AASHTO standards. As vehicles, bicycles must ride with the flow of traffic. Bike lanes, therefore, should be one-way and should be clearly marked as such. Two-way bike lanes are discouraged. Bike lanes on one-way streets can be either left side or right side oriented to best suit the mix of parking and turning movements, but are typically located on the right-side. Curbs, raised pavement, or raised buttons are generally not recommended for use as bike lane markings since they are a safety hazard to cyclists and interfere with the natural and mechanical sweeping of the bike lane.

A bike lane may be established adjacent to a parking lane, with bicyclists positioned between the travel lane and the parking lane. However, this location requires that motorists entering and leaving the parking lane will need to be mindful of the bike lane operation. The opening of car doors into the bike lane is also of concern to bicyclists, as the "dooring" of a bicyclist can happen very quickly and without advance indication.

A special bike lane that is positioned between the parking lane and sidewalk zone is called a cycle track. This special design has been employed in Portland and elsewhere, and is being considered for use in the Dallas Bike Plan. Careful consideration of operational safety, especially driveway density, and maintenance is required, as well as practical considerations on available space and funding.

Bicycle Routes

Shared roadways designated as bike routes should be signed using standard MUTCD signage. Many cities, such as Dallas, have developed special designed signs with logos and/or route numbers. Such designations are used to denote streets that can see significant bicycle usage or are a link in the bikeway network. Designation and improvement as a bike route may warrant a higher level of street maintenance (debris, potholes) than a shared roadway.

Standard MUTCD Signage

Localized Bicycle Route Signage

Paths, Sidepaths and Trails

A bike path is an off-road bikeway/pedway that is physically separated from roadways by open space or a barrier. It may be within the roadway right-of-way, a utility right-of-way (only if allowed by easement) or an independent easement. These facilities are sometimes referred to as bike trails or hike and bike trails. Bike paths should be 10 to 12 feet wide, as a desirable standard depending upon activity levels, with a minimum width of 8 feet. Maintenance vehicles driving on 8 –foot wide paths tend to damage the edges. Therefore, 8-foot wide paths should be avoided unless physical limitations cannot accommodate a greater width. Bike paths with high traffic volumes should be 12 feet wide or more, but should narrow to ten feet in the vicinity of a street intersection. One-way bike paths are difficult to police and should be avoided, if possible. Where they are used, they should be clearly signed as one-way, with a standard width of 6 feet and a minimum width of 5 feet. Bike paths should have an additional 2 feet of smoothly graded area on either side of the pavement. In addition, there should be 3 feet of horizontal and 10 feet (8 feet minimum) of overhead clearance on either side of the pavement.

Bike paths should be constructed of smooth, hard, all-weather paving such as concrete or asphalt. Although more expensive, concrete paths require less maintenance than asphalt paths, which can buckle, crack and erode quickly. Good maintenance, with associated higher operation and maintenance costs, is essential for bike paths to eliminate and avoid hazardous conditions.

It should be noted that bike paths that pass in close proximity to neighborhoods or provide high levels of recreational activity can be expected to be multiple use trails. Conflicts between cyclists and skaters, joggers, pedestrians, animals and less experienced cyclists should be anticipated and considered in appropriate design.

Curb cuts and ramps for access to bike paths should be provided at all street intersections with the bike path. Slopes should comply with current requirements of the Americans with Disabilities Act (ADA). Curb cuts should be a minimum of 8 feet wide.

Bike paths located immediately adjacent to a roadway are called side paths. In addition to all the prescribed bike path design guidelines, a side path should be 5 feet from a traffic lane, where possible.

Retrofit Roadway Designs

Much of the existing roadway network in Denton was built before the current design standards were adopted. Wide curb lanes on arterial streets and 8-foot sidepaths on collectors are now required by ordinance, but will need to be retrofit, to the extent possible, into existing roadways that do not have the pavement width or right of way to accommodate them. When traffic conditions allow, "road diet" treatments can be employed to reduce the number of travel lane(s) in order to add bike lanes or wide curb lanes. Existing four lane roadways with 12-foot wide travel lanes can be re-striped to provide 10-foot inside lanes and 14-foot outside lanes, creating a Wide Curb Lane.

In some instances, design provisions may need to use minimum widths but should not extend below minimum standards of roadway classification without careful considerations of the traffic operations and safety implications of doing so. All variances from established City guidelines and standards need to be approved by the City Engineer. Design variances on TxDOT facilities need to be approved through their design review process.

Courtesy: Complete Streets Coalition
www.completestreets.org

Roadway Intersection Design

Statistical studies of bicycle-motor vehicle and pedestrian-motor vehicle accidents have indicated that a majority of these accidents occur at or near roadway intersections. Proper design of intersections to better accommodate bicyclists and pedestrians must be introduced along with education of bicyclists on how to properly position themselves and behave to proceed safely through the intersection. A primary need is to get the roadway designer to include consideration of the bicyclist and pedestrian in the design of a new roadway; whether a designated bikeway is planned or not.

"A primary need is to get the roadway designer to include consideration of the bicyclist and pedestrian in the design of a new roadway; whether a designated bikeway is planned or not."

Minimum Green Time for Bicyclists and Crossing Time for Pedestrians

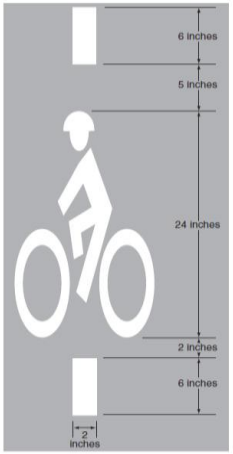
In addition to the minimum time for motor vehicles, the minimum crossing times for pedestrians and bicyclists should be considered, especially for lower volume cross streets. Guidance for signal timing to accommodate bicyclist and pedestrians is contained in Chapter 18 of the Highway Capacity Manual 2010. The minimum Green and clearance timings of each signalized intersection should be evaluated for accommodation of bicyclists and pedestrians.

Signal Approach Detection

Most traffic signals in urbanized Denton have been equipped with pedestrian push buttons to actuate the signal to allow pedestrians to cross the street. Signal detection of bicyclists on the roadway often relies on equipment designed to detect large metal objects, and thus may require modification or replacement to detect bicyclists on the approaches. The ability of the detectors at each signalized intersection should be evaluated for adequate detection of bicyclists and pedestrians.

Pavement Markings

Channelization of motor vehicles, pedestrians and bicyclists at and through the intersections help to make movements predictable and best positioned to optimize safety and capacity. Bike lanes at the approach to the stop bar may be provided even if not provided along the length of the street. Short dashed lines through the intersection can provide guidance through larger intersections. Special pavement markings and signs can give bicyclists guidance on where to stop to be detected at the traffic signals.



R10-22

Signage and Striping

Signs and pavement markings for bicycle facilities on roadways encourage bicycling use and advertise the bicycle as a vehicle on the road. They help legitimize the presence of bicycles in the eyes of motorists and potential bicyclists. All signage and lane striping should be in general accordance with the current edition of the *Texas Manual of Uniform Traffic Control Devices* (MUTCD).

Signage

The basic bike route sign should be used on all designated bike routes. For the longer regional routes, a numbered bikeway sign could be utilized. One scheme used in some cities is to number bike routes sequentially east to west (odd) and north to south (even) to facilitate wayfinding.

The "Share the Road" warning sign for on-street facilities, has been adopted within the National Manual on Uniform Traffic Control Devices (NMUTCD) as has the "sharrows" pavement symbol. Some communities, such as Dallas, have even placed a special logo or shape on their route designation signage. Some communities have numbered their regional bicycle routes, as states have done for regional highways. Austin has developed a "share the road" sign using a State of Texas color scheme and capital building silhouette. The regional Veloweb bike route signs would also be good candidates for a specially designed sign.

Striping

Striping of bike lanes should be in conformance to the MUTCD. All multi-use paths which are 10 feet in width or greater should receive a yellow center line stripe. The sharrow symbol can be placed in the travel lane of a shared street to further draw the attention of motorists to the potential presence of bicyclists. The sharrow is placed in the travel lane, not indicative of the path of the bicyclists.

Speed Humps

Speed humps are sometimes used on local streets and some collector streets to slow traffic or reduce cut-through traffic. Speed humps are not a problem for bicyclists, and in fact the calmer street operation is better for bicyclists as a result.


Striping


Sharrow

Speed Humps

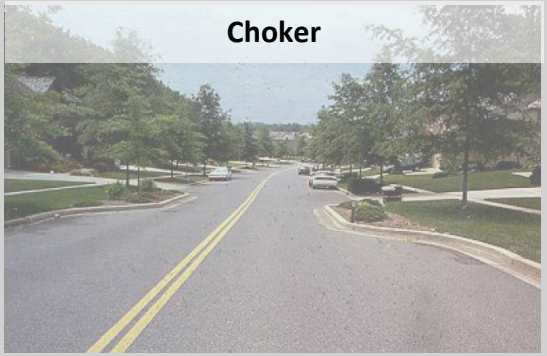
Traffic Calming

Traffic calming is a term referring to roadway design techniques that are used to slow vehicular traffic in order to improve safety for bicyclists, pedestrians and motorists. These techniques typically involve vertical or horizontal deflection of traffic or reduced sight lines on long streets to lower the speed of traffic.

A variety of traffic calming techniques exist and their flexibility in design and usage allow them to be tailored to fit individualized circumstances and conditions. Examples of the various traffic calming techniques that are available include, but are not limited to:

- Bulb Outs (Curb Extensions)
- Roundabouts
- Speed Humps/Speed Table
- Medians
- Chicanes
- Diverters
- Chokers
- Channelization

Many of these alternatives are already being proactively applied in Denton through existing design criteria and Engineering staff.



Bicycle Amenities

Bicycle Parking

Bicycle parking should be provided at all public buildings that are potential cyclist destinations and at privately owned facilities that are potential bicyclists destinations. Bike lockers and sheltered parking may also be considered.

Signage

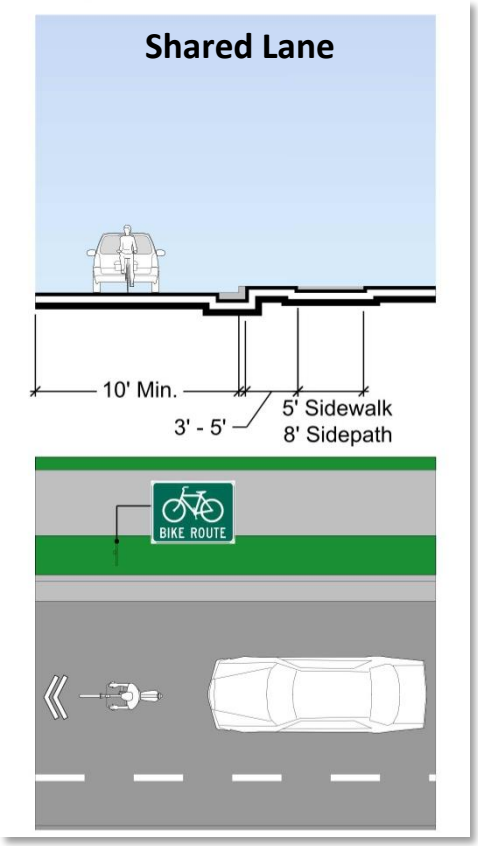
Signage delineating bicycle routes should be visible for both bicyclists and vehicular traffic. Caution and notice signs should also be included to provide a safe bicycling environment.

Transit

Bicycles are one component of the greater transportation network. Bicycle parking and accommodation should be provided on public transit to encourage the convenient and connected use of transit.

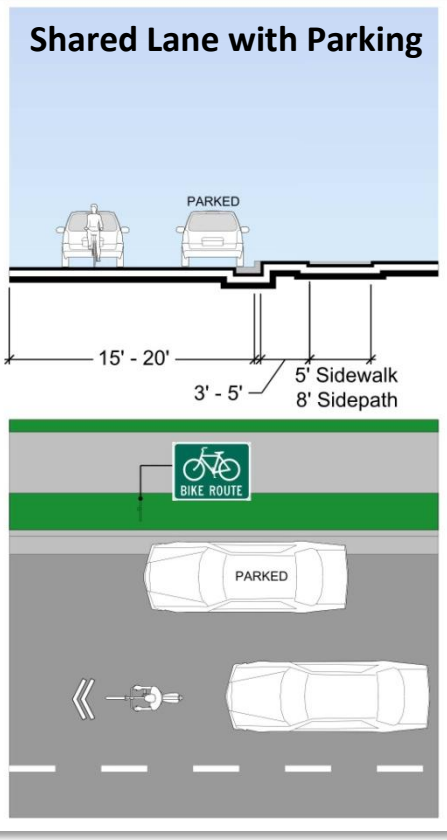
Possible Roadway Design

Shared Lane



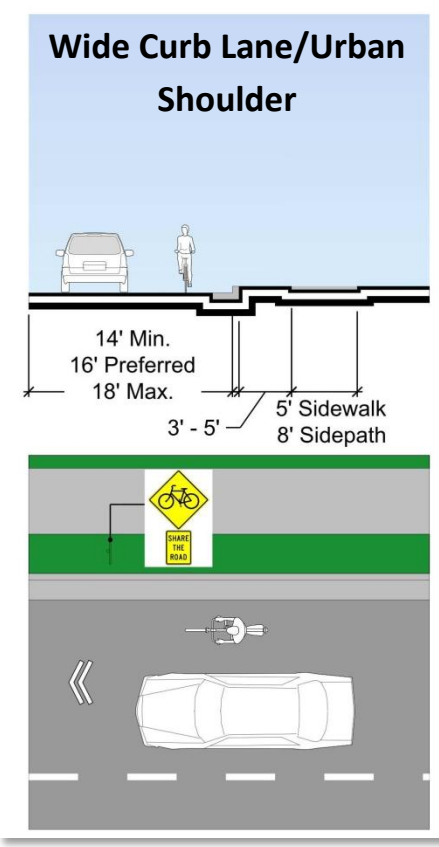
- 10’ to 13’ Wide
- Speed Limit 35 MPH or less
- Local or Collector Street
- Use “Sharrow” as Needed
- Bike Route signs
- Bikes May Use Full Lane signs, as needed
- Both directions, typical

Shared Lane with Parking

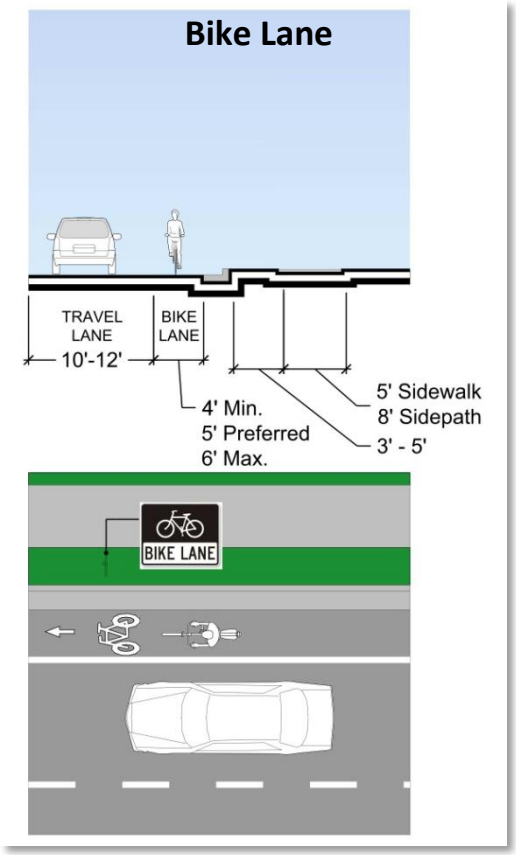


- 16’ to 20’ Wide, including parking area
- Speed Limit 35 MPH or less
- Local or Collector Street
- Use “Sharrow” as Needed
- Bike Route signs
- Both directions, typical

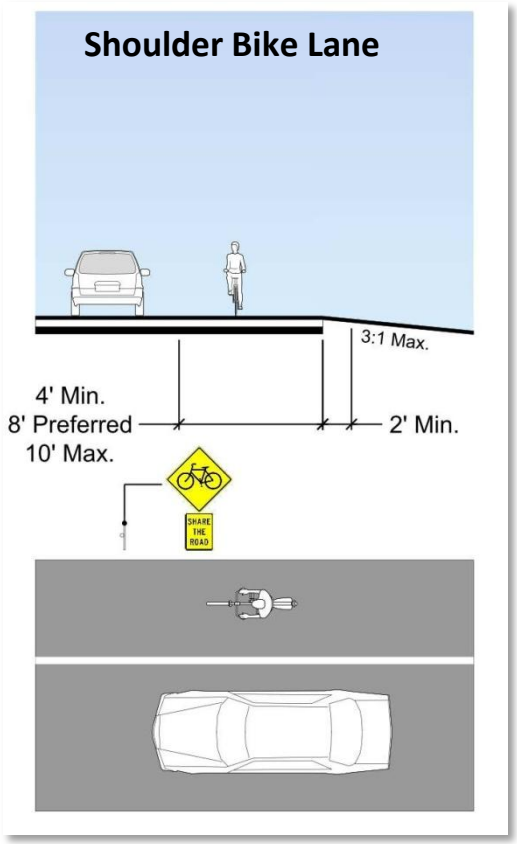
Wide Curb Lane/Urban Shoulder



- 14’ to 16’ Wide, plus gutter width, max of 18’
- Speed Limit 35 MPH or less
- Collector or Arterial Street
- Use “Sharrow” as Needed
- Bicycle Warning and Share the Road signs
- Both directions, typical



- 10’ to 12’ Wide
- Speed Limit 35 MPH or less
- Local or Collector Street
- Bike Lane signs and striping
- Both directions, typical unless one-way



- 4’ to 10’ Wide, increasing with speed limit
- Speed Limit 40 MPH or more
- Rural Arterial section
- Bicycle Warning and Share the Road signs
- Both directions, typical

Typical Facility Development Costs

The following costs are provided for use in preparing an order of magnitude estimate of the construction cost for bicycle and pedestrian facility improvements. This data will help to facilitate initial planning decisions. A cost range is provided on a per mile basis, recognizing that there are many variables which affect final cost (i.e. site conditions, utilities, drainage, availability of right-of-way, fluctuations in construction market). For this reason, the costs presented here reflect only those costs related to materials and labor for construction based on minimum facility requirements. Costs for facility improvements associated with larger roadway projects will usually attain lower unit construction prices than separate improvement projects. In addition, other resultant costs, such as higher Operation and Maintenance costs, are not reflected herein.

Each facility project will typically require an engineering study to determine all the design issues and estimated cost. Factors such as right-of-way acquisition, bridges and other grade separated crossings, utility relocation, clearing and grubbing of existing conditions, landscape plantings, lighting benches, retaining walls, property fencing and other amenities need to be included in each project's individual cost estimate.

Engineering design fees can be expected to be 8 to 15 percent of the total project cost, depending on a variety of factors including overall construction cost and design complexity. Each construction project should also include a minimum 10 percent contingency fund (conceptual level cost estimates typically include a 20% contingency allowance).

The following cost estimates for bicycle facilities were developed using average unit costs for specific improvement types. This list represents basic cost units for various facility types, and do not include bridges or other special structures nor extensive landscaping or other amenities, ROW costs, design fees, etc. It should be emphasized that this type of cost estimating is only intended to impart relative costs to allow projects to be ranked or prioritized and not to set capital funding levels. Actual construction costs can vary widely and be significantly higher once field due diligence and investigations are conducted for actual site conditions.

Improvements	Typical Unit Cost
Roadway restriping (remove existing stripes and add new stripes and signs)	$20,000 to 50,000 per mile
6' wide paving of existing gravel shoulder along roadway in both directions	$300,000 to $500,000 per mile
10' wide paving of separated trail facility	$150,000 to $400,000 per mile
5'-8' wide sidewalk/sidepath	$80,000 to $150,000 per mile
Signing of bicycle facilities (5 signs per mile each way)	$3,000 to $5,000 per mile
Traffic Signal Installation	$200,000 to $300,000 per intersection

BICYCLE FACILITIES

System Development Criteria

The factors to be considered in selecting the proper type and location of bicycle facilities are reflected in the goals and objectives. The system development criteria considered herein can be summarized into the following three categories:

Increase Accessibility

Potential use can be maximized
Access points to and from the facility
Directness of route, minimize delay
Cross physical barriers to provide opportunities for bicycling and walking

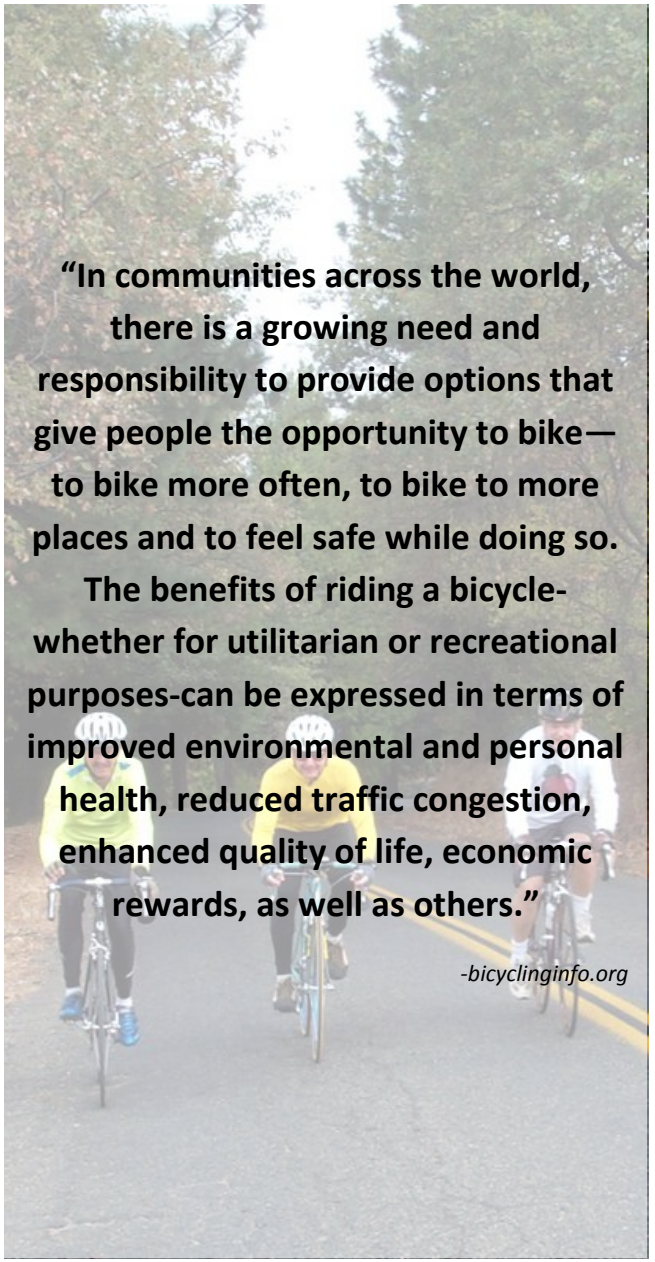
Promote Safe Use of Bicycles

Minimize conflicts
Minimize potential for number and severity of accidents
Provide good quality pavement surface
Allow proper security of facility

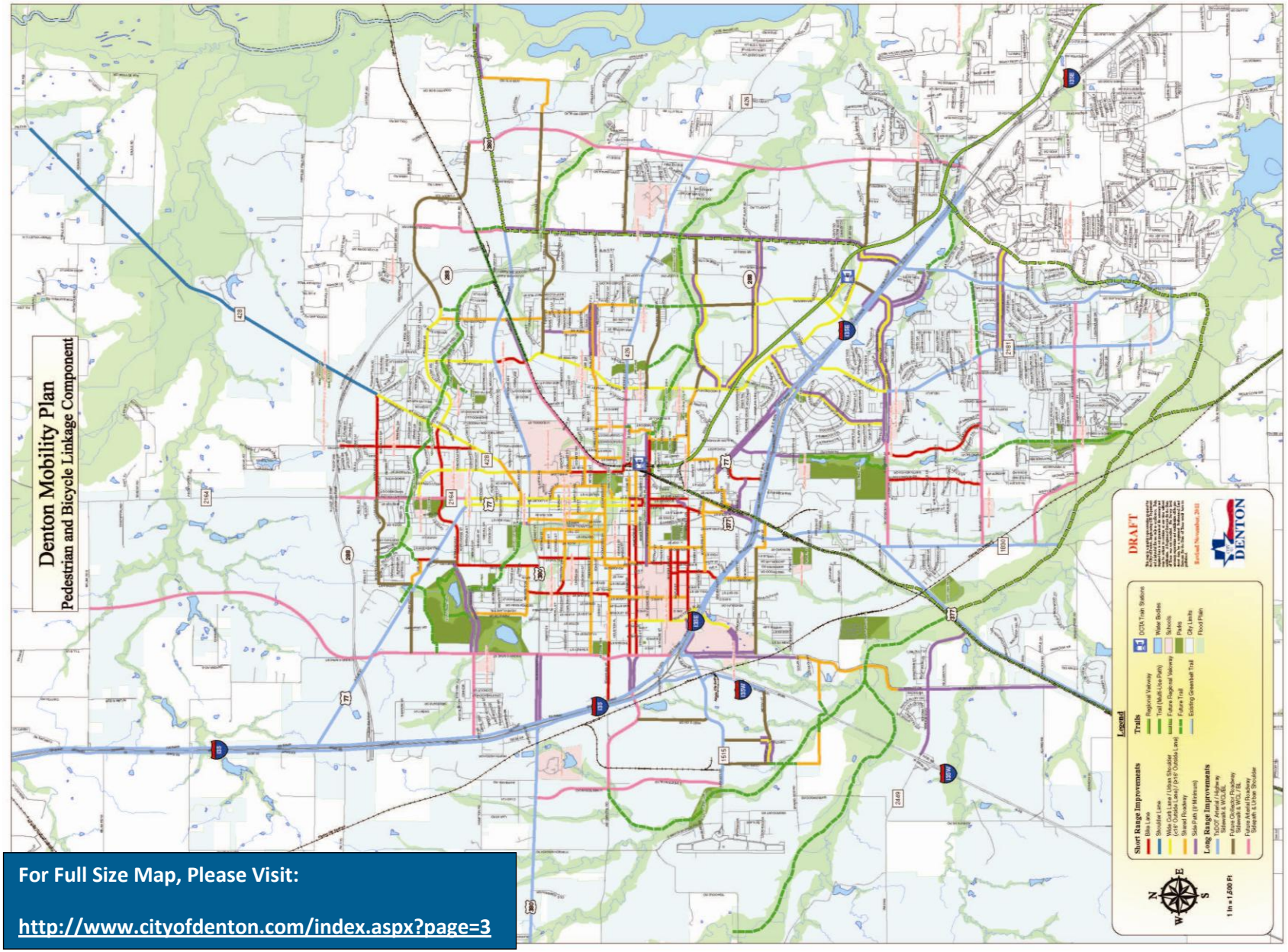
Encourage Use of Bicycle Modes of Transportation

Connect residential areas with major activity centers and recreational areas;
Provide adequate coverage with proper facilities
Provide continuity of designated facilities
Provide connections to major transit facilities to promote intermodal travel.

Any one of these factors may be the dominant consideration depending on the individual situations such as location of activity centers, available street network and off-road corridors, and physical barriers.



Bicycle Plan Map



For Full Size Map, Please Visit:

http://www.cityofdenton.com/index.aspx?page=3

Proposed Facilities

Update to the Pedestrian and Bicycle Linkage Component of the Denton Mobility Plan

The various on-street and off-street routes, lanes, sidepaths and trails recommended in this document form a network of facilities that comprise the Update to the Pedestrian and Bicycle Linkage Component of the Denton Mobility Plan. This plan is officially a component of the Denton Mobility Plan, together with the Roadway Component and the Rail and Trucking Component, Connectivity Component and guide the future development of the city's public right-of-way and infrastructure.

Immediate Range Facilities (One to Three Years)

There are many existing city streets that may be able to be adapted by striping, restriping or simply erecting signage to create several miles of on-street bicycle facilities. A reasonable time frame for development of these readily developed facilities is within the next one to three years, but depends totally on the availability of funding. The streets that appear to be the best candidates and were indicated in surveys during the public input sessions are listed in Appendix A. Many of these facilities are in the UNT, TWU and downtown areas of Denton.

Short Range Facilities (Three to Ten Years)

There are many more city streets and greenway corridors that will take a longer time to either assemble the funding or right-of-way to develop the on-street and off-street networks. On-street and sidepath projects that appear to be able to be developed within a Short Range time frame of 3 to 10years are listed in Appendix A. The hike and bike trail network will take significant funding as well, and a few of those projects could be accomplished in the short range as funding becomes available.

Long Range Facilities (After 10 Years)

A significant portion of the hike and bike trail system will be developed over a period of time beyond the 10 year time frame. Much of the on-street network is on roadways that are yet to be developed to their full section and once they do will be developed with current design standards that should accommodate bicyclists and pedestrians.

Summary of Facilities Proposed within this Update	
Shared Routes	27 miles
Wide Curb Lanes (WCL)	24 miles
Bike Lanes (BL)	20 miles
Side Paths	36 miles
Trails & Veloway	61 miles
TxDOT Roadway w/WCL or BL	57 miles
Future Collector w/ Side path and WCL or BL	15 miles
Future Arterial Roadway w/ Sidewalk and WCL or BL	27 miles
Immediate Range On-Street Facilities	
35 miles @ $0.6 Million to $1.2 Million	
Short Range On-Street Facilities	
35 miles @0.6 Million to 1.4 Million	

Prioritization

The comprehensive network of bicycle facilities should be implemented in stages, simply due to fiscal, physical and other constraints. In order to achieve an orderly implementation, a prioritization of projects is needed. Levels and resources of funding can change during the implementation period; therefore, the prioritization plan must be flexible. The prioritization program allows bike routes, bike lanes, side paths and multi-use trails to be evaluated based on a set of criteria that is open to review and clearly understandable. The list of bicycle project prioritization criteria is provided in the box to the right.

Connectivity of Demand

Provides a connection between significant bicycle activity centers (e.g. neighborhoods, town centers, public facilities, transit facilities, parks, trails, commercial developments).

Public Support/Commitment

Includes general public and political support for the individual project.

Cost Effectiveness

Can the project be accomplished in conjunction with another planned improvement project that is currently funded? Does the project improve overall road safety, etc. for the least cost?

Funding Commitments

Has commitment been made to fund the construction and ongoing maintenance of the facility?

Right-of-Way

Is sufficient existing right-of-way available or unencumbered so that the project may proceed immediately?

Network Development

Does this particular segment of bikeway connect other bikeways and provide an important linkage to facilitate regional bicycle travel?

Barriers

Does this particular project eliminate a potential barrier to bicycle travel or is there an existing barrier which would make completion of this bicycle facility difficult?

Reduction in Accidents

Is there data that indicates bicycle facility development along or within this corridor will improve bicyclist safety?

Public Input for Prioritization

During the Public Meeting conducted on April 13, 2011 several exercises were conducted with the attendees to gauge community priorities for implementation. The information gathered is intended to aid City decision makers as they assess and prioritize which portions of the Plan to implement first. Respondents showed a preference for more designated lanes on streets and bike/pedestrian-friendly street crossings. Respondents also indicated that Oak, Hickory, Elm, and Locust Streets were among their top priorities. It should be noted that these results are not characterized as being indicative of the priorities of the community as a whole, only those of the attendees.

Prioritization of Roadways from Public Meeting

Oak	8*	UNT	1*
Hickory	5*	Bell	1*
Elm	5*	Windsor	1*
Locust	4*	Nottingham	1*
University	3*	Old North	1*
Loop 288	2*	S. Denton	1*
Airport Road	2*	Alice	1*
Bonnie Brae	1*	Square to Golden	
Green Belt	1*	Triangle	1*
McKinney	1*		

**Number of Votes Received*

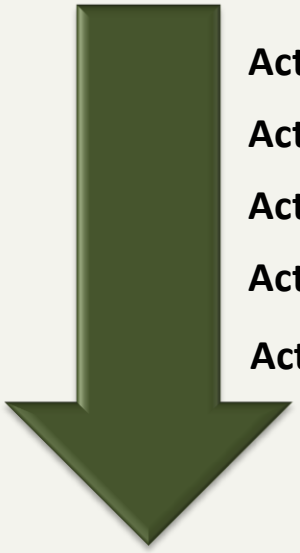
"If I had a Million Dollars"

Attendants of the Public Meeting were given ten dots, representing $100,000 each, and were asked to spend their money according to which facilities they would give first priority towards constructing. The top two facility priorities indicated by participants were to 1) Designate More Lanes on Streets and 2) Provide Bike-Friendly Crossings of Major Streets.

IMPLEMENTATION PLAN

The National Bicycling and Walking Study, developed by the Federal Highway Administration, recommended the action plan shown below for state, regional and local governments to work towards creating bicycling compatible environments in their community.

Following this basic framework, a plan for implementation of the City of Denton Bicycle Plan is described in the following paragraphs. All action items listed under each action area are directly coordinated with the objectives listed on page 6 of Chapter 2: Goals and Objectives.



Action Area 1: Organize a Bicycle Program

Action Area 2: Plan and Construct Needed Facilities

Action Area 3: Promote Bicycling and Walking

Action Area 4: Educate Bicyclists and the Public

Action Area 5: Enforce Laws and Regulations

Bike Plan Coordinator

Some communities make use of a bicycle Coordinator or Bicycle Plan Coordinator. A Bicycle Plan coordinator works with advocates, local elected officials, business leaders, media, law enforcement, transit providers and the general public to build partnerships providing leadership and vision so these groups may embrace and implement facilities and programs that increase the number of residents safely bicycling. Coordinator may:

- Review development proposals to ensure that local bicycle requirements are incorporated;
- Develop and implement educational and promotional programs, such as Bike to Work Day;
- Write grant proposals;
- Serve as public contact for bicycling inquiries and complaints;
- Staff the local bicycle advisory committee; and
- Coordinate with neighboring communities, transit agencies and public health staff to implement policies and projects.

-www.bicyclinginfo.org

Action Area 1: Organize a Bicycle Program

Action Item 1.1	**Monitor, maintain and update the Update to the Pedestrian and Bicycle Linkage Component of the Denton Mobility Plan.**
Task 1.1.1	Establish the roles and responsibilities for City staff within Planning, Engineering, and Parks and Recreation Departments to monitor the implementation of immediate and ongoing task items.
Task 1.1.2	Maintain a list of all public infrastructure projects in the City of Denton and whether and how they are incorporating bicycle and pedestrian accommodations.
Task 1.1.3	Prepare an annual report summarizing the progress implementation of the Bike Plan.
Task 1.1.4	Make changes to the update as needed as concepts change and opportunities arise.
Task 1.1.5	Dedicate budget for updates as they become necessary.
Action Item 1.2	**Maintain liaison between City Departments and local bicycling advocacy groups.**
Task 1.2.1	Formalize the roles and responsibilities of a designated employee(s) within the Planning, Engineering, Parks and Recreation, and Police Departments for interface with bicycling advocates.
Task 1.2.2	Provide on-line resources for informing bicycling advocates and other interested parties on City bicycling programs and policies and facilities planning, design and implementation.
Task 1.2.3	Conduct bicycle program coordination meetings with department liaisons and local bicycling advocates to discuss ongoing city activities related to implementation of the update.
Action Item 1.3	**Promote Coordination among the responsible agencies.**
Task 1.3.1	Formalize the roles and responsibilities of City staff for interface with the NCTCOG Pedestrian and Bicyclist Committee and other committees to provide input into the regional veloweb and promotion of bicycling and to assess the potential for regional funding of update recommendations.
Task 1.3.2	Formalize the roles and responsibilities of city staff for interface with the TxDOT Dallas District/North Region Bicycle and Pedestrian Coordinator to facilitate the incorporation of bicyclist and pedestrian accommodations on local TxDOT facilities and design projects.
Task 1.3.3	Formalize the roles and responsibilities of City staff for interface with Denton County and the other cities within Denton County to implement the update's recommendations and regional veloweb.

Action Item 1.4 **Implement a program of signs, maps and other bicycling and pedestrian facility and program information.**

- **Task 1.4.1** Hold a local contest to develop a bicycle network logo.
- **Task 1.4.2** Prepare designs for route numbering and other specialty signs and information kiosks.
- **Task 1.4.3** Prepare a strategic plan for bikeway network information signage and kiosk placement.
- **Task 1.4.4** Identify funding for creation and placement of signs, maps and kiosks.
- **Task 1.4.5** Prepare and distribute a Bike Facilities map for Denton.

Action Area 2: Plan and Construct Needed Facilities

Action Item 2.1	**Incorporate bicyclist accommodations in ongoing project design and facilities maintenance**
Task 2.1.1	Work with TxDOT to on the design of the reconstruction of IH 35E to incorporate new crossings of IH 35E for at least Pennsylvania/San Jacinto and at Wind River Lane; incorporate bicyclist accommodations at the IH 35E crossings of North Texas Blvd, McCormick Street, Mayhill Road, and Post Oak Drive; and to provide grade separated crossings for the veloway trail at the BNSF railroad near US 377 and at the creek crossing west of Post Oak.
Task 2.1.2	Assess all street improvement projects for the ability to accommodate bicyclists and document the decision on how or whether to accommodate them.
Task 2.1.3	Annually assess the opportunities to expand the existing trail network in Denton and focus resources on attaining funding and implementing those priority projects.
Task 2.1.4	Annually assess the opportunities to upgrade and expand the sidewalk and sidepath network in Denton and focus resources on attaining funding and implementing those priority projects.
Task 2.1.5	Review the ability of all signalized intersections in Denton to detect bicycles and develop a plan for needed actions.
Action Item 2.2	**Identify and pursue sources of funds for implementation of bicycle and pedestrian facilities**
Task 2.2.1	Parks and Recreation Department may identify available non-city funding sources for trail and sidepath projects for funding of projects to incrementally complete the trails master plan portion of update recommendations.
Task 2.2.3	City budgetary discussions should consider the amount that can be dedicated each year from city-controlled funds to implement portions of the update recommendations.

Action Area 3: Promote Bicycling

Action Item 3.1	**Develop and execute a bicycling public awareness campaign annually**
Task 3.1.1	Regularly compile and evaluate the available motorist and public information materials and best practices in Texas and throughout the US.
Task 3.1.2	Prioritize the objectives and set funding levels for promotion of bicycling annually.
Task 3.1.3	Develop and execute an annual event during National Bicycle Month (May) annually.
Task 3.1.4	Regularly identify sources of funding and partnerships for the public awareness campaign.
Action Item 3.2	**Collaborate with local bicycling advocates and businesses to establish a regional annual bicycling event in Denton**
Task 3.2.1	Establish a committee charged with creating and promoting a bicycling event in Denton.
Task 3.2.2	Coordinate with regional bicycling interests and organizations for promotion of Denton bicycling event.

Action Area 4: Educate Bicyclists and the Public

Action Area 4.1	**Encourage Denton ISD to incorporate bicycling education as part of their curriculum and activities**
Task 4.1.1	Continue to encourage and support the use of "Bike Rodeos" in order to educate DISD students on safe bicycling techniques.
Task 4.1.2	Promote bicycle awareness to school children, including the benefits of bicycling.
Task 4.1.3	Encourage creating a certificate for completion of bicycling education.
Action Item 4.2	**Encourage UNT and TWU to conduct bicycling proficiency training as part of the student orientation program**
Task 4.2.1	Educate new students on the benefits and advantages of bicycling to and from class.
Task 4.2.2	Educate new students on proper bicycling etiquette and safety, including the required local safety devices and fines for unsafe bicycling behavior.
Task 4.2.3	Provide new students with the locations of bicycle facilities in Denton.
Action Item 4.3	**Parks and Recreation and Police Department collaborate to offer a Smart Cycling program of training for the general public**
Task 4.3.1	Conduct the Smart Cycling program semi-annually with one session conducted during May in conjunction with National Bike Month.
Task 4.3.2	Educate the public on proper bicycling etiquette and safety, including required local safety devices and fines for unsafe bicycling behavior.
Task 4.3.3	Advertise the Smart Cycling program in bicycle literature and give adequate public notice and registration information to the public prior to conducting bicycle training session.
Action Item 4.4	**Prepare and execute an annual public information program on the proper response of motorists when encountering bicyclists on roadways**
Task 4.4.1	Utilize National Bicycle Month as an opportunity to create and distribute information on bicycle awareness and proper motorist etiquette when encountering bicyclists.
Task 4.4.2	Work with Denton ISD to incorporate information on the proper response of motorists to bicyclists in driver education courses.
Task 4.4.3	Coordinate with UNT and TWU to distribute information on proper response of motorists to bicyclists during National Bicycle Month.

Action Area 5: Enforce Laws and Regulations

Action Item 5.1 Encourage helmets and other safety devices for bicyclists

Task 5.1.1 Develop a list of required safety devices that should be encouraged while bicycling in Denton.

Task 5.1.2 Educate the public on the required safety devices and their importance.

Action Item 5.2 Establish an annual "Safe Denton Bicyclists" award

Task 5.2.1 Establish criteria for evaluating candidates for the Safe Denton Bicyclist award.

Task 5.2.2 Announce the award recipient each year during Bike-to-Work week during National Bike Month.

Task 5.2.3 Work with local bicycle organizations to establish a potential reward for Safe Denton Bicyclist award recipient.

Possible Action Timeline

Immediate	Ongoing	Short Term	Long Term
Task 1.1.1 Task 1.2.1 Task 1.3.1 Task 1.3.2 Task 1.3.3 Task 1.4.1 Task 1.4.2 Task 1.4.3 Task 1.4.4 Task 2.1.5 Task 5.1.1	Task 1.1.2 Task 1.1.3 Task 1.2.2 Task 1.2.3 Task 2.1.1 Task 2.1.2 Task 2.1.3 Task 2.1.4 Task 2.2.1 Task 2.2.3 Task 3.1.1 Task 3.1.2 Task 3.1.3 Task 3.1.4 Task 4.1.1 Task 4.1.2 Tasks 4.2.1 Task 4.2.2 Task 4.2.3 Task 4.3.1 Task 4.1.2 Task 4.3.3 Task 4.4.1 Task 4.4.2 Task 4.4.3 Task 5.1.2	Task 1.1.4 Task 1.1.5 Task 1.4.5 Task 3.2.1 Task 3.2.2 Task 4.1.3 Task 5.2.1 Task 5.2.2 Task 5.2.3	
Immediate Actions are typically those targeted for completion within the **first one to three** years of the Plan.	***Ongoing Actions*** are typically action items of a policy nature, those which require constant consideration by City Staff.	***Short Term Actions*** are typically those targeted for completion within the first **three to ten years** after Plan adoption.	***Long Term Actions*** are typically those targeted for completion within **ten to twenty years** after Plan adoption.

APPENDICIES

Appendix A: Immediate and Short-Range On-Street Facility Projects

*These costs are for budgetary purposes only and do not include ROW, Street Repair, Reconfiguration, or Reconstruction, Design Survey or Signals

Immediate Priority On-Street Facility Projects (1-3 Years Upon Funding)

Facility Name	Facility Type	Begin	End	Length, ft	Cost/mi (Lower)	Cost/mi (Upper)	Cost (Lower)	Cost (Upper)
Alice St	Shared_Roadway	Crescent St	W University Dr	1,758	3,000	5,000	$999	$1,665
Alice St	Shared_Roadway	Panhandle St	Crescent St	1,508	3,000	5,000	$857	$1,428
Alice St	Shared_Roadway	W Congress St	Panhandle St	722	3,000	5,000	$410	$683
Amherst Dr	Shared_Roadway	Malone St	Hinkle Dr	1,503	3,000	5,000	$854	$1,423
Anna St	Shared_Roadway	Crescent St	W University W to SP	2,252	3,000	5,000	$1,279	$2,132
Anna St	Shared_Roadway	Panhandle St	Crescent St	1,476	3,000	5,000	$839	$1,398
Audra Ln	Wide_Curb_Lane	Paisley St	Audra Ln	2,998	20,000	50,000	$11,357	$28,393
Bernard St	Shared_Roadway	W Highland St	W Sycamore St	1,201	3,000	5,000	$682	$1,137
Bernard St	Shared_Roadway	W Collins St	W Eagle Dr	883	3,000	5,000	$502	$837
Bernard St	Shared_Roadway	Maple St	W Highland St	405	3,000	5,000	$230	$384
Bernard St	Shared_Roadway	W Eagle Dr	Maple St	588	3,000	5,000	$334	$557
Blagg/Trinity	Shared_Roadway	Lakeview Blvd	E University Dr	5,872	3,000	5,000	$3,337	$5,561
Coit St	Shared_Roadway	W Congress St	Panhandle St	748	3,000	5,000	$425	$709
Coit St	Shared_Roadway	Panhandle St	Crescent St	1,482	3,000	5,000	$842	$1,404
Coit/Westway	Shared_Roadway	Crescent St	Alice St	1,850	3,000	5,000	$1,051	$1,752
Congress-Oakland-Withers	Shared_Roadway	N Locust St	N Bell Ave	1,400	3,000	5,000	$795	$1,326
Crescent St	Bike_Lane	Malone St	Bryan St	827	20,000	50,000	$3,131	$7,827
Crescent St	Shared_Roadway	Bryan St	Fulton St	1,269	3,000	5,000	$721	$1,202
Crescent St	Shared_Roadway	Fulton St	Alice St	948	3,000	5,000	$538	$897
Crescent St	Shared_Roadway	Alice St	Anna St	1,096	3,000	5,000	$623	$1,038
Crescent-Bolivar	Shared_Roadway	Anna St	W Congress St	2,725	3,000	5,000	$1,548	$2,580
E Hickory St	Shared_Roadway	Locust St	Railroad Ave	1,865	3,000	5,000	$1,059	$1,766
E Hickory St	Shared_Roadway	Elm St	Locust St	370	3,000	5,000	$210	$350

E Oak St	Shared_Roadway	N Elm St	N Bell Ave	1,662	3,000	5,000	$944	$1,574
E Sycamore St	Bike_Lane	W Veloway	E Veloway	431	20,000	50,000	$1,634	$4,085
E Sycamore St	Bike_Lane	S Locust St	W Veloway	1,444	20,000	50,000	$5,469	$13,673
E Sycamore St	Bike_Lane	S Elm St	S Locust St	382	20,000	50,000	$1,448	$3,619
E Windsor St	Bike_Lane	N Bell Ave	Stuart Rd	1,296	20,000	50,000	$4,907	$12,268
E Windsor St	Bike_Lane	Stuart Rd	E Sherman Dr	1,126	20,000	50,000	$4,267	$10,667
E Windsor St	Wide_Curb_Lane	Nottingham Dr	Old North Rd	2,690	20,000	50,000	$10,191	$25,476
Fulton St	Bike_Lane	Crescent St	W University Dr	1,451	20,000	50,000	$5,496	$13,739
Fulton St	Bike_Lane	W Congress St	Crescent St	1,520	20,000	50,000	$5,759	$14,397
Fulton St	Shared_Roadway	W Oak St	W Congress St	1,368	3,000	5,000	$777	$1,295
Hercules Ln	Bike_Lane	Stuart Rd	E Sherman Dr	2,955	20,000	50,000	$11,193	$27,982
Hercules Ln	Bike_Lane	N Locust St	Stuart Rd	2,924	20,000	50,000	$11,077	$27,694
Hinkle Dr	Bike_Lane	Fairground Trail	W Windsor St	2,555	20,000	50,000	$9,678	$24,196
Hinkle Dr	Bike_Lane	W University Dr	Amherst Dr	639	20,000	50,000	$2,420	$6,051
Hinkle Dr	Bike_Lane	Amherst Dr	Fairground Trail	1,365	20,000	50,000	$5,170	$12,924
Jagoe St	Shared_Roadway	W Oak St	Scripture St	1,118	3,000	5,000	$635	$1,058
Locust St	Bike_Lane	W Eagle Dr	E Sycamore St	2,186	20,000	50,000	$8,278	$20,696
Locust St	Bike_Lane	E Mulberry St	E Hickory St	370	20,000	50,000	$1,401	$3,503
Malone St	Bike_Lane	Scripture St	Crescent St	2,996	20,000	50,000	$11,348	$28,371
Malone St	Bike_Lane	Crescent St	W University Dr	996	20,000	50,000	$3,772	$9,430
Malone St	Bike_Lane	W University Dr	Amherst Dr	682	20,000	50,000	$2,584	$6,459
Malone-Auburn-Parkside	Shared_Roadway	Malone St	W Windsor St	4,357	3,000	5,000	$2,476	$4,126
McCormick St	Bike_Lane	Maple St	W Highland St	395	20,000	50,000	$1,497	$3,743
McCormick St	Bike_Lane	W Collins St	W Eagle Dr	953	20,000	50,000	$3,610	$9,025
McCormick St	Bike_Lane	W Eagle Dr	Maple St	586	20,000	50,000	$2,221	$5,552
McCormick St	Bike_Lane	I35E	W Collins St	1,011	20,000	50,000	$3,830	$9,576
McCormick St	Shared_Roadway	Willowwood St	I35E	1,987	3,000	5,000	$1,129	$1,881
Mockingbird Ln	Shared_Roadway	E McKinney St	Paisley St	2,616	3,000	5,000	$1,486	$2,477
Mockingbird Ln	Shared_Roadway	Paisley St	Audra Ln	2,909	3,000	5,000	$1,653	$2,754
Mockingbird Ln	Shared_Roadway	Paisley St	Mingo Rd	1,896	3,000	5,000	$1,077	$1,795

N Ave C	Shared_Roadway	W Hickory St	W Oak St	377	3,000	5,000	$214	$357
N Bell Ave	Bike_Lane	Mingo Rd	Withers St	1,074	20,000	50,000	$4,068	$10,169
N Bell Ave	Bike_Lane	Withers St	E College St	1,250	20,000	50,000	$4,735	$11,837
N Bell Ave	Shared_Roadway	College St	E Sherman Dr	3,479	3,000	5,000	$1,977	$3,294
N Elm St	Bike_Lane	W Hickory St	W Oak St	380	20,000	50,000	$1,439	$3,597
N Elm St	Wide_Curb_Lane	W Congress St	W Sherman DR	4,657	20,000	50,000	$17,640	$44,099
N Elm St	Wide_Curb_Lane	W Oak St	W Congress St	1,357	20,000	50,000	$5,139	$12,846
N Locust St	Bike_Lane	E Hickory St	W Oak St	373	20,000	50,000	$1,413	$3,534
N Locust St	Wide_Curb_Lane	E Congress St	W Sherman Dr	4,670	20,000	50,000	$17,689	$44,224
N Locust St	Wide_Curb_Lane	E Oak St	E Congress St	1,366	20,000	50,000	$5,173	$12,931
N Texas Blvd	Shared_Roadway	W Hickory St	W Oak St	359	3,000	5,000	$204	$340
N Texas Blvd	Wide_Curb_Lane	W Highland St	W Hickory St	1,947	20,000	50,000	$7,375	$18,438
N Texas Blvd	Wide_Curb_Lane	I35E	W Eagle Dr	719	20,000	50,000	$2,723	$6,807
N Texas Blvd	Wide_Curb_Lane	W Eagle Dr	NE of Eagle at side path	415	20,000	50,000	$1,572	$3,930
N Texas Blvd	Wide_Curb_Lane	NE of Eagle at side path	W Highland St	864	20,000	50,000	$3,273	$8,182
N Welch St	Shared_Roadway	W Hickory St	W Oak St	368	3,000	5,000	$209	$349
Oakland St	Shared_Roadway	Withers St	NLocust St	2,808	3,000	5,000	$1,596	$2,659
Paisley St	Shared_Roadway	Audra Ln	Mockingbird Ln	3,734	3,000	5,000	$2,122	$3,536
Paisley St	Shared_Roadway	N Wood St	Audra Ln	3,223	3,000	5,000	$1,831	$3,052
Paisley St	Shared_Roadway	Frame St	N Wood St	1,775	3,000	5,000	$1,009	$1,681
Panhandle St	Shared_Roadway	N Bonnie Brae St	Malone St	3,482	3,000	5,000	$1,978	$3,297
Panhandle St	Shared_Roadway	Malone St	Fulton St	1,985	3,000	5,000	$1,128	$1,879
Panhandle St	Shared_Roadway	Fulton St	Alice St	959	3,000	5,000	$545	$908
Panhandle St	Shared_Roadway	Coit St	Bolivar St	920	3,000	5,000	$523	$871
Panhandle St	Shared_Roadway	Alice St	Coit St	676	3,000	5,000	$384	$640
Ponder Ave	Shared_Roadway	W Oak St	Scripture St	1,077	3,000	5,000	$612	$1,020
Ponder-Congress	Shared_Roadway	Scripture St	Fulton St	662	3,000	5,000	$376	$627
Riney-Donna	Bike_Lane	N Elm St	Del Rd	615	20,000	50,000	$2,328	$5,819
S Ave C	Shared_Roadway	W Eagle St	Maple St	543	3,000	5,000	$309	$514

S Ave C	Shared_Roadway	W Highland St	W Hickory St	1,928	3,000	5,000	$1,096	$1,826
S Ave C	Shared_Roadway	Maple St	W Highland St	402	3,000	5,000	$228	$381
S Elm St	Bike_Lane	W Eagle Dr	Sycamore St	2,208	20,000	50,000	$8,365	$20,912
S Elm St	Bike_Lane	W Mulberry St	W Hickory St	371	20,000	50,000	$1,404	$3,511
S Elm St	Bike_Lane	W Sycamore St	W Mulberry St	359	20,000	50,000	$1,361	$3,402
S Locust St	Bike_Lane	E Sycamore St	E Mulberry St	364	20,000	50,000	$1,380	$3,451
S Welch St	Bike_Lane	W Highland St	W Sycamore St	1,204	20,000	50,000	$4,561	$11,402
S Welch St	Bike_Lane	W Eagle Dr	Maple St	584	20,000	50,000	$2,213	$5,532
S Welch St	Bike_Lane	Maple St	W Highland St	391	20,000	50,000	$1,481	$3,702
S Welch St	Bike_Lane	W Mulberry St	W Hickory St	390	20,000	50,000	$1,479	$3,697
S Welch St	Bike_Lane	W Sycamore St	W Mulberry St	353	20,000	50,000	$1,336	$3,340
Scripture St	Bike_Lane	I35	Jagoe St	3,459	20,000	50,000	$13,102	$32,754
Scripture St	Shared_Roadway	Jagoe St	Ponder Ave	1,748	3,000	5,000	$993	$1,655
Scripture St	Shared_Roadway	I35	Jagoe St	2,502	3,000	5,000	$1,422	$2,369
Stuart Rd	Bike_Lane	Hercules Ln	Just S of Loop 288	2,059	20,000	50,000	$7,798	$19,495
Stuart Rd	Bike_Lane	Coronado Dr	Windsor St	1,843	20,000	50,000	$6,982	$17,454
Stuart Rd	Shared_Roadway	Sherman Dr	Coronado Dr	231	3,000	5,000	$131	$219
W Collins St	Shared_Roadway	Benard St	Fort Wort Dr	1,994	3,000	5,000	$1,133	$1,888
W Collins St	Shared_Roadway	Ave A	Bernard St	1,380	3,000	5,000	$784	$1,307
W Congress St	Shared_Roadway	Fulton St	Bolivar St	2,562	3,000	5,000	$1,456	$2,426
W Congress St	Shared_Roadway	Bolivar St	N Elm St	447	3,000	5,000	$254	$423
W Congress St	Shared_Roadway	N Elm St	N Locust St	388	3,000	5,000	$220	$367
W Eagle Dr	Bike_Lane	S Ave C	Ave A	1,445	20,000	50,000	$5,472	$13,679
W Eagle Dr	Bike_Lane	N Texas Blvd	S Ave C	921	20,000	50,000	$3,490	$8,725
W Eagle Dr	Bike_Lane	S Welch St	Bernard St	875	20,000	50,000	$3,316	$8,290
W Eagle Dr	Bike_Lane	Ave A	S Welch St	498	20,000	50,000	$1,885	$4,713
W Eagle Dr	Bike_Lane	Bernard St	S Elm St	2,221	20,000	50,000	$8,415	$21,037
W Hickory St	Bike_Lane	Welch St	N Carroll Blvd	2,132	20,000	50,000	$8,077	$20,192
W Hickory St	Bike_Lane	N Texas Blvd	Ave C	1,337	20,000	50,000	$5,066	$12,665
W Hickory St	Bike_Lane	Ave C	Welch St	1,966	20,000	50,000	$7,447	$18,616
W Hickory St	Bike_Lane	I35	N Texas Blvd	1,943	20,000	50,000	$7,361	$18,402

W Hickory St	Shared_Roadway	N Carroll Blvd	Elm St	1,100	3,000	5,000	$625	$1,042
W Oak St	Bike_Lane	Fulton St	N Carroll Blvd	1,917	20,000	50,000	$7,262	$18,155
W Oak St	Bike_Lane	Jagoe St	Ponder Ave	1,780	20,000	50,000	$6,744	$16,861
W Oak St	Bike_Lane	N Texas Blvd	N Ave C	1,338	20,000	50,000	$5,068	$12,670
W Oak St	Bike_Lane	Ponder Ave	Fulton St	405	20,000	50,000	$1,536	$3,840
W Oak St	Bike_Lane	I35	N Texas Blvd	1,950	20,000	50,000	$7,385	$18,462
W Oak St	Shared_Roadway	N Carroll Blvd	N Elm St	1,078	3,000	5,000	$613	$1,021
W Sycamore St	Bike_Lane + Signal	S Carroll St	S Elm St	1,072	20,000	50,000	$254,061	$260,153
W Sycamore St	Shared_Roadway	S Welch St	Benard St	875	3,000	5,000	$497	$828
W Sycamore St	Shared_Roadway	Bernard St	S Carroll St	1,291	3,000	5,000	$734	$1,223
			Total Immediate Range Project Miles:	**34.86**	**Total Immediate Range Project Cost:**		**$643,863**	**$1,190,062**

Short-Range Priority On-Street Facility Projects (3 to 10 Years Upon Funding)

*These costs are for budgetary purposes only and do not include ROW, Street Repair, Reconfiguration/Reconstruction, Design, Survey or Signals

Facility Name	Facility Type	Begin	End	Length, ft.	Cost/mi (Lower)	Cost/mi (Upper)	Cost (Lower)	Cost (Upper)
Acme-Bernard	Shared_Roadway	Fort Worth Dr	Willowwood St	1,019	3,000	5,000	$579	$965
Alegra Vista Dr	Shared_Roadway	Sombre Vista Dr	Dallas Dr	562	3,000	5,000	$319	$532
Bell Pl	Bike_Lane	E McKinney St	Mingo Rd	650	20,000	50,000	$2,461	$6,152
Bonnie Brae St	Shared_Roadway	Hickory Creek Trail	Corbin Rd	2,838	3,000	5,000	$1,612	$2,687
Bonnie Brae St	Shared_Roadway	450' N of Riesling	Hickory Creek Trail	2,766	3,000	5,000	$1,572	$2,620
Brinker Rd	Wide_Curb_Lane	Veloway	Loop 288	2,778	20,000	50,000	$10,524	$26,311
Brinker Rd	Wide_Curb_Lane	Colorado Blvd	Veloway	1,304	20,000	50,000	$4,941	$12,352
Brinker Rd	Wide_Curb_Lane	Loop 28	Spencer Rd	1,077	20,000	50,000	$4,081	$10,203
Bushey-Bradshaw	Shared_Roadway	Morse St	E Sycamore St	2,387	3,000	5,000	$1,356	$2,261
Centre Place Dr	Bike_Lane	I35E	Sombre Vista Dr	2,196	20,000	50,000	$8,319	$20,797
Colorado Blvd	Wide_Curb_Lane	San Jacinto Blvd	Spencer Rd	3,250	20,000	50,000	$12,311	$30,778

Colorado Blvd	Wide_Curb_Lane	Medpark Dr	Brinker Rd	2,131	20,000	50,000	$8,073	$20,182
Colorado Blvd	Wide_Curb_Lane	Loop 288	San Jacinto Blvd	1,911	20,000	50,000	$7,239	$18,096
Colorado Blvd	Wide_Curb_Lane	Brinker Rd	Loop 288	2,792	20,000	50,000	$10,574	$26,435
Colorado Blvd	Wide_Curb_Lane	S Mayhill Rd	Medpark Dr	1,487	20,000	50,000	$5,631	$14,078
Colorado Blvd	Wide_Curb_Lane	S Mayhill Rd	Veloway	430	20,000	50,000	$1,627	$4,068
Corbin Rd	Shared_Roadway	900 feet East of I35	S Bonnie Brae St	2,300	3,000	5,000	$1,307	$2,178
Corbin Rd	Shared_Roadway	Spring Side Rd	On Corbin at FP	3,081	3,000	5,000	$1,751	$2,918
Daugherty/Myrtle	Shared_Roadway	S Locust St	Collins St	1,460	3,000	5,000	$829	$1,382
Daugherty-Smith	Shared_Roadway	Locust St	Dallas St	2,431	3,000	5,000	$1,381	$2,302
Del Rd	Shared_Roadway	Donna Rd	Nicosia St	1,667	3,000	5,000	$947	$1,579
Donna Rd	Bike_Lane	Del Dr	Cooper Creek Trail Ext	189	20,000	50,000	$714	$1,786
E Sherman Dr	Shared_Roadway	N Locust St	N Bell Ave	1,717	3,000	5,000	$975	$1,626
E Sherman Dr	Shared_Roadway	N Bell Ave	Greenwood Dr	823	3,000	5,000	$468	$780
E Sherman Dr	Wide_Curb_Lane	Greenwood Dr	E Windsor St	3,808	20,000	50,000	$14,423	$36,057
E Sherman Dr	Wide_Curb_Lane	E Windsor St	Cooper Creek Trail	685	20,000	50,000	$2,594	$6,484
E Sherman Dr	Wide_Curb_Lane	Cooper Creek Trail	Hercules Ln	3,256	20,000	50,000	$12,334	$30,835
E Sycamore St	Bike_Lane	Veloway	S Bradshaw St	1,496	20,000	50,000	$5,668	$14,170
E Sycamore St	Shared_Roadway	S Bradshaw St	Pecan Creek Trail	349	3,000	5,000	$199	$331
E Windsor St	Wide_Curb_Lane	E Sherman Dr	Cooper Creek Trail	2,410	20,000	50,000	$9,129	$22,822
E Windsor St	Wide_Curb_Lane	Cooper Creek Trail	Nottingham Dr	2,081	20,000	50,000	$7,883	$19,709
E Windsor St	Wide_Curb_Lane	Old North Rd	Loop 288	598	20,000	50,000	$2,263	$5,658
Forest Ridge Dr	Bike_Lane	E Ryan Rd	Hobson Ln	5,345	20,000	50,000	$20,248	$50,619
Fort Worth Dr	Bike_Lane	W Collins St	W Eagle St	774	20,000	50,000	$2,933	$7,332
Lillian B Miller Pkwy	Wide_Curb_Lane	Teasley Ln	I35E	4,057	20,000	50,000	$15,369	$38,422
Locust-Collins	Shared_Roadway	W Daugherty St	Fort Worth Dr	1,999	3,000	5,000	$1,136	$1,893
Maple St	Bike_Lane	S Ave C	Ave A	1,401	20,000	50,000	$5,309	$13,272

Maple St	Bike_Lane	Ave A	S Welch St	567	20,000	50,000	$2,149	$5,371
Maple St	Bike_Lane	S Welch St	Bernard St	882	20,000	50,000	$3,340	$8,349
Medpark Dr	Wide_Curb_Lane	Brinker Rd	Colorado Blvd	2,116	20,000	50,000	$8,016	$20,040
Montecito Rd	Bike_Lane	E Ryan Rd	E Hobson Ln	6,017	20,000	50,000	$22,792	$56,981
Morse St	Shared_Roadway	Bushey St	S Woodrow Ln	2,752	3,000	5,000	$1,564	$2,606
Morse St	Shared_Roadway	Veloway	Bushey St	1,352	3,000	5,000	$768	$1,280
Morse St	Wide_Curb_Lane	Brinker Rd Extension	S Loop 288	1,873	20,000	50,000	$7,094	$17,735
Mulberry St	Bike_Lane	S Elm St	S Locust St	379	20,000	50,000	$1,437	$3,592
N Bell Ave	Wide_Curb_Lane	E Windsor St	N Locust St	2,326	20,000	50,000	$8,812	$22,031
N Bell Ave	Wide_Curb_Lane	E Sherman Dr	Windsor St	3,696	20,000	50,000	$14,001	$35,002
N Elm St	Wide_Curb_Lane	W Sherman Dr	N Locust St	3,542	20,000	50,000	$13,416	$33,539
N Locust St	Wide_Curb_Lane	W Sherman Dr	N Elm St	3,092	20,000	50,000	$11,712	$29,280
N Wood St	Shared_Roadway	E McKinney St	Paisley St	1,589	3,000	5,000	$903	$1,505
Nottingham Dr	Bike_Lane	Mingo Rd	E University Dr	1,808	20,000	50,000	$6,847	$17,119
Nottingham Dr	Wide_Curb_Lane	E University Dr	Cooper Creek Trail	2,986	20,000	50,000	$11,312	$28,281
Nottingham Dr	Wide_Curb_Lane	Cooper Creek Trail	E Windsor St	860	20,000	50,000	$3,258	$8,146
Nottingham Dr	Wide_Curb_Lane	Audra Ln	Mingo Rd	1,064	20,000	50,000	$4,032	$10,080
Oak Valley	Shared_Roadway	Paisley St	Whispering Oaks	1,624	3,000	5,000	$923	$1,538
Old North Rd	Shared_Roadway	Mingo Rd	Cooper Creek Trail	2,907	3,000	5,000	$1,652	$2,753
Old North Rd	Shared_Roadway	Cooper Creek Trail	E Windsor St	989	3,000	5,000	$562	$937
Pennsylvania Dr	Wide_Curb_Lane	Teasley Ln	I 35E	5,814	20,000	50,000	$22,022	$55,056
Robinson Rd	Wide_Curb_Lane	State School Rd	Veloway	2,000	20,000	50,000	$7,577	$18,942
Robinson Rd	Wide_Curb_Lane	Teasley Ln	State School Rd	3,764	20,000	50,000	$14,259	$35,647
S Bonnie Brae St	Shared_Roadway	Corbin Rd	S of Highland Park Rd	1,327	3,000	5,000	$754	$1,257
S Locust St	Shared_Roadway	300' S of E Daugherty St	E Daugherty St	357	3,000	5,000	$203	$338
S Mayhill Rd	Wide_Curb_Lane	I35E	Colorado Blvd	2,367	20,000	50,000	$8,967	$22,417

S Woodrow Ln	Wide_Curb_Lane	Pecan Creek Trail	Paisley St	4,638	20,000	50,000	$17,568	$43,920
S Woodrow Ln	Wide_Curb_Lane	Shady Oaks Dr	Morse St	1,290	20,000	50,000	$4,887	$12,217
S Woodrow Ln	Wide_Curb_Lane	Morse St	Pecan Creek Trail	1,452	20,000	50,000	$5,501	$13,752
S Woodrow Ln	Wide_Curb_Lane	Spencer Rd	Shady Oaks Rd	428	20,000	50,000	$1,621	$4,052
San Jacinto Blvd	Side_Path	I 35E	Colorado Blvd	2,224	80,000	150,000	$33,694	$63,177
San Jacinto Blvd	Wide_Curb_Lane	I35E	Colorado Blvd	2,224	20,000	50,000	$8,424	$21,061
Shady Oaks Dr	Wide_Curb_Lane	S Woodrow Ln	Morse Rd Extension	1,647	20,000	50,000	$6,239	$15,597
Shady Oaks Dr	Wide_Curb_Lane	Morse Rd Ext'n	Brinker Rd Ext'n	3,698	20,000	50,000	$14,006	$35,015
Shelby Ln	Wide_Curb_Lane	Corbin Rd	Dakota Ln	1,333	20,000	50,000	$5,051	$12,627
Smith-Hill	Shared_Roadway	Dallas St	Veloway	2,421	3,000	5,000	$1,376	$2,293
Spencer Rd	Wide_Curb_Lane	S Woodrow Ln	Brinker Rd	5,355	20,000	50,000	$20,285	$50,713
Spencer Rd	Wide_Curb_Lane	Loop 288	S Mayhill Rd	2,476	20,000	50,000	$9,378	$23,445
Spencer Rd	Wide_Curb_Lane	Brinker Rd	Loop 288	1,193	20,000	50,000	$4,520	$11,301
Stuart Dr	Bike_Lane	Cooper Creek Tr	Hercules Ln	2,602	20,000	50,000	$9,858	$24,645
Stuart Dr	Bike_Lane	W Windsor St	Cooper Creek Trail	819	20,000	50,000	$3,101	$7,753
Sycamore-Crawford-Oak	Shared_Roadway	Pecan Creek Trail	On Oak East of Crawford	1,645	3,000	5,000	$935	$1,558
W Highland St	Bike_Lane	S Welch St	Bernard St	875	20,000	50,000	$3,315	$8,287
W Highland St	Bike_Lane	N Texas Blvd	S Ave C	1,321	20,000	50,000	$5,002	$12,505
W Highland St	Bike_Lane	S Ave C	Ave A	1,385	20,000	50,000	$5,246	$13,115
W Highland St	Bike_Lane	Ave A	S Welch St	578	20,000	50,000	$2,189	$5,474
W Sherman Dr	Shared_Roadway	N Elm St	N Locust St	406	3,000	5,000	$230	$384
W Windsor St	Bike_Lane	Hinkle Dr	N Elm St	2,392	20,000	50,000	$9,062	$22,656
W Windsor St	Bike_Lane	N Elm St	N Locust St	2,033	20,000	50,000	$7,701	$19,254
W Windsor St	Bike_Lane	N Locust St	N Bell Ave	1,605	20,000	50,000	$6,081	$15,202
Walt Parker Dr	Wide_Curb_Lane	S Bonnie Brae St	I35E	1,981	20,000	50,000	$7,502	$18,756
Wind River Ln	Wide_Curb_Lane	Unicorn Lake Blvd	I35E	5,922	20,000	50,000	$22,432	$56,081
			Total Short Range Project Miles:	**34.8 Mi**	**Total Short Range Costs:**		**$582,658**	**$1,415,334**

Appendix B: Funding

Funds for bicycle and pedestrian projects, programs and activities may be funded through many different sources, of which the Federal-aid program is only one. Each funding source may have specific criteria for eligibility of project or program types, physical locations in which they may be implemented or other constraints on how the funds are used.

Some upcoming funding opportunities for bicycle and pedestrian improvements in Denton may include:

The 2005 Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), which is the most recent funding authorization legislation for Federal-aid programs, requires each state DOT to set aside federal funds from eligible categories for the construction of bicycle and pedestrian transportation facilities.

Transportation Enhancement Program

The Texas Department of Transportation (TxDOT) issued the 2009 Statewide Transportation Enhancement Program (STEP) Call for Projects on October 9, 2009. As stipulated in the "Texas Transportation Enhancement Program Guide 2009," projects that fall within the North Central Texas Council of Governments (NCTCOG) Metropolitan Planning Area (MPA) must be submitted to NCTCOG for approval prior to the submission to TxDOT. A letter of support for eligible projects is provided by NCTCOG to local governments to include in their completed applications to their local TxDOT District Office.

On January 29, 2010, the Regional Transportation Council received the following project submittals from cities in the region that have been provided to local TxDOT districts:

- Dallas District Bike/Ped Projects = 20 projects totaling $65,536,651
- Fort Worth District Bike/Ped Projects = 19 projects totaling $29,742,774

Only a small number of these projects are expected to be funded. This is typically an annual program that is always very competitive. Typically, a project must be part of an overall master plan and the benefits to the community must be well documented.

Much of the funds for the STEP program for the remainder of the current SAFTEA-LU authorization have already been allocated by the TRC to projects for the region.

Safe Routes to School Program

Safe Routes to School programs create practical projects to make school routes safer for children to walk and bicycle, such as sidewalks, crosswalks and bicycle facilities. Community leaders, parents and schools also use education programs to help children travel safely to and from school. Read more in the flyer from the National Center for Safe Routes to School.

The 2009 SRTS Program Call applications were due November 30, 2009. The program call for projects is anticipated to be on an annual basis, pending funding authorizations. The 2009 program did not include funding for preparation of plans, as it had in the past, but rather focused on implementation of facilities.

Congestion Mitigation and Air Quality Program

In 2004, the U.S. Environmental Protection Agency (EPA) designated nine counties in North Central Texas as nonattainment for the pollutant ozone in accordance with the National Ambient Air Quality Standards (NAAQS). These standards are designed to protect human and environmental health, and ground-level ozone is monitored and targeted for reductions due to its potentially harmful effects. Four main

sources of ozone-causing emissions include On-road Mobile Sources like cars and trucks, Non-road Mobile Sources like construction equipment, Point Sources like electric generating utilities and industrial boilers, and Area Sources like solvent use and agriculture.

Development of an air quality plan, known as the State Implementation Plan (SIP), is required for all nonattainment areas in order to demonstrate how ozone will be reduced to levels compliant with the NAAQS. The SIP for the Dallas-Fort Worth nonattainment area includes programs to get older cars off the road, technologies to clean up vehicles already on the road, and education programs so that citizens can do their part in improving air quality in North Texas.

In the past, projects to encourage walking and bicycling in north Texas have been funded under the CMAQ program. Recent funding constraints and requirements to prove air quality benefits have made these funds more restrictive and yet still very competitive. Much of the funds for the CMAQ program for the remainder of the current SAFTEA-LU have already been allocated by the TRC to projects for the region.

Hazard Elimination Program

The Hazard Elimination (HES) Program is part of the Highway Safety Improvement Program (HSIP). The basic objective of the HES Program is to reduce the number and severity of crashes. The program objectives are accomplished through "highway safety projects." HES projects may be for locations both on and off the state highway system. HES projects may accomplish any of the following:

- Correct or improve high-hazard locations
- Eliminate roadside obstacles
- Treat roadside obstacles
- Improve highway signing and pavement marking
- Install traffic control or warning devices at locations with a high number of crashes.

These projects may range from spot-safety improvements and upgrading of existing conditions to new roadway construction (such as grade separations). Highway safety projects should be small in scope, low in cost, and can be let to contract within three years. The TxDOT Districts will advise local communities of an upcoming call for projects.

Other Agency Funding

Texas Recreational Trails Program

Texas Parks and Wildlife Department (TPWD) administers the National Recreational Trails Fund in Texas under the approval of the Federal Highway Administration (FHWA). This federally funded program receives its funding from a portion of federal gas taxes paid on fuel used in non-highway recreational vehicles. The grants can be up to 80% of project cost with a maximum of $200,000 for non-motorized trail grants and currently there is not a maximum amount for motorized trail grants (call 512-389-8224 for motorized trail grant funding availability). 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. Application deadline is May 1st each year.

Texas Parks and Wildlife Commission Regional Grants

This grant program was created to assist local governments with the acquisition and development of multi-jurisdictional public recreation areas in the metropolitan areas of the state. It allows cities, counties,

water districts, and other units of local government to acquire and develop parkland. The program provides 50% matching fund, reimbursement grants to eligible local governments for both active recreation and conservation opportunities. Master plans submission deadline is 60 days prior to application deadline. Grants are awarded yearly by TPW Commission when funds are available. This program is currently inactive, but may be reinstated in 2010.

Environmental Protection Agency - Community Action for a Renewed Environment (CARE)

[Deadline: March 9, 2010] http://www.epa.gov/air/grants/care_rfp_1_10.pdf

The Environmental Protection Agency is making $2 million available to reduce pollution at the local level through community-based programs. Two types of awards are available: Level 1 awards ($75,000-$100,000) are designed to help establish partnerships on the community level to develop local environmental priorities; Level 2 awards ($150,000-$300,000) are designed to help with implementation of risk reduction activities and measure results for communities which have already established partnerships and identified priority risks. Note: this is a highly competitive fund and not directly applicable to bike/ped initiatives.

Texas Department of State Health Services

TDSHS may be a resource for educational and safety programs that increase physical activity, fight obesity, and improve health. On September 17, 2009, the Centers for Disease Control and Prevention announced a new program: Communities Putting Prevention to Work. Thirty to forty communities will receive a total of $373 million in American Recovery and Reinvestment Act (stimulus) dollars through this competitive grant program to support interventions that reduce obesity (through improved physical activity and nutrition) and/or reduce tobacco use. Communities can apply for either focus area or both. This landmark opportunity is aimed at mobilizing community resources toward broad-based policy, systems, organizational and environmental changes. The application places an emphasis on communities demonstrating effective coalitions, and notes that special consideration should be given to the inclusion of populations disproportionately affected by chronic diseases. Note that construction and research are not eligible activities.

On September 29, 2009 the Department of Health and Human Services (HHS) announced the release of $120 million in American Recovery and Reinvestment Act (ARRA) funds for prevention and wellness programs for U.S. states and territories, building on the recent announcement of the $373 million funding opportunity for communities and tribes around the country. In all, the comprehensive Communities Putting Prevention to Work initiative will make $650 million available for public health efforts to address obesity, increase physical activity, improve nutrition, and decrease smoking.

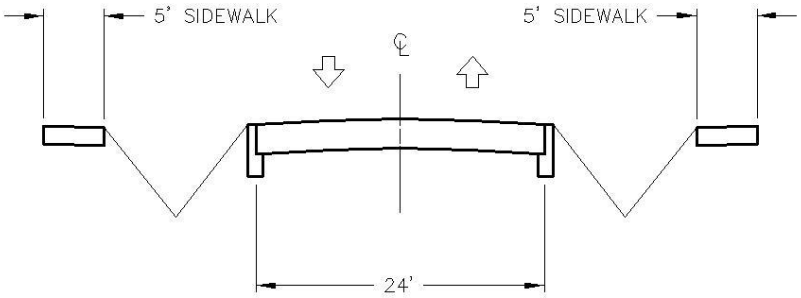
Lead Applicant needs to be either a local or state health department. The deadline for 2009 Awards was December 1, 2009. It is uncertain whether additional funds will be made available in the future, but to be ready it is in the city's interest to work with the health department to demonstrate how the city and local advocates can be a resource to them.

The key to the success of Communities Putting Prevention to Work will be to implement community-wide policies, systems, and environmental changes that reach across all levels of the socio-ecological model and include the full engagement of the leadership in city

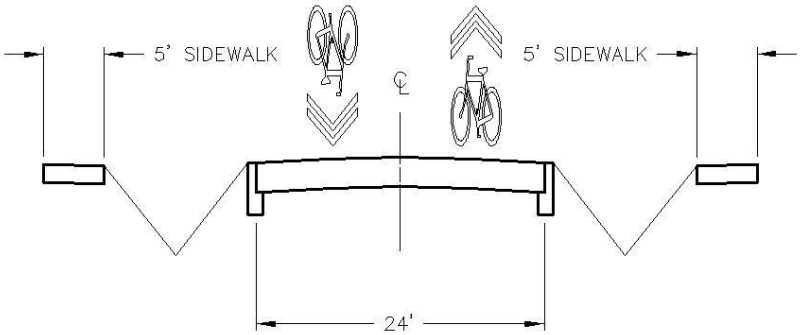
government, boards of health, schools, businesses, community and faith-based organizations, community developers, transportation and land use planners, parks and recreation officials, health care purchasers, health plans, health care providers, academic institutions, foundations, other Recovery Act-funded community activities, and many other community sectors working together to promote health and prevent chronic diseases. Funded programs need to build on, but not duplicate current Federal programs as well as state, local, or community programs and coordinate fully with existing programs and resources in the community."

Appendix C: City of Denton Roadway Design Standards

Rural / Suburban Street Section

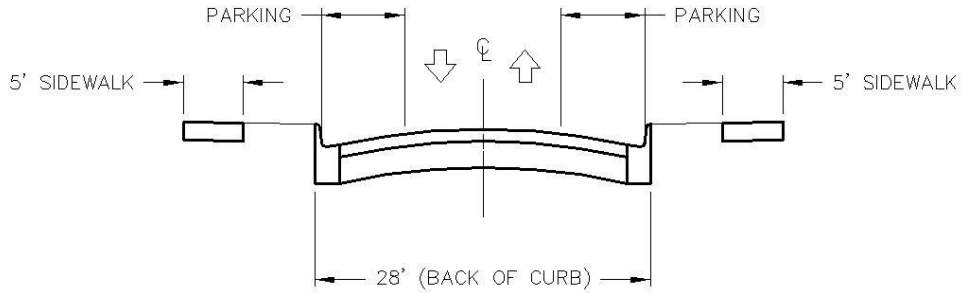


Current Accommodation: Shared Lanes



Alternative Design Concept : As is, Add Sharrows

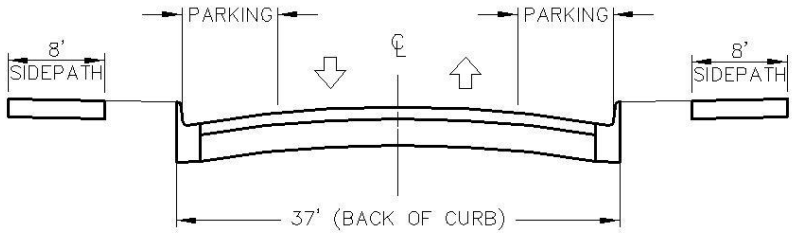
Residential Street Section



Current Accommodation: Shared Lanes

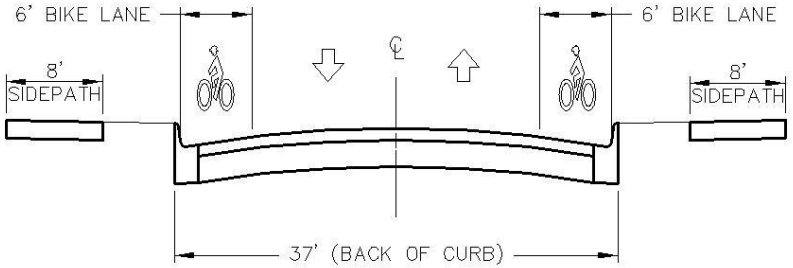
Alternative Design Concept : None

Residential Avenue Section (Residential Collector)



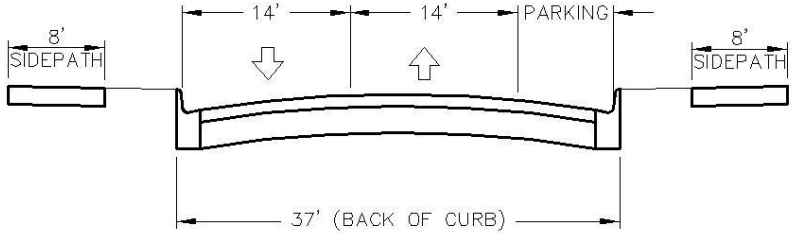
Current Accommodation:

Shared Lanes, Sidepath both sides



Alternative Design Concept (A) :

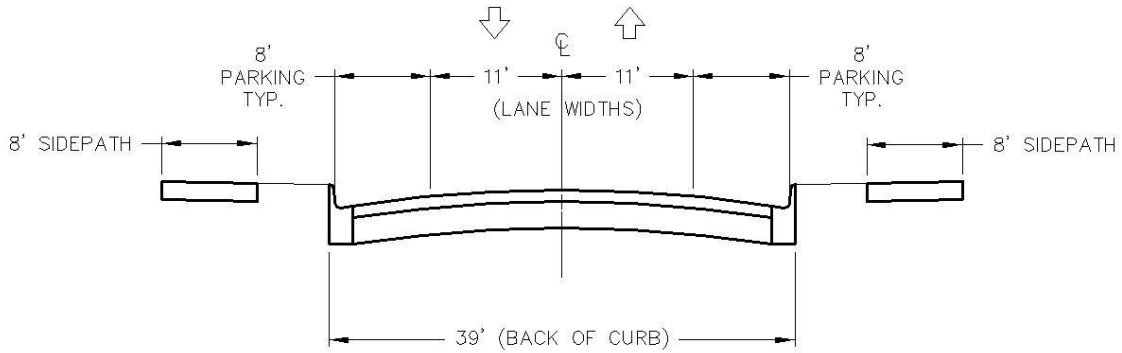
6' Bike Lanes, No-Parking



Alternative Design Concept (B) :

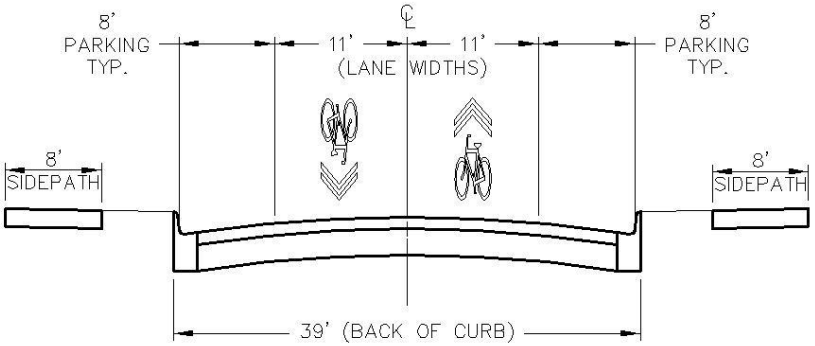
2-14' Wide Shared Lanes,
Parking on one side

Main Street Mixed Use Collector Section (1 of 2) (Commercial Collector)



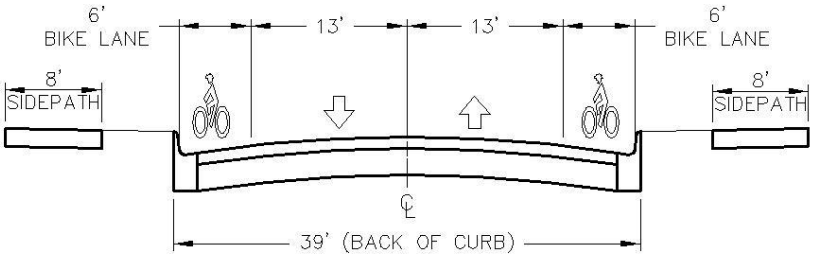
Current Accommodation: Shared Lanes, Sidepath both sides

Main Street Mixed Use Collector Section (2 of 2) (Commercial Collector)



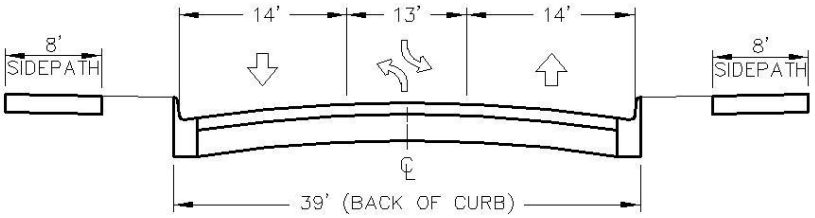
Alternative Design Concept (A) :

As is, Add Sharrows



Alternative Design Concept (B) :

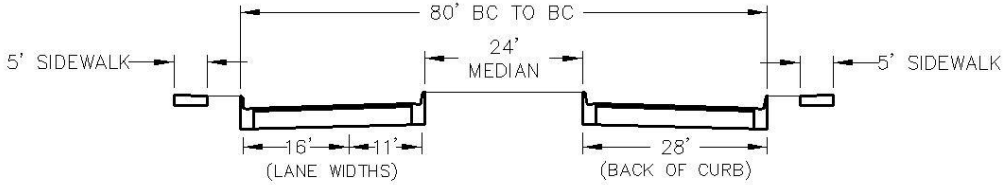
6' Bike Lanes, No Parking



Alternative Design Concept (C) :

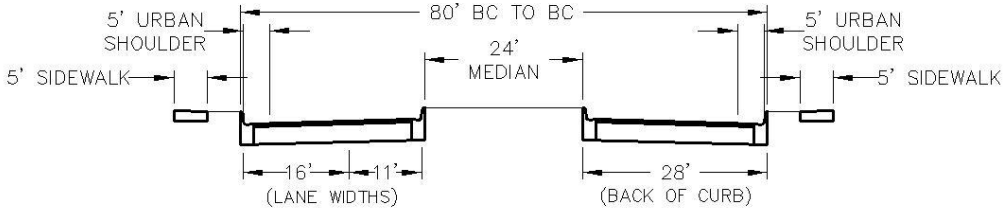
Continuous Left TurnLane,
2-14' Wide Shared Lanes

Secondary Arterial Section



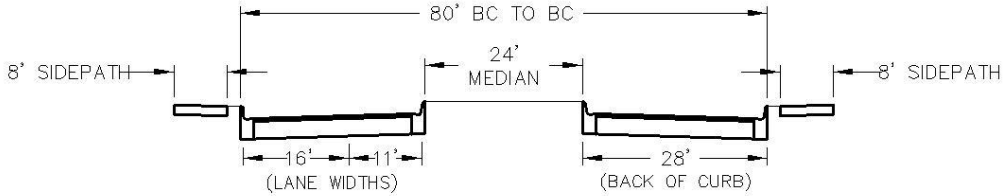
Current Accommodation:

Shared Wide Curb Lanes,
Sidewalk



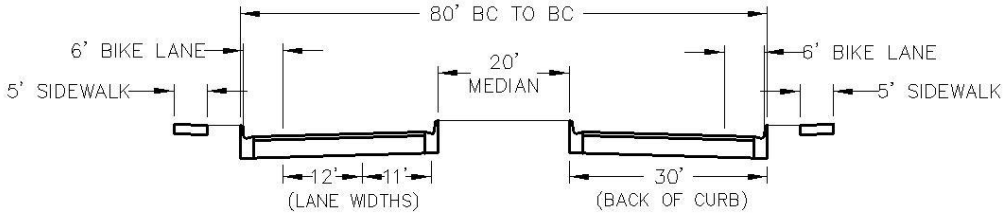
Alternative Design Concept (A) :

As is, Stripe 5' Urban Shoulders
Add Share the Road Signs



Alternative Design Concept (B) :

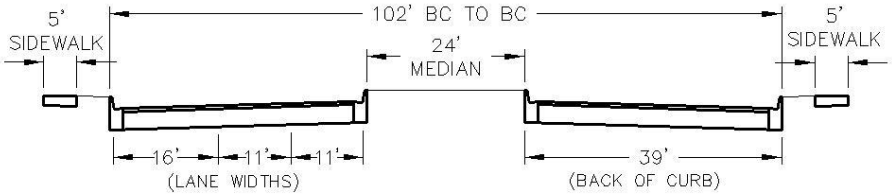
As is, 8' Sidepath Both Sides



Alternative Design Concept (C) :

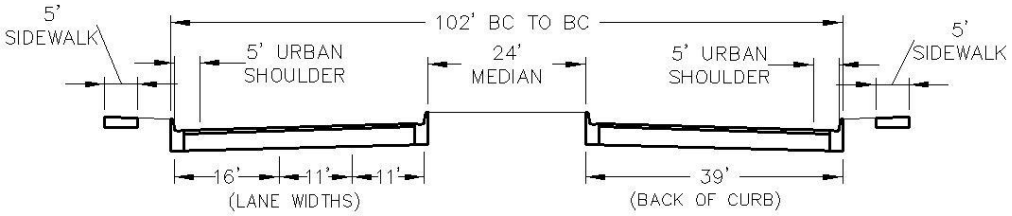
Stripe 6' Bike Lanes
1-11' Lane, 1-12' Lane
Reduce Median width to 20'

Primary Arterial Section



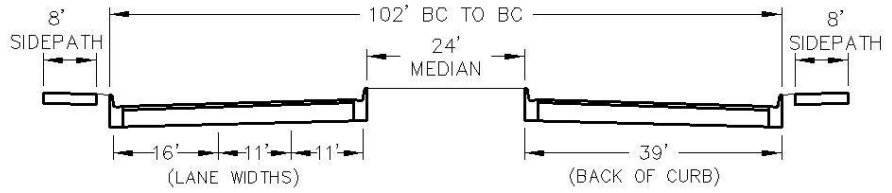
Current Accommodation:

Shared Wide Curb Lanes,
Sidewalk



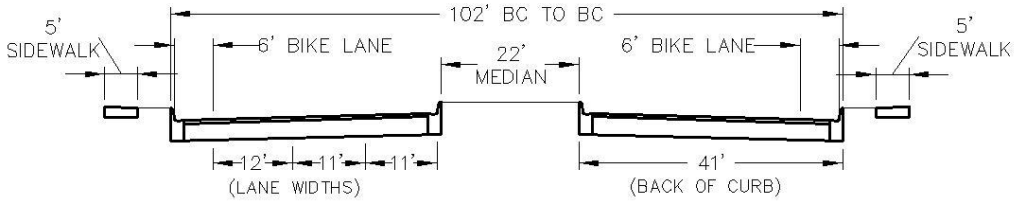
Alternative Design Concept (A) :

As is, Stripe 5' Urban Shoulders
Add Share the Road Signs



Alternative Design Concept (B) :

As is, 8' Sidepath Both Sides



Alternative Design Concept (C) :

Stripe 6' Bike Lanes
2-11' Lanes, 1-12' Lane
Reduce Median width to 22'

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